

Carrier-Specific Risks in Georgia's Energy Economy

Topic: Input-Output Analysis: Energy policies (2)

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(1) The paper investigates the structural nature of Georgia's energy vulnerability by addressing three interconnected questions: 1) Which Georgian sectors are most interdependent on imported energy inputs when accounting for both direct and indirect intersectoral linkages? 2) To what extent was Georgia's economic stability reliant on Azerbaijani energy intervention following the 2006 Russian gas disruption? 3) How has the structure of Georgia's energy dependence evolved since 2006, and what systematic risks are posed by the re-emergence of alternative (Russian) supply paths?

(2) The study employs a multi-regional input-output (MRIO) framework to map the propagation of energy shocks through the domestic production network. To quantify systemic fragility, we apply a Partner-Targeted Hypothetical Extraction Method (HEM). This approach simulates counterfactual "worst-case" scenarios by zeroing out specific origin-destination-product channels—such as the withdrawal of refined petroleum from a specific partner—to measure the resulting aggregate and sectoral output losses. We combine demand-driven (Leontief) logic to identify supply-chain bottlenecks with supply-driven (Ghosh) logic to trace upstream sensitivities.

(3) The analysis is primarily grounded in the GLORIA MRIO Database (Release 059a, August 2024), which provides a high-resolution time series of global trade and production across 164 regions and 120 sectors. This data is specifically harmonized to maintain consistency across the historical (2006) and modern (2023) study periods. To ensure empirical validity, the MRIO domestic blocks were cross-validated against official national accounts and symmetric Input-Output Tables from the National Statistics Office of Georgia (GeoStat).

(4) The research offers several original contributions to the field of energy security:

- Quantifying the "Energy Weapon": By targeting specific geopolitical supply links rather than generic sectors, the study translates abstract "power-plays" into concrete metrics of industrial output loss, framing energy security as a quantifiable factor of political autonomy.
- Discovery of "Hidden" Bottlenecks: Unlike traditional intensity-based metrics, this work identifies "network-mediated dependency," revealing that sectors like construction and agricultural services are primary points of failure due to their position downstream of transport-heavy supply chains.
- Carrier-Specific Risk Identification: The study demonstrates that energy risk is not a monolith; it proves that vulnerabilities are "carrier-specific," showing that a sector resilient to gas shocks may remain critically paralyzed by a petroleum disruption.
- Temporal Stress-Testing: It provides the first quantitative "longitudinal stress test" of the Georgian economy, using the 2006 crisis not qualitatively, but as a calibrated baseline to validate modern vulnerability.