



Dynamics of material consumption on economic growth: investigating resource inefficiency within the European Union

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Background and Aim

Domestic material consumption (**DMC**) remains a significant source of climate change, as identified within the sustainable development goal twelve (**SDG12**) by the United Nations.

Investigate the dynamics of economic growth and material consumption nexus for Ireland with more recent data, relative to the EU-28 members.

Observe

- How domestic material consumption has proliferated economic growth in the European Union and within individual member states.

Explore

- The dynamics of the relationship between material consumption and economic growth for the EU-28.

Compare

- Observations & performance between a low resource efficiency economy, such as Ireland, against top performers in reference to top ten SDG12 and resource productivity performers in the EU-28.

Research Question

Is there a reason for the slow progress in SDG12 (responsible consumption and production), or can the impact of material consumption on economic growth be the reason countries have found it challenging to achieve progress in this area?

Figure 1: Resource Productivity index for EU28 (2017)

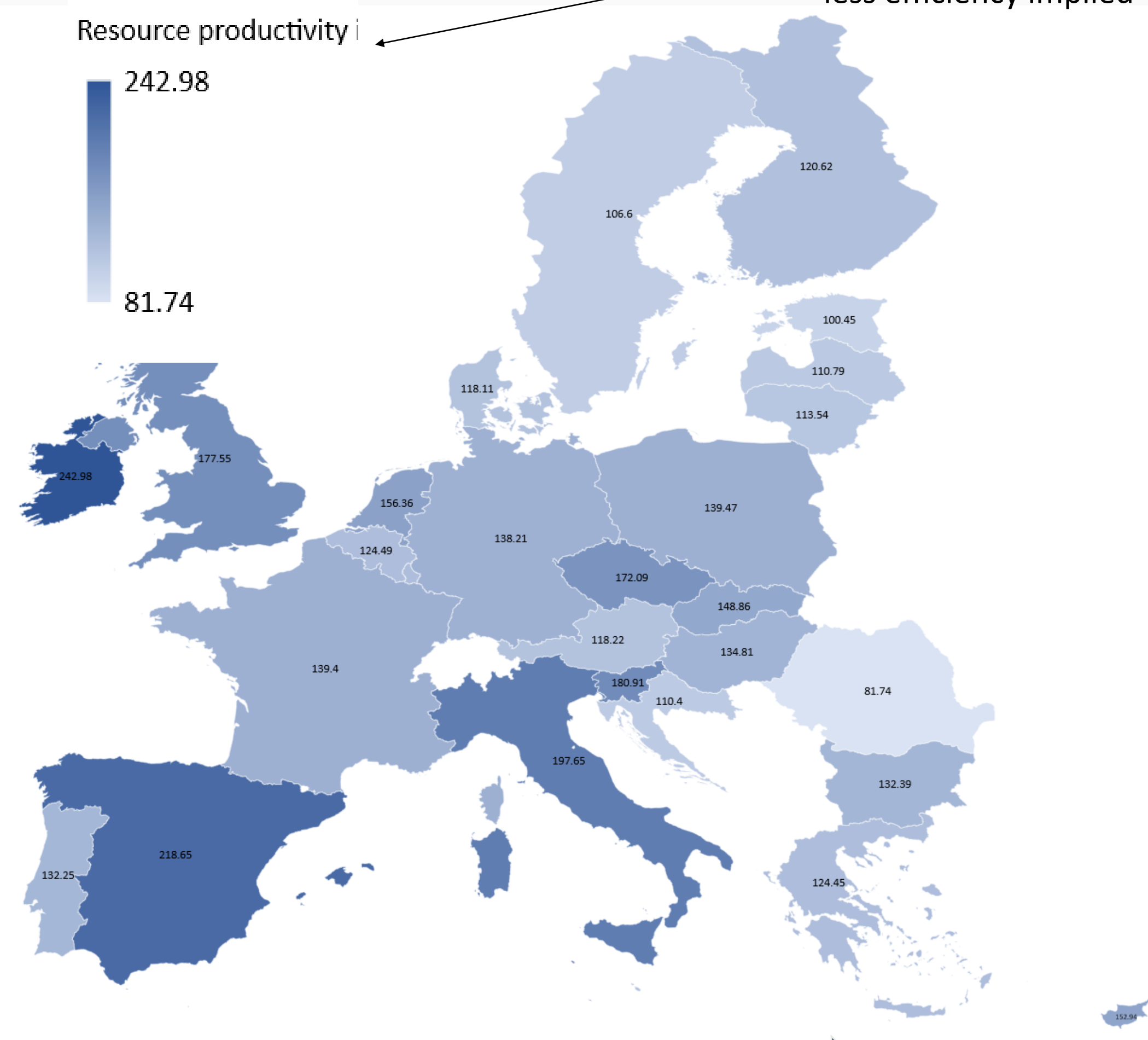
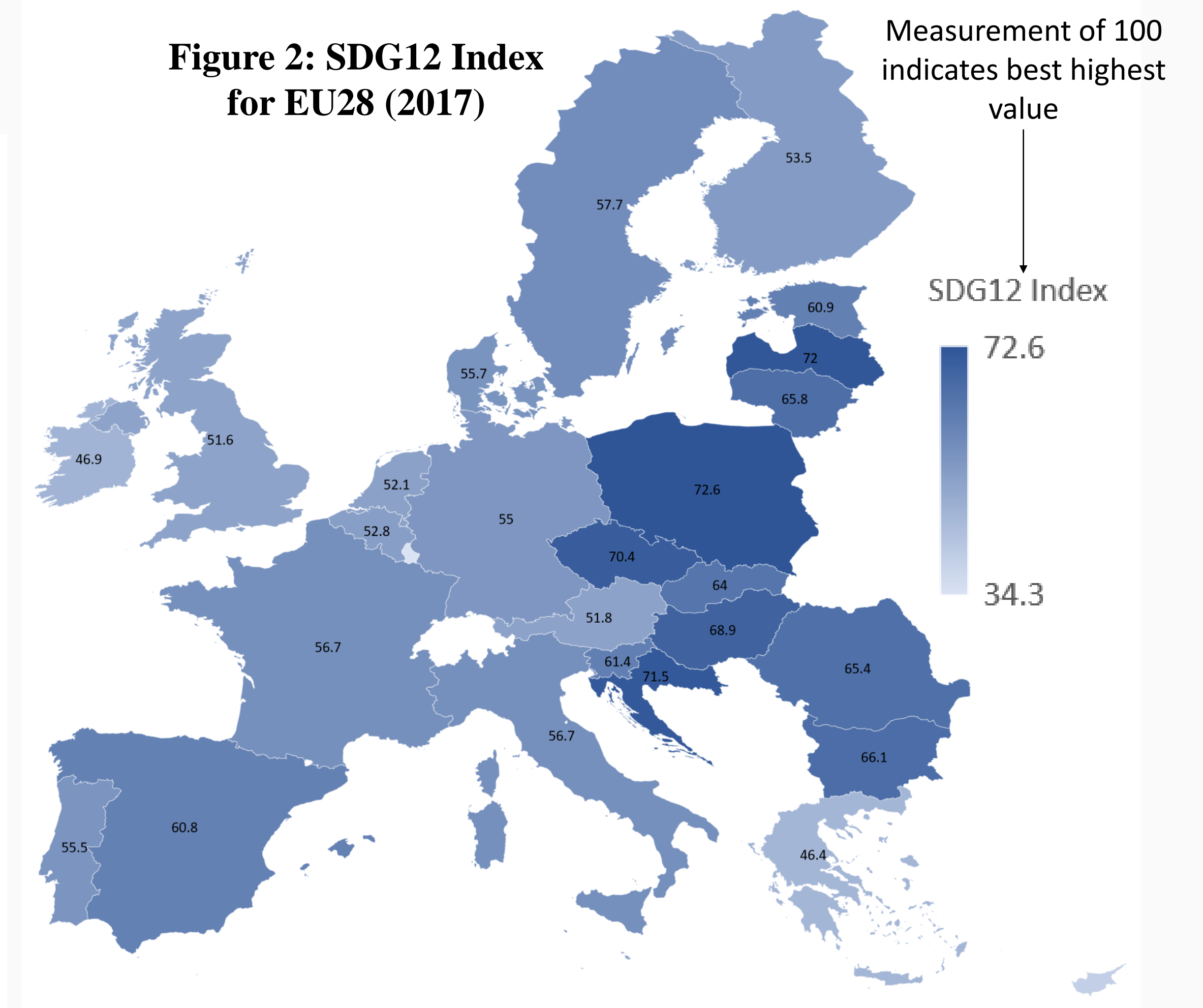


Figure 2: SDG12 Index for EU28 (2017)



Methodology

Granger-type autoregressive distributed lag (ARDL) panel estimation technique

Data period and coverage

Panel data of EU28 member states (2007-2017)

Variables

- Three key indicators to proxy for the level of material usage or extraction in a country: domestic material consumption (DMC), domestic material (DM) input & domestic material extraction.

-Control variables: trade openness, real GDP, population, labor force, research & development (R&D)

Scenarios

Individual country tests and comparison by resource efficiency performance across members.

Individual country tests and comparison between top SDG12 performers in 2017.

Growth and feedback effects

Findings

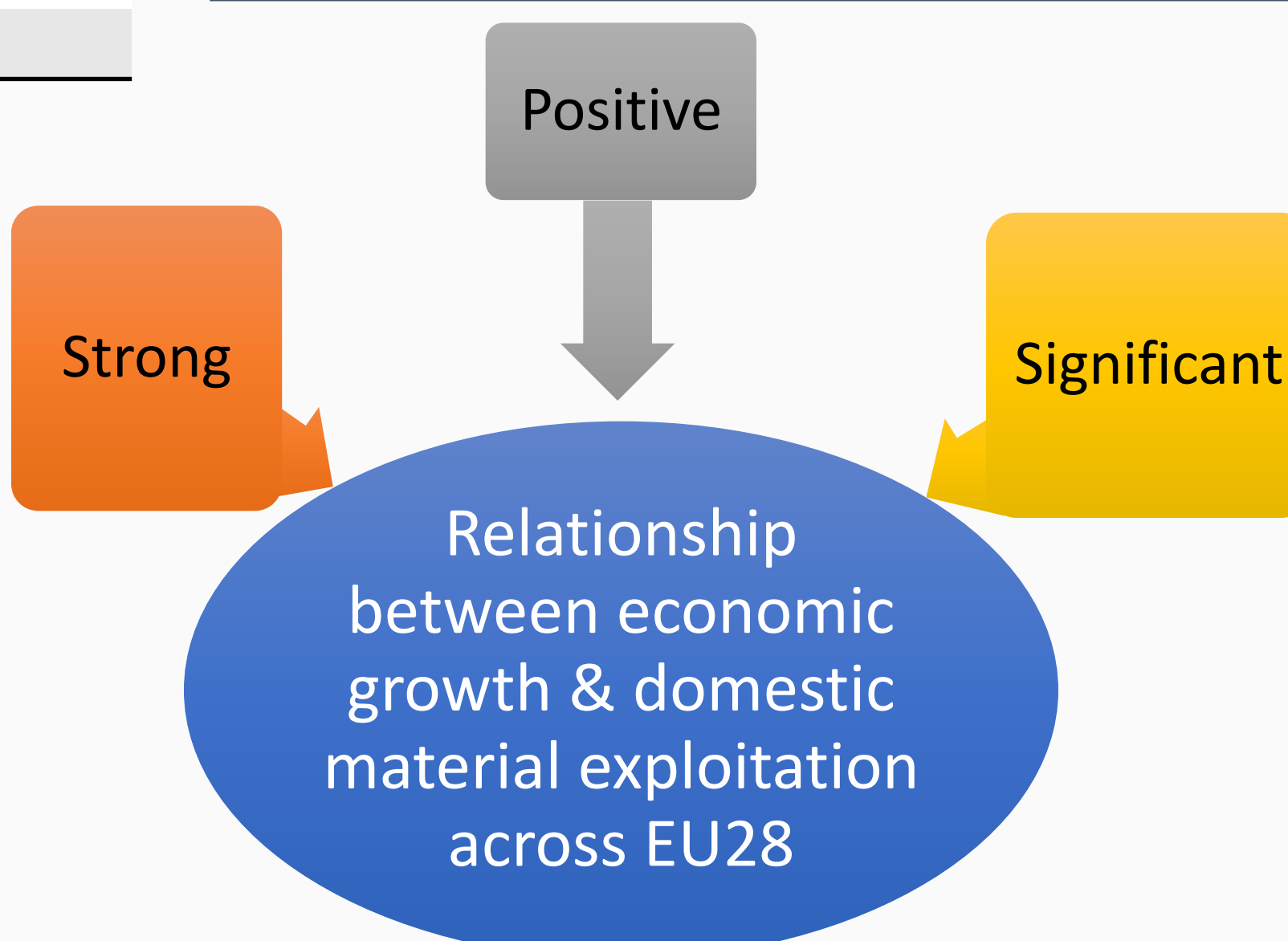
- Countries with high RPI score (Table 1), have a lower impact of DMC on economic growth, than higher ranked countries on the resource productivity list.
- Lower ranked SDG12 countries (Table 2) have significant material usage effect on growth, whereas with higher ranked countries, material usage does not seem to have an effect.

Table 1: Resource Productivity Index (RPI)		
Variable	Low RPI Score	High RPI Score
DMC	0.6225*** (0.0725)	-0.0982 (0.2046)
DM Input	0.6753*** (0.0743)	-0.0114 (0.1890)
DM Extraction	0.9153*** (0.0901)	-0.2812 (0.1950)

Table 1: Comparison between high and low resource productivity countries

Table 2: SDG12 Rank		
Variable	Low SDG	High SDG
DMC	0.6225*** (0.0725)	-0.0982 (0.2046)
DM Input	0.6753*** (0.0743)	-0.0114 (0.1890)
DM Extraction	0.9153*** (0.0901)	-0.2812 (0.1950)

Table 2: Comparison between high and low SDG12 ranking countries



Implication

- Countries, such as Ireland, that are less efficient in domestic material use, experience a lesser impact of material use on economic performance, which can lead to a dangerous cycle of inefficiency.
- Any policies targeted at the regulation of domestic material exploitation in Ireland, and the rest of the EU28 member states, should take the strong linkage between material exploitation and economic growth into consideration, prior to implementation.

Conclusion

- Countries with high levels of domestic material consumption (Ireland included), proxied by the resource productivity index, tend to have a relatively lower impact of material use on economic performance.

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