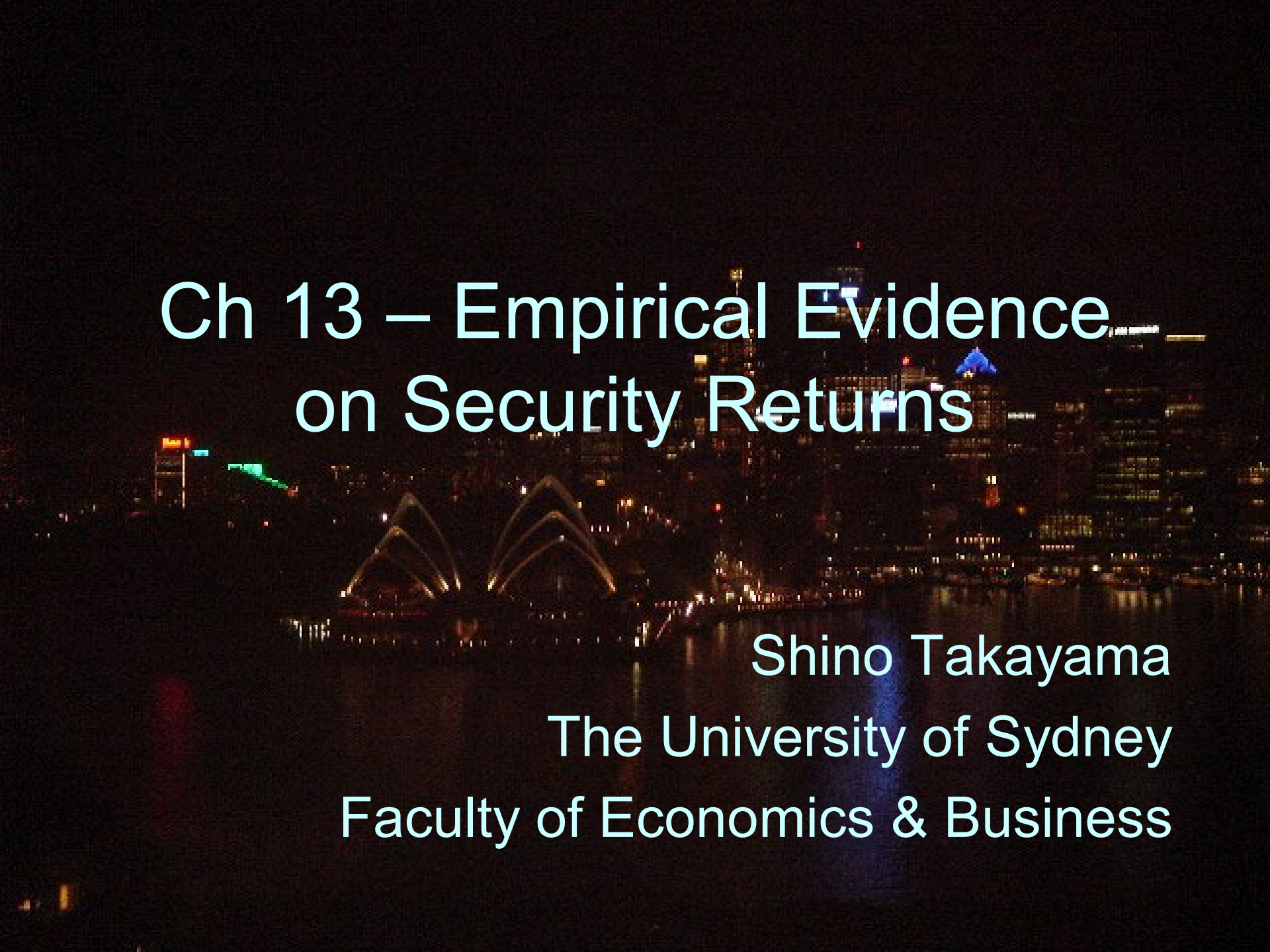

Ch 13 – Empirical Evidence on Security Returns

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Overview of Investigation

- Tests of the single factor CAPM or APT Model
- Tests of the Multifactor APT Model
  - Results are difficult to interpret
- Studies on volatility of returns over time

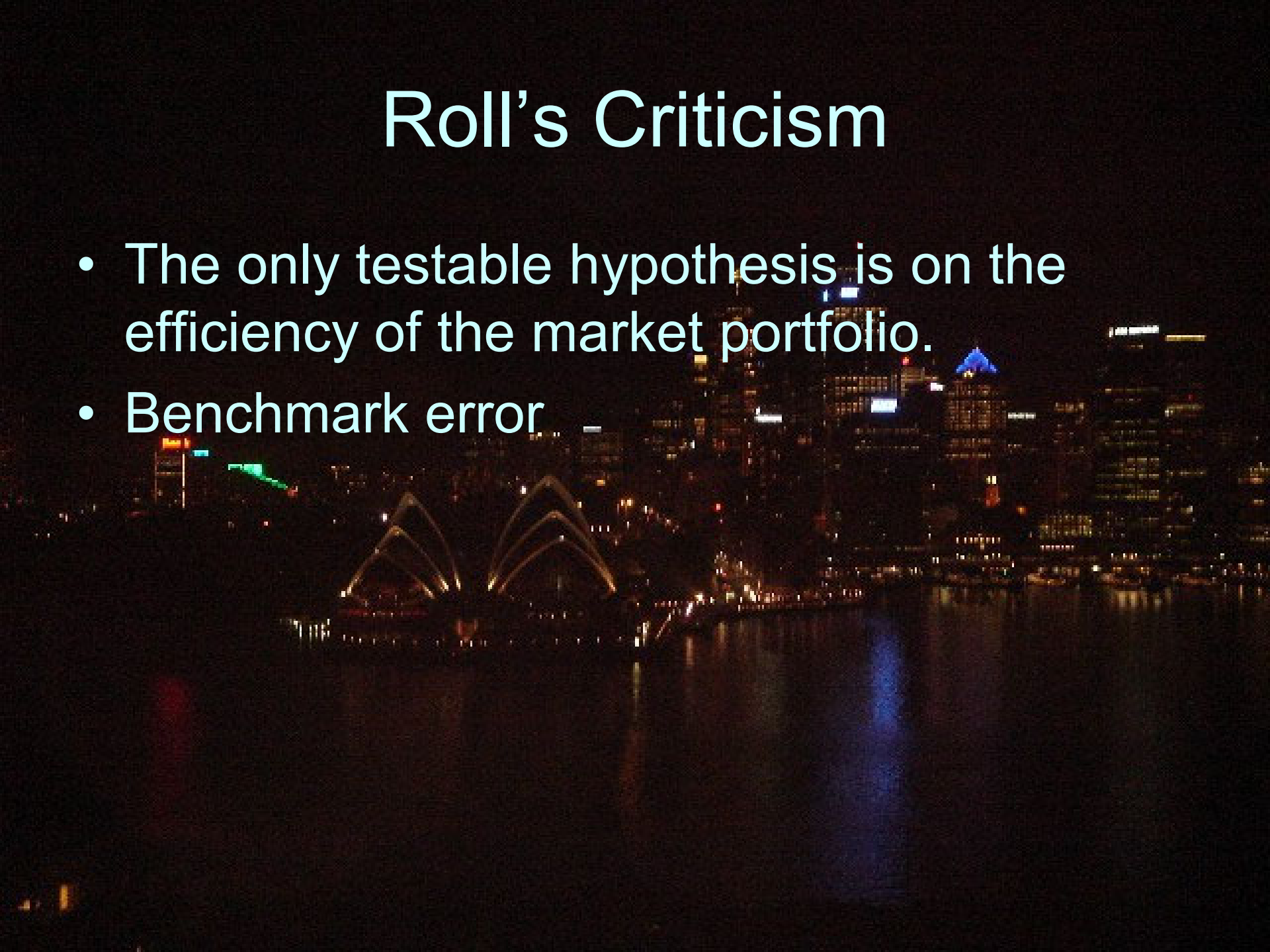
Test of the Single Factor Model

Tests of the expected return beta relationship:

- First Pass Regression
  - Estimate beta, average risk premiums and unsystematic risk.
- Second Pass: Using estimates from the first pass to determine if model is supported by the data.
- Most tests do not generally support the single factor model.

Roll's Criticism

- The only testable hypothesis is on the efficiency of the market portfolio.
- Benchmark error



Measurement Error in Beta

- Statistical property
- If beta is measured with error in the first stage, second stage results will be biased in the direction the tests have supported.
- Test results could result from measurement error.

Jaganathan and Wang Study

- Included factors for cyclical behavior of betas and human capital.
- When these factors were included the results showed returns were a function of beta.
- Size is not an important factor when cyclical behavior and human capital are included.

Tests of the Multifactor Model

- Chen, Roll and Ross 1986 Study

<u>Factors</u>

Growth rate in industrial production

Changes in expected inflation

Unexpected inflation

Changes in risk premiums on bonds

Unexpected changes in term premium on bonds

Anomalies Literature

Is the CAPM or APT Model Valid?

- Numerous studies show the approach is not valid.
- Why do the studies show this result?
  - Other factors influence returns on securities.
  - Statistical problems prohibit a good test of the model.

Fama-French Three Factor Model

- Size and book-to-market ratios explain returns on securities
- Smaller firms experience higher returns
- High book to market firms experience higher returns
- Returns are explained by size, book to market and by beta

Interpretations: Fama-French Model

- Size and book to market are factors that describe returns – results are consistent with APT
- Results may indicate irrational preferences for large size and low book to market firms
- More study needed

Time-Varying Volatility

- Stock prices change primarily in reaction to information.
- New information arrival is time varying.
- Volatility is therefore not constant through time.

Stock Volatility Studies & Techniques

- Volatility is not constant through time.
- Improved modeling techniques should improve results of tests of the risk-return relationship.
- ARCH and GARCH models incorporate time varying volatility.

Equity Premium

- What does equity premium mean?

Equity Premium Puzzle

- Rewards for bearing risk appear to excessive.
- Possible Causes
  - Unanticipated capital gains
  - Survivorship bias
- Survivorship bias also creates the appearance of abnormal returns in market efficiency studies.