Autocatalytic Networks and the Green Economy

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Evaluating the potential "co-benefits, synergies and trade-offs" between the economy and green industries is crucial to inform policymakers and better design effective decision-making to limit climate change, especially as the window of opportunity is rapidly narrowing. Despite having strong theoretical underpinnings, there are still substantial gaps between the theoretical insights and practical implementation of green growth policies.

In this paper, we study the dynamical inter-dependence between "brown" and "green" products. For this purpose, we join two types of literature, the economic complexity framework and the Autocatalytic framework, to analyze the collective self-reinforcing effect between multiple exported products. We use data on bilateral trade flows from the *Base pour l'Analyse du Commerce International* (BACI) at the 6 digits level to study the statistical inter-relation between multiple exports with a focus on green goods and their relation to the more traditional economy. More precisely, we focus on the autocatalytic structure over the period 1995-2018 for 5022 products of 225 selected countries. We take an extensive set of 522 products relevant to the green economy at the 6-digits level draw on existing classification (APEC, OECD and WTO). The novelty is to provide a comprehensive analysis of the time evolution of autocatalytic effect of green products and idenfities how existing green capabilities might predict subsequent growth in brown industries. Our research aims to explore the hypothesis that green sectors are strongly dependent on less environmentally friendly industries.

Preliminary results show that green goods benefit from less self-reinforcing effect than their brown counterpart. Furthermore, green goods are more likely to catalyze other green goods compared to their brown counterparts. Reciprocally brown goods are more likely to catalyze other brown goods. These results have important implications for green industrial policy design since green industry could have unintended consequences to the reinforcement of less environmentally friendly economic activities while might benefit from reinforcing effect from development of capabilities on specific products.

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