

# Supply Chain Risk, Trade and Economic Fragility

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## *Abstract :*

We study how equilibrium patterns of production, trade, and input sourcing in complex supply chains are shaped by aggregate risk. We develop a quantitative model of sequential production under risk, with inputs for each production stage sourced from multiple origins. Input production is subject to aggregate shocks that can vary by origin-destination and production stage. We analytically characterize country-stage input sourcing as a function of the variances of global shocks and production elasticities within and across all stages, and derive results showing the welfare impact of increases in risk in upstream stages relative to downstream stages. We quantify the model using 3 stages of production and 50 countries. Counterfactuals show that revealed comparative advantage flattens in a risky world, as countries diversify away from the relatively most productive regions to mitigate risk. On average, welfare volatility increases with increasing supply chain complexity, but riskier countries benefit from the increased opportunities to diversify as the number of production stages increase. We also quantify the welfare impacts of an increase in Chinese-origin risk, and an increase in U.S. trade costs in a world with risky global supply chains.