# Ukraine's niche and domestic agrifood markets' development potential

P.Pyvovar, O.Nykolyuk, A.Chmil, R.Nazarkina, H.Stolnikovych, M.Bogonos

Ukraine stands as a significant player in global agricultural markets. Although it is facing tremendous damages and losses from the war (i.e., as of June 2023, the country lost $150.5 billion as damages to its infrastructure, $8.7 billion of which were to the primary agricultural production sector; and $265.6 billion as economic losses, $40.3 billion of which were to the agricultural sector), in 2022/2023 marketing year it ranked 6th in the total global wheat exports, 4th in maize exports, 7th in barley exports and 1st in sunflower oil exports.

As the war persists, maintaining a foothold on the global agrifood markets becomes progressively challenging: agrifood producers are grappling with mounting asset damages and escalating production costs. Therefore, exploring the possibilities to fortify Ukraine's agrifood sector is pivotal.

# Main findings  ● ● ●

**cheese, buckwheat, milk powder** have greater potential for development
**potatoes, apples and grapes** (table and wine) are second-best choice

The team of experts rom **Polissia National University, KSE Agrocenter and National University for Life and Environmental Sciences** have identified niche and domestic agrifood markets in Ukraine with the highest potential for development and gross value added in agriculture improvement.

They applied cluster analysis of partial indices reflecting the average growth rates of the selected growth indicators and estimated the integral indices of development trends for the niche and domestic markets (the methodology is described in the Appendix) of Ukraine. Data on key parameters such as area of crops, volume of production, yield/productivity of animals and crops, domestic market prices, export and import values and prices from State Service of Statistics of Ukraine were used.

# The results of the cluster analysis

Based on the results of the cluster analysis (**Figure 1**), the markets that entered the second cluster (dry milk and cheese) and the fourth cluster (potatoes, apples and buckwheat) are considered promising. Specifically, for markets in cluster 4, favorable changes in the indicators of their development are observed, including internal market price, volume and value of exports and imports, and export price. Cluster 2 markets are characterized by the highest growth rates in export prices and a decrease in the value and price of imports. Most of the indicators for markets in clusters 1 and 3 decreased from 2019 to 2022.

**Figure 1. Results of cluster analysis of the selected niche and domestic agrifood markets.**
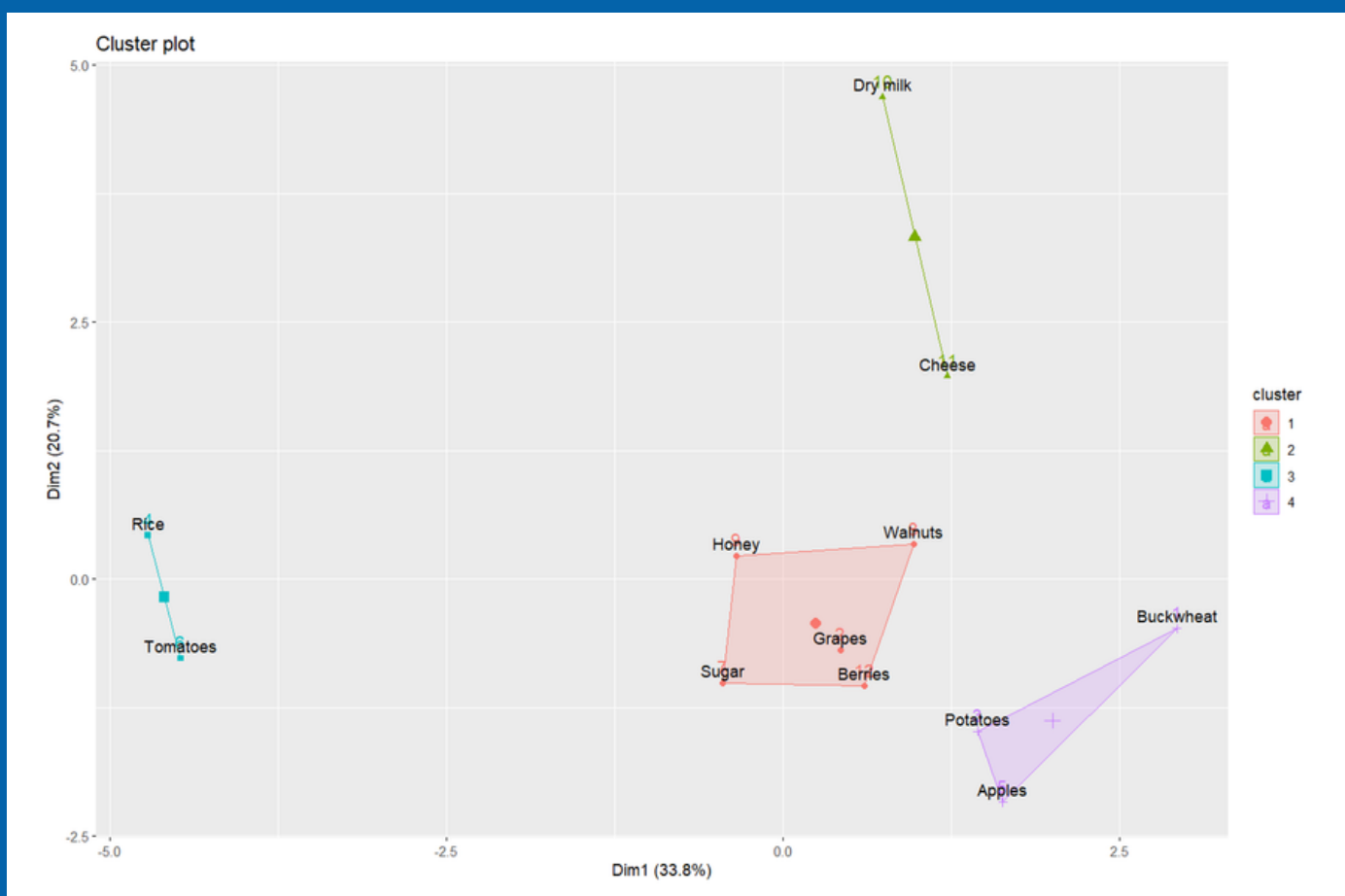


*Source: Authors' estimates*

# The results of the trends indices analysis

Integral development trend indices partly correspond to the results of the cluster analysis (**Table 1**). According to the estimates, the markets for cheese, buckwheat, milk powder, and grapes are considered as those with greater potential for development.

## Table 1. The results of cluster analysis and Integral development trend indices

| Market | Cluster analysis | Integral development trend index |
|---|:---:|:---:|
| **Cheese** | 2 | **0.8571** |
| **Buckwheat** | 4 | **0.6923** |
| Potatoes | 4 | 0.6154 |
| Apples | 4 | 0.6154 |
| **Dry milk** | 2 | **0.7143** |
| Sugar beet | 1 | 0.5385 |
| Berries | 1 | 0.61538 |
| Grapes (wine and table grapes) | 1 | **0.6923** |
| Walnut | 1 | 0.3846 |
| Rice | 3 | 0.1538 |
| Tomatoes | 3 | 0.2308 |
| Honey | 1 | 0.2308 |

*Source: Authors' estimates*

# Both methods show ● ● ● ●

Both methods show that **cheese, buckwheat and milk powder** have greater potential for development, whereas markets for **potatoes, apples and grapes** (table and wine) are second-best choice.

It's important to underscore that the discovery of the market potential is important for fostering policy support, investments and discussions on cross-border markets integration.

# Contacts

Center for Food
and Land Use Research (KSE Agrocenter)

© 2023, Ukraine,
Kyiv School of Economics
Mykoly Shpaka St, 3

www.agrocenter.kse.ua

agrifood@kse.org.ua

Telegram chanel
KSE Agrocenter

www.kse.ua

KSE | Center for Food
and Land Use Research

# Appendix

**Stage 1** Indices calculation

1.1 Calculation of partial indices as average rates of growth of indicators of the level of development of commodity markets:

$$i_{jk} = \frac{\sum_{t=1}^{T}\left(\dfrac{x_{jtk}}{x_{j(t-1)k}} \cdot 100 - 100\right)}{T} \qquad t \in T, \; j \in J, \; k \in K$$

Where $i_{jk}$ is a partial index for the j indicator of the k commodity. $x_{jtk}$, $x_{j(t-1)k}$ is the value of the indicator j of the market of the commodity k in, respectively, year t and t-1, T is the number of years, J is the number of investigated indicators of the market development; K - the number of surveyed agricultural markets.

1.2 Integral index of development

$$I_k = \frac{\left(\dfrac{\sum_{j^+=1}^{J^+} i_{j^+k}}{J_k^+}\right) \div \left(\dfrac{\sum_{j^-=1}^{J^-} i_{j^-k}}{J_k^-}\right)}{2}$$

$i_{j^+k}$, $i_{j^-k}$ – partial index of respectively stimulating and destimulating indicator j of the market of commodity k; $J_k^+$, $J_k^-$ total number of stimulating and destimulating indicators forcommodity k.

**Stage 2** Cluster analysis

Cluster analysis of commodity markets based on partial indices that reflect average rates of growth of indicators of the level of development of commodity markets (1.1).

**Stage 3** Trend evaluation

Evaluation of the nature of the trend of agricultural market development indicators.

3.1. Assigning the values of boolean estimates to the trends of changes in indicators of the development of commodity markets:

$$b_{j^+k} = \begin{cases} 1, & \text{if } x_{j^+k} = f(t) - \text{upward trend} \\ 0, & \text{if } x_{j^+k} = f(t) - \text{downward trend} \end{cases}$$

$$b_{j^-k} = \begin{cases} 1, & \text{if } x_{j^-k} = f(t) - \text{downward trend} \\ 0, & \text{if } x_{j^-k} = f(t) - \text{upward trend} \end{cases} \qquad j^+ \in J_k^+, \; j^- \in J_k^-$$

Where $b_{j^+k}$, $b_{j^-k}$ – estimates of the development trend of the j-th stimulating or de-stimulating, respectively, indicator for the market of commodity k; $x_{j^+k}$ $x_{j^-k}$ , is the stimulating or destimulating respectively indicator j of market development of commodity k.

3.2 Integral growth trend rating calculation

$$E_k = \frac{\displaystyle\sum_{j^+=1}^{J^+} b_{j^+k} + \sum_{j^-=1}^{J^-} b_{j^-k}}{J^+ + J^-}$$

Where $E_k$ is an integral assessment of market development trends of commodity k; $i_{jk}^+$ , $i_{jk}^-$ – partial index, respectively, of the stimulating and destimulating indicator j for the market of commodity k; $J_k^+$, $J_k^-$ – the number, respectively, of stimulating and destimulating indicators for commodity k.