# Investment Game

## Contacts

You can send the reports to [marco.guzzetti@polimi.it](mailto:marco.guzzetti@polimi.it)

## Rules

Every team represents a fund.

During the game, every two weeks, the team valuates the portfolio by using market prices, informs the clients and takes actions to maximize the value of the investment while respecting the constraints decided at the beginning of the game.

You are allowed to change composition as many times as you want, whenever you want: in order for the new composition to become effective, though, you have to communicate it via e-mail.

External events may happen: a supervisory institution may demand a scenario analysis, a client may deposit or withdraw some money,…

## Goal

Your goal is to maximize the information ratio:

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that is, the expected excess return (with respect to the benchmark) divided by the volatility of the excess return. The ratio will be estimated based on the historical daily data.

## Evaluation criteria

You will get a score based both on your result and the quality of your reports, as follows:

* If you do not participate: 0
* If you complete the game: 1-3 points, based on the following criteria:
  + Level of service: you provided plain and complete information, you were punctual
  + Investment process: your results are correct, you made a thoughtful use of the algorithms, you provided a solid economic justification for your choices
  + Ex post analysis: your analysis was deep, and the main drivers were highlighted

## Reports: What and when

* **Composition: 09/24.** If you want to participate, the team representative must send via e-mail
  + the name of the team members
  + the type of fund that you want to run (i.e. if there exists any constraint to the composition) and a suitable benchmark. If you are in doubt, use the standard benchmark below.
  + the composition of the fund: this is a table listing the asset identifiers, the amount purchased (quantity), the price/value of the asset, the fx rate at the date and the weight of the asset in the portfolio. To compute the quantity, use the price as of 09/22 EOD.
  + A short explanation of the reasons underlying the selection.
* **Periodical valuations 10/09 and 10/22 by 18.00.** The reference dates for the valuations are 10/07 and 10/20 respectively. The team representative must send:
  + a public report: the report will be shared with the other teams. It contains basic information intended for the clients:
    - A table or chart with the composition (class name and weight only) aggregated using a criterion of your choice
    - A chart with the time series of the cumulative return, both of the fund and of the benchmark
    - A very short comment on the past performances, your view for the future and the changes to the composition
    - IR
  + a technical report, which will not be shared. Make sure to describe exactly your methodology, algorithms and choices. Include working code + data and do not forget to cite the references: attach them if possible. The detailed composition must be included. The technical report should be 4-6 pages long.
* **Reminder.** Recall that, if you want, you can change the composition at any time, not only when you receive new data or when you send the reports. However, any change you make will become effective only after you send an e-mail. Notice that if the prices are available with a time lag, you will not be able to compute the exact quantity for each asset, therefore, it is ok to send only an approximate composition. Example: on 3/10 you discover that the FED will raise the interest rates and therefore you choose to sell short duration. You work your magic and send the new composition on 4/10. On 10/10 you send the periodical report: to compute the performance, you will use the pre-change composition up to the 4/10 (end of day) and the new one from then on.
* **Final valuation and report: 11/05** **at 18.00.** The team representative must send a final report containing:
  + Absolute performance analysis
  + Relative performance analysis
  + Commentary: what you would change if you could, and what you are happy with; strength and weaknesses of your approach; lucky strikes (be honest!); whatever you think is relevant

The final report as of date is 11/03.

## Info

* At the beginning of the game you have 5,000,000 euro (cash).
* Assume a risk-free rate of 0%.
* Transaction costs are equal to 0.3%: they apply both to sales and purchases.
* The reference value is the Euro; this means that you must present your performance in this currency.
* Benchmark: you can make your own benchmark, if data are available to you. If you are uncertain, use a mix of a broad equity index (MSCI World, S&P500, …) and an aggregate bond index (JPM MAGGIE, Bloomberg Barclays Global-Aggregate TRI, …). If you can’t find the index, use an ETF in place (a good one). Choose the weights according to your desired level of risk.
* You can include in your portfolio every financial instrument that you can price. However, to keep things simple, I strongly suggest limiting yourself to indices, stocks and funds. You can obtain prices for several assets from Yahoo finance.
* “Non-traditional” strategies, such as those involving derivatives or long-short positions have to be approved in advance.

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