

World Trade Flows in Photovoltaic Cells: A Gravity Approach Including Bilateral Tariff Rates

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Abstract

This paper investigates the determinants of the world trade flows in one of the principal environmental goods, photovoltaic cells, focusing on the period of growing trade of this industry between 2000 and 2004, with the emphasis of the effects of bilateral tariffs. Our cross-section analysis based on gravity model including bilateral tariffs as one of the trade costs demonstrates the systematic effects of bilateral tariff rates as well as distance effect and APEC bloc effect on the bilateral trade flows in photovoltaic cells sector among 51 countries in each year between 2000 and 2004. Our panel analysis based on fixed effects model of gravity equation by allowing trading-pair heterogeneity using the data of 2000-2004 consolidates the significant effect of bilateral tariff rates on the trade flows, and demonstrates the globalization effect on trade growth in this sector. As for the pattern of bilateral trade of this sector, we find from our cross-section analysis that the bilateral trade flows are larger for the country-pairs with similar GDP per capita by exchanging the differentiated products, which can be explained by the monopolistic competition model. The results of our gravity analysis for photovoltaic cells suggest the effectiveness of the current efforts of APEC and WTO for tariff reduction on various kinds of environmental goods for expanding bilateral trade flows of those goods among the covered countries of either developed or newly industrialized countries, which would lead to environmental protection through worldwide diffusion of those goods.