# MSc Finar WM: Financial Econometrics
# sed Exercise

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## Instructions



Please complete the Exercise below and submit:



- Point 1. before 6/2/2023 at 15:59 on The Hub. Submission will only be possible via The Hub. Late submissions will not be considered.
- Points 2. and 3. before 6/3/2023 at 15:59 on The Hub. Submission will only be possible via The Hub. Late submissions will not be considered.



Please complete the exercise within your allocated syndicate groups and submit one solution for each group. The maximum number of pages for this exercise is 5, excluding tables and graphs. Papers exceeding the length limit will only be evaluated on the first 5 pages.



## Exercise - $1/n$

This empirical exercise is based on the work by De Miguel, Garlappi and Uppal (2009).

### Portfolios and factors construction

Let's construct tradable portfolios from the given dataset.

1. Upload data (filename: `assignment_data18.RData`) in R.
2. Data contain daily close prices, standard industrial classification (SIC) code and market cap (ME) for a large cross-section of stocks in the US. The first row contains the permno of any given stock, the second row the date, the third the SIC code, the fourth the closing price, and the fifth market cap.
3. Upload the five Fama-French factors monthly data.

http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

(Link).


**Trading strat**

1. Form $1/n$ po[illegible]e methodology of De Miguel, Garlappi and Uppal (2009), consi[illegible]3 months formation periods, and 1, 3, 6 months holding periods. Report the average number of stocks and the average ME within each portfolio, over the considered sample size.



**(30% of mark)**

2. Calculate the returns of the $1/n$ portfolios, considering 6, 12 and 48 months formation periods, and 1, 3, 6 months holding periods. Calculate the returns of the same $1/n$ portfolios, using a volatility targeting device similar to Barroso and Santa-Clara (2015). The volatility target is equal to the unconditional volatility of the market portfolio obtained by the Fama-French factors data.



For any of the strategies, report summary statistics, Sharpe ratios, $t$-ratios, maximum drawdowns, a plot of the cumulative returns over time. Comment on the different performances and risk-return profiles of the strategies.





**(45% of mark)**

3. Run regressions of each strategy's returns on the **five** Fama-French factors and comment on the sign, size and the significance of the estimated alphas and betas.



**(25% of mark)**

# References

Barroso, P. and P. Santa-Clara (2015). Momentum has its moments. *Journal of Financial Economics*, 116, 111-120.

De Miguel, V., L. Garlappi and R. Uppal (2009). Optimal Versus Naive Diversification: How Inefficient is the $1/N$ Portfolio Strategy? *The Review of Financial Studies*, 22, 1915-1953.