

Executive Summary: Ontario Gateway Insurance Analysis

Problem Context

Ontario Gateway Corporation is currently assessing insurance policies to cover potential aircraft losses over a five-year period, beginning March 1, 1997. This decision is critical, as the company operates with high leverage and faces substantial risk from aircraft crashes, currency fluctuations, and political factors associated with its transatlantic operations. Selecting the appropriate insurance policy is essential to safeguard the company from significant financial exposure due to aircraft-related incidents, while also optimizing costs to maintain healthy cash flow. Ensuring sufficient insurance coverage while minimizing costs is vital to maintaining Ontario Gateway's stability and long-term growth prospects.

Key Decision Making Criteria

Ontario Gateway's insurance needs center around mitigating the risk of catastrophic losses that could threaten the company's financial stability. With a modern fleet consisting of Boeing 757-200, Airbus a340-200, and Airbus a340-300 crafts, and operations within and across North America and Europe, the potential impact of an aircraft crash and the costs associated with the insurance plan could be financially devastating. The key criteria used to evaluate the right insurance policy are:

1. The company's goal is to select an insurance policy that provides sufficient coverage to prevent losses exceeding \$37 million in the first year. Ontario Gateway operates with significant debt, and as a result, its cash flow is already strained. If the company were to incur losses exceeding the \$37 million safeguard in the first year, it could potentially push the company into bankruptcy.
2. The total costs associated with the insurance plan over the five years needs to be optimal, while ensuring the lowest risk of violating criteria 1.

Analysis on the four policies

To evaluate the available options, a simulation of 100,000 data points, as per the industry average of 1 in 5 million chances of a craft crash, was conducted to assess the financial impact of potential aircraft crashes under four proposed insurance plans. The simulation modeled expected crash occurrences, financial loss per crash, and each plan's cost over the five-year period, based on the premiums, costs, deductibles, coverage policies, and rebates offered by each plan. Key findings include:

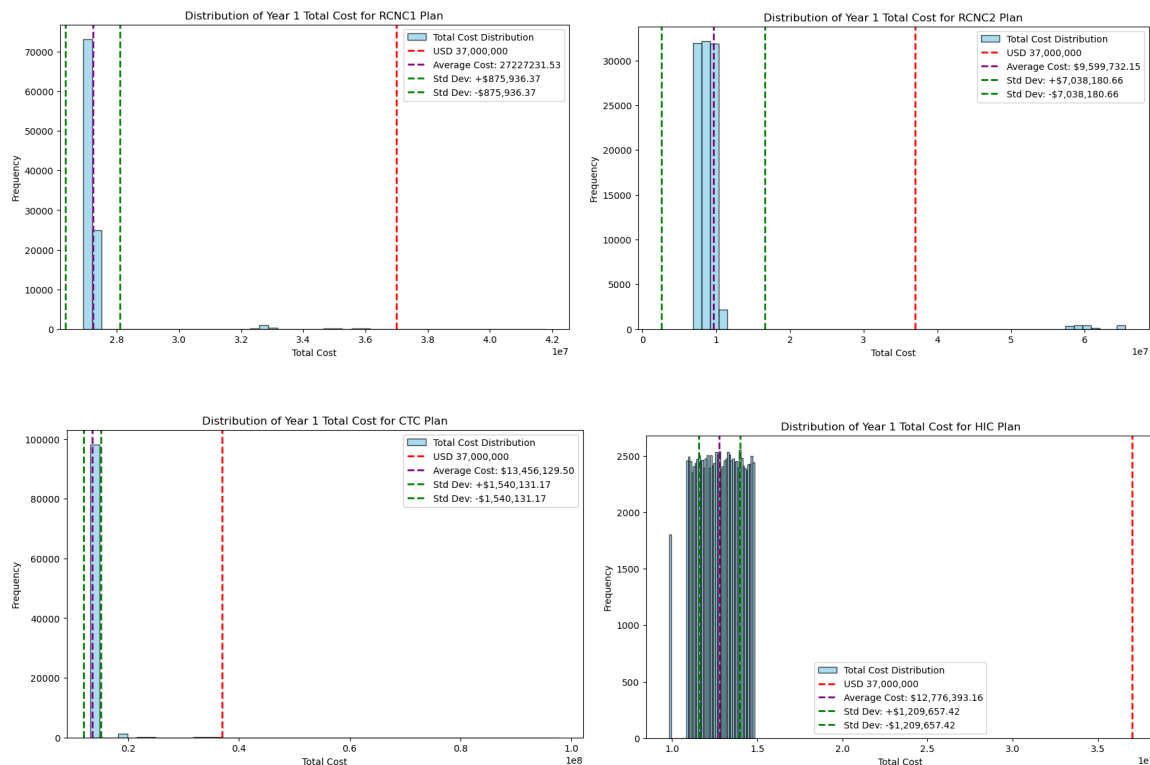
1. **RCNC1 (Royal Canadian National Corporation - Plan 1):** This plan covers complete accidental replacement costs with an annual fee of 0.45% of the fleet's value and a 10% deductible on each aircraft. A rebate clause applies, where RCNC will refund 20% of any cumulative profits after claims at the end of the five-year term.
2. **RCNC2 (Royal Canadian National Corporation - Plan 2):** This plan charges a fixed premium of 0.10% of the fleet's total insured value plus a variable premium based on

actual losses each year, at 90% of total losses during the year or 1% of the insured value of the fleet, whichever is less.

3. **CTC (Canadian Trust Company):** CTC's proposal involves an annual premium of \$13 million, covering 90% of losses up to a maximum of \$80 million for any single incident or cumulative losses in a given year.
4. **HIC (Hawthorne Insurance Corporation):** Designed specifically for Ontario Gateway, this plan charges an annual premium of 0.165% of the fleet's insured value, paying for losses above \$24 million. An additional rebate clause refunds 3.5% of the cumulative profits at the end of the 5 year period.

The results obtained from the simulation show us that:

1. The average total costs in the first year, for none of the plans exceed \$37 million, as confirmed by the averages, standard deviations, and hypothesis testing at a 95% confidence level for each plan.



2. There is the risk (probability) of the total cost exceeding the threshold value, in most plans, and is most pronounced in RCNC 2 results and not possible in HIC results, as tabulated in the results below.

Plan	Risk - Proportion of values that exceed the the total cost threshold of USD 37 M in Y1 (%)
RCNC 1	0.028 %
RCNC 2	2.430 %
CTC	0.028 %
HIC	0.000 %

3. The most optimal average total cost over the 5 years is presented by the RCNC 2 plan

Plan	Total Average Cost over 5 years (USD)
RCNC 1	22.730 million
RCNC 2	9.951 million
CTC	13.51 million
HIC	12.47 million

Sensitivity to a lower accident probability

Additionally, the simulation was also conducted at a 25% lower accident probability, since Ontario Gateway's fleet is newer and consists of crafts from two world class manufacturers. This simulation and similar evaluation metrics and hypothesis testing show similar trends in results. The average cost over year 1, risk of exceeding the 37 M USD threshold in year 1, and total average costs across 5 years for each plan in this scenario are tabulated below:

Plan	Average Cost over year 1 (USD)	Standard deviation is year 1 cost (USD)	Risk - Proportion of values that exceed the the total cost threshold of USD 37 M in Y1 (%)	Total Average Cost over 5 years (USD)
RCNC1	27.23 million	875,936	0.016%	22.62 million
RCNC2	9.60 million	7,038,181	1.803%	9.63 million
CTC	13.46 million	1,540,131	0.016%	13.46 million
HIC	12.78 million	1,209,657	0.000%	12.47 million

It is to be noted that the total cost of the plans has generally decreased, with the RCNC2 plan showing the most significant cost reduction due to its sensitivity to accident probability. In contrast, the HIC plan, which includes a high deductible and a rebate clause, behaves differently. The high deductible reduces payout frequency, while the rebate clause provides a refund based on the difference between the annual fee and payouts. As accident probability decreases, crash costs also drop, but the high deductible limits the impact on payouts.

Final Recommendation: HIC Plan

Based on the evaluation of the plans, the Royal Canadian National Corporation Plan 2 (RCNC2) has the lowest average total cost over the 5 years but also has the highest probability/risk of the total cost exceeding USD 37,000,000 (2.4%) which can lead to of a potential bankruptcy in the first year. On the other hand, the Hawthorne Insurance Corporation Plan (HIC) has 0 probability of exceeding USD 37,000,000 in the first year and has the second lowest total cost over the 5 years (11% greater/ ~ 10 M greater than RCNC 2, which is only slightly greater than the standard deviation of RCNC 2). Furthermore, these trends stand true at even a lower probability of aircraft accidents and crashes. Therefore, in order to mitigate the risk of bankruptcy in the first year, we recommend the HIC plan.