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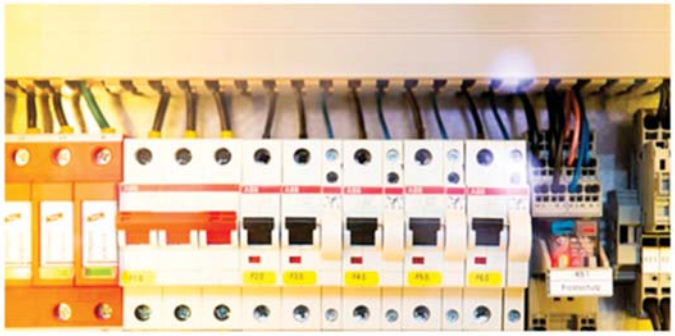

ELECTRICAL MACHINERY AND PARTS

IN-DEPTH REVIEW OF STRATEGIC TRADE SECTORS IN UKRAINE

USAID COMPETITIVE ECONOMY PROGRAM IN UKRAINE (USAID CEP)

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USAID Competitive Economy Program in Ukraine (USAID CEP) promotes a strong, diverse, and open economy of Ukraine by enhancing the business environment for small and medium enterprises (SMEs), improving competitiveness in promising industries, and enabling Ukrainian companies to benefit from international trade.

This Research Conducted by:

INSTITUTE
FOR ECONOMIC RESEARCH
AND POLICY CONSULTING

Table of Contents

List of abbreviations

EEM	electric equipment manufacturing
GDP	gross domestic product
GVA	gross value added
MFN	most favored nation
PE	private entrepreneur (short for a physical person – entrepreneur)
RCA	revealed comparative advantage
SME	small and medium-sized enterprises
UAH	Ukrainian hryvnia

Executive Summary

The electric equipment manufacturing (EEM) sector is quite small in Ukraine, accounting for 0.5% of Gross Value Added (GVA). Disruption of trade links with Russia, high domestic competition, and obsolete technology limited growth in the sector.

The sector is heavily reliant on international trade as it exports its large part of its products and imports many of its inputs. The market share of the EEM producers on the domestic market is low.

Most of the exports go to the EU and Russia. The EEM sector exports a wide selection of products in low quantities as the Ukrainian export share for most products is below 1%. One exception is the export of electric coffee and tea makers, where Ukraine accounts for 5% of world exports.

About half of imported electrical equipment comes from the EU, and another 18% came from China in 2018. There is a lot of untapped potential in the trade with Turkey as the EEM sector's exports are minimal, and the share of imports is low at 3%.

Ukrainian exports of the electric equipment to Turkey can be done subject to a relatively low average duty of less than 2%. However, non-tariff barriers seem quite high. In Ukraine, we see the reverse situation: importers from Turkey are required to pay duty on the MFN basis up to 10% or about 4% on average, but they have an easier time complying with technical regulations.

Summary table

Indicator	Value	Year of observation
Value added, % of GVA	0.5	2018
SMEs value added, % of sector total	77	2017
Real output growth, % CAGR, 2018	1.4	2018
Hired employees, thous.	50.4	2018
Average monthly wage, UAH	8201	2018
Exports, USD bn	1.18	2018
Exports, % of domestic production	67	2017
Imports, USD bn	2.76	2018
Imports, % of domestic absorption	82	2017
Ukraine RCA, world	0.56	2018
Ukraine RCA, Turkey	0.07	2018

Sources: Ukrstat, WITS, authors' estimates

1. The general situation in the sector

1.1. Domestic production

Value added. The electrical equipment manufacturing (EEM) sector is relatively small in Ukraine. It produces different products ranging from transformers and wires to batteries to household appliances. We should note that though cable producers are an essential part of the EEM sector, producers of automotive cable harnesses and other electric products for the car industry are not classified as part of the EEM.[1] The EEM sector in Ukraine produced ca. 0.5% of the gross value added in 2018, which is less than 0.7% observed in 2013.

Table 1: Value added in the EEM sector*, 2013 – 2018

	2013	2014	2015	2016	2017	2018
Value added, UAH bn	8.5	7.5	7.4	9.2	11.3	15.3
Value added, % of output	34.1	33.2	28.3	30.0	29.9	32.9
Value added, % of GVA	0.7	0.5	0.4	0.5	0.4	0.5
Value added produced by PE, % of total	0.2	0.4	0.5	0.6	0.9	0.8

Source: Ukrstat, IER estimates
*Note: * based on information for private companies*

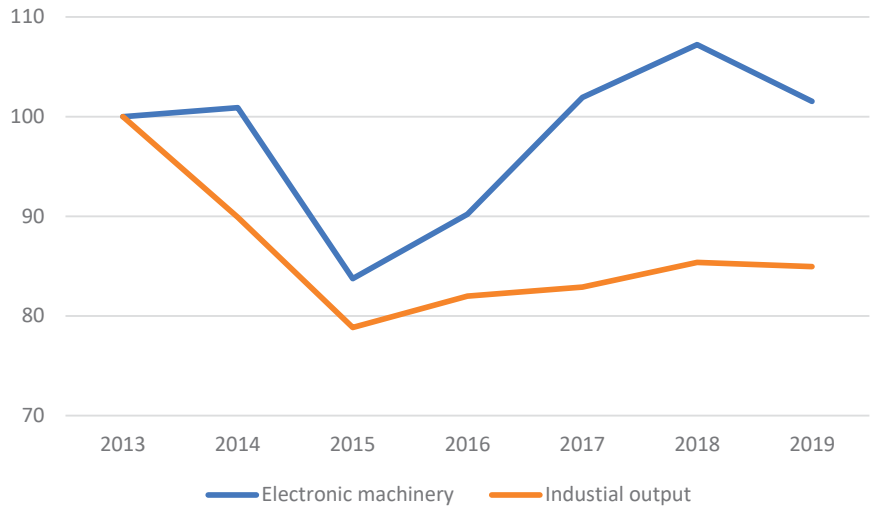
In 2018, 1039 companies and 467 entrepreneurs in the EEM sector reported their activity to the statistical office. The number of active companies in the industry was stable over the last years, but the number of entrepreneurs increased, as it was 265 private entrepreneurs in 2013.

Six large companies were working in the sector in 2018, and the rest were SMEs. The largest companies include Ukrgrafit plant in Zaporizhia that produces electrodes and other graphite-based parts for electrical equipment, Electrolux Ukraine household appliances plant in Ivano-Frankivsk, State-owned Electrovazhmash in Kharkiv that produces generators (used in power plants, large electric machines, locomotives etc.), ZTR electrical transformer plant in Zaporizhia, Odescable and Pivdencable cable plants in Odesa and Kharkiv respectively. In 2017, the five largest companies accounted for 23% of the value-added generated in the sector (2018 data are confidential). The 152 medium companies contributed another 59% of value-added in 2017.

The EEM sector performed slightly better than the industrial sector as a whole over the last years. 2015 slump in output due to the Eastern Ukraine conflict was followed by significant growth in 2016-2018 (see Figure 1). Recovery in the EEM sector was broad-based, with growth observed in all subsectors. However, in 2019, the sector output decreased again.

[1] According to EU PRODCOM, automotive cables belong to NACE code 29.31, while other cable and wiring producers are NACE 27.3.

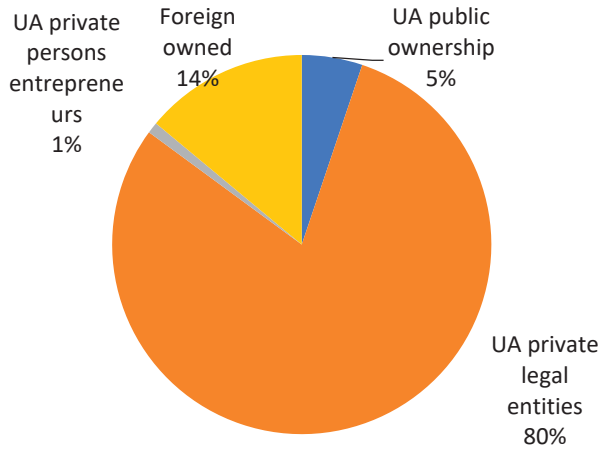
Figure 1: Real output trends, 2013-2019, index 2013=100



Source: Ukrstat

Ownership structure. Domestically owned companies commanded 80% market share in the EEM sector in 2018 (see Figure 2). Plants built during the Soviet period in Ukraine were sold to Ukrainian investors, and the majority remain in Ukrainian hands. Some of them are owned through shell companies registered in Cyprus, the British Virgin Islands and other financial centers.

Figure 2: Ownership structure of the EEM sector, 2018



Source: Own calculations based on Ruslana and Ukrstat data

Among the six largest companies listed above, four are Ukrainian-owned (two cable plants, ZTR, and Ukrgrafit). Electrovazhmash is the only company of significant size in the EEM sector that remains publicly owned. The market share of foreign-owned companies is relatively small at 14%, but several essential players in the global EEM market are represented in Ukraine. Swedish appliance giant Electrolux AB owns Electrolux Ukraine, the largest FDI company. Other foreign companies with significant FDI in Ukraine include Fujicura from Japan that produces cables in Ukraine, HVAC producer Groupe Atlantic from France, Shreder Belgian lighting-systems company, and Polish TF Kable cable producer.

Market concentration. Company sales data shows that concentration was moderate, with top-8 companies accounting for about 21% of total sales in the EEM sector. There is a strong backbench of middle-sized companies. According to the Ukrstat enterprise data, small companies accounted for only 15% of total sales in 2018.

Access to finance. According to the NBU statistics, bank loans outstanding to the EEM sector companies were UAH 13.6 bn by end-April 2020. The EEM sector has relatively good access to bank funding as compared to other industries. However, the bulk of the loan portfolio is short-term loans in foreign currency. That is likely working capital financing for exporters. Loans with maturity over a year accounted only for 29% of the total.

That was confirmed during consultations held to formulate Exports Strategy for machine building in 2018.[2] Though meetings were held with representatives of the entire machine-building sector, the concerns of producers are likely fully applicable to the EEM sector. Producers complained about high cost and difficulties in access for longer-term financing, i.e. for equipment upgrades. Producers also noted conservative valuations of the collateral that limited sizes of the loans; for instance, equipment is valued as scrap metal. That means that the EEM firms likely had to fund most of the investment internally.

Informal sector. The level of informality is likely low in the EEM sector as starting new production requires considerable investment, and their products are generally more challenging to sell informally. World Bank enterprise survey data[3] from 2019 nevertheless show that 32% of companies surveyed in the broader machinery and equipment sector competed against informal firms, and 42% of surveyed companies identified competition from the informal sector as a significant constraint. That is slightly lower than average for manufacturing but still considerable. That may reflect competition from informal imports that comes on the domestic market without paying VAT and customs duties. That is particularly important for household appliances producers.

1.2. Employment

Sector's role as an employer. The EEM sector is a relatively small employer as a whole, employing less than 1% of the private sector workforce. However, the largest companies have reasonably large workforces. The company with the largest workforce has almost 4000 employees, and 16 more had over 500 employees. The machine-building employers complain about inadequate vocational training as well as brain drain. It seems that wage incentives induced employees to move to similar companies in other countries or other sectors with higher wages.

Table 2: Employment in the sector*, 2013 – 2018

	2013	2014	2015	2016	2017	2018
The number of hired employees in the sector, thous.	74.6	65.8	56.8	54.4	51.8	50.5

[2] According to Draft the export strategy for machine building. Please see https://www.me.gov.ua/Documents/Download?id=0cb5f246-3e6a-47a1-a811-d59b71fbc4f0 te

[3] As found on enterprisesurveys.org

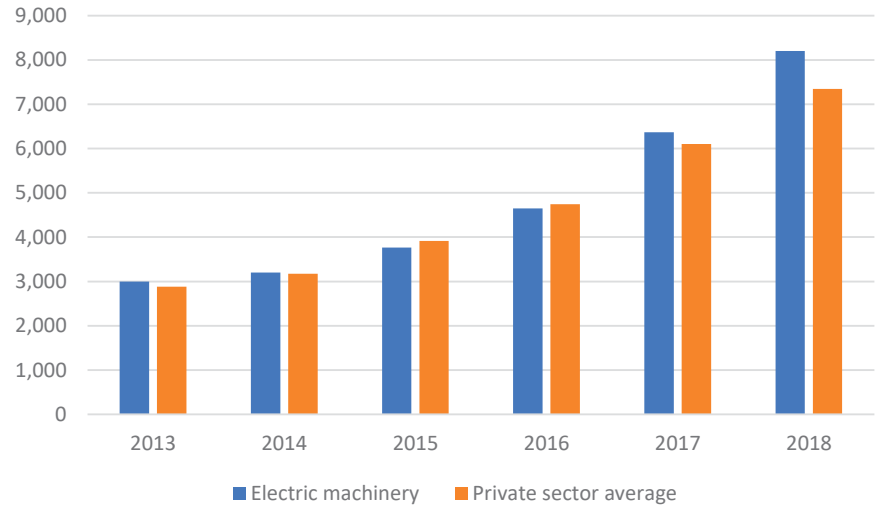
	2013	2014	2015	2016	2017	2018
Hired employees in the sector, % of total in the economy	0.9	0.9	0.9	0.8	0.8	0.7
Average monthly wage, UAH	2998	3204	3765	4650	6367	8201
Average monthly wage, USD	375	270	172	182	239	302
Real average monthly wage, index, 2013=100	74.6	65.8	56.8	54.4	51.8	50.5

Source: Ukrstat
*Note: * based on information for private companies*

Self-employment. Self-employment in the EEM sector is minimal due to high start-up costs. However, the EEM sector likely supports some self-employment in the allied services fields such as engineering, R&D and other professional services.

Wages and labor mobility. The average wage in the EEM sector was close to the average for the economy over the last years, but it grew faster (see Figure 3). However, the EEM sector wages are lower than average for manufacturing jobs, and in fact, workers in the EEM sector seem to be among the worst paid among industrial workers. That may be fueling the employee drain we discussed before.

Figure 3: Average monthly wage, 2013-2018



Source: Ukrstat

Data on employee turnover show the considerable rate of staff movement in the EEM sector and the industry as a whole. Over two years in 2018-2019, 7.8% of employees in the industry left their jobs were fired on average each quarter, and only 6.4% were newly hired. Among all industrial workers, 6.5% left their jobs each quarter, and 5.6% were hired. That is somewhat lower than hire and

separation rates observed in the US,[4] but Ukraine has much more rigid labor regulations than the US, where a default rule is "at-will employment".

1.3. Sector development assessment

The EEM sector now faces quite a few challenges:

Technology. The industry is behind on technology. It was lagging non-Soviet countries after the break-up of the Soviet Union, and it never had the chance to catch up. To catch up, it needs to raise more financing and invest in the modernization of its equipment and production processes. The strengthened protection of property rights, including intellectual property, will also be essential to facilitate innovations and boost sector development.

Financing. The sector has limited access to long-term funding, as most Ukrainian companies do. Larger EEM firms have enough collateral to get some working capital financing but raising long-term loans is problematic in part because there are very few long-term investors in Ukraine.

Trade reorientation. Ongoing conflict with Russia means that trade with Russia may cease abruptly. Thus, the EEM companies must move from Post-Soviet value chains to the new global ones. Otherwise, they would not replace lost orders. To achieve the reorientation and integration in new value chains, it may be necessary to improve quality control and standard compliance and work jointly with other machine-building companies to create clusters.

Labor force. The EEM companies need to have enough qualified workers to keep plants open as old workers leave the field and few new ones join. That may mean expanded benefits and increased involvement in vocational training.

Impact of Covid-19 pandemic. Finally, the EEM sector would need to deal with the aftermath of the Covid-19 pandemic. On the one hand, it means lower income in Ukraine and other countries and thus lower demand for electric machinery and potential workplace outbreaks of Covid-19 sickness. On the other hand, some global companies in the sector are likely to move production closer to the home turf and closer to the EU borders. That may be an excellent opportunity for Ukrainian EEM companies, but Ukraine may quickly lose to neighboring countries.

2. Foreign trade

2.1. Exports and imports

Exports of the EEM sector dropped sharply in 2014-2015 as trade links with Russia frayed due to the armed conflict in eastern Ukraine. In 2016-2018, the DCFTA with the EU helped expand exports to the EU, but that was not enough to cover previous years' losses.

Table 3: Foreign trade in the EEM sector*, 2013 – 2018

	2013	2014	2015	2016	2017	2018
Value of exports, USD bn	1.67	1.20	0.79	0.75	0.99	1.18

[4] https://data.bls.gov/PDQWeb/jt. Note that only a few countries seem to provide labor turnover data. See https://www.bls.gov/opub/mlr/2015/article/pdf/comparison-of-u-s-and-international-labor-turnover-statistics.pdf

	2013	2014	2015	2016	2017	2018
Exports growth, % year-on-year		-28	-34	-5	32	19
Exports, % of total exports	2.6	2.2	2.1	2.1	2.3	2.5
Value of imports, USD bn	3.37	2.47	1.57	1.84	2.30	2.86
Imports growth, % year-on-year		-27	-36	18	25	25
Imports, % of total imports	4.4	4.5	4.2	4.7	4.6	5.0
Trade balance, USD bn	-1.70	-1.27	-0.78	-1.09	-1.30	-1.68

Source: Ukrstat/WITS
Note: not including automobile cables

The EEM sector heavily relies on international trade to function. About two-thirds of the sector's output is exported, and a large share of the sector's inputs are imported.

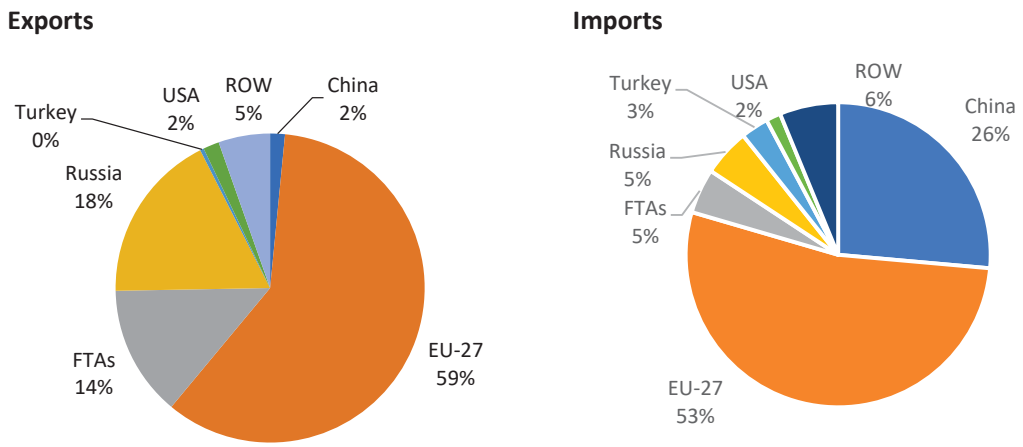
Table 4: Export orientation and import dependence of the sector, 2017

	% of exports in domestic production	% of imports in internal absorption	% imported inputs in intermediate consumption
Electric machinery sector	67%	82%	30%

Source: SAM 2017

Russia and the EU are primary destinations for Ukrainian exports, though, in 2018, exports to the EU far outpaced the exports to Russia. The largest individual trading partner among the EU countries is Hungary.

Figure 4: Key trade destinations of the sector, 2018



Source: Ukrstat

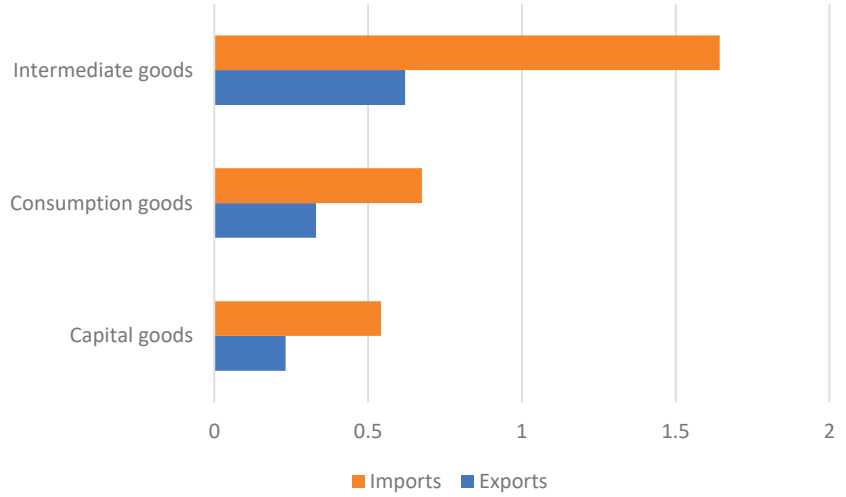
Note: data for Turkey, China, Belarus, Moldova, Armenia, Azerbaijan, Georgia, Uzbekistan, Kazakhstan, and Tajikistan include IT services and telecommunications.

Trade with Turkey is minimal. Exports are almost non-existing, while Turkish goods account for 3% of the imports. A prospective free trade agreement may help to open the Turkish market to our exports, according to our informants, though non-tariff barriers are also limiting factor in market access.

Ukrainian exports are relatively diversified in terms of goods. The largest export item is exports of electro-thermic coffee or tea makers (HS 8516 71), where Ukraine is in the top-10 of global exporters and was responsible for almost 3% of global exports in 2018. For most products in the EEM sector, the Ukrainian producers contributed less than 1% to world exports.

Market share of imported products is high for investment products as well as consumer goods, e.g. household appliances. Thus, the EEM sector producers face stiff competition in the domestic market. That may have pushed them to specialize in niche products, and some of them to focus on export markets instead of domestic ones.

Figure 6: Trade by the end-use, 2018, USD bn



Source: WITS

2.2. Revealed comparative advantage

At the sector level, Ukraine has no comparative advantage in the EEM sector both globally and on the market of Turkey. For Turkey, the conclusion is the opposite: its products are competitive overall and on the Ukrainian market. Relatively low market share is likely due to the incumbent advantages of the EU exporters and cost advantages of Chinese exporters.

Table 5: Revealed Comparative Advantage on the sector level

	2013	**2018**
Ukraine RCA		
World	0.67	0.56
Turkey	0.04	0.07
Turkey RCA		
World	1.71	1.37

	2013	2018
Ukraine	1.73	1.63

Sources: WITS, own estimates

The Ukrainian producers enjoy a comparative advantage for several products in the EEM sector. For the most part, these are niche products with little international trade. For example, Ukrainian producers achieved a 12% share of world exports of high-output DC motors (or USD 33 m out of USD 269 m). Other products where EEM producers generated over or close to 1% of the world exports include coffee makers, carbon electrodes, shaver parts, particular subspecies of welding machines, electric lamps and welding apparatus. Out of these products, only exports of coffee makers and carbon electrodes exceeded USD 100 m.[5]

However, most of these products are not exported to Turkey. In fact, in 2018, only two EEM products enjoy a comparative advantage on the Turkish market (See Table 6a), but the export of these products did not reach a million-dollar point in 2018. Moreover, Ukraine lost its comparative advantage for several EEM products between 2013 and 2018.

Table 6a: Revealed Comparative Advantage of Ukraine, top-5 products

HS 2007	Description	2013	2018
World			
850134	DC motors (excl. universal AC/DC motors); DC generators (excl. generating sets), of an output >375kW	38.84	55.28
850133	DC motors (excl. universal AC/DC motors); DC generators (excl. generating sets), of an output >75kW but not >375kW	30.46	18.10
851671	Coffee/tea makers, electric	0.05	13.31
851529	Other machines & apparatus for resistance welding of metal, other than fully/partly automatic	12.31	10.88
851090	Parts of the electric appliances of 85.10	0.76	10.55
Turkey			
854790	Insulating fittings for electrical machines/appliances/equip.(excl. of 85.46, 8547.10 & 8547.20); electrical conduit tubing & joints therefor, of base metal lined with insulating material	0.00	8.40
851539	Machines & apparatus for arc (incl. plasma arc) welding of metals, other than fully/partly auto.	0.00	1.03
851010	Shavers, with self-contained electric motor	2.39	0.00
851090	Parts of the electric appliances of 85.10	1.13	0.00
841451	Table/floor/wall/window/ceiling/roof fans, with a self-contained electric motor of an output not >125W	1.07	0.72

[5] If we group two types of electrodes listed in the table 6a

Source: WITS, own calculations

Turkey has a strong EEM sector with a substantial number of competitive products. Those with the highest world exports market share include certain types of dryers, freezers and dishwashers, and some other kitchen appliances, as well as some types of liquid transformers and circuit breakers. Most of these products also have some presence in the Ukrainian market. Some products have even stronger RCA for Ukraine than globally. This might be statistical noise where Turkish suppliers were lucky in getting one of the few import orders for some types of electric equipment. Still, the list also includes some goods with over a million dollars in exports, including generator parts and certain types of generating sets.

Table 6b: Revealed Comparative Advantage of Turkey, top-5 products

HS 2007	Description	2013	2018
World			
845121	Drying machines other than 84.50, each of a dry linen capacity not >10kg	8.05	17.95
841840	Freezers of the upright type, not >900 l capacity, electric/other	18.06	17.52
842211	Dishwashing machines of the h-hold. type	14.39	16.25
845011	Household/laundry-type washing machines (incl. machines which both wash & dry), each of a dry linen capacity not >10kg, fully-auto.	12.00	15.43
841810	Combined refrigerator-freezers, fitted with separate external doors, electric/other	9.41	9.20
Ukraine			
630110	Electric blankets	21.36	45.39
850300	Parts suit. for use solely/principally with the machines of 85.01/85.02	6.28	19.59
732190	Parts of the non-electric domestic appliances of 7321.11-7321.83, of iron/steel	12.90	19.35
853910	Sealed beam electric filament lamp units	2.54	18.99
853990	Parts of the electric lamps of 85.39	3.92	15.56

Source: WITS, own calculations

3. Trade regime issues

3.1. Trade regime for exporters to Turkey

Until recently, Turkey applied GSP duties for Ukrainian electric equipment. Thus, most electric equipment could be exported from Ukraine to Turkey free of duty. Since 2018, GSP status was revoked, and Turkey started to apply MFN duties for Ukrainian goods. These are relatively low at 2 to 4%.

However, Turkey applies several non-tariff measures in the sector. According to the TRAINS database, there are a total of 23 non-tariff measures. Most of the electrical equipment is subject to technical regulations. Export of regulated electrical equipment at a minimum requires obtaining importer authorization and conformity certificate. Some goods are subject to further technical barriers such as certification requirement, product authorization. These complicated procedures downplay potential competitive advantages generated by Ukraine's legal harmonization with the EU technical regulations, also used by Turkey. Finally, the EEM sector produces several dual-use goods that subject to enhanced controls in international trade.

For some goods, there are non-technical barriers as well. Some of the electric equipment is subject to a special consumption tax that is similar to excise tax in its application. Other goods are subject to import surveillance. According to the EU report,[6] import surveillance in Turkey is akin to a minimum import price in its effect. Before importing a product subject to surveillance at a customs price below the level set by the Turkish government, the importer needs to receive a surveillance certificate from customs authorities. To get the certificate application containing detailed information about importer and supplier of goods and then issuance of the certificate is discretionary. Faced with these requirements, no importer bothered to apply for the certificate instead of choosing to inflate customs value above the threshold.

Extensive formalities related to exports by the EEM sector producers may have discouraged them from using preferential access to the Turkish market.

3.2. Trade regime for importers from Turkey

Ukraine currently applies the MFN tariffs for goods from Turkey. MFN import duties on electric equipment range from 0% to 10%, with many tariff lines rated at 5%. The weighted average import duty on Turkish domestic appliances was 5.8% in 2018, while import duties on other imported electric equipment were 1.8%. It is lower than Ukraine's MFN average for these products that are 6.4% for domestic appliances and 3.4% for other electrical equipment.

Electric equipment is subject to technical regulation in Ukraine as well. Manufacturers and importers are required to make sure that equipment imported to Ukraine conforms to technical regulations. However, formalities required to comply with technical regulations are less extensive than in Turkey. The responsible party is required to document the compliance with the regulations internally, ensure that necessary markings are present on the product, and it needs to fill out a conformity declaration that would declare the conformity of the product to the technical regulation.

Several types of electric equipment are on the priority list of market surveillance in Ukraine[7] , meaning that they are more likely to be checked for compliance with regulations than other goods. The IER estimates the effect of technical regulations on imports of domestic appliances as equivalent to 10.6% duty on imports and for other electric equipment as 8.6% duty. For Turkey, these barriers might be lower as both Turkey and Ukraine have been aligning their technical regulations with the EU norms.

There are few non-technical barriers to imports of electric equipment in Ukraine. For the majority of imported electrical equipment, the importer needs to provide a security guarantee for payment of import duties and other import-related payments before goods allowed into the customs territory of Ukraine.[8] Domestic appliances may be considered high-risk imports and thus attract enhanced

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[6] https://trade.ec.europa.eu/doclib/docs/2018/march/tradoc_156626.02.23%20REPORT%20TO%20THE%20COMMITTEE%20NON-CONF.pdf

[7] See http://www.consumer.gov.ua/ContentPages/Sektoralni_Plani/113/

[8] This requirement is applicable for majority of imported goods other than electric equipment as well

scrutiny from customs officials. As we mentioned above, the EEM sector produces some dual-use products that may need export authorization and may attract added customs formalities.

4. Impact of the FTA with Turkey

We modelled several policy shocks to assess the impacts on FTA with Turkey on Ukraine, including:

- The reduction in trade costs due to reduced time required to import or export goods, both on the Ukrainian and the Turkish sides;
- The reduction of non-tariff barriers on goods by both Ukraine and Turkey;
- The mutual elimination of tariffs between Ukraine and Turkey; and
- The decrease in barriers on foreign providers of services for selected categories of services, not including tourism and hospitality sector.

As the EEM sector's protection is very moderate, direct policy changes related to the EEM sector play a limited role, while indirect effects drive the results.

The model shows that in the case of deep liberalization FTA, the EEM output will drop by 11.3%, driven primarily by the reallocation of resources provoked by tariff liberalization in Turkey and the reduction in time-in-trade costs on exports in Ukraine. The sector's exports will drop by a considerable 12.9%, while imports will stay mostly unchanged, featuring 0.2% in the deep liberalization FTA scenario. As a result, the domestic supply will decline by 8.0%.

5. Conclusions and recommendations

The electric equipment manufacturing (EEM) sector is quite small in Ukraine, accounting for 0.5% of Gross Value Added (GVA). Disruption of trade links with Russia, high domestic competition, and obsolete technology limited growth in the sector.

The sector is mostly privately owned. Electrovazhmash is the only company of significant size in the EEM sector that remains owned by the state. The role of foreign-owned companies is moderate, at 14%. There are six large companies in the industry accounting for a bit more than one-fifth of total sales, followed by over 150 medium-sized companies generating 59% of value-added.

The sector is heavily reliant on international trade as it exports its large part of its products and imports many of its inputs. The market share of the EEM producers on the domestic market is low.

Most of the exports go to the EU and Russia. The EEM sector exports a wide selection of products in low quantities as the Ukrainian export share for most products is below 1%. One exception is the export of electric coffee and tea makers, where Ukraine accounts for 5% of world exports.

About half of imported electrical equipment comes from the EU, and another 18% came from China in 2018. There is a lot of untapped potential in the trade with Turkey as the EEM sector's exports are minimal, and the share of imports is low at 3%.

Ukrainian exports of the electric equipment to Turkey can be done subject to a relatively low average duty of less than 2%. However, non-tariff barriers seem quite high. In Ukraine, we see the reverse situation: importers from Turkey are required to pay duty on the MFN basis up to 10% or about 4% on average, but they have an easier time complying with technical regulations.

Both Turkey and Ukraine have been aligning their technical regulations with the EU norms. The mutual recognition of conformity assessment would be beneficial for trade. Another opportunity is diagonal cumulation within the Pan-European-Mediterranean Convention on Rules of Origin, expected to become of Ukraine-Turkey rules of origin protocol.

To boost the sector's development, we suggest focusing on the following issues:

- Technological modernization of the EEM sector that requires better access to long-term financing. In turn, it is conditioned upon the improvement of property rights protection in the country;
- Active integration in regional and global value chains that are expected to change in response to economic and logistic challenges emerged due to COVID-19;
- Improvement of vocational education and life-long training to boost labor force productivity;
- Improvement of quality control and standard compliance to increase competitiveness, and
- Establishment of clusters with other machine-building companies, servicing companies, and education establishment.