

The Impact of Technology Level on Global Value Chain Formation

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Abstract: In this paper we investigate, both theoretically and empirically, the role of technology level in Global Value Chain (GVC) formation from two aspects: position and participation volume. We develop a simple multi-country model where countries are heterogeneous with respect to their technology level and labor force. In GVC, there are several intermediate production stages with a specific technology threshold. A country can produce at a stage if its technology level is higher than the stage's threshold. The unit labor requirement of a country in each stage is assumed to be inversely proportional to the difference between the technology level of the country and the technology threshold of the stage. According to this framework the country with higher technology level is producing at the stage with higher technology threshold. In contrast to previous studies that emphasize countries' order and position in GVC (e.g., Costinot et al 2013), our work focuses on both the “volume” and “position” of participation. We examine an increase in technology level of a country (named reference country) in our GVC. The effect of this increase is threefold: GVC participation volume of the country with lowest technology level decreases; countries with technology level lower than that of reference country experience an increase in GVC participation volume (including the reference country); GVC participation volume of countries with higher technology level is not affected. We conduct an empirical analysis using World Input-Output Database (WIOD), which covers 27 European Union countries and 13 other major countries in the world for the period from 1995 to 2011 to confirm our hypotheses.

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