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Will developing countries become pollution havens for developed countries?

An empirical investigation in the Belt and Road

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Abstract: The pollution haven hypothesis (PHH) posits that differentiated environmental regulations will result in inter-country relocation of dirty industries. This article proposes a pollution haven hypothesis validated model to conduct a comprehensive analysis on the PHH in a case study of the Belt and Road, composed of calculating carbon emission embodied in imports and exports, testing the PHH and exploring the formation mechanism of pollution havens. The findings obtained show that China has become a pollution haven for 22 developed countries, and 19 developing countries have become China's pollution havens. There is weak evidence in favor of the PHH in trades between China and the other 22 countries. Moreover, the validity of the PHH is jointly associated with international production fragmentation as well as factor endowment.

Keywords: Belt and Road; the PHH; Multi-regional input-output analysis; Global value chains theory; Factor endowment theory

1. Introduction

The PHH has been an important debate on the environmental effects of international trade, the pattern of which is reshaped obviously by factor endowment and global production fragmentation. China put forward the Belt and Road and created a new economic model of openness and inclusiveness in 2013. However, several developed countries argue that China will relocate domestic pollution and output overcapacity by the Belt and Road, which undoubtedly hinders the development of the Belt and Road. Therefore, for the healthy development of the Belt and Road, it's of critical importance to study whether there is a pollution transfer in trades between China and the other countries along the Belt and Road.

Since the PHH was first proposed (Walter and Ugelow, 1979), numerous researchers have devoted extensive effort to theoretical (Conrad, 2005; Kheder and Zugravu, 2008) and empirical studies (Al-mulali and Tang, 2013; Tang, 2015; Zhang et al, 2017) from different perspectives and achieved fruitful results. The literature assessing the empirical validity of the PHH is generally divided into the following three categories: (i) The first set typically finds no meaningful support for the PHH. Jeppsen et al. (2002) review early empirical studies in detail. They summarize that most of these studies use cross-sectional data in U.S. and find weak evidence for the existence of pollution havens. Except for U.S. cases, Grether et al. (2012) also find that differences in environmental policies only marginally affected the pollution haven component of world trade (Manderson and Kneller, 2012; Rezza, 2013; Ren et al, 2014; Tang and Tan, 2015; Zhu, 2016; Garsous and Koźluk, 2017; Adewuyi and Awodumi, 2017). (ii) The second set typically finds economically and statistically significant evidence in favor of the PHH. The existing literature utilizes foreign direct investment (FDI) to examine how the foreign

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