ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Statistic of Financial Markets

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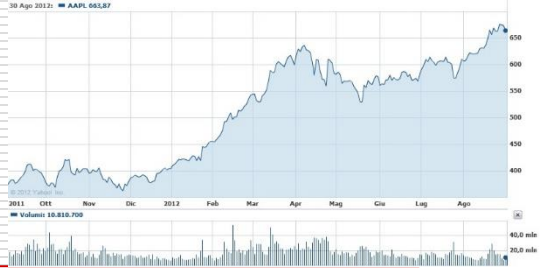
Part 1: Trend modelling



- A trend captures the 'persistent' component of prices' dynamic. Once identified, it represent the base to build a future stock prices scenario, with a "good chance" of lowering the risk/return ratio.

Three main ways of identifying a trend:

- **Calibration methods** *(hints)*

  (i.e. sector rotation, bonds/stocks/commodities trend-cycle sequence)

- **Graphical models**

  (i.e. technical analysis: graphical approach)

- *(Simple)* **Statistical models**

  (i.e simple stochastic processes, smoothers, cointegration (pairs trading))

Learning outcome: Understanding statistical methods as generalizations of graphical techniques. Adopting this framework as a base for building probabilistic scenarios.

Part 2: Trading

- Being rational in trading is as important as knowing the statistical techniques. Traders* (and Popper) suggests that the more you know about the past (the more significant the econometric relations you can estimate), the higher the risk of "default" in case of rare event.
- Any rational (quantitative) approach should consider the

  investor's goal and risk aversion

  and apply:

  - **Risk management**
  - **Money management (hints)**

Learning outcomes: Knowing the most common trading rules.
Setting up enter/exit strategies to keep the risk-return ratio under control.
Acquiring the capability to build a (probabilistic) trading strategy.

(*) N.N Taleb (2007) *The Black Swan*

Part 3: Optimization (forecasting)

- The – quantitative - assessment of a trading rule(s) should be based on past performances ***"constrained"*** maximization.

  - **KISS principle**
  - **Loss functions**
    - **Limits of a "standard" MSE approach in trading**
    - **Optimization of subjective loss functions**
    - **Directional losses**
  - **Forecasting evaluation** (single model and rival models)
    - **Descriptive approach**
    - **Inferential approach**

Learning Outcome: Acquiring proficiency in optimizing a set of trading rules (trading System).

40% il labs

- Stata (*very basic skills*)
- Excel (*programming optimization algor.*)
- V-trader (*simulating trading sessions.*)

- (hopefully) Matlab (*not programming…. i.e. very basic skills of the* Neural Network Toolbox)

- Assesment: Written final test
- Course material → 100% teacher's slide)