

**EXPORT PERFORMANCE AND INDUSTRIAL OPPORTUNITIES OF METALS
AND METALWORKING SECTOR IN REPUBLIC OF MACEDONIA**

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- The main aim of the paper is to explore the question *„what are the main industrial opportunities of metals and metalworking sector in Republic of Macedonia?“*
- Identification of **export diversification** and **structural transformation** in the analyzed sectors

Export diversification – increase of number of exporting products

Structural transformation – moving from activities with lower to activities with higher productivity

The product space can be represented by a matrix of the pairwise distances for all n products:

$$\Delta = \begin{bmatrix} 0 & \delta_{1,2} & \delta_{1,3} & \dots & \delta_{1,n} \\ & \ddots & \delta_{2,3} & \ddots & \vdots \\ & & \ddots & \ddots & \vdots \\ & & & \ddots & \delta_{n-1,n} \\ & & & & 0 \end{bmatrix}$$

The index that measure the distance between goods i and j in year t , which is called proximity, equals

$$\varphi_{i,j,t} = \min \left\{ P(x_{it}|x_{jt}), P(x_{jt}|x_{it}) \right\}$$

where for any country c

$$x_{c,t}, x_{c,t} = \begin{cases} 1 \dots \text{if} \dots RCA_{c,t} \geq 1 & \text{for country } c \\ 0 \dots \text{if} \dots RCA_{c,t} \leq 1 & \text{for country } c \end{cases}$$

We use index called “density” to measure the average proximity of a new potential product j to a country’s current productive structure:

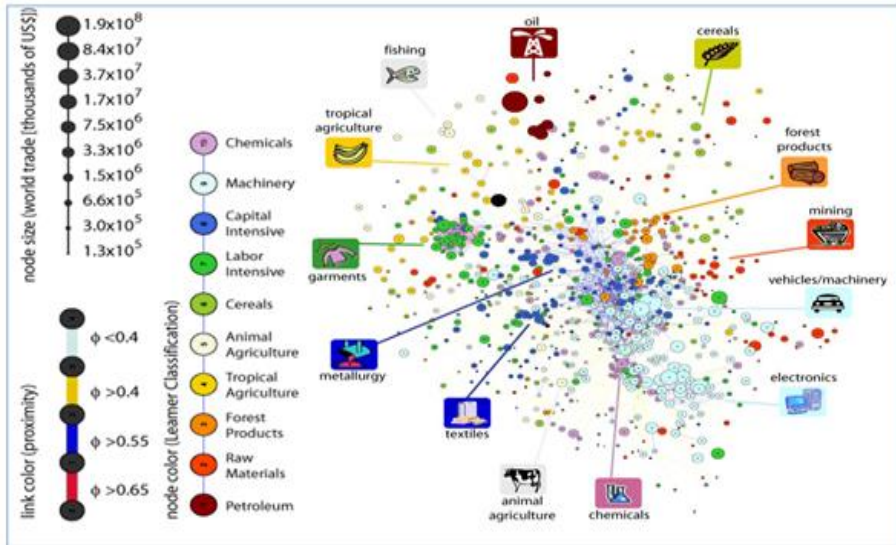
$$density_{i,t} = \frac{\sum_j x_{ij} \phi_{i,j,k}}{\sum_j \phi_{i,j,k}}$$

where high density value means that the country has many developed products surrounding to the j product

The **product sophistication level** ($PRODY_K$) is calculated as a weighted average of GDP per capita of countries exporting that product. The index can be presented by the following equation:

$$PRODY_K = \sum_j \frac{(x_{jk}/X_j)}{\sum_j (x_{jk}/X_j)} Y_j$$

Product space model



Export performance of metals and metalworking sector

The **metals** and **metalworking sector** are still one of the most important exporting sectors in Republic of Macedonia though these sectors have gone through the serious challenges as a result of the global economic and financial crisis.

The data show that the total export value of these two sectors in **2016** is **536.4 million US \$**, while the relative share in country's export is more than **11.3%**.

These sectors have also very significant direct and multiple impact in GDP, employment, budget revenue, corporative responsibility).

Top 10 exporting products in metals and metalworking industry

#	HS-product code	Export value, in US \$	Relative share in total export, %
1	720260	85.161.414	1.40%
2	730660	70.144.496	1.10%
3	720842	66.939.364	1.10%
4	721070	53.115.379	0.86%
5	720843	48.470.021	0.79%
6	721049	31.175.314	0.51%
7	720221	29.240.285	0.47%
8	730630	23.405.561	0.38%
9	732183	20.220.755	0.33%
10	730890	15.243.472	0.25%

Export diversification and structure

The export of these sectors is composed from **312** products out of total **589 products** which are subject of trading within these industries at global market, according to 6-digit HS classification of products based on UN ComTrade statistics, while the number of products that are exported with comparative advantages ($RCA > 1$) is **47 products**.

More than **10%** of total exporting products that Republic of Macedonia exports with comparative advantages are coming from metals and metalworking sector.

The top ten products according to the value of RCA index

#	HS-product code	RCA	PRODY, US \$	Export value, US\$
1	730120	46.97	22.726	5.368.648
2	730661	38.43	18.046	51.026.876
3	732189	30.66	26.137	14.733.341
4	731441	20.41	21.430	3.159.666
5	732119	15.14	19.121	3.987.270
6	720221	93.95	31.628	93.785.960
7	720260	243.1	13.164	286.257.634
8	720851	22.67	20.887	77.977.510
9	720852	45.68	19.042	51.389.703
10	721070	17.89	15.238	64.160.885

Industrial opportunities of metals and metalworking industry

#	product code	Product description	Density index	PRODY, US \$
1	720719	Iron or non-alloy steel; semi-finished products of iron or non-alloy steel, containing by weight less than 0.25% of carbon, other than rectangular or square cross-section	0.0976	39.300
2	731442	Iron or steel wire; grill, netting and fencing, coated with plastic	0.0894	47.671
3	730240	Iron or steel, railway or tramway track construction material; fish-plates and sole plates	0.0872	25.374
4	720838	Iron or non-alloy steel; in coils, without patterns in relief, flat-rolled, of a width 600mm or more, hot-rolled, of a thickness of 3mm or more but less than 4.75mm	0.0826	21.545
5	731021	Cans; which are to be closed by soldering or crimping, for any material (excluding compressed or liquefied gas), less than 50l capacity, of iron or steel	0.0773	23.015
6	732290	Air heaters and hot air distributors, (not electrically heated), incorporating a motor-driven fan or blower and parts thereof, of iron or steel	0.0755	31.058
7	730840	Iron or steel; structures and parts thereof, props and similar equipment for scaffolding, shuttering or pit-propping	0.0753	32.948
8	731010	Tanks, casks, drums, cans, boxes and similar containers, for any material (excluding compressed or liquefied gas), of iron or steel, capacity not exceeding 300l, whether or not lined or heat-insulated	0.0741	23.519
9	730230	Iron or steel, railway or tramway track construction material; switch blades, crossing frogs, point rods and other crossing pieces	0.0738	67.044
10	731431	Iron or steel, railway or tramway track construction material; switch blades, crossing frogs, point rods and other crossing pieces	0.0712	41.553

Main Issues for developing New Products in Metalworking Sector

- Higher production costs compared to the competition
- Lower productivity compared with competition
- New markets and customers will have to be found
- More than 70% of the inputs used in the production are imported
- Availability of skilled labor
- Access to capital/finance
- Transport and logistic infrastructure
- Insufficient information on foreign markets
- Low level of innovativeness
- No investments in Research and Development sectors
- Higher absorption of working capital

Positive impacts for developing New Products in Metalworking Sector

- Introduction of new, higher value added products that would complement the current range and thus enable to satisfy more requests from the existing.
- Long term relations with existing customers should be an advantage for selling new products.
- Availability of skilled labor (existing skilled labor could be used for production of New Products).
- Lower fixed costs if the existing production lines could be adopted for production of New Products.
- Increase company Reputation

Why it is crucial for the country to develop New Products

- Increased market share.
- Lower risk of import barriers for domestic companies.
- Lower import costs will lead to higher margins.
- Continued existence and Growth of the companies.
- Economic and employment growth.
- Improved society and quality of life.

Thank you for your attention!