

ROBOT INVESTING  
ASSET ALLOCATION FOR PRIVATE BANKING CLIENTS

EDUARDO MARIA PEREIRA DA ROSA NUNES

STUDENT NO. 2295

INDIVIDUAL REPORT

A Project carried out on the Master in Finance Program, under the supervision of:

Professor Pedro Santa Clara

## **Theoretical and Methodological Context**

In the first meeting with Banco Invest, the bank issued a challenge for its Private Banking sector, which is responsible for the management of its clients' wealth via asset allocation. The challenge was to develop a model which does not require market views as input. Instead, its only input should be market data so that the asset allocation model is independent of behavioural and emotional biases.

Our supervisor and we, thus, decided that the model should be built around two market anomalies, which are yet to be arbitrated away, that have been known to generate consistently attractive returns across roughly every asset class available to an investor. These two anomalies are the value and momentum anomalies, which are both well documented in literature and continue to draw its attention due to its persistence across time and different asset classes. To exploit these anomalies, one solely needs information flowing from financial markets.

The model itself, i.e., the framework in which the value and momentum anomalies are translated into an allocation of wealth across assets, departs slightly from the usual approaches employed in asset allocation. This is because the said approaches do not allow one to perform the allocation exercise based on asset specific characteristics, such as value and momentum, as easily and robustly as the model we propose.

## **Individual Contributions to the Project**

In my opinion, I was able to have a real contribution to the project and positively impact our ways of overcoming challenges and developing most appropriate and innovative ways of obtaining attractive results.

First of all, from the beginning of our project, I highlighted the importance of acting collaboratively and as a team, namely listening to every team member's perspective and thoughts and aim at creating strong synergies, thus easing the development of most effective processes and achieve positive results.

Throughout the very initial stage of our work project, when the group was still discussing with both Bank representatives and the Supervisor the main objectives and restrictions we had to consider, in order to best establish what exactly we would suggest and work on, I intensely researched and read recommended studies aiming at being able to appropriately understand the topic and respective details and actively contribute to the creation of an idea that would best meet the challenges and requirements imposed.

Following this initial stage, and with our project idea already established and approved, I continuously worked on developing the investment strategy by focusing on each asset class individually and carefully, at first. More specifically, I focused on developing our "Free Model" in each of our considered classes, from data analysis and computation of trading measures to weights' determination and performance analysis. In order to guarantee accuracy and avoid both comprehensive and computational errors, each team member completed this stage individually and, afterwards, we discussed and compared every included step and result, for each asset class, hence ensuring everything was concordant, well-understood and correct. It is appropriate to underline that, even when accomplishing tasks individually, the team was always willing to interact, collaborate and enhance an interdependent attitude that consistently enabled us to work more effectively and benefit from important synergies. While working on

this step, I also tried to best understand the economic and trading intuitions, as well as the main advantages and disadvantages, of proceeding to characteristics' truncation and standardizations, both in time-series and cross-sectional terms, aiming at best evaluating if, and when, it would be beneficial to consider these procedures.

After developing and concluding our base Free Model, we were challenged by the Bank to include two important restrictions in our strategy, in order to be totally in line with the Bank's investment policies and thus further tailor our project to the reality. I thoroughly researched and analysed best ways of incorporating the No-Leverage and No-Short-Sell constraints in our investment model, aiming at not excessively jeopardizing its performance. I carefully considered the main pros and cons of several possibilities, we considered everyone's perspective and thoughts on different suggested alternatives and were able to develop robust ways of overcoming this challenging situation.

Moreover, from my perspective, it is relevant to mention that I continuously tried to organize work and improve the team's processes in the most appropriate way, namely by listing and prioritizing tasks, communicating in a clear way with my colleagues, assessing the most productive ways of getting tasks completed and planning ahead our future challenges and respective ways of overcoming them. Also, throughout meetings not only with my team members, but also with Bank's representatives and directors, as well as with our Supervisor, I communicated openly and clearly, in a confident and engaging way. I pushed myself to get tasks done and to develop work most effectively, and constantly aimed at delivering work to the highest quality standard throughout the project, as well as learn the most from my colleagues, which had an absolutely crucial role in the elaboration and success of this work project, and massively contributed to my personal development.

## **Personal Reflection**

As far as I am concerned, this work project importantly contributed to my development both in personal and professional terms. Firstly, it clearly expanded my knowledge and further increased my interest and passion relative to the Asset Management industry. Developing an investment strategy, across several asset classes and geographies, that precisely meets client-specific needs, preferences and goals, was truly a very enriching experience which strongly contributed to my career prospects and professional development. Besides, this team-based project allowed me to further acquire and develop important interpersonal and communication skills, as well as other important factors as ability to think innovatively, for instance.

More specifically, and firstly, I will share my perspective on how this work project strongly contributed to developing my analytical ability. In fact, by having to work with an expressive amount of data, formulate trading signals based on two distinct indicators, appropriately and accurately determine assets' weights monthly, and continuously develop both strong quantitative and qualitative analyses, for which high reasoning levels were crucial. Henceforth, in order to be successful in these tasks, I tried to acquire the most information possible to develop the best ways of completing each step, I kept a great level of focus on the analysis and results' computation, and on permanently improving my reasoning and problem-solving abilities. As a result, in my opinion, I was able to importantly develop a strong sense of logical thinking and not only enlarge, but also improve, a wide analytical skillset which I consider a fundamental asset for accurate quantitative and qualitative analyses.

Building on the aforementioned, I think it is also relevant to point that the work project also vastly contributed to my attention to detail, which I consider of vital importance. More specifically, in order to successfully build a robust investment strategy which answers both client-specific needs and preferences and bank restrictions, it was totally necessary to not only carefully determine and calculate trading signals, amongst others, but also develop most

appropriate ways of incorporating transaction costs and compute assets' weights according to certain restrictions. Along with this type of task, maintaining special attention to issues as forward looking biases or data mining, as well as double-checking every step consistently, was of utmost importance. This project enhanced my awareness relative to how details matter and can impact, and clearly improved my attention to details, even when leading with a big amount of data.

Moreover, I also developed a strong sense of resilience and learnt how to best react to and answer specific challenges. Namely, after completing our free-model, the bank challenged the group to find appropriate ways of incorporating two main investment restrictions, specifically concerning leverage and short-selling. From that point, we focused on exploring and finding creative, innovative and, principally, effective ways of incorporating these two strong restrictions in our model, without expressively jeopardizing its performance. The group was able to accurately develop alternatives to incorporate both client's preferences and bank's restrictions and, personally, I feel that I considerably improved my ability to not only think laterally and innovatively, but also to react to and overcome challenges efficiently.

Also, besides clear improvements in my organization and time-management abilities, I feel that, throughout the project, I was able to considerably improve my interpersonal and communication skills, as well as vastly extend my team-working ability. Specifically, having a good communication, by appropriately building and expressing several ideas and perspectives, not only between team members but also with Bank's representatives and our supervisor, was of utmost importance to consistently develop productive ways of achieving consensus and, consequently, reach our objectives with success. Besides, I continuously enhanced how important it is to listen to every team member's opinion and points of view, stimulated participation and brainstorming, suggested several task splits and respective deadlines and, in a nutshell, I think I worked on developing an impactful collaboration

throughout the project. In my opinion, we were a very interdependent team, with high levels of collaboration, giving rise to important synergies, what undoubtedly improved our efficiency and significantly contributed to the achievement of positive and satisfactory outcomes.

Amongst others, these were the main learnings and personal developments that I consider this project provided me and improved. As previously mentioned, in my opinion, the work developed, from the idea-generation stage until finalizing and completing the last details of our investment strategy, was extremely productive, efficient and useful, allowing us to, in fact, create with success a robust diversified investment model, without being excessively complex, which is able to generate very attractive returns while, simultaneously, considering and answering to client-specific goals and bank's investment restrictions. The work done was extremely enriching and beneficial, in diverse senses, for me in personal terms. I am considerably proud of the final outcome of this project, and, similarly important, of the group's energy, teamwork, productivity and efficiency.