

## **Digitalization, positioning in global value chain and carbon emissions embodied in exports**

Topic: Global value chain analysis II (Chair: Kirsten S. Wiebe, SINTEF industry)

Author: Yanan Zhang

Co-Authors: Yongming HUANG, JAMAL KHAN

### **Abstract:**

Globally, the rapid digitalization process has been altering production and consumption patterns for decades, and as a result, it has become a critical enabler of a low-carbon economy. This study examines the impact of digitalization and the position of global value chain (GVC) on carbon emissions embodied in exports (CEEE). We do so by incorporating total trade accounting method into the traditional MRIO model from the perspective of the GVC specialisation system and computing the CEEE on the production side. We use high-dimensional fixed-effect models and three-dimensional panel data covering 18 manufacturing industries in 38 economies from 2000 to 2014. The results show that digitalization and CEEE have an inverted U-shaped relationship, with upgrading GVC positions reducing CEEE significantly. Furthermore, it is easier for developed countries (high-tech industries) to achieve the goal of lowering CEEE by entering the downward phase of the inverted U-shaped curve through digitalization than it is for developing countries (low-tech industries). Moreover, improvements in GVC position in developed countries (high-tech industries) have a greater impact on CEEE reduction than in developing countries (low-tech industries). Finally, the nonlinear moderating effect model findings show that upgrading GVC position weakens (or smooths) the inverted U-shaped relationship between digitalization and CEEE, shifting the curve's turning point to the left. Therefore, in order to achieve the goal of global sustainable development, a country's focus should be not only on digitalization and its development, but also on actively improving its position in GVC.