

# Empirically Based Simulation

The Case of Twin Peaks in National Income

by

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## Abstract

Only recently a new stylised fact of economic growth has been introduced, the bimodal shape of the distribution of per capita income or the twin-peaked nature of that distribution. Drawing on the Summers/Hestons Penn World Table 5.6 (1991) we determine kernel density distributions which are able to detect the aforementioned twin peaked structure and show that the world income distribution starting with an unimodal structure in 1960 evolves subsequently to a bimodal or twin-peak structure. This empirical results can be explained theoretically by a synergetic model based on the master equation approach as in Pyka/Krüger/Cantner (1999). This paper attempts to extend this discussion by taking the reverse procedure, that is to find empirical evidence for the working mechanism of the theoretical model. We determine empirically the transition rates used in the synergetic approach by applying alternatively NLS to chosen functional forms and genetic programming in order to determine the functional forms and the parameters simultaneously. Using the so determined transition rates in the synergetic model leads in both cases to the emergence of the bimodal distribution, which, however, is only in the latter case a persistent phenomenon.

**Keywords** – bimodal productivity structure – master equation approach – genetic programming –

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