FINANCIAL SERVICES COMMISSION

CLIMATE RISK ASSESSMENT FOR INSURANCE COMPANIES

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Climate Risk Assessment for Insurance Companies

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Physical climate risk is of growing concern for domestic general insurers in Barbados. Insurance is a crucial safety net for mitigating these risks and having adequate insurance coverage enables quicker recovery from catastrophic losses. Insurance acts as a risk transfer mechanism transmitting financial risk from policyholders to insurers. With climate forecasts projecting more frequent and extreme weather phenomena, there is a higher probability of general insurers experiencing greater financial strain risk of insolvency. The Financial Services Commission (FSC), as the regulator of the insurance sector, has been enhancing its supervisory framework regarding climate risk assessment to improve climate risk policy decision-making.

In 2022, the FSC released a Natural Disaster Stress Testing (NDST) Guideline for annual submission by general insurance companies. This framework provided general insurers a basis for self-assessment of financial stability impacts from increasing climate risk. Insurance companies are to monitor their capital positions with the results provided to the FSC, allowing for the identification of those insurers likely to require assistance after a climatic event.

Insurers aren't the only stakeholders affected by climate events. Instead there are a diverse set of key stakeholders, including businesses, government entities and individual homeowners that are affected. Businesses need quick access to funds to resume operations after a climatic event. The recovery process for uninsured and underinsured vulnerable groups that lack access to affordable insurance could be more difficult. As such, it may be up to the government or international agencies to provide possible assistanceThis study attempts to do two things. Firstly, it aims to determine the protection gap between the value of total properties on the island that could be economically insured and the collective stock that is actually insured by these companies at the parish level. Secondly, it attempts to estimate the potential total economic losses and, ultimately, the uninsured losses generated by specified climate scenarios.

Protection Gap Methodology

The FSC requested and aggregated the property portfolios from the top 7 property insurers in Barbados. Together, these companies accounted for more than 90% of the property insurance market and are a reasonable proxy for the entire industry. This dataset included the location, property type (i.e., residential or commercial), and sum insured of property policies throughout Barbados. These were comprised of the following segments:

i) buildings and other structures,
ii) contents; and
iii) business interruption policies.

The Coastal Zone Management Unit (CZMU) provided data that outlined the total property values by parish. This data was revised to provide an estimate as of 2024 for the current value

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of the housing stock of Barbados[2]. The Total Sums Assured was also estimated by parish for the entire industry, based on the information submitted by the 7 insurers. Those policies that were "non-comprehensive" or did not cover catastrophic losses, e.g., fire-only policies, were quantified but not included in the analysis. Non-comprehensive property policies accounted for approximately 1.1 percent of all property policies for structures sold, meaning that most of the property insurance policies sold covered damages by climate events. Furthermore, the most comprehensive policies covered a wide cross section of climate-related peril likely to impact Barbados (storms, rainfall, floods, etc.)

To calculate the 'insurance protection gap', the following simple formula was used:

$$\textit{Insurance Protection Gap} = \textit{Total Property Values} - \textit{Sum Insured for Buildings \& other structures}^{3} \quad (1)$$

In addition, the financial impact for the country for each scenario was determined. The uninsured losses (risk protection gaps) for each scenario were estimated for events such as 1-in-100 storm surges, rainfall, floods, and wind speed. The CZMU has also provided estimated damage functions for each parish by specific perils and return period (e.g., 1-in-50-years, 1-in-100-years) to allow for calculation of the impact of each climate risk scenario:

$$\textit{Risk protection gap (Peril*)} = \sum[(Total\ Property\ Values_{p,c} - Sum\ Insured\ for\ Buildings\ \&\ other\ structures_{p,c}) \times Peril\_Damage\ Fuction_{p,c}] \quad (2)$$

where p = parish, c = property category

* Storm surge, Flood or Wind

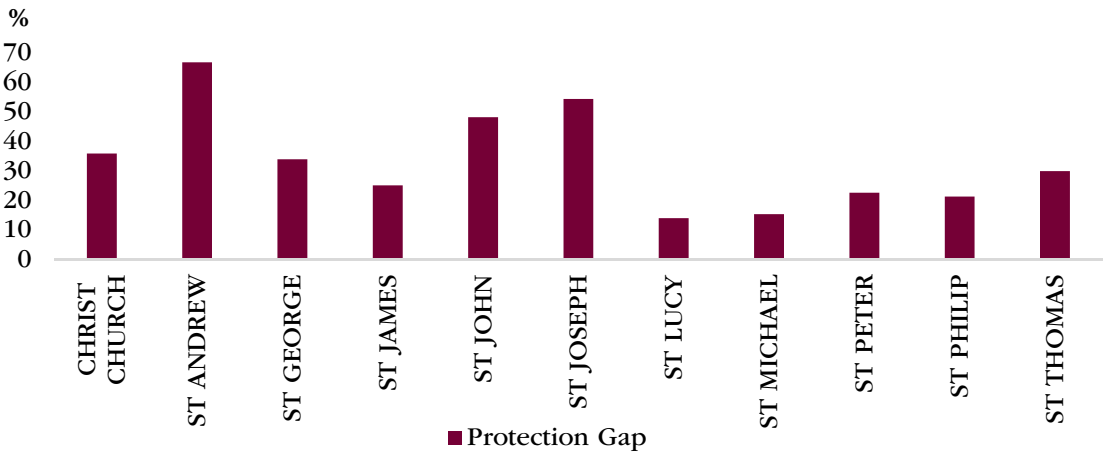
Initial Insights and Results

The insurance protection gap for property catastrophe cover was estimated to be around 26 percent of the estimated total property value. After applying inflation to the available housing stock data and estimating the total property value in Barbados, it was determined that the overall protection gap was significant. When calculated by parish, the largest percentage protection gaps were observed in St. Andrew, St. Joseph, and St. John at 66.6 percent, 54.2 percent, and 48.1 percent, respectively (Figure 1). According to the Population and Housing Census 2021, these parishes host a relatively low population, accounting for only 10 percent of the island's population (Barbados Statistical Service, 2021). High insurance protection gaps can lead to increased vulnerability, a greater burden on the government, and a slower recovery in the aftermath of a disaster.

[2] The CZMU provided 2017 data, however, in the absence of more current data or a comparable metric the domestic inflation rate obtained from Central Bank of Barbados statistics was used as a proxy, with the annual inflation rate being derived from the "Housing, Water, Electricity, Gas, and Other Fuels" measure.

[3] 'Sum Insured for buildings and other structures' excludes: contents, business interruption, mortgage indemnity, or any add-on property policies.

Figure 1: Insurance Protection Gap by Parish as a % of Total Property Value



Source: Financial Services Commission

The estimated preliminary impacts from each peril will be disproportionate across the island, with the most significant economic losses projected for St. James, St. Peter, and Christ Church under the 1-in-100-year storm surge scenario. The overall risk protection gap, or the estimated uninsured losses, for 1-in-100 storm surge, wind speed, and rainfall flood events were estimated to be 37.7 percent, 31.1 percent, and 24.5 percent of total economic losses. Despite being the scenario with the largest financial impact, storm surge impact was, as expected largely restricted to coastal properties, many of which are in tourism-related business. In contrast, the impact of rainfall, flood and wind damage scenarios was projected to occur in a more uniform manner across Barbados. Initial projections indicated that most wind speed losses originated from residential homes (61 percent). Rainfall flood damage was split more evenly between residential homes, tourism commercial, and non-tourism commercial at 36.3 percent, 35.1 percent, and 28.6 percent, respectively.

The majority of the uninsured losses for the 1-in-100 storm surge scenario impacts were suffered by tourism commercial properties (hotels, villas, guesthouses, etc.). For residential properties, the risk protection gaps are estimated at around 22.0 percent (storm surge), 36.5 percent (rainfall flood), and 39.5 percent (wind) (Table 1). By contrast, the risk protection gaps observed for the tourism-related properties were significantly higher at 69.9 percent (storm surge), 52.2 percent (rainfall flood), and 67.1 percent (wind) (Table 1). This was expected as the vast majority of these properties are situated near (or on) the south and west coasts, which are expected to be the primary points of impact for these scenarios. These uninsured losses experienced by the tourism sector were estimated to be BDS$1.37 billion, which is over a third of total property values in the sector. Significant uninsured losses for a tourism-dependent country could see the sector struggle to recover from catastrophic events without the necessary payouts, leading to increased unemployment and significant contractions in GDP.

Table 1: Projected Percentage Uninsured Losses by Scenario and Property Type

Risk Protection Gaps	Storm Surge	Wind Speed	Rainfall Flood
Residential	22.02%	39.50%	36.51%
Tourism Commercial	69.90%	52.24%	67.11%
Non-Tourism Commercial	11.68%	10.59%	5.82%
All Properties	**37.71%**	**31.05%**	**24.48%**

Source: Financial Services Commission

Recommendations and Future Work

While this initial study provided useful insights for analysis to the FSC some expansion and improvement in scope and data collection in future iterations could provide greater analytical outputs. The initial data, while very useful, was dated, and approximations were needed to calculate the estimates for property, etc. More contemporary data would account for the most recent construction in each parish as well as any buildings that have been demolished, leading to a more accurate assessment of the country's overall protection gap and the projected economic losses.

While this study looked at primarily property insurance, other lines of business could be impacted during severe climate events. Motor insurance is designed to cover physical damage to vehicles (depending on the level and terms of the policy). Vehicles, like stationary property, can be directly vulnerable when in the path of climate-related perils, including flooding, wildfires, storms etc. As with property insurance, this may give way to rising premium rates or exclusions from coverage in these events. This, in turn, could result in policyholders finding themselves uninsured for certain damages.

Future iterations of this work could help to enhance the FSC's current stress-testing framework and possible collaboration with other agencies. Stress testing is a key tool to determine the impact of various scenarios on the financial balance sheets and income statements of individual insurance companies, and ultimately, the wider industry and financial system. It can reveal very important information about financial resilience, exposure, and management quality of companies under these adverse scenarios. The FSC performs stress testing for insurance companies and requires registrants to conduct their own stress testing. However, it is necessary to properly calibrate current scenarios and ensure that risk channels are properly identified, examined, and quantified, as well as try to ensure that the scenarios are relevant. One immediate example of an area for investigation would be using the calculated economic losses to determine an appropriate level of unexpected incurred claims that the industry could sustain, should such a scenario materialise.

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