

# Does Global Value Chain Participation Decouple Chinese Development from CO<sub>2</sub> Emissions? A Structural Decomposition Analysis

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As the largest CO<sub>2</sub> emitter over the world, China accounted for 27.2% of global emissions in 2016. The Chinese government has pledged to peak its emissions before 2030. However, the prospect is not optimistic since China's emissions kept increasing in recent years due to economic resurgence. Decoupling economic activities and CO<sub>2</sub> emissions is central to achieving the climate goals of China and the entire world. Global value chains (GVCs) have profound impacts on the economic growth and environmental issues, and China has increasingly participated in GVCs. Examining the impacts of GVCs on China's decoupling from emissions is of significance to identifying strategies to promote sustainability in China.

This paper shows that both the production and consumption of China were on the trajectory towards decarbonization in 2007-2012, though both were relative decoupling from CO<sub>2</sub> emissions. The final consumption of China was greener than its production activities. But the production related activities decarbonized more evidently than the activities induced by China's consumption in 2007-2012. The structural decomposition analysis (SDA) results reveal that GVCs were the primary source of China's decoupling from emissions during this period. Compared to the international value chains between China and foreign countries, domestic value chains within China played a more important role in greening Chinese economy. Sectoral emission intensity improvement was the main contributor, while the key barriers to further decoupling were the regional shift of global final demand and outsourcing structure of intermediates along GVCs. The progress in decoupling along GVCs slowed down after the financial crisis. Despite the considerable improvement, GVCs remained the main obstacle to environmental sustainability of China at the end of the study period.

Efforts from both the production and consumption sides are clearly needed to further decouple China's development from CO<sub>2</sub> emissions. Our results suggest that promoting green consumption and stimulating the diffusion and transfer of advanced production technologies within China are vital to further decarbonization. In particular, moving up GVCs is deemed important to emissions mitigation as well as economic growth, which relies heavily on fostering industrial competitiveness.

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