3rd INFER Symposium on Agri-Tech Economics for Sustainable Futures

Towards better understanding of structural changes in EU agriculture: the index decomposition approach

Nelė Jurkėnaitė and Tomas Baležentis

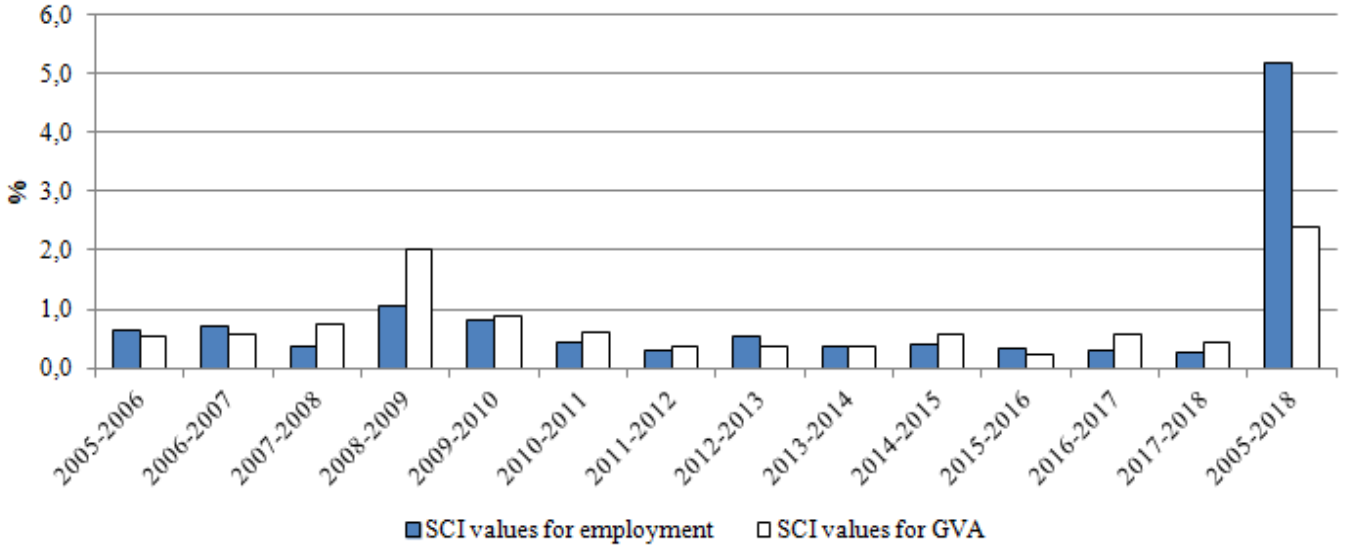
This research has received funding from European Social Fund
project No 09.3.3-LMT-K-712-01-0007
under grant agreement with the Research Council of Lithuania (LMTLT).

Objectives

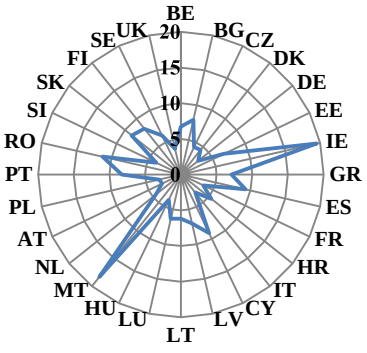
- To analyse the changing role of agriculture in the EU economic system.

- To investigate structural changes of the EU agricultural system focusing on the evolution of the average farm size.

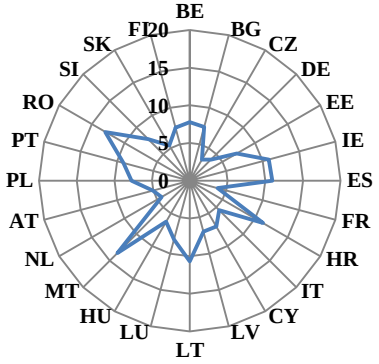
Structural Change Indices, 2005–2018



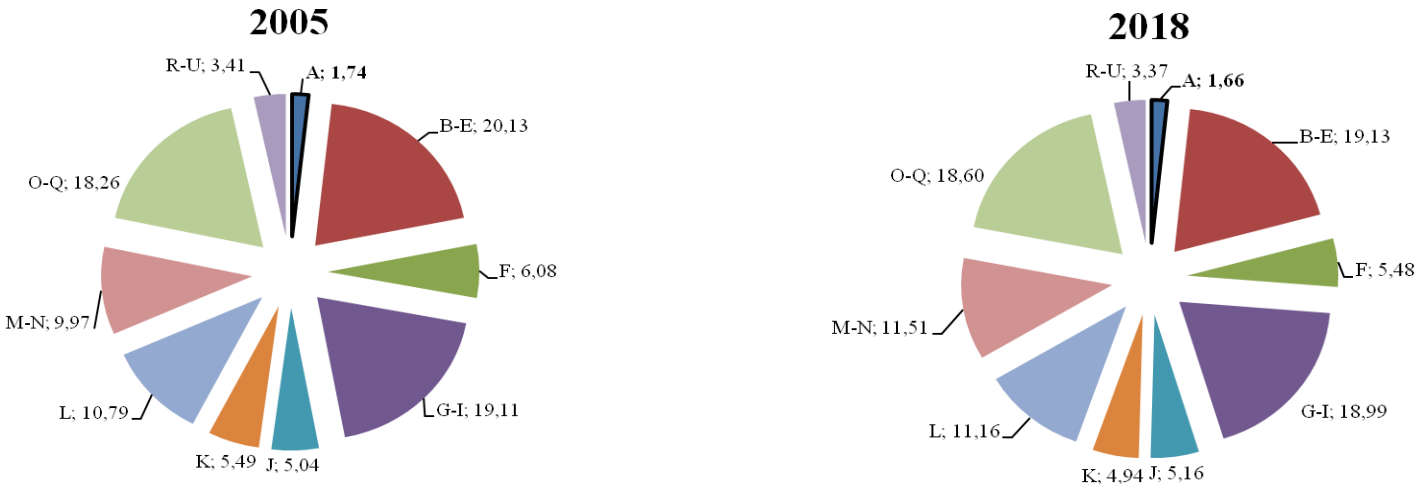
SCI values for GVA



SCI values for employment

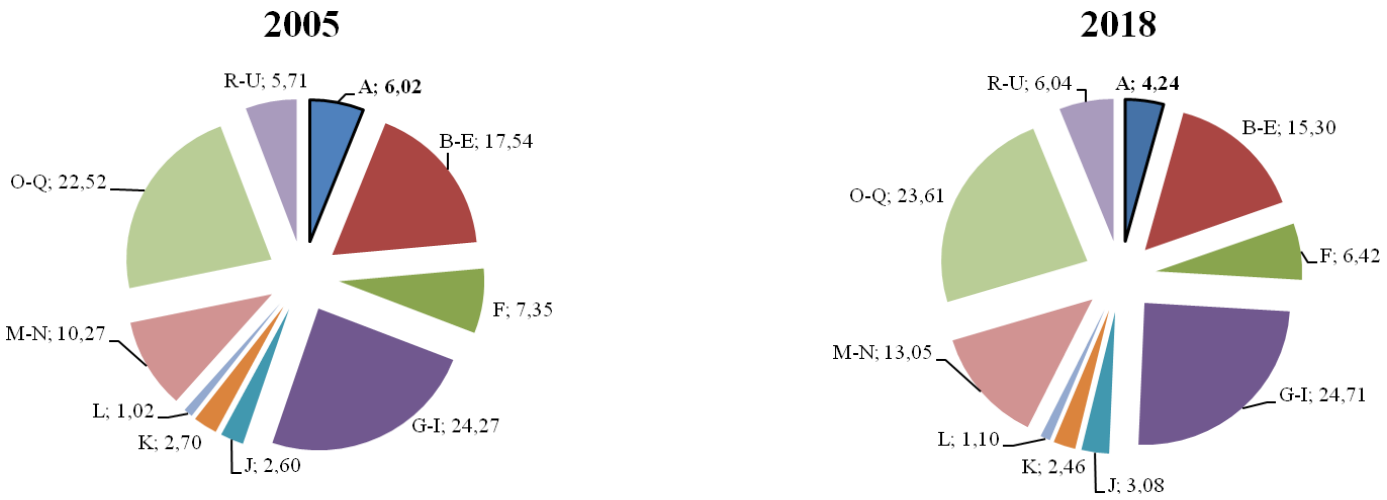


Changing Role of Agriculture in the Structure of Gross Value Added



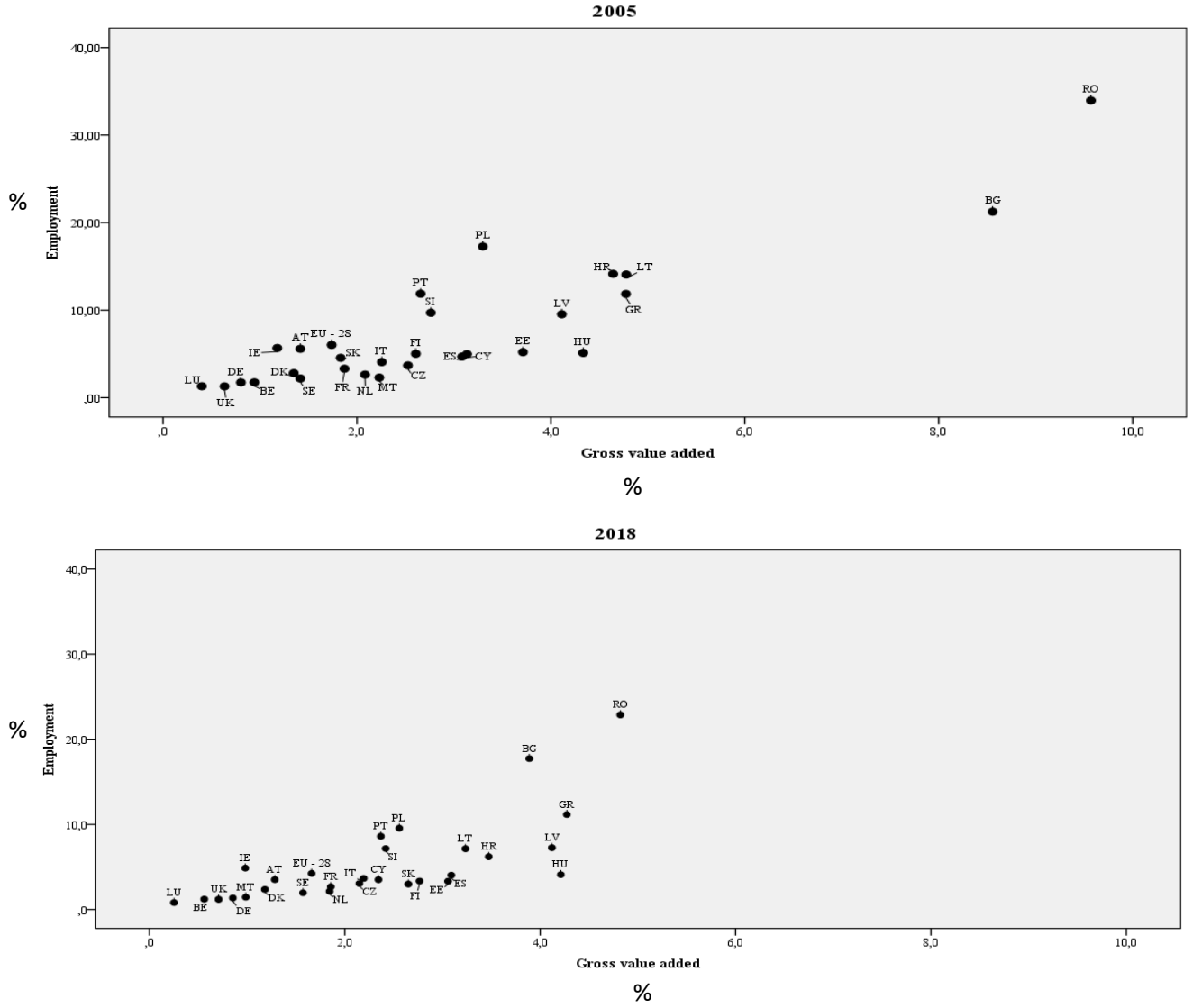
Economic activities: **A – agriculture, forestry, and fishing**; B–E – industry (except construction); F – construction; G–I – wholesale and retail trade, transport, accommodation and food service activities; J – information and communication; K – financial and insurance activities; L – real estate activities; M–N – professional, scientific and technical activities; administrative and support service activities; O–Q – public administration, defence, education, human health and social work activities; R–U – arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies.

Changing Role of Agriculture in the Structure of Employment



Economic activities: **A – agriculture, forestry, and fishing**; B–E – industry (except construction); F – construction; G–I – wholesale and retail trade, transport, accommodation and food service activities; J – information and communication; K – financial and insurance activities; L – real estate activities; M–N – professional, scientific and technical activities; administrative and support service activities; O–Q – public administration, defence, education, human health and social work activities; R–U – arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies.

Changing Role of Agriculture, Forestry, and Fishing activity in Member States



Structural Changes in EU Agriculture

The decomposition of the average EU farm size has the below mentioned IDA specification

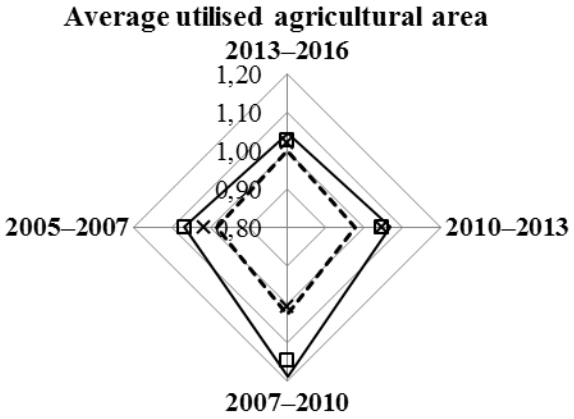
$$\frac{FS}{f} = \sum_{mn} \frac{FS_{mn}}{f_{mn}} = \sum_{mn} \frac{f_n}{f} \times \frac{f_{mn}}{f_n} \times \frac{FS_{mn}}{f_{mn}}$$

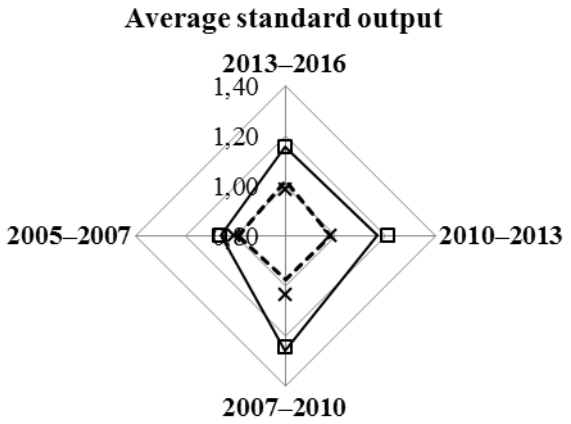
f – the total number of farms in the EU,
f_n – shows the total number of the EU farms in the n^{th} farming type,
f_{mn} – the number of farms in the n^{th} farming type of the m^{th} Member State,
FS_{mn} – the measure of the farm size in m^{th} Member State for the n^{th} farming type, while
FS – the total measure of the farm size of EU agriculture.

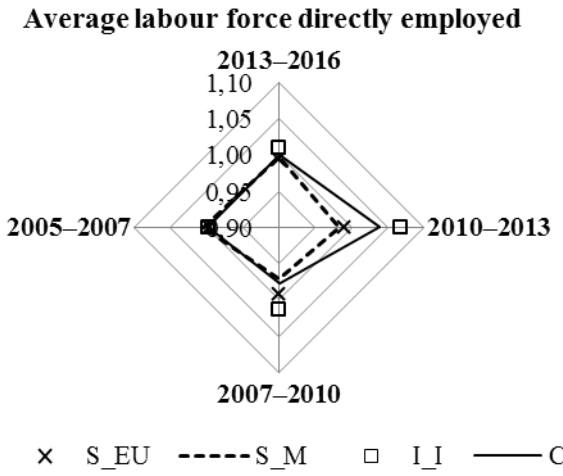
The change is calculated applying Logarithmic mean Divisia index I:

$$C_T = \frac{\left(\frac{FS^a}{f^a}\right)}{\left(\frac{FS^b}{f^b}\right)} = S_{EU} \times S_M \times I_I$$

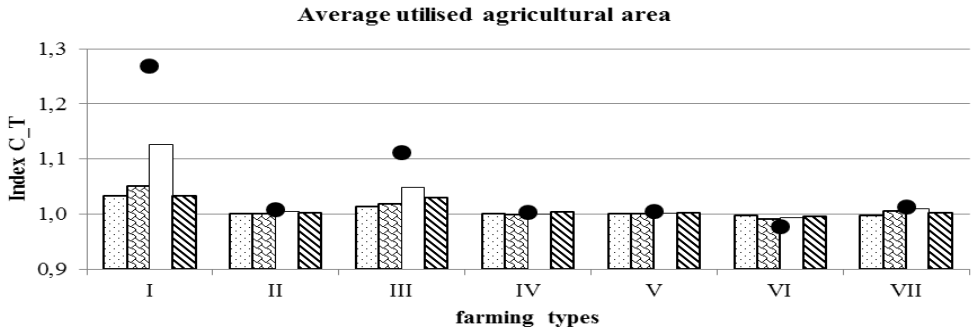
Changes in the Average Farm Size at the EU level

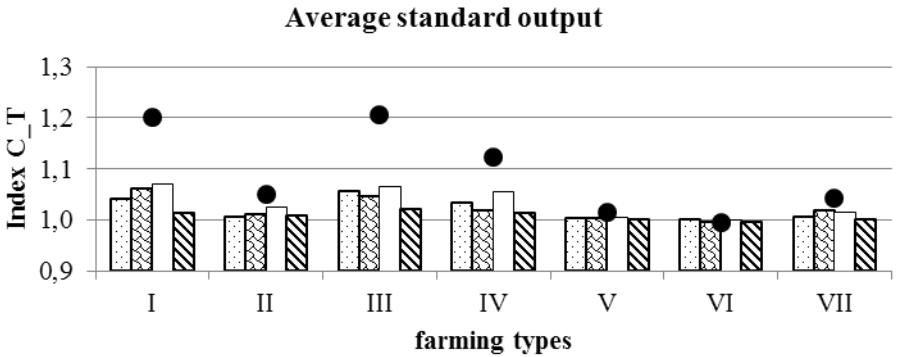




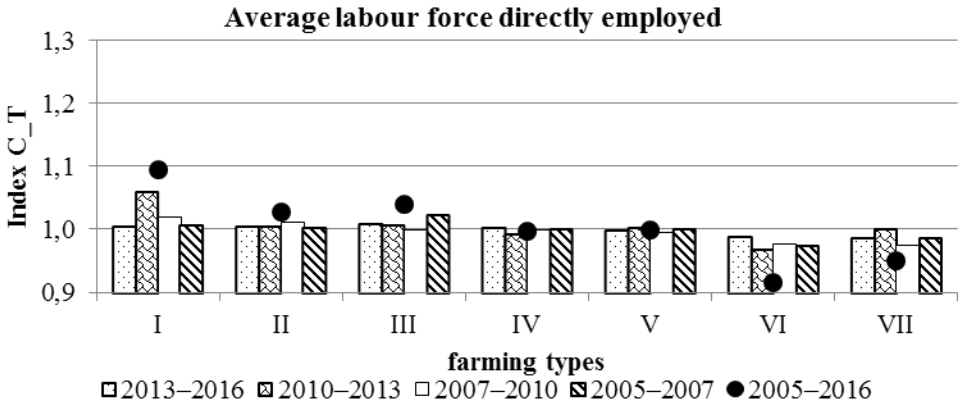


Changes in the Average Farm Size by Type of Farming at the EU Level, 2005–2016



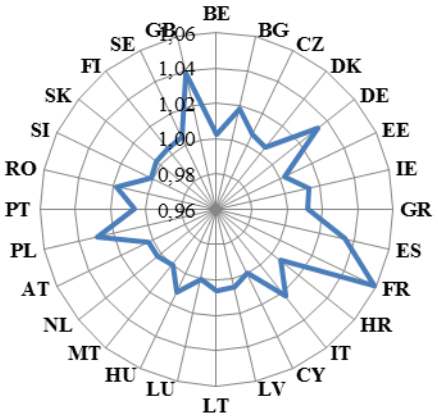


I – specialist field crops
II – specialist horticulture, fruit, and citrus fruit
III – specialist grazing livestock
IV – specialist granivores
V – mixed cropping
VI – mixed livestock
VII – mixed combined

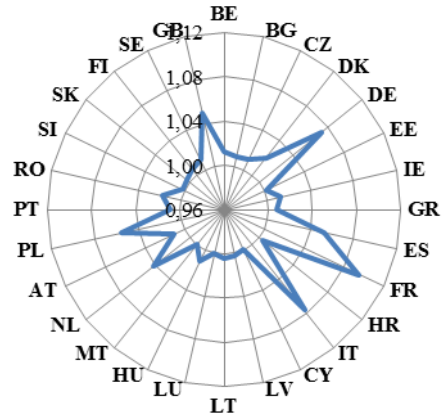


Decomposition of the index C_T by Member States, 2005–2016

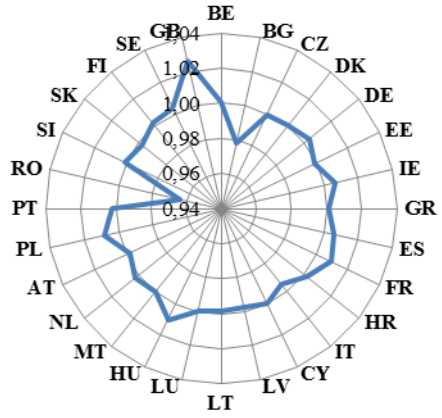
Average utilised agricultural area



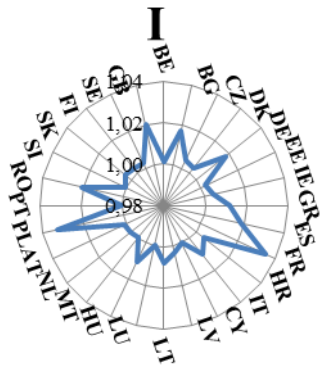
Average standard output

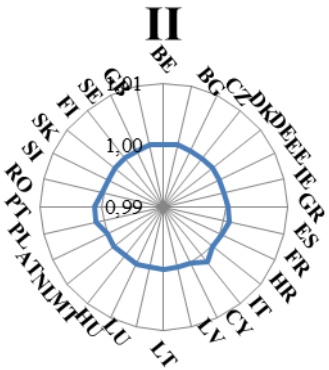


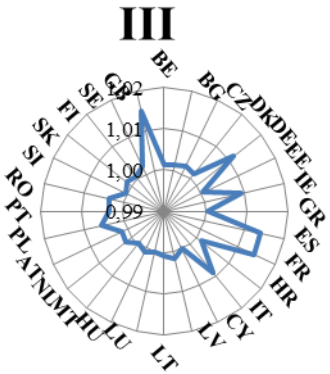
Average labour force directly employed

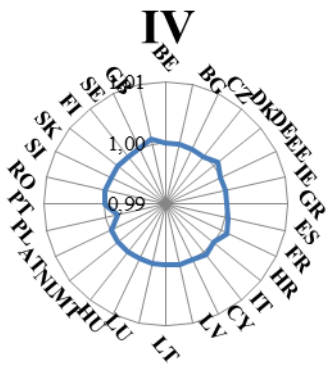


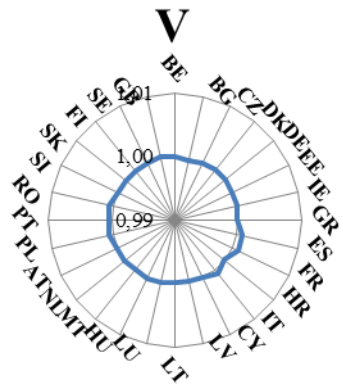
Decomposition of the index C_T for the average utilized agricultural area, 2005–2016

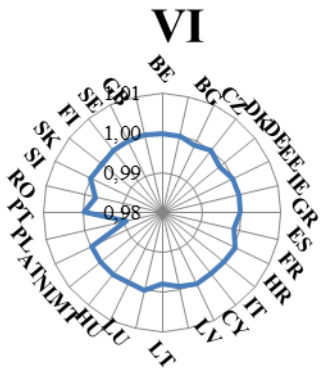


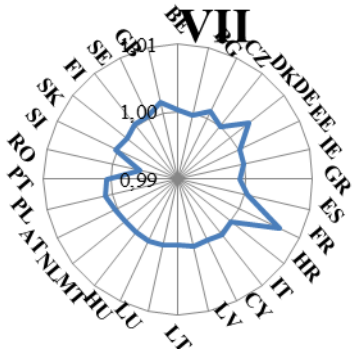








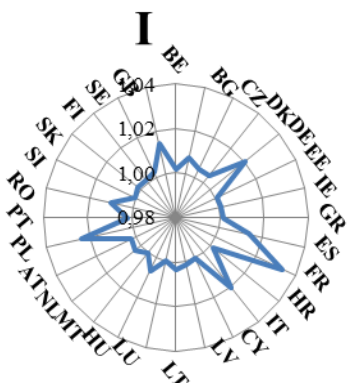


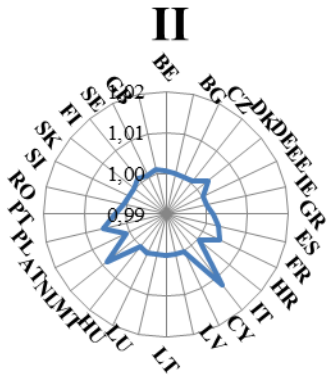


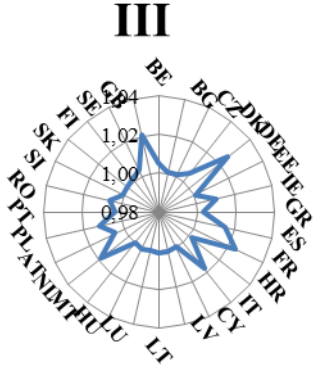
I – specialist field crops
II – specialist horticulture, fruit, and citrus fruit
III – specialist grazing livestock

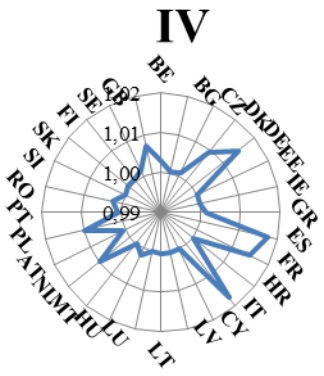
IV – specialist granivores
V – mixed cropping
VI – mixed livestock
VII – mixed combined

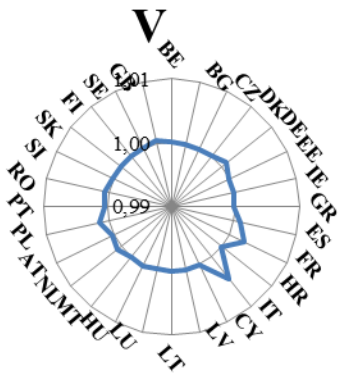
Decomposition of the index C_T for the average standard output, 2005–2016

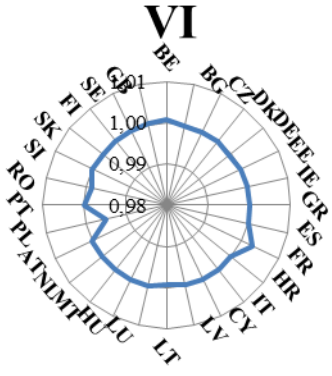


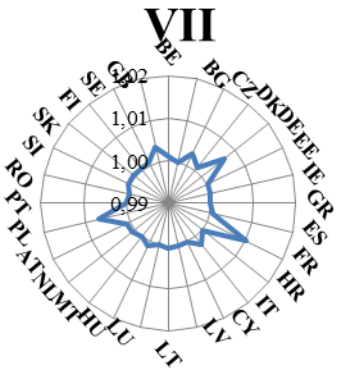








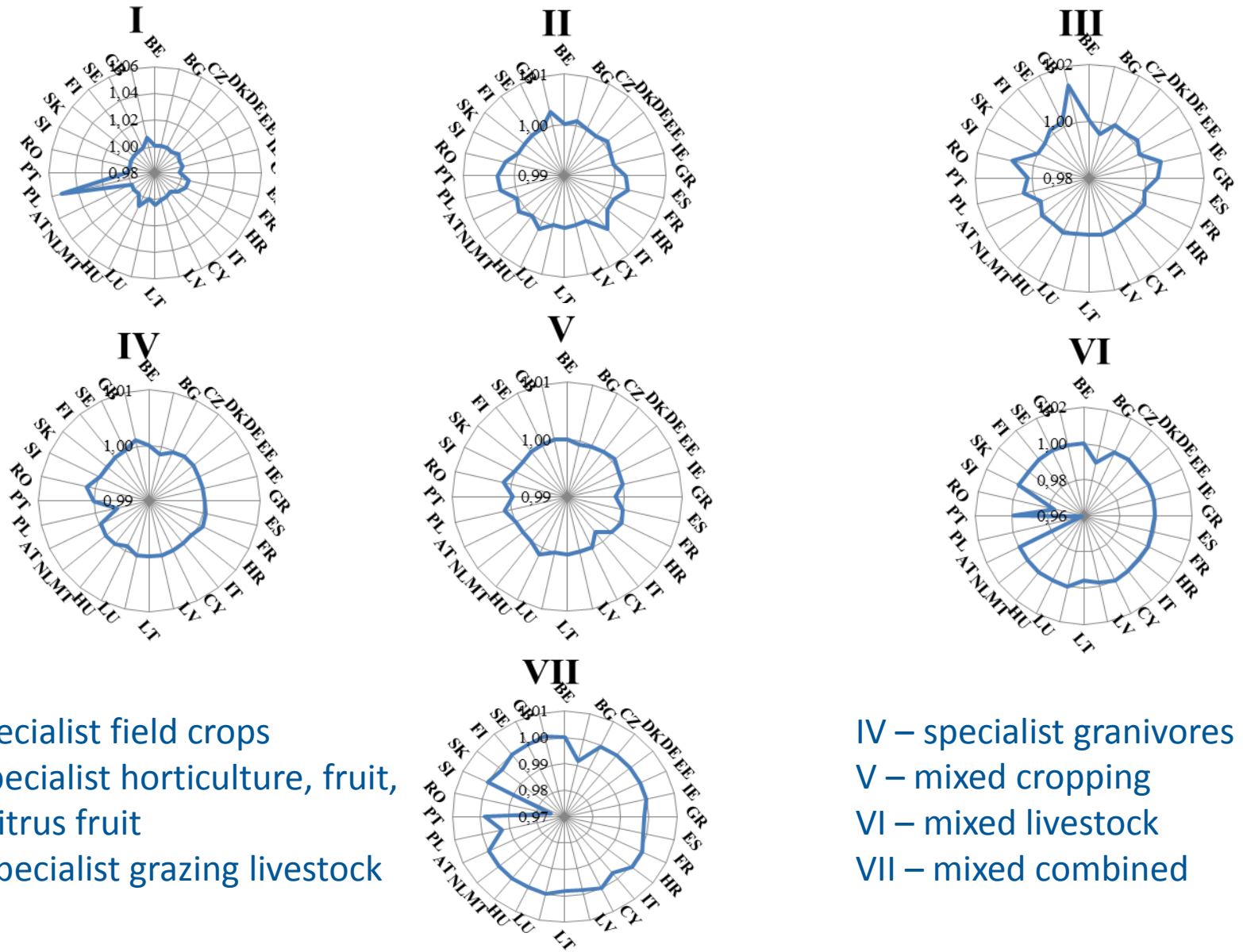




I – specialist field crops
II – specialist horticulture, fruit, and citrus fruit
III – specialist grazing livestock

IV – specialist granivores
V – mixed cropping
VI – mixed livestock
VII – mixed combined

Decomposition of the index C_T for directly employed labour force, 2005–2016



I – specialist field crops
II – specialist horticulture, fruit, and citrus fruit
III – specialist grazing livestock
IV – specialist granivores
V – mixed cropping
VI – mixed livestock
VII – mixed combined

Main findings

- Over the period 2005–2018, the share of agriculture, forestry, and fishing activity in the GVA and employment structure of the EU economic activities decreased.

- The dynamics and directions of structural changes depend on Member States. The diminishing role of agriculture, forestry, and fishing activity is typical in most of the countries, however, the pace of change is country-specific.

Main findings

- Over the period 2005–2016, agriculture experienced significant changes in terms of the average utilized agricultural area and standard output growth, while the direct employment situation on farms remained almost stable.

- Results suggest that the highest growth of the average farm size at the EU level was on specialist field crops and specialist grazing livestock farms, while mixed livestock farms demonstrated the shrinking of the average farm size.

- The evolution of national agricultural systems is country-specific.

Thank you for your time this evening!