Simulation Results - Baseline

This document summarizes the main simulated moments and welfare comparisons across different model specifications evaluated in the sovereign default framework with climate risk.

Risk-Neutral Models

Model	Spread	Debt/GDP	Default	Hurricane	GDP Loss	Mean GDP
Benchmark	517.6	0.49	0.045	0.047	−0.057	0.917
1P RN	365.3	0.52	0.050	0.047	−0.057	0.917
2P RN	652.8	0.52	0.053	0.047	−0.057	0.917
CAT RN	482.1	0.50	0.043	0.047	−0.057	0.917

Simulated moments from risk-neutral model set. GDP loss conditional on hurricane occurrence.

Risk-Averse Models

Model	Spread	Debt/GDP	Default	Hurricane	GDP Loss	Mean GDP
Benchmark	548.9	0.50	0.040	0.046	−0.057	0.917
1P RA	901.7	0.39	0.044	0.046	−0.057	0.917
2P RA	894.1	0.41	0.044	0.046	−0.057	0.917
CAT RA	1106.4	0.43	0.043	0.046	−0.057	0.917

Simulated moments from risk-averse model set. GDP loss conditional on hurricane occurrence.

Welfare Gains

Below are the consumption-equivalent welfare gains (in %) for alternative model specifications relative to their respective benchmark.

Model	Welfare Gain (%)
1P_RN	−0.224
2P_RN	−0.260
CAT_RN	−0.024
1P_RA	−0.579
2P_RA	−0.573
CAT_RA	−0.110

Consumption-equivalent welfare gains relative to the benchmark.

Simulation Results - Climate Change

Risk-Neutral Models

Model	Spread	Debt/GDP	Default	Hurricane	GDP Loss	Mean GDP
Benchmark	673.5	0.48	0.046	0.062	−0.067	0.898
1P RN	923.9	0.46	0.051	0.062	−0.067	0.898
2P RN	814.3	0.49	0.054	0.062	−0.067	0.898

Simulated moments from risk-neutral model set. GDP loss conditional on hurricane occurrence. Climate Change

Model	Spread	Debt/GDP	Default	Hurricane	GDP Loss	Mean GDP
CAT RN	506.6	0.54	0.044	0.062	−0.067	0.898

Simulated moments from risk-neutral model set. GDP loss conditional on hurricane occurrence. Climate Change

Risk-Averse Models

Model	Spread	Debt/GDP	Default	Hurricane	GDP Loss	Mean GDP
Benchmark	132.7	0.31	0.008	0.061	−0.064	0.898
1P RA	923.3	0.40	0.014	0.061	−0.064	0.898
2P RA	1105.9	0.40	0.015	0.061	−0.064	0.898
CAT RA	675.0	0.35	0.036	0.061	−0.064	0.898

Simulated moments from risk-averse model set. GDP loss conditional on hurricane occurrence. Climate Change

Welfare Gains

Below are the consumption-equivalent welfare gains (in %) for alternative model specifications relative to their respective benchmark.

Model	Welfare Gain (%)
1P_RN	−0.019
2P_RN	−0.235
CAT_RN	0.080
1P_RA	−0.779
2P_RA	−0.893
CAT_RA	−0.436

Consumption-equivalent welfare gains relative to the benchmark (Climate Change).

Simulation Results - CAT Shares

Risk-Neutral Models

Model	Spread	Debt/GDP	Default	Hurricane	GDP Loss	Mean GDP
Benchmark	517.6	0.49	0.045	0.047	−0.057	0.917
CAT 55%	482.1	0.50	0.043	0.047	−0.057	0.917
CAT 1.55%	540.6	0.49	0.045	0.047	−0.057	0.917
CAT 100%	323.2	0.55	0.051	0.047	−0.057	0.917

Simulated moments from risk-neutral model set. GDP loss conditional on hurricane occurrence.

Risk-Averse Models

Model	Spread	Debt/GDP	Default	Hurricane	GDP Loss	Mean GDP
Benchmark	548.9	0.50	0.040	0.046	−0.057	0.917
CAT 55%	1106.4	0.43	0.043	0.046	−0.057	0.917

Simulated moments from risk-averse model set. GDP loss conditional on hurricane occurrence.

Model	Spread	Debt/GDP	Default	Hurricane	GDP Loss	Mean GDP
CAT 1.55%	498.7	0.45	0.040	0.046	−0.057	0.917
CAT 100%	799.3	0.43	0.048	0.046	−0.057	0.917

Simulated moments from risk-averse model set. GDP loss conditional on hurricane occurrence.

Welfare Gains

Below are the consumption-equivalent welfare gains (in %) for alternative model specifications relative to their respective benchmark.

Model	Welfare Gain (%)
CAT RN 55%	−0.024
CAT RN 1.55%	−0.006
CAT RN 100%	0.163
CAT RA 55%	−0.110
CAT RA 1.55%	0.074
CAT RA 100%	−0.102

Consumption-equivalent welfare gains relative to the benchmark.

Calibration Results

Case	α_0	α_1	β	ω_c	Avg. Spread (bps)	Debt/GDP (%)	Default Freq. (%)	Bond Price Monotonicity
Average	6	−70	0.86	0.765	574.112	0.489	0.0489	×
Brazil	11	−141	0.855	0.78	574.335	0.498	0.0436	✓
Mixed 1	9	−100	0.877	0.765	571.566	0.4528	0.0511	✓
Mixed 2	8	−80	0.86	0.76	485.473	0.483	0.0525	×

Each row represents a sensitivity case with risk premia parameters (α_0, α_1). β and ω_c are jointly calibrated to match Jamaica's average spread and debt-to-GDP ratio. ✓ denotes monotonic bond price schedule across GDP.