HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY

# Time Series Econometrics, Spring 2021

# Practice Session 2

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February 6, 2021

all kinds of

# Formal Tests

# **Problem 1.** Conventional testing: recap

Consider a one-sample one-sided $z$-test, with data $\{x_i\}_{i=1}^N \sim$ i.i.d., $H_o = \{\mathbb{E}X = \mu\}$, and $H_a = \{\mathbb{E}X < \mu\}$.

? Construct the test statistics. Is something missing?

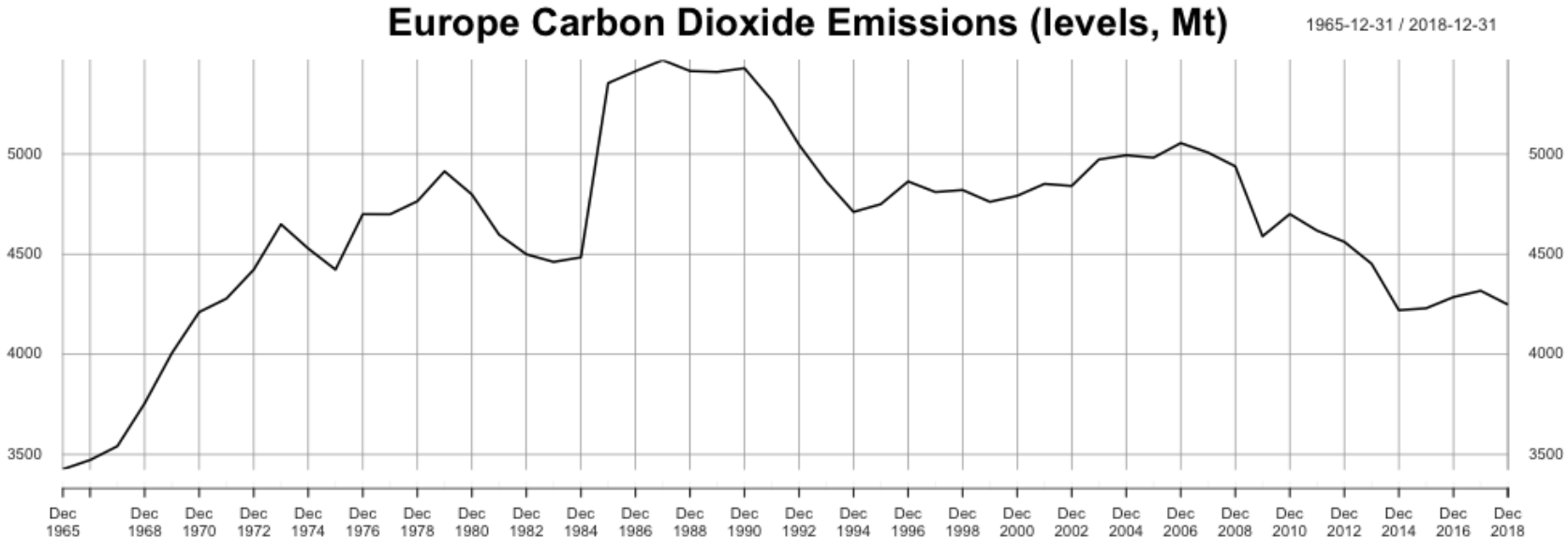
? What's its distribution under the true null?

? Suggest some appropriate critical size values $(\alpha)$.

? What are the corresponding critical values (of the statistics)? How are they different from the ones of the two-sided test?

? Describe the test in terms of critical values and P-values.

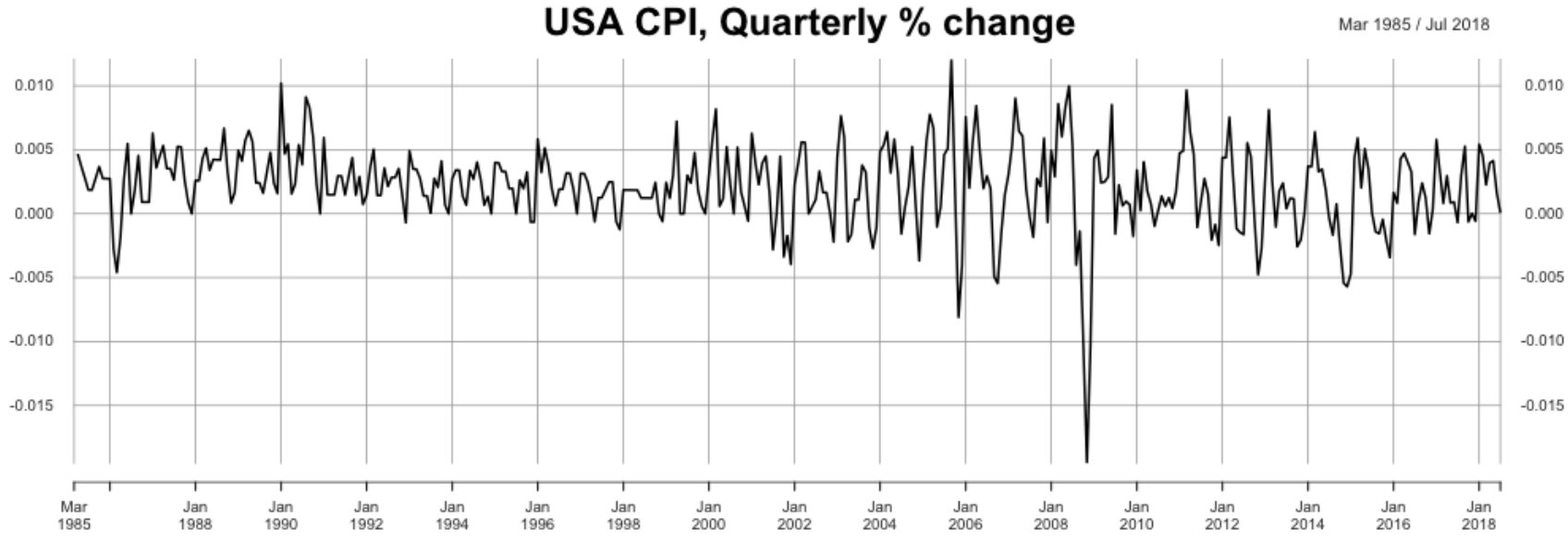
# **Problem 2.** Interpreting ADF & KPSS results (1)




| **Test** | **P-value** |
|---|---|
| ADF | 0.4423 |
| KPSS | 0.0827 |

? Interpret the results & make a conclusion

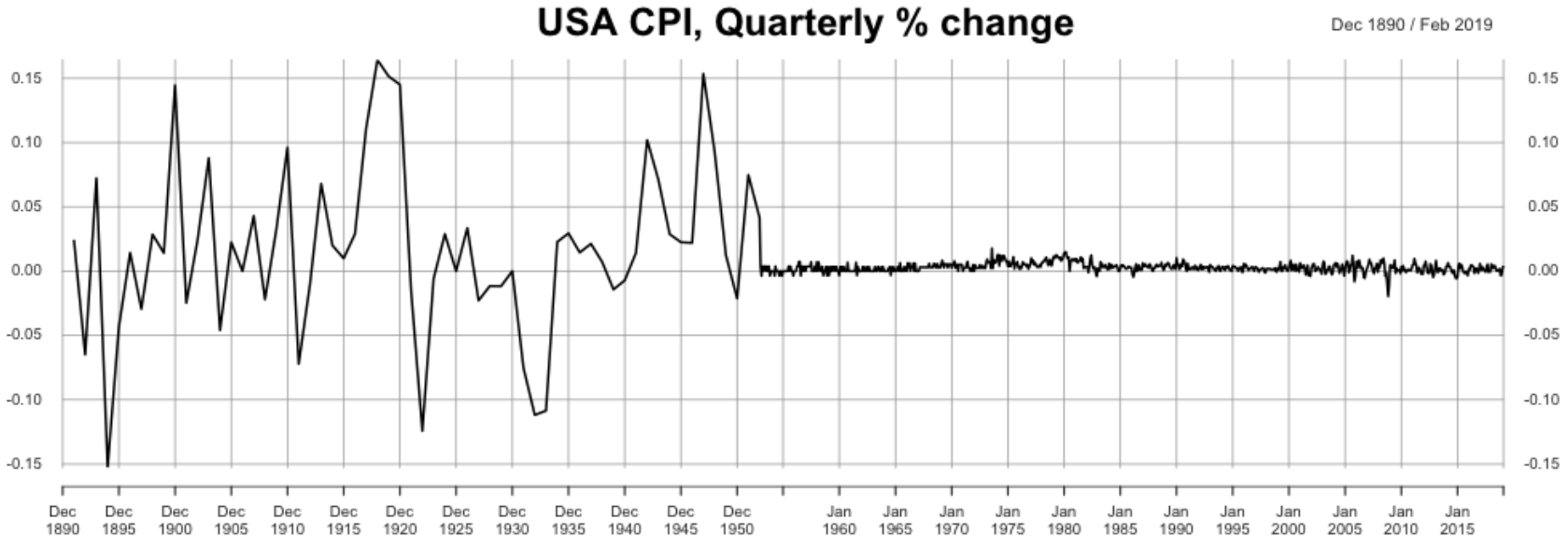
# **Problem 2.** Interpreting ADF & KPSS results (2)




| **Test** | **P-value** |
|---|---|
| ADF | < 0.01 |
| KPSS | 0.0102 |

? Interpret the results & make a conclusion

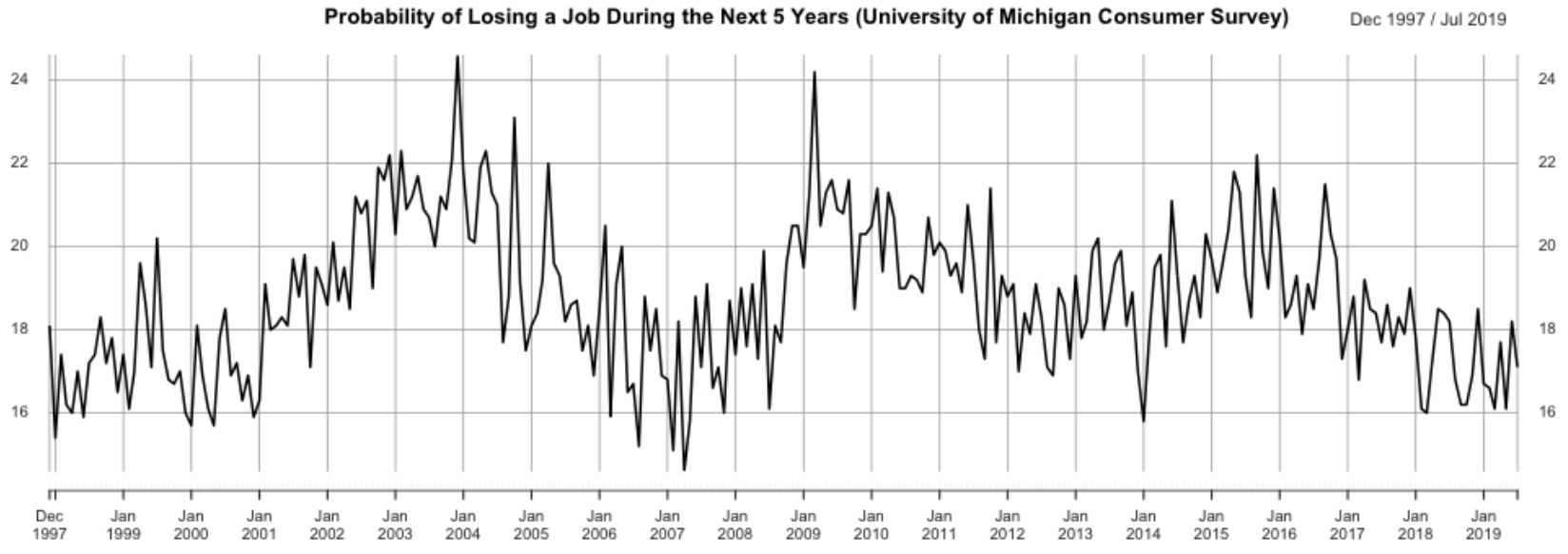
# **Problem 2.** Interpreting ADF & KPSS results (3)




| **Test** | **P-value** |
|---|---|
| ADF | < 0.01 |
| KPSS | 0.044 |

? Interpret the results & make a conclusion

# **Problem 2.** Interpreting ADF & KPSS results (4)




| **Test** | **P-value** |
|---|---|
| ADF | 0.3994 |
| KPSS | > 0.1 |

? Interpret the results & make a conclusion

Differences & other

# Stationary Transformations

# Differences: quick recall

? Define the first difference of some TS $\{X_t\}_{t=-\infty}^{+\infty}$

? What do we mean by "*differences preserve units*"?

? Give an example when differences are not meaningful.

recall that "*preserve units*" property again

? Say, some TS differences are perfectly stationary. Then what's the initial TS like? Assume the diffs are positive on average.

? When the diffs might not be enough to "kill" non-stationarity?

Give a general answer and a few real-life examples.

Suggest a good way to

# transform a typical GDP to get a stationary TS

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Post your answer and ask a question about this class