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Econometrics can be used to answer many practical questions in economics and finance:

- Suppose you own a business. How might you use the previous 10 years' worth of monthly sales data to predict next month's sales?
- You wish to test whether the "permanent income hypothesis" holds. Can you use whether consumption spending is a relatively constant fraction of national income?
- You are a financial researcher. You wish to determine whether gold prices lead stock prices, or vice versa. Is there a relationship between these variables? If so, can you use it to make money?

Answering each of these questions requires slightly different statistical apparatuses, but they all fall under the umbrella of "time series econometrics."

1.1 What Makes Time Series Econometrics Unique?

Consider the differences in the two panels of Fig. 1.1. Panel (a) shows cross-sectional data, and panel (b), a time series. Standard econometrics—the econometrics of cross sections—relies on the fact that observations are independent. If we take a sample of people and ask whether they are unemployed today, we will get a mixture of answers. And even though we might be in a particularly bad spell in the economy, one person's unemployment status is not likely to affect another person's. It's sort of as though person A can't get a job just because person B is unemployed. But if we are focused on the unemployment rate, year after year, then this year's unemployment is likely influenced by last year's economy. The observations in time series are almost never independent. Usually, one observation is correlated with the previous observation.