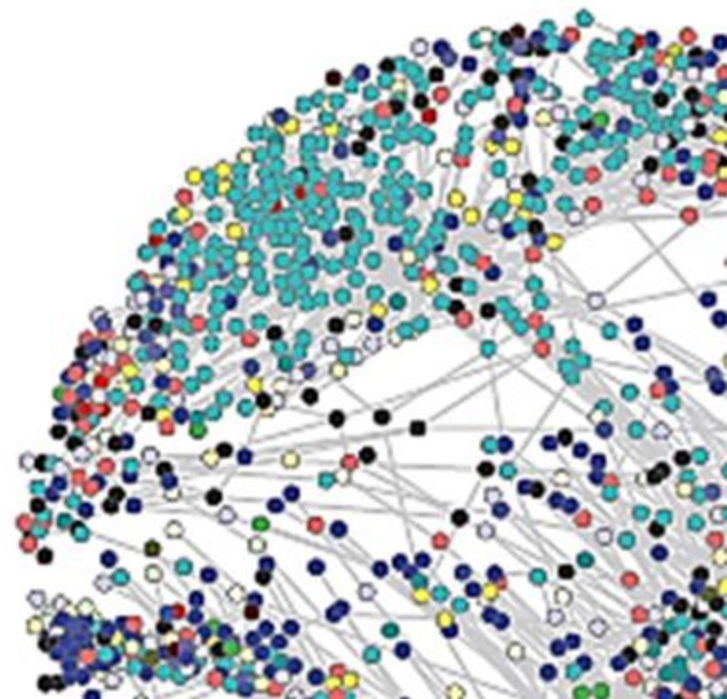


**Expert Group Meeting on Green Economy for  
Sustainable Development Goals: National  
Implementation of Low Carbon Development**  
March 13-15, 2018, Jeju, Republic of Korea

**Sustainable and Inclusive Economic  
Diversification**

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Division for Sustainable Development  
Department of Economic and Social Affairs  
United Nations



# Content

- The predicament
  - How to reconcile the need to reduce carbon emissions to avoid climate change with the need to promote rapid inclusive economic growth to eliminate global disparities?
- Recent results on economic complexity
- Implications for green growth strategies



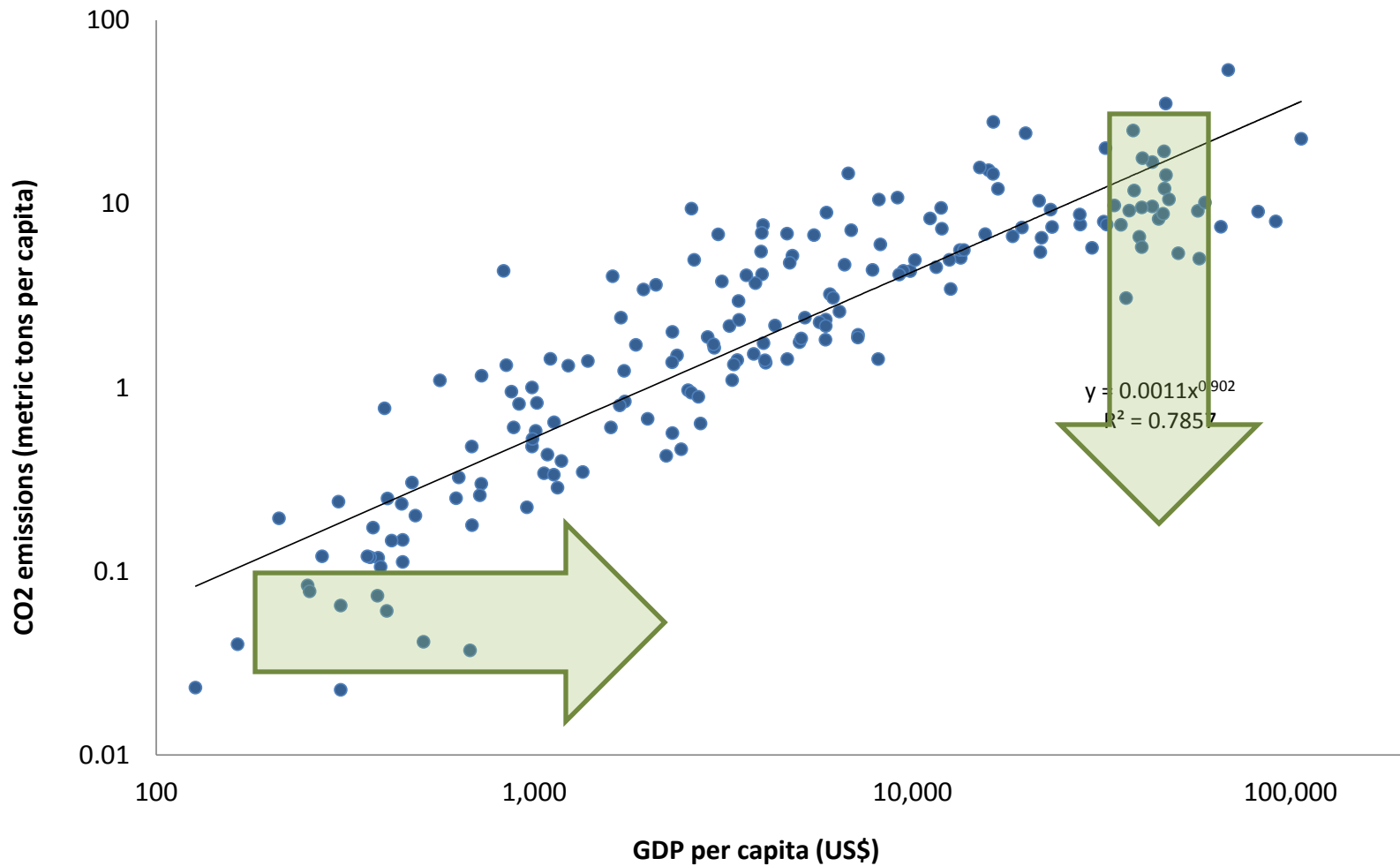
TRANSFORMING OUR WORLD:



THE 2030 AGENDA FOR  
SUSTAINABLE DEVELOPMENT

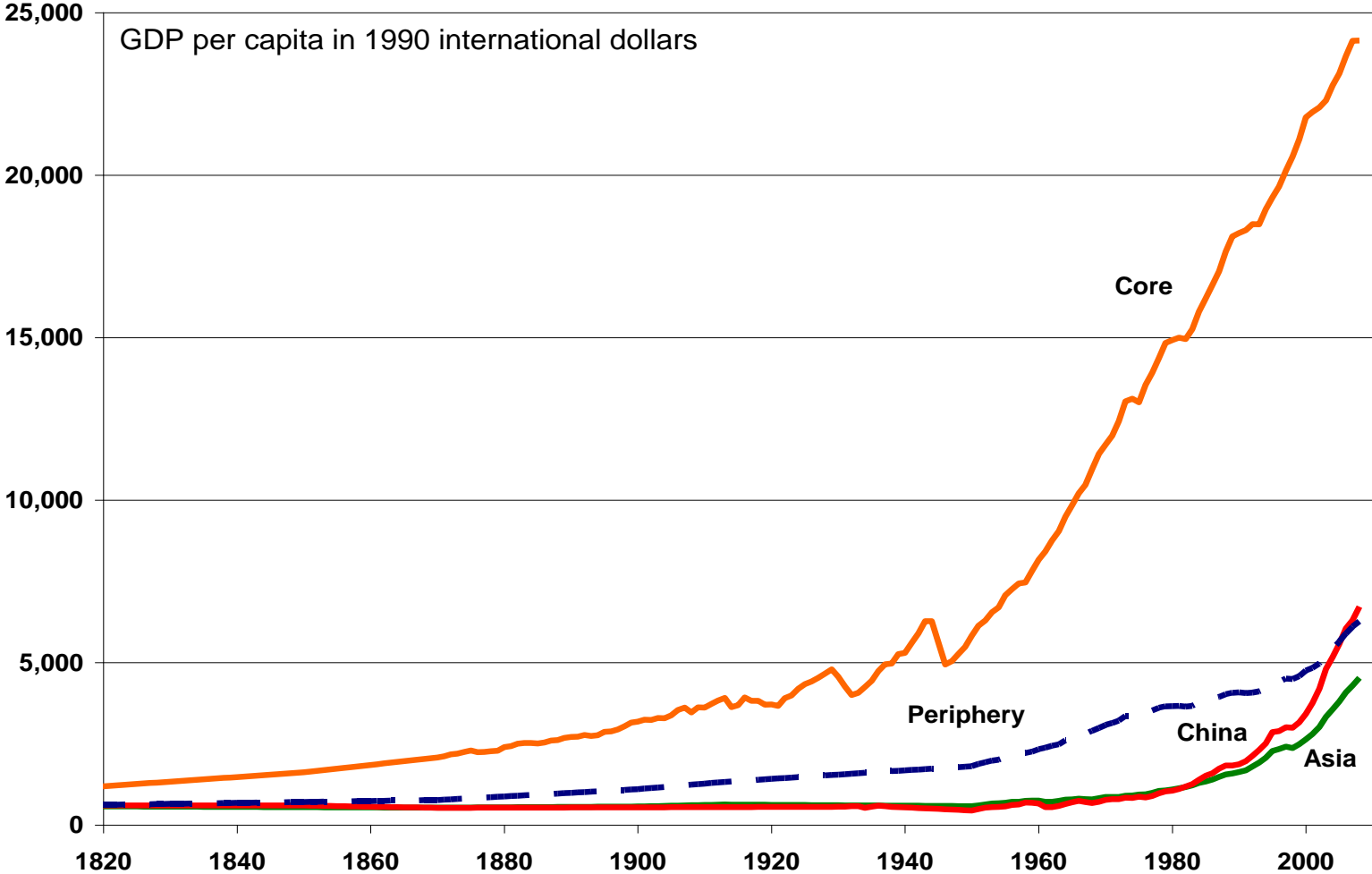
- “We recognize that **poverty eradication** in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development.”
- “We are determined to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on **climate change**, so that it can support the needs of the present and future generations”

# Higher income is associated with higher CO<sub>2</sub> emissions per capita



Source: Author based on data from World Bank, 2011b (accessed November 2011).

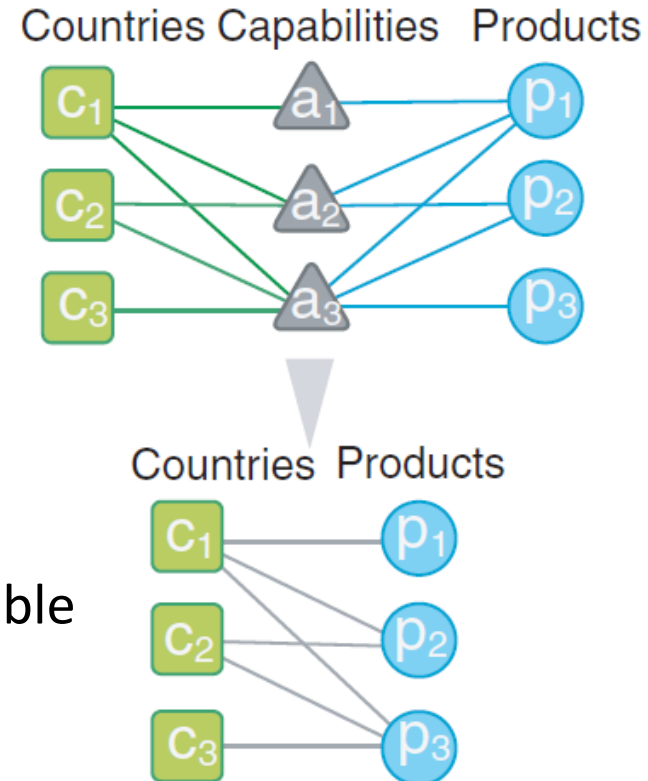
# Developing countries have tried to find sustained growth during the past 200 years



Source: Author based on data from Maddison, 2009.

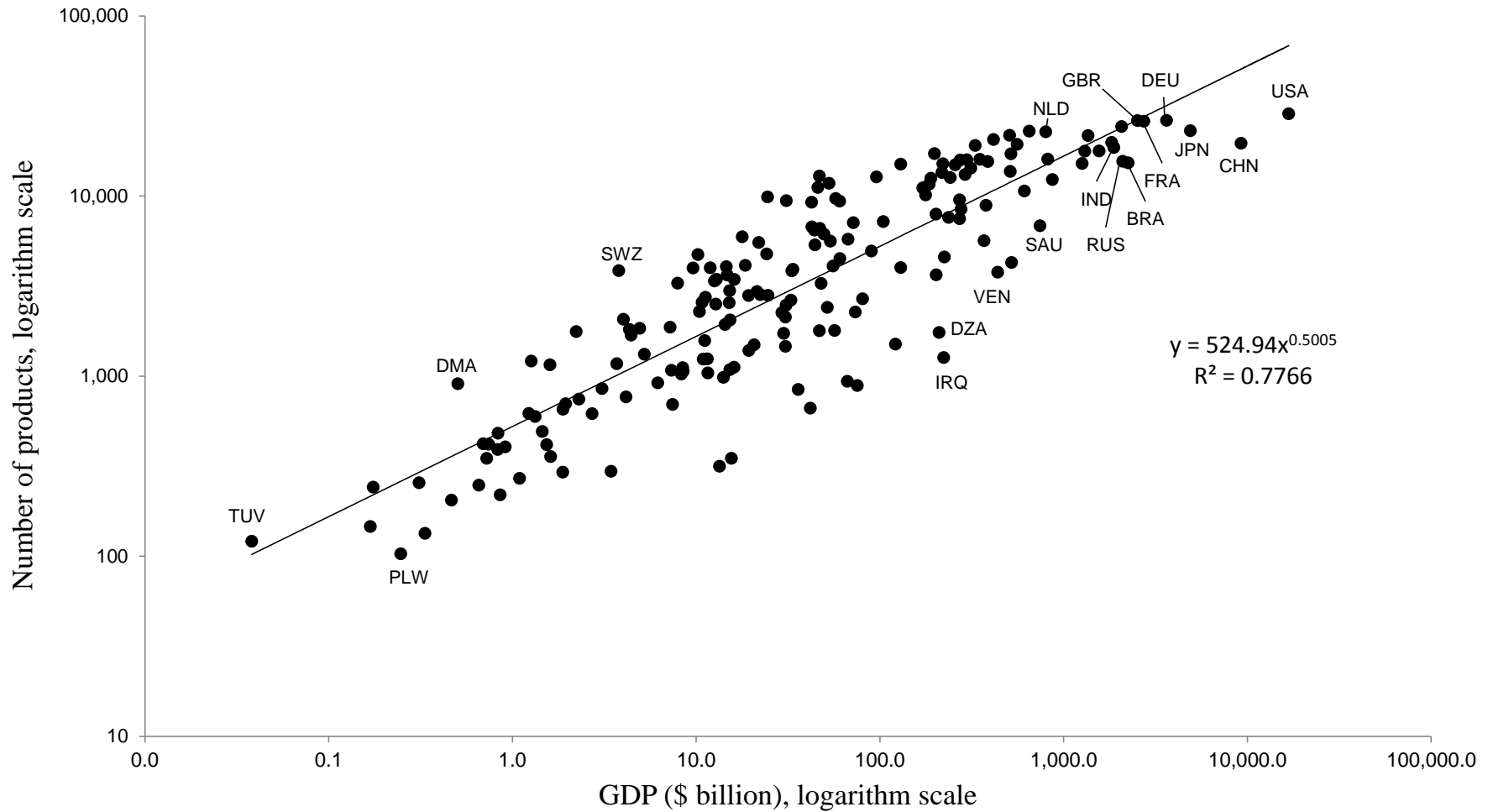
# Complexity Perspectives on Structural Change

- Empirical literature (econophysics):
  - Trade data
  - Tools and methods of network theory and system dynamics
- Seminal work:
  - Hidalgo et. Al 2007
  - Hidalgo & Hausmann, 2009
- Key ideas:
  - Products that countries produce can tell us something about their productive non-tradable capabilities
  - More capabilities → more products (Diversification)  
Diversification  $\approx$  complex economy  $\approx$  Development

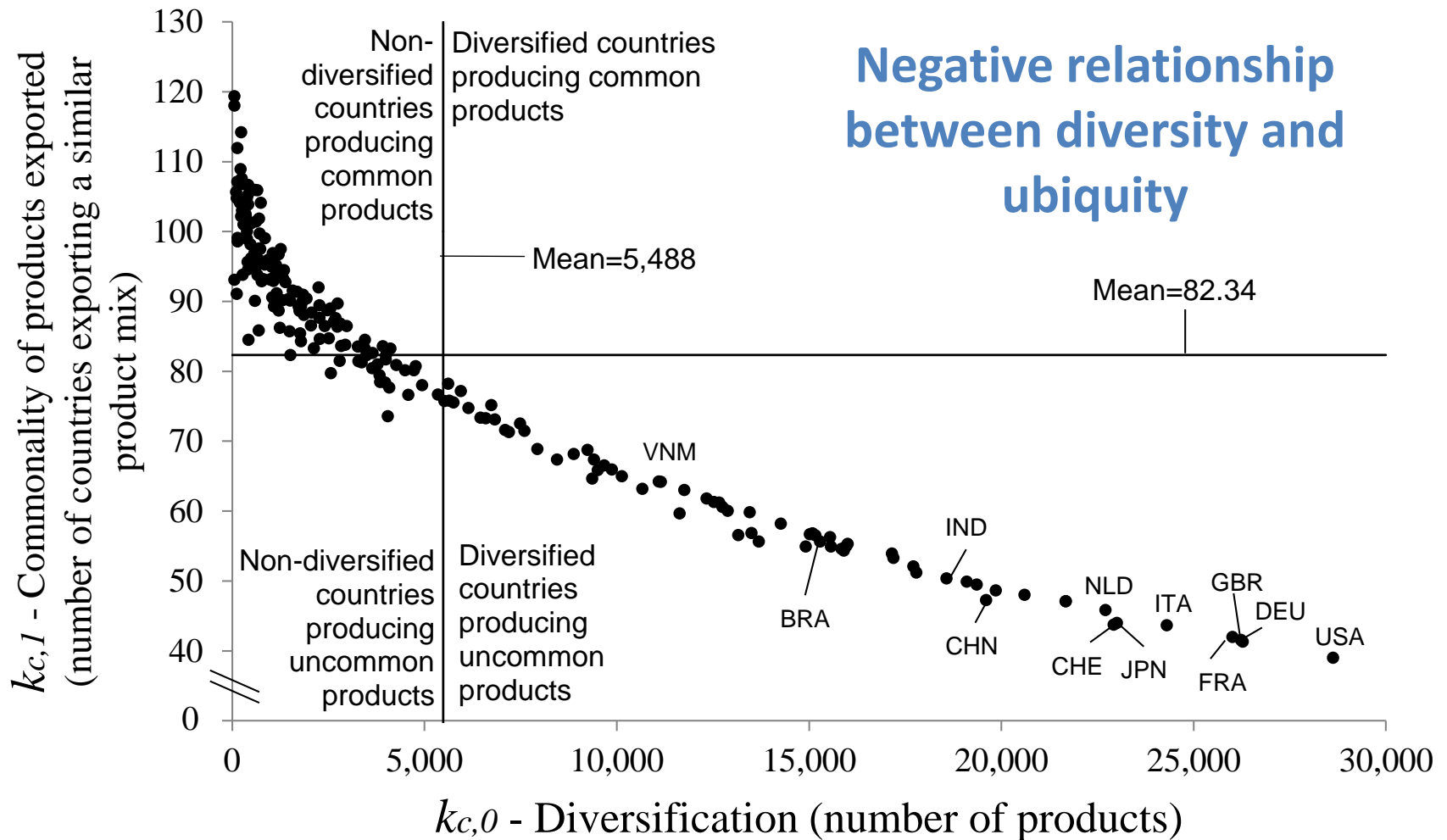


Source: Hidalgo and Hausmann (2009)

# Diversification is associated with higher total GDP

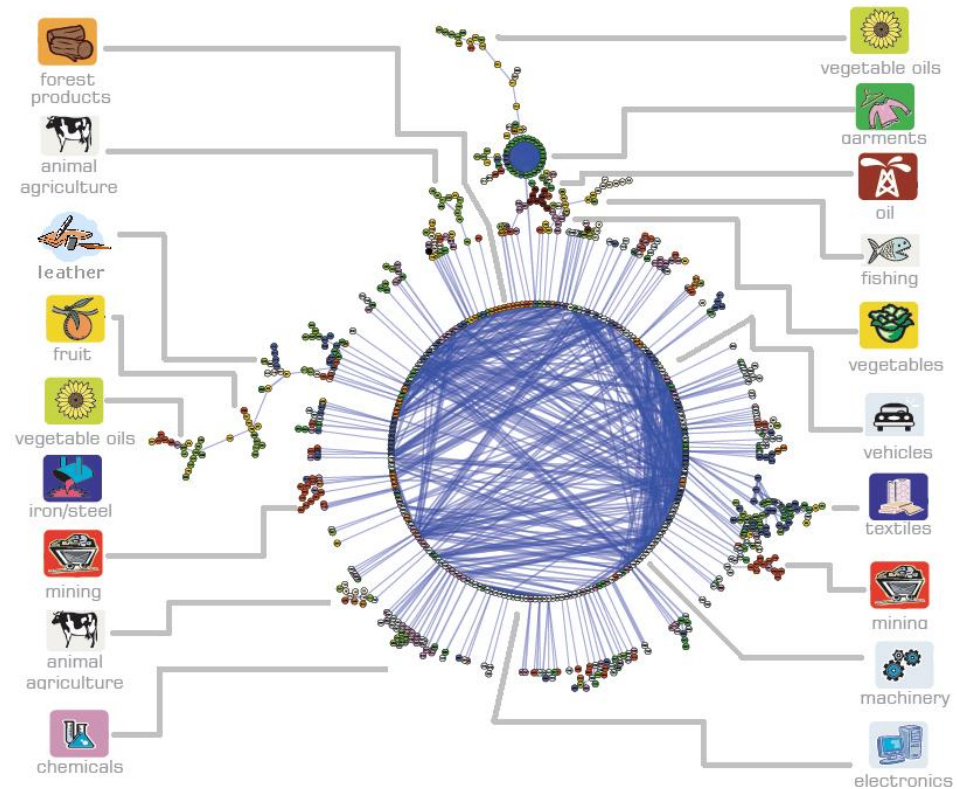
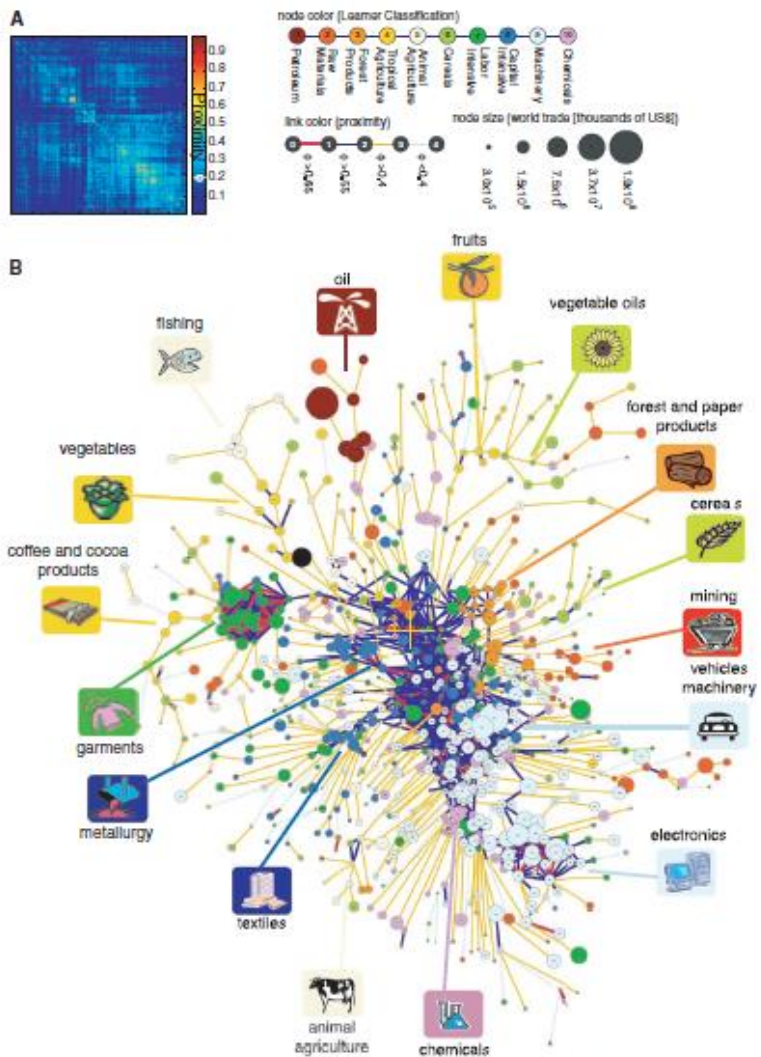


# Diversification is associated with lower foreign competition regarding the exported products





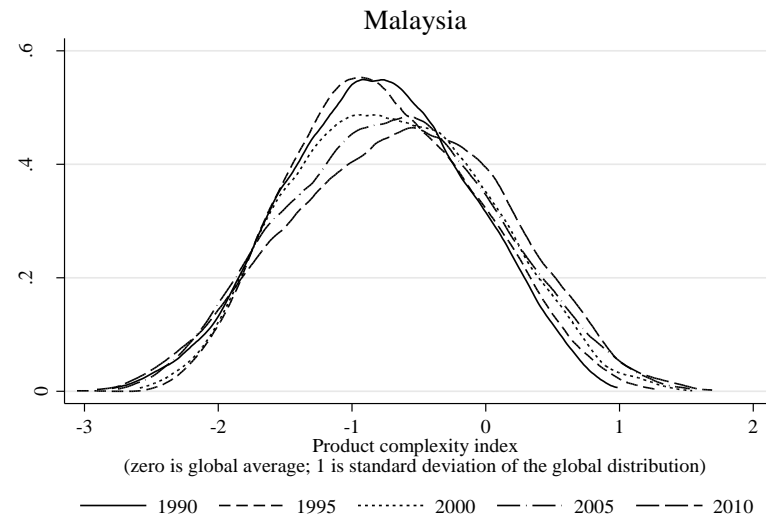
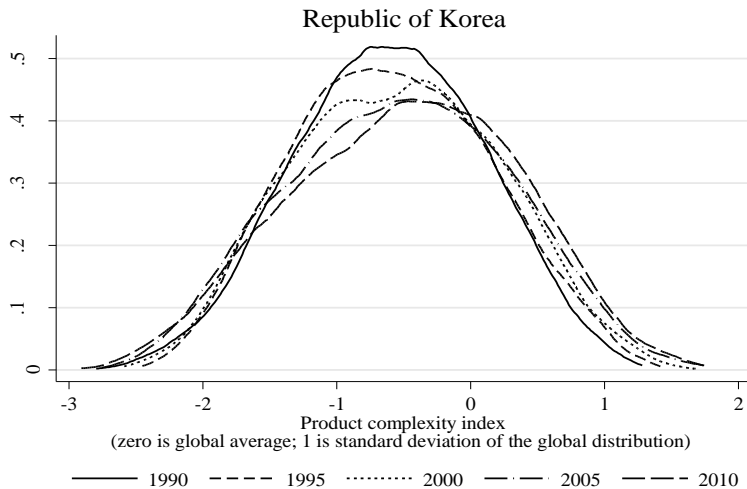
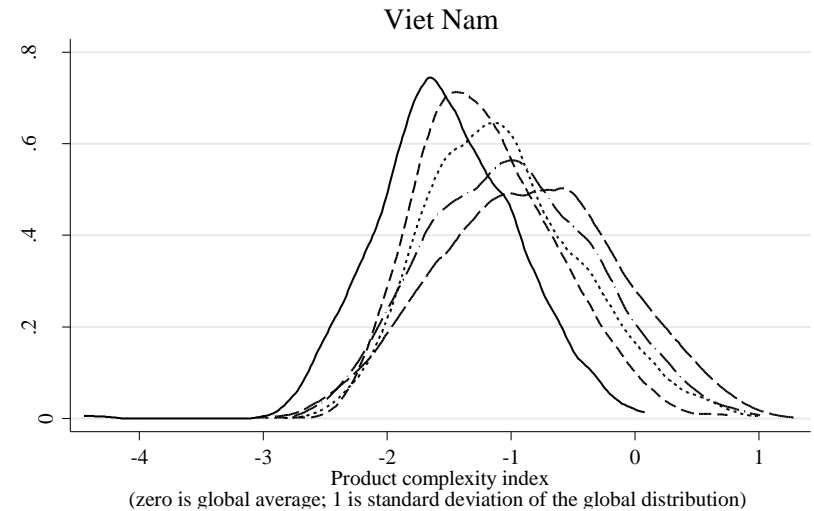
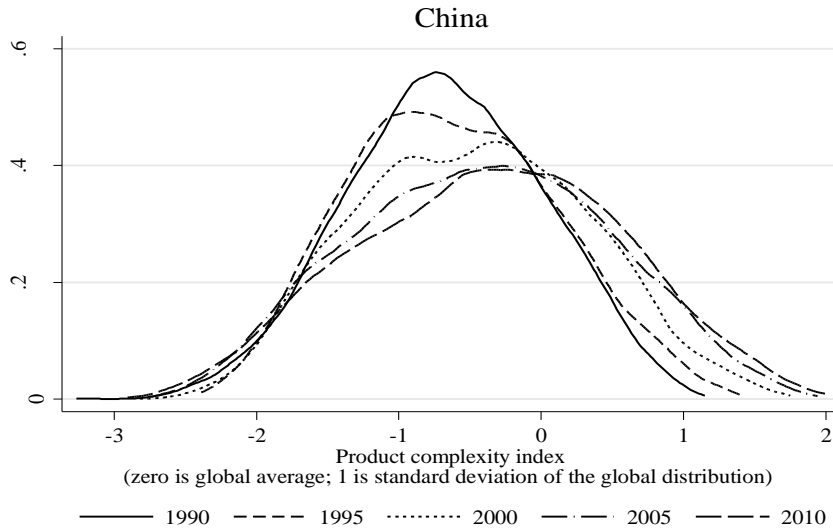
# Diversification is path dependent



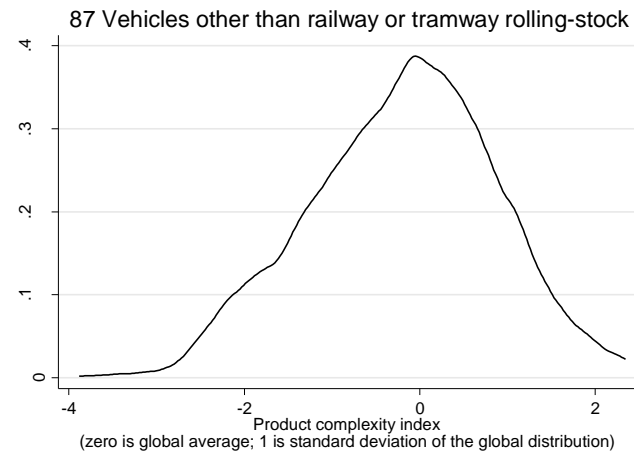
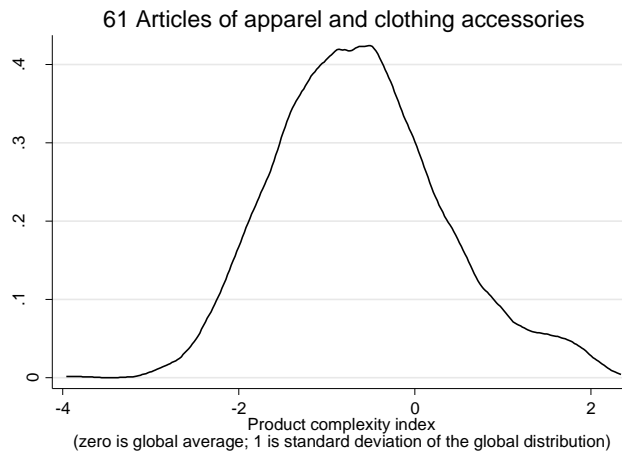
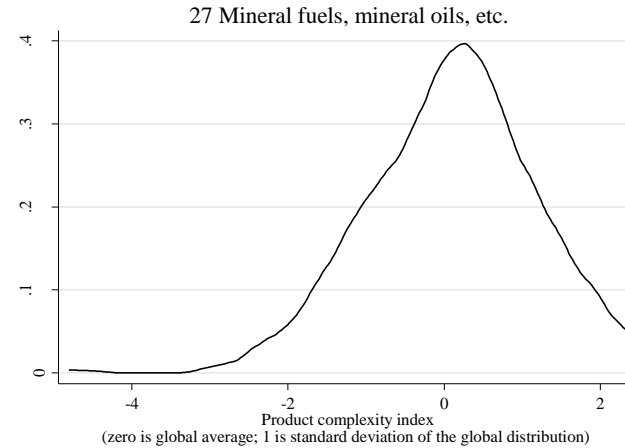
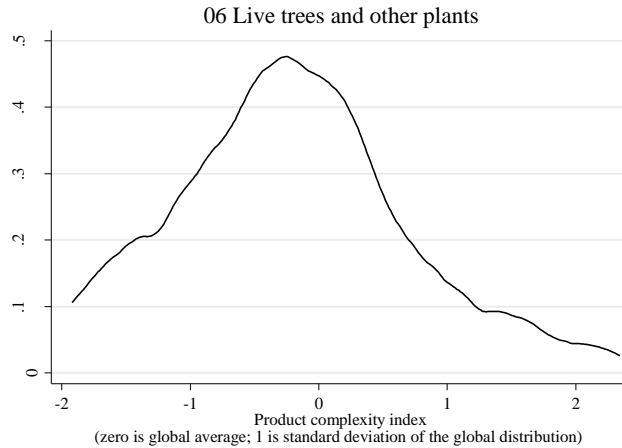
Source: Hidalgo, Klinger, B., Barabasi, A-L, and Hausmann, R. (2007). The product space conditions the development of nations.

Source: Freire(2017).Diversification and structural economic dynamics.

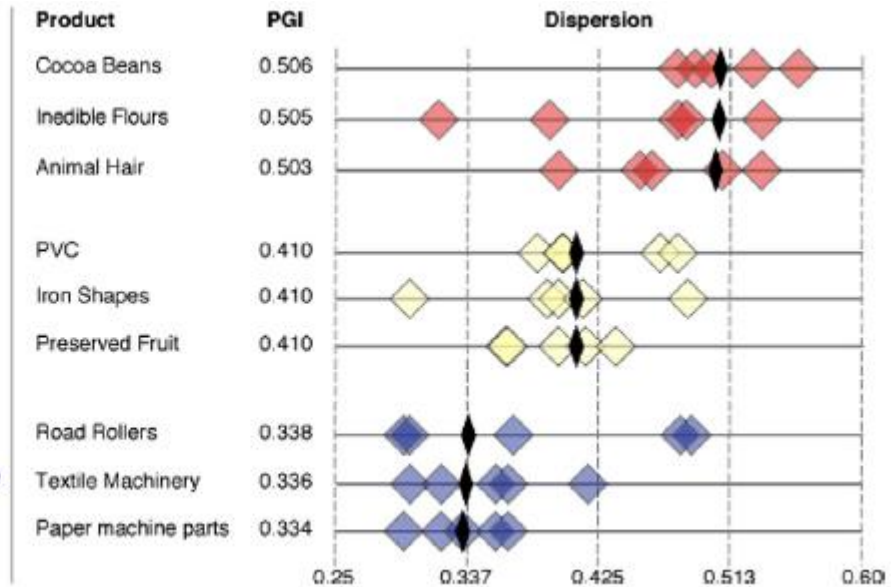
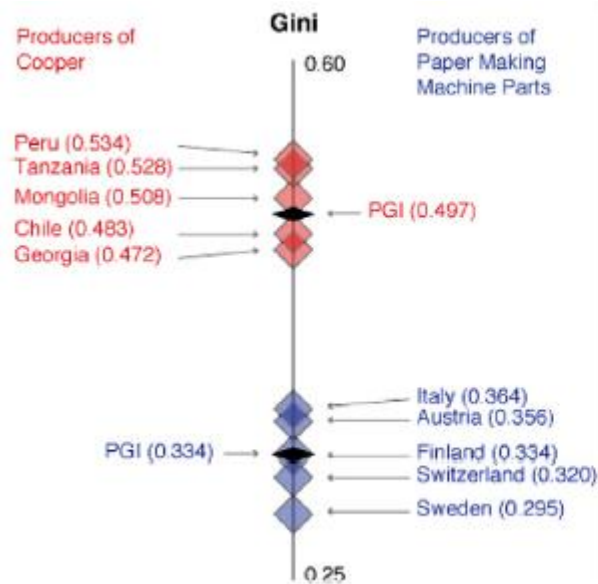
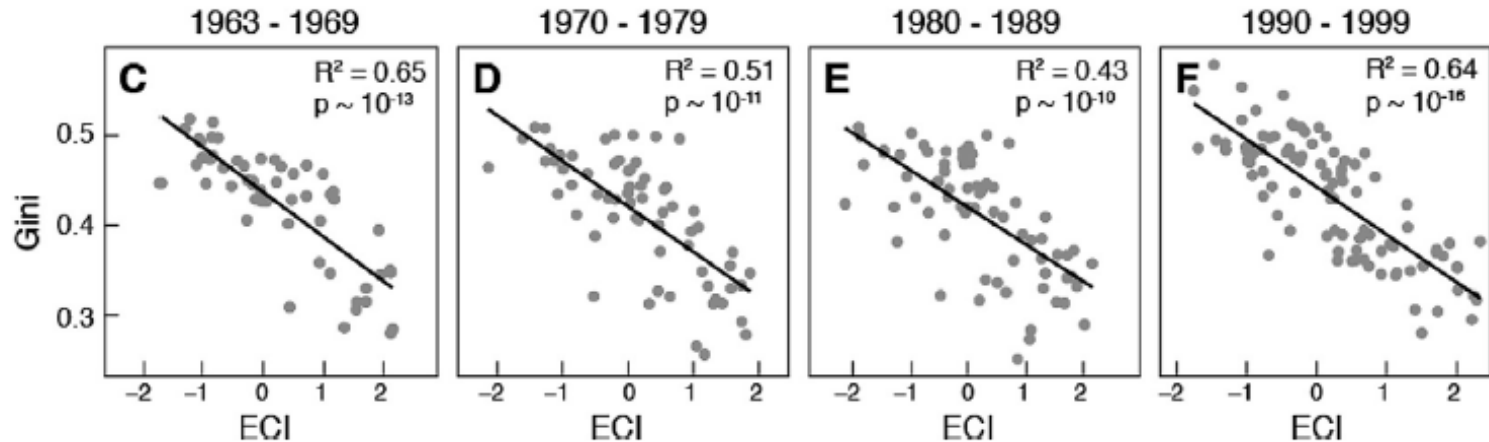
# As economies develop and diversify, they tend to add exports of higher complexity



# What matters in terms of product complexity is not the broad industry classification but the individual products within the industry



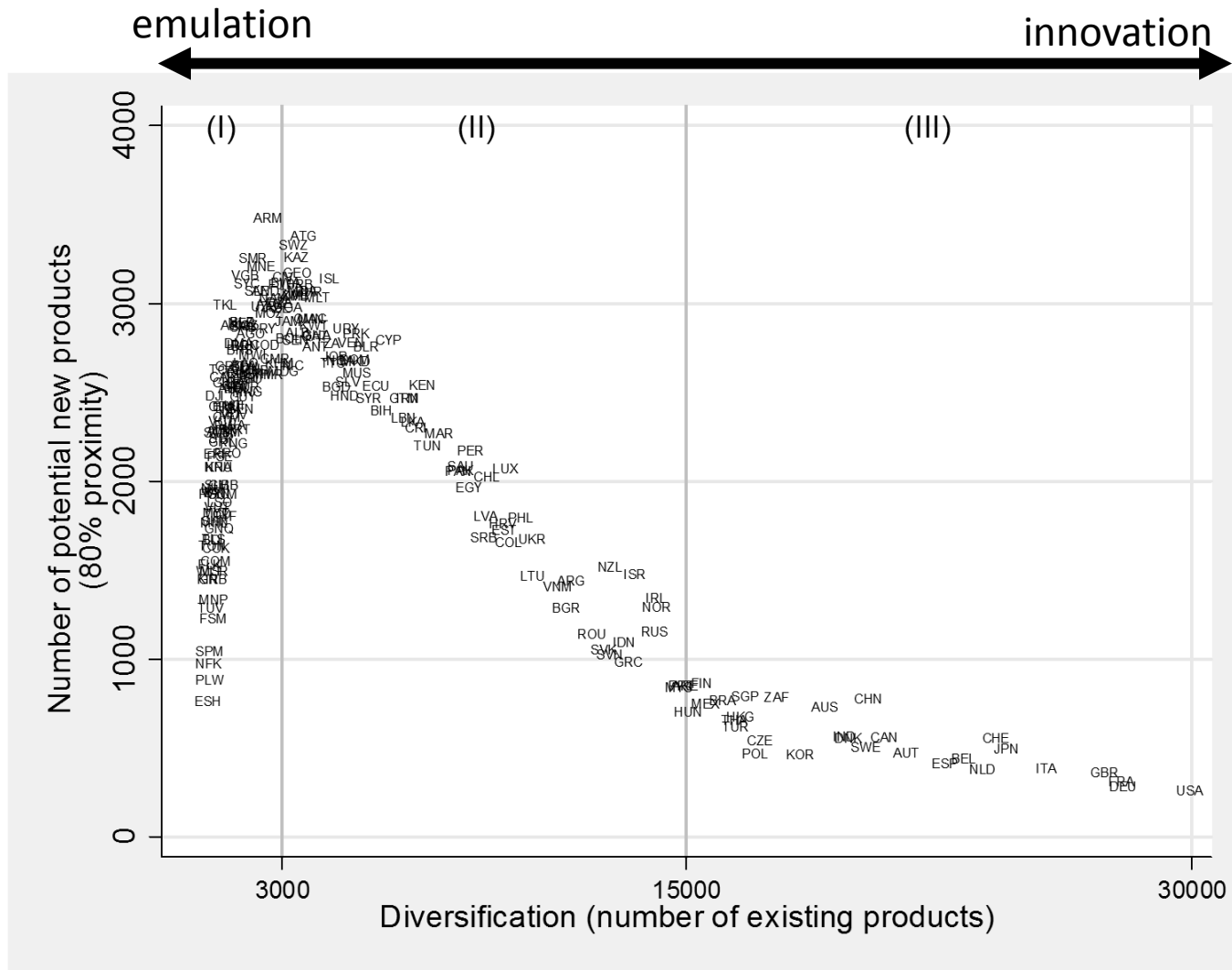
# Countries exporting complex products have lower levels of income inequality



# Use of product space to identify products for diversification

- Examples
  - Brazil (De La Cruz and Riker, 2012)
  - China and India (Neves, 2012)
  - Colombia (Hausmann and Klinger, 2008)
  - Kazakhstan (Felipe and Hidalgo, 2015)
  - Latvia (Vitola and Davidsons, 2008)
  - Myanmar (Ayres and Freire, 2014)
  - Portugal (Freitas et al., 2013, 2015)
  - South-Asian countries (Freire, 2013b),
  - Selected ASEAN countries (Bayudan-Dacuycuy and Lim, 2017)
  - Least developed, landlocked and small island countries (ESCAP, 2014, 2015; Freire, 2013a, 2017)
  - Atlas covering 128 countries (Hausmann et al., 2013)

# Relationship between the level of diversification and the number of potential new products

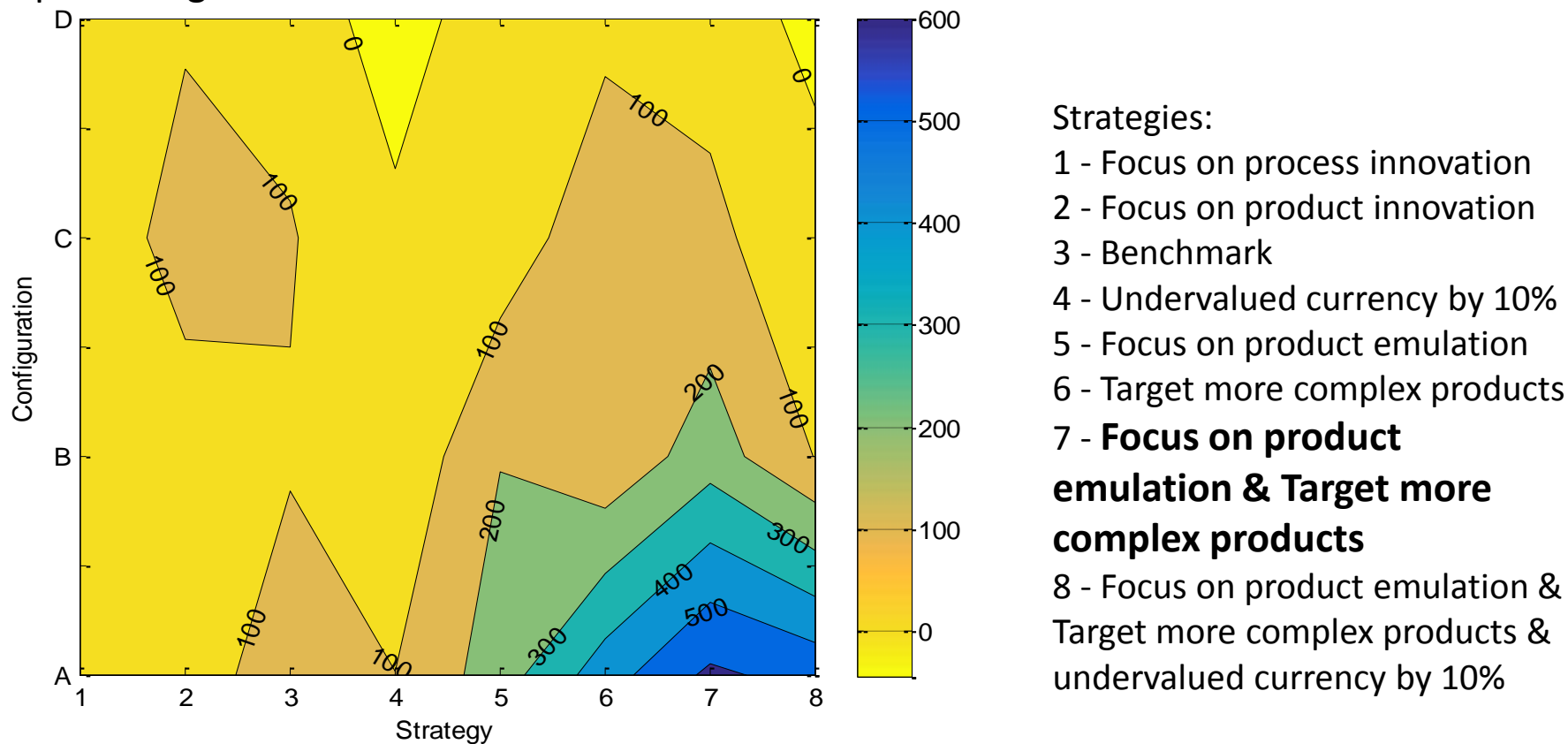


Source: Freire(2017).Diversification and structural economic dynamics.

# Strategy for less diversified countries to catch-up: focus on emulation targeting products with above average complexity

Formal model: multi-country multi-sector model with endogenous diversification

Example of result of computer simulations: Comparison of catch up strategies,  
percentage increase in GDP

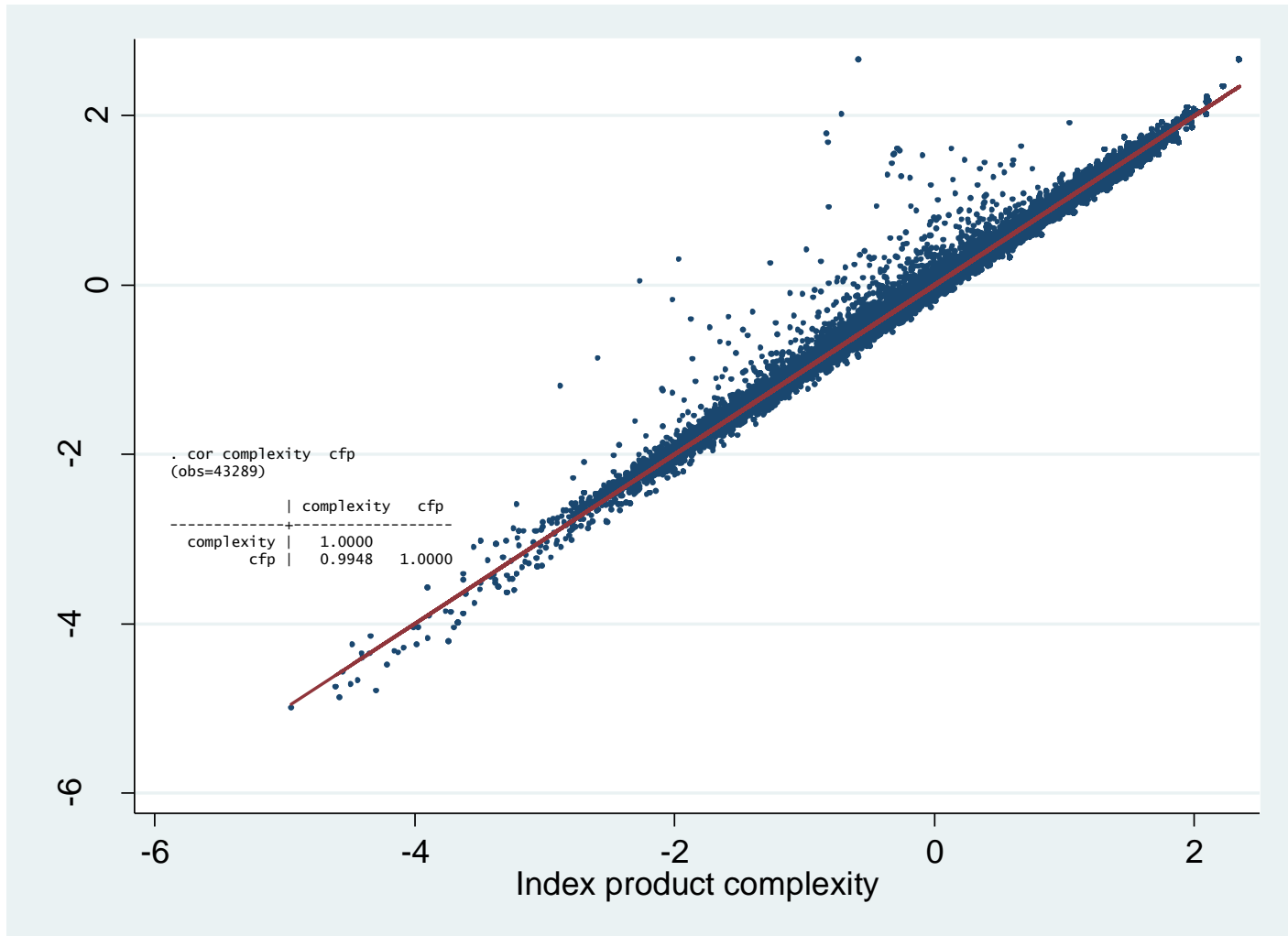


# Finding a greener diversification path

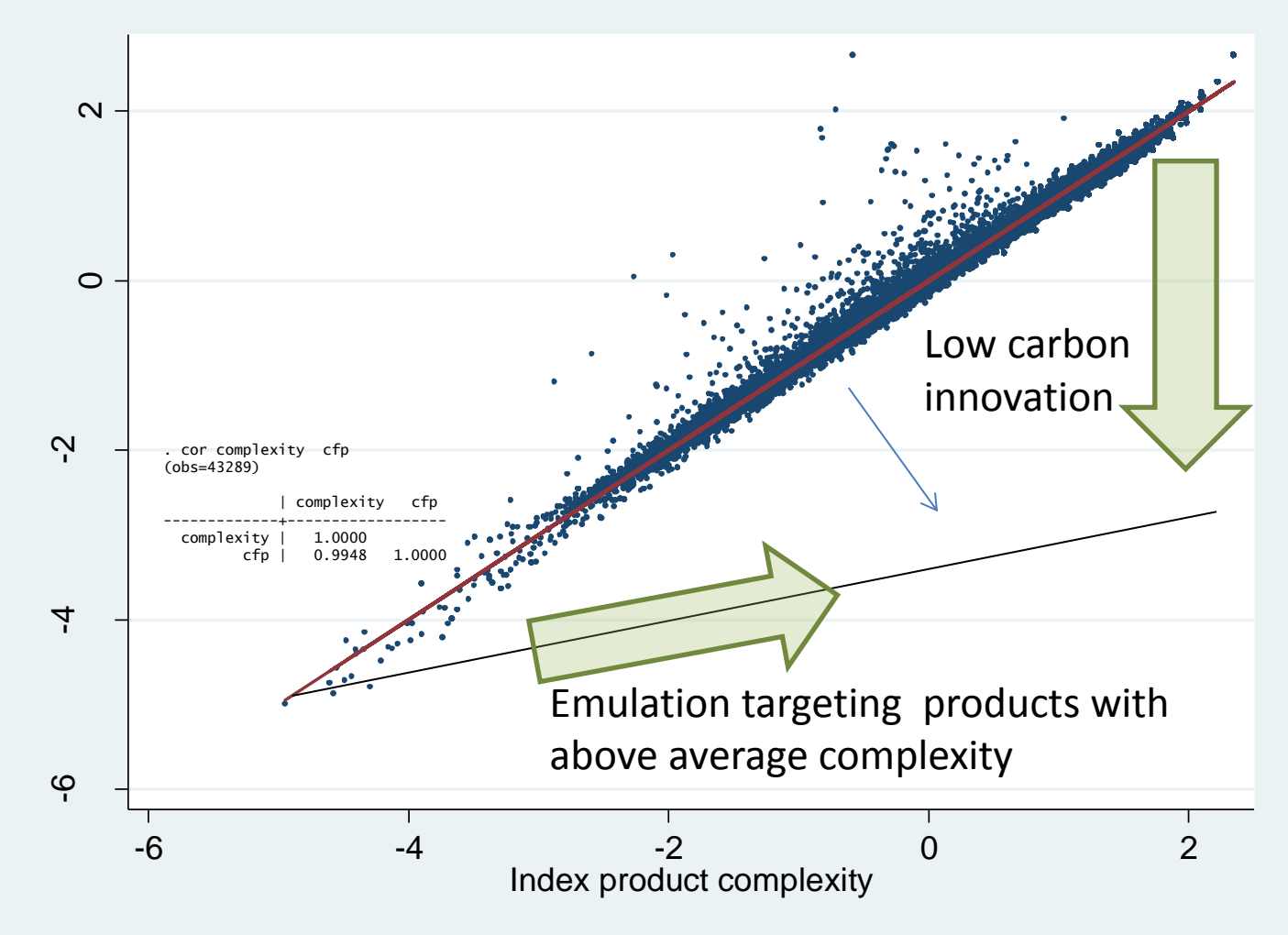
- “In principle we can use the method of reflections to characterize countries and products by N variables” (Hidalgo and Hausmann, 2009)
  - Use CO<sub>2</sub> emissions per capita
- Identify the products that are more complex & associated with lower carbon footprint & that are nearby in the product space to the existing product-mix of the countries



# However.....High correlation between complexity and carbon footprint



# Solution: Dual Track



Source: Author based on data from the United Nations Commodity Trade Statistics Database (COMTRADE).

# Main Messages

- Economic development happens through the diversification of economies towards more complex products
- Focus on sustainable industrialization and structural change should complement strategies that focus on greener sources of energy
- Recent results on economic complexity can inform decision makers in developing countries on how to identify potential new sectors for economic diversification associated with lower inequality
- Dual track for greener path:
  - More diversified economies should focus on low carbon innovation
  - Less diversified economies should focus on emulation targeting products with above average complexity

Thank you

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