# **Methodology and model**

In this section, we discuss about estimation methodology of our model. Then, we analyze potential problems of estimation that we have to solve, and we explain to you our different models that give try to give an answer about our hypothesis.

## **Method Choice**

As mentioned in the previous section, we use daily data for 227 companies between the beginning of 2006 and at the end of 2019.

Our study is about an analysis of a financial data and companies over time period. Then, two possibilities could be possible: Panel Data & Time series.

Panel data seems us to be the better solution because we analyze **i companies** over **t period.**

The use of panel data has many advantages, in terms of the flexibility of econometric modeling and the ability to control for unobserved heterogeneity. It also involves a number of econometric issues that require specific attention.

## **Potential error of estimation**

### Omitted variables bias

Omitted variable biais is very frequent in financial study. => fixed effect / random effect + control variables

Fixed effect : their removal of time-invariant unobserved heterogeneity (e.g. manager quality, firm culture), consistency of such estimators imposes strict exogeneity of the explanatory variables (for a finite number of time periods).

### Measurement error

Winsor => Split & repurchase => in one day big evolution of PE

### Reverser causality

In our study, the major problem of endogeneity is **reverse causality.** That means that the growth of total ETF NAV influence PE of company, but the reverse is also true. Then, it is not possible to estimate correctly the impact of Total ETF NAV growth on company PE.

* F > 10 => test OK
* Relevant => enter in S&P => enter in asset of ETF => impact growth of NAV Value
* Exogeneous => enter in S&P -> increase popularity and potential effect in price -> PE go up
* **Article Ben-david**

## **Mode**l

**Panel Model (fixed effect)**

* **Expliquer pourquoi ce n’est pas juste**

**IV Panel Model (fixed effect)**

* **Difference In difference => beta 1**
* **Expliquer pourquoi c’est le bon avec les données**

**Panel model (fixed effect)**

**Panel model (random effect) => see for random structure**