



Estimation of Import Share Elasticity of Photovoltaic Modules

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Abstract

This paper estimates the import share elasticities of photovoltaic modules (PV) for Japan and the rest of the world using the quarterly data of PV prices and trade volume from 2010 Q1 to 2012 Q3, during which Japan's import share of PV rapidly increased from 8.3 percent to 32.3 percent. The estimated import share elasticity based on the trans-log function is -0.63 and the elasticity of substitution is estimated as 5.66 for Japan. These results suggest that the current PV module market in Japan is highly competitive with imports and domestic products as close substitutes and in turn high price sensitivity.

In the aftermath of the Fukushima nuclear accident in March 2011, a new plan for rearranging electricity power generation is required for Japan. Based on the plans provided by the government last summer, the most ambitious target is to increase the share of renewable energy to 37 percent of the total power generation by 2030, compared to 10 percent at present. However, it is estimated that to achieve this ambitious target will require the electricity price to increase by about 50 percent, mainly as a result of a large-scale expansion of feed-in tariff policy. Although this change in energy policy will greatly stimulate PV demand, growth in this sector could not be automatically assumed since Japan's PV makers must face the rapid increase in the electricity price, which in turn feeds into their production cost to the detriment of their competitiveness. The simulation results based on the estimated import share functions in this paper suggest that this loss of price competitiveness will reduce domestic production in Japan via both a large increase in import shares and a decrease in exports to the world market, reflecting the property of the highly competitive market of PV and the decreasing scale of production of Japan's PV makers. The results can be inferred for the wider economy that to ensure a sound, favourable basis for growth, it is of paramount importance to avoid a hike in the domestic price of electricity as currently estimated, and to search for a more realistic target of renewable energy power generation.

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