Literature Survey

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1 Introduction

This project examines **energy systems** and **economic trends** across multiple countries, seeking to understand how *policies or events* affect emissions, consumption, and growth. Such a cross-national perspective can reveal **regional disparities**, the **effectiveness of different policy instruments**, and broader **global transitions**. Below are three studies that form a relevant foundation, counterpart, and methodological reference for this approach.

2 Relevant Multi-Country or Cross-National Articles

2.1 Energy Consumption, Emissions, and Growth Nexus

Reference Apergis, N., & Payne, J. E. (2010). The emissions, energy consumption, and growth nexus: Evidence from 13 major polluting countries. *Energy Policy, 38*(2), 818–825.

Description This paper uses a **panel data** approach to examine the relationship among *energy consumption, CO_2 emissions, and economic growth* in 13 major polluting countries over several decades. It applies **co-integration** and **Granger causality** tests to identify **long-run** and **short-run** interactions.

Pros

- **Truly multi-country**: Avoids a single-nation bias and uncovers patterns across diverse economies.
- **Robust Econometrics**: The co-integration approach accommodates *long-run equilibria* between emissions, consumption, and GDP.

Cons

- **Focus on Large Polluters**: Smaller or less-polluting nations might exhibit different dynamics not captured here.
- **Limited Policy Detail**: It identifies overall relationships but does not deeply dissect *which* policies (e.g., carbon taxes, feed-in tariffs) drive changes.

Relevance

- **Foundation**: Illustrates a *multi-country time-series* framework.
- **Methods**: Offers a model for linking emissions and GDP in a broad cross-national setting.

2.2 Global Carbon Pricing Policies

Reference Best, R., Burke, P. J., & Jotzo, F. (2020). Carbon pricing efficacy: Cross-country evidence. *Environmental and Resource Economics, 77*(1), 69–94.

Description Investigates how **carbon pricing policies** (including carbon taxes and emissions trading systems) have impacted **CO_2 emissions** across a panel of countries. The authors use **panel regression** techniques to compare *emission trajectories* in jurisdictions with and without carbon pricing, controlling for energy mix, GDP, and other factors.

Pros

- **Direct Policy Analysis**: Focuses on a key instrument (carbon pricing) and measures its effect quantitatively.
- **Comparative Approach**: Contrasts multiple countries that adopt carbon pricing at different times or rates.

Cons

- **Policy Heterogeneity**: Carbon pricing schemes vary widely in design (price level, coverage), which can blur the results.
- **Moderate Historical Span**: Since carbon taxes and ETS are relatively recent, the dataset may not cover very long time horizons.

Relevance

- **Counterpart**: Provides *multi-country* policy event analysis, relevant if you want to compare *before vs. after* policy introduction.
- **Main Methods**: Demonstrates difference-in-differences or panel regression to isolate policy impacts on emissions.

2.3 Renewables Deployment and Economic Outcomes in OECD and Emerging Economies

Reference Marques, A. C., & Fuinhas, J. A. (2012). Are public policies towards renewables successful? Evidence from European countries. *Renewable Energy, 44*, 109–118.

Description Though titled "European countries," the methodology and findings are widely cited in **cross-national** contexts, examining how **policy frameworks** (feed-in tariffs, quota

obligations) influence **renewable energy deployment** and, indirectly, economic indicators. Extensible to broader OECD or emerging markets.

Pros

- **Policy Mechanisms**: Offers insight into which *renewable support* schemes are more effective for scaling up wind/solar.
- **Panel Data**: Covers multiple European nations, but the empirical techniques can be applied to multi-nation sets elsewhere.

Cons

- **Regional Focus**: Mainly Europe. For a truly global scope, you might supplement with data from Asia or the Americas.
- **Policy Overlaps**: Distinguishing the effect of each policy type can be complex, as many countries adopt multiple measures simultaneously.

Relevance

- **Methods**: Shows how to incorporate *policy dummy variables* for feed-in tariffs, quotas, or premium tariffs across multiple countries.
- **Foundation**: Demonstrates a framework for analyzing *renewable policy* success and any correlation with macroeconomic variables.

3 Synthesis and Implications

Collectively, these studies reveal how **multi-country analyses** can identify broader patterns in **energy consumption, emissions, and economic growth**. Where Apergis and Payne (2010) highlight *long-run* relationships in major polluters, Best et al. (2020) measure the

actual effect of a specific policy tool (carbon pricing) across different nations. Meanwhile, Marques and Fuinhas (2012) delve into **renewable policy** success, focusing on feed-in tariffs and other incentives.

For a **national-level** multi-country project, these references show:

- **Data Handling**: How to assemble panel data over time for many countries.
- **Policy Variables**: Using dummy variables or continuous measures (e.g., carbon price rates, feed-in tariff levels) to evaluate *policy effectiveness*.
- **Methodological Rigor**: Employing co-integration, panel regressions, or event studies to parse out **cause-and-effect** from mere correlation.

4 References

1. Apergis, N., & Payne, J. E. (2010). The emissions, energy consumption, and growth nexus: Evidence from 13 major polluting countries. *Energy Policy, 38*(2), 818–825.
2. Best, R., Burke, P. J., & Jotzo, F. (2020). Carbon pricing efficacy: Cross-country evidence. *Environmental and Resource Economics, 77*(1), 69–94.
3. Marques, A. C., & Fuinhas, J. A. (2012). Are public policies towards renewables successful? Evidence from European countries. *Renewable Energy, 44*, 109–118.