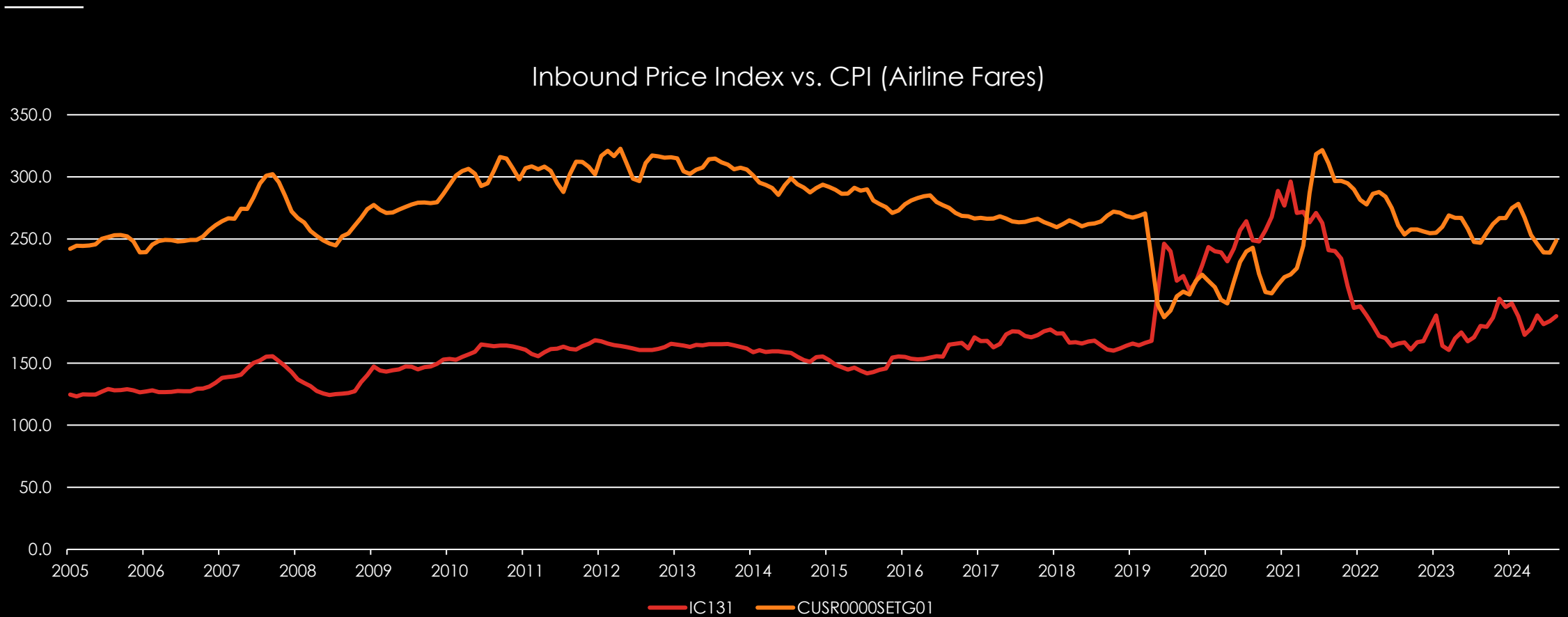




MODEL RISK IN MOTION

Gavin Chan

PRIOR AND POST COVID



Institutional Investor

May 1978

The fear of market inventory funds
Is aggressive cash management a myth?
The pressure for research "ideas"

**Who is Barr
Rosenberg?
And what
the hell is he
talking about?**

WHY DO
WE CARE
ABOUT
MODEL
RISK?

Because every error
generates losses?



WHAT IS MODEL RISK?

Model implementation

Model drift

Model usage

MODEL IMPLEMENTATION

Root Cause

- Coding / implementation error
- Incorrect assumptions

Detection

- Code review and static testing
- Sensitivity Analysis: Test the model output in response to varying input parameters

Bond Coupon Discount Formula

$$\text{Price} = \sum_{t=1}^n \frac{\text{Coupon}}{(1+r)^t} + \frac{\text{Par Value}}{(1+r)^n}$$

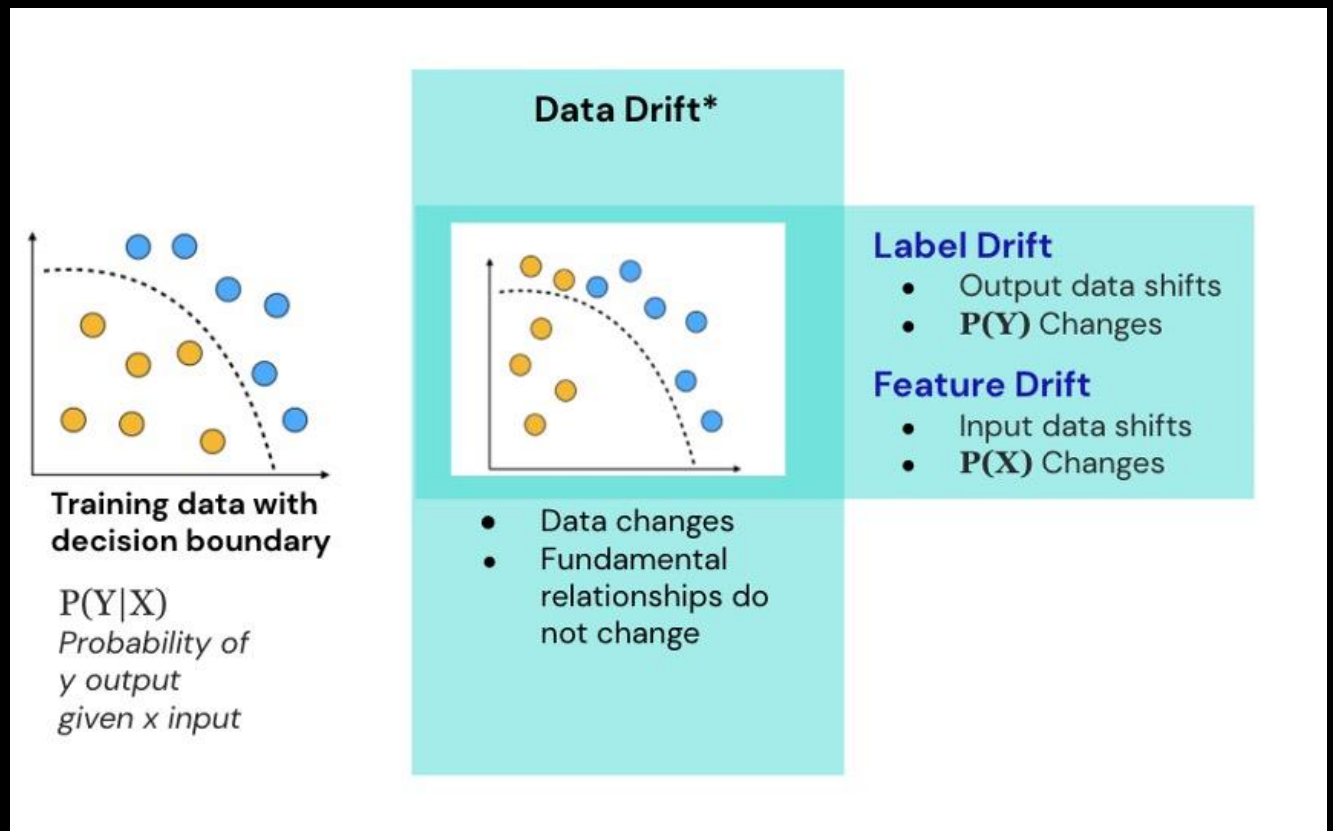
MODEL DRIFT

Root Cause

- Input data drift
- Output data drift

Detection

- Data statistical quality monitoring
- Non-parametric statistical test



MODEL DRIFT DETECTION

-
- Data statistical quality monitoring
 - Mean, median, standard deviation, percentiles, etc
 - Sliding window comparison: Compare mean, median and standard deviation between successive window to detect drift / regime change
 - Non-parametric statistical test
 - Kolmogorov-Smirnov test: Compare the distributions of a continuous feature in current vs. reference data
 - Chi-square test: Used for categorical features to detect distribution shifts

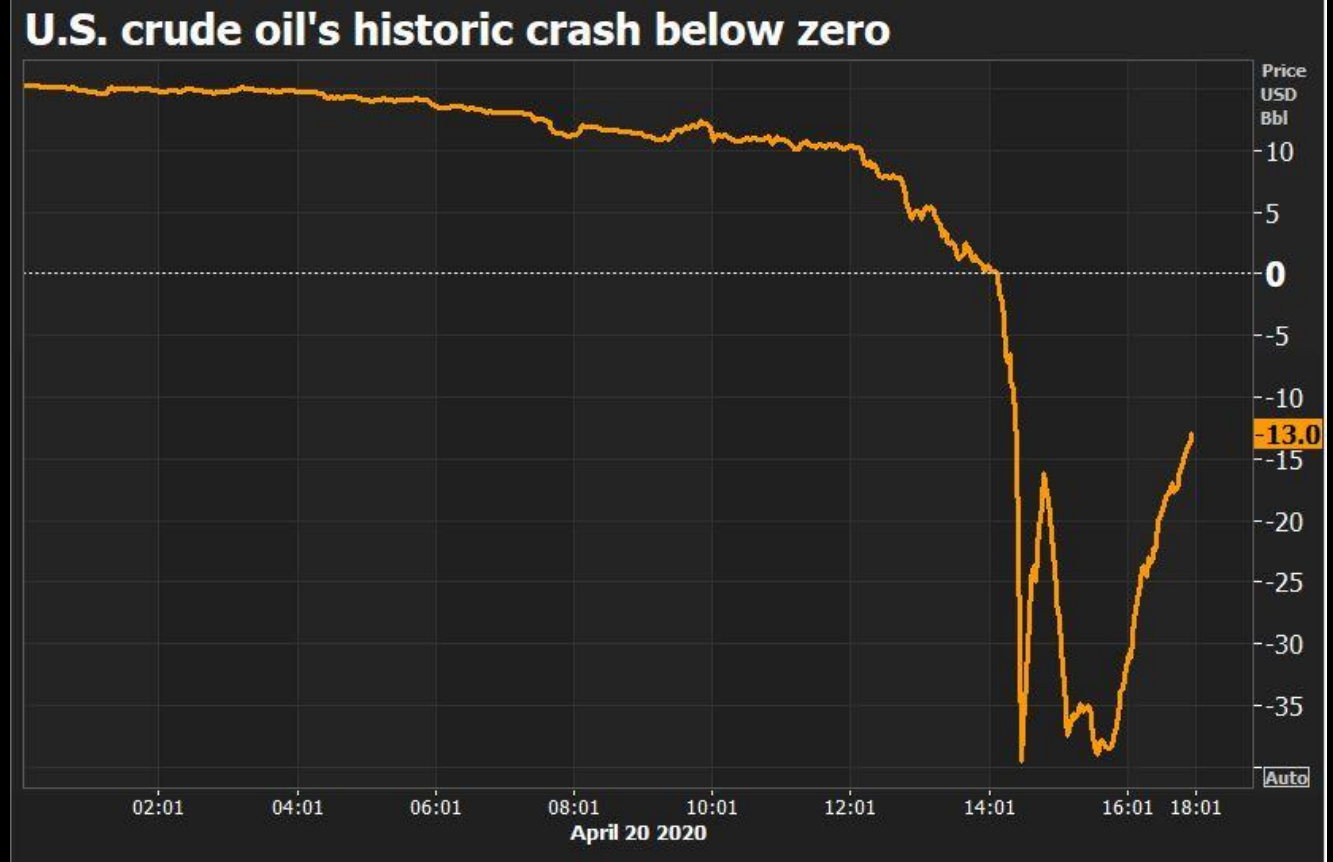
MODEL USAGE

Root Cause

- Violations of data assumptions
- Violations of statistical assumptions

Detection

- Regular model review
- Guardrails in model implementation



HOW TO AVOID THE PITFALLS

1

Build the model
with economic
intuitions

2

Define your
hypothesis, and
rethink if it makes
sense

3

Kick the tires
asap

PLACE THE RIGHT BETS

- Framing the hypothesis
- Gathering the evidence
- Risk management and validation
- Audit-ready showdown



GROUND TRUTH

- Can you define the ground truth of your problem?
 - Examples: Loan default prediction vs. customer behavior
- Is the definition of the ground truth universally agreed, or observable?
 - Examples: Forward P/E vs. trading volume



SCALABILITY IN MODEL GOVERNANCE

1. Have you set up a framework to benchmark and test any similar models?
2. How can you produce intermediate results regarding to ad-hoc requests?
3. Have you defined a guardrail to reject your hypothesis in the future?



Q&A

