Robo-Advisory Quantitative Portfolio Management.

User Guide

Swissquote Bank

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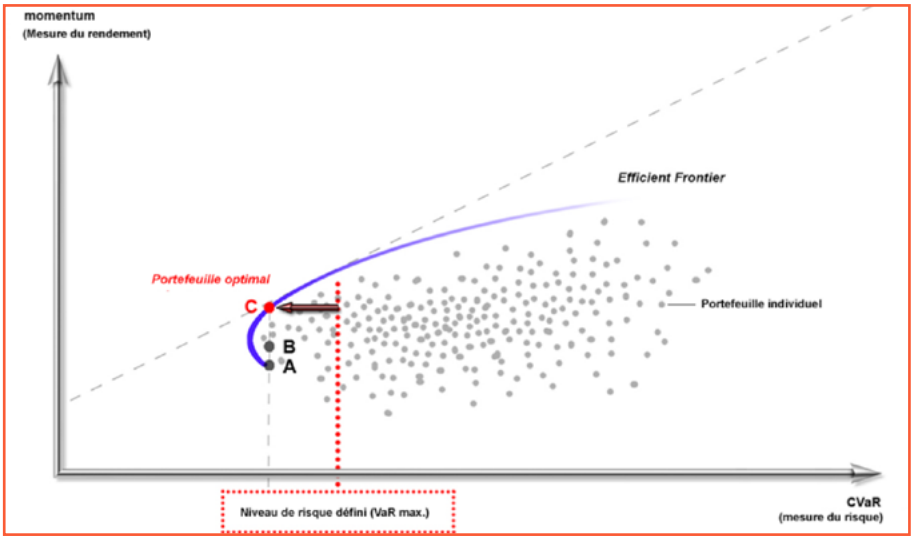
Introduction

Quantitative portfolio management is a modern solution that combines statistics, mathematics and algorithms to select securities in an environment characterised by markets that are increasingly international and efficient. Unlike qualitative and fundamental management, it excludes future prospects and profit expectations in order to remove any emotional dimension from the investment process.

Whereas traditional asset management considers each security in isolation, quantitative portfolio management focuses on interactions between assets. On the basis of statistical analysis of historical performance, it seeks to establish systematic allocation rules to construct an optimal portfolio containing securities that move in opposite directions and neutralise their risks.

The underlying universe from which the portfolio is constructed contains thousands of securities (individual securities and ETFs) that can be combined in different ways to obtain an infinite number of portfolios. Once the user has defined the maximum level of risk, the quantitative management algorithm examines all the portfolios that meet this criterion (portfolios A, B and C in the graph) to select the optimal one, i.e. the portfolio that offers the best expected performance for the maximum defined risk (portfolio C in the graph).



Once the optimal portfolio has been constructed, the markets continue to move, as does the portfolio. The quantitative management algorithm will therefore regularly carry out reallocations to realign the portfolio with the optimal portfolio.

There are three types of reallocation in Swissquote's Robo-Advisor:

Periodic reallocation
The Robo-Advisor carries out automatic reallocation at regular intervals to return the portfolio to the efficient frontier.

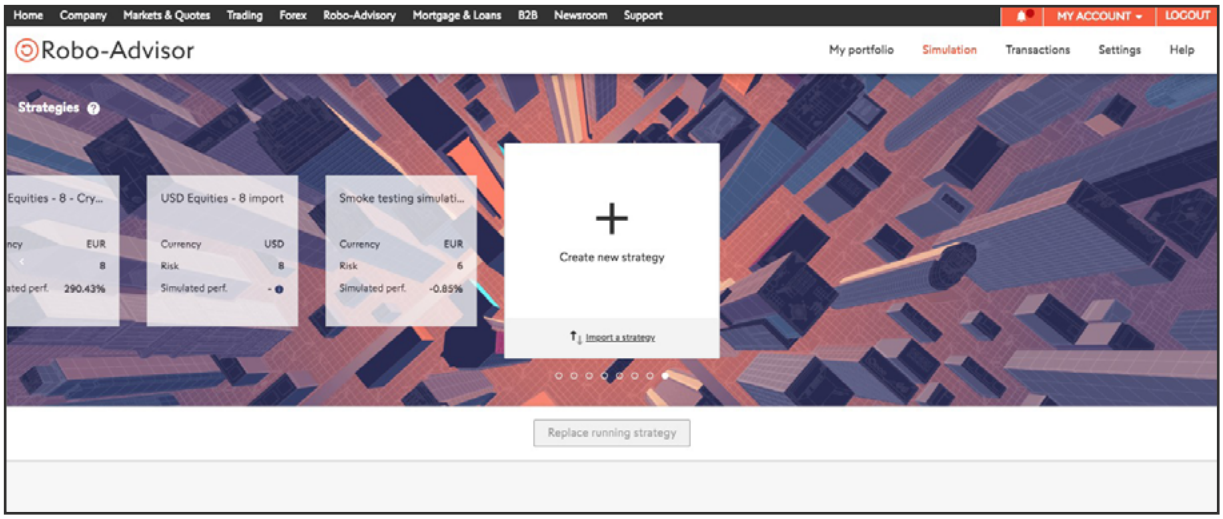
Reallocation on the basis of risk
The Robo-Advisor continuously compares the maximum defined risk with the actual market risk. As soon as a security changes to such an extent that the portfolio's overall risk exceeds the maximum level, the security in question is sold in order to lower the portfolio's risk back down to within the defined limits.

Manual reallocation
It is possible at any time to change the Robo-Advisor's strategy and start the reallocation process manually. This is implemented immediately to create a new optimal portfolio based on the changes.

Simulation menu

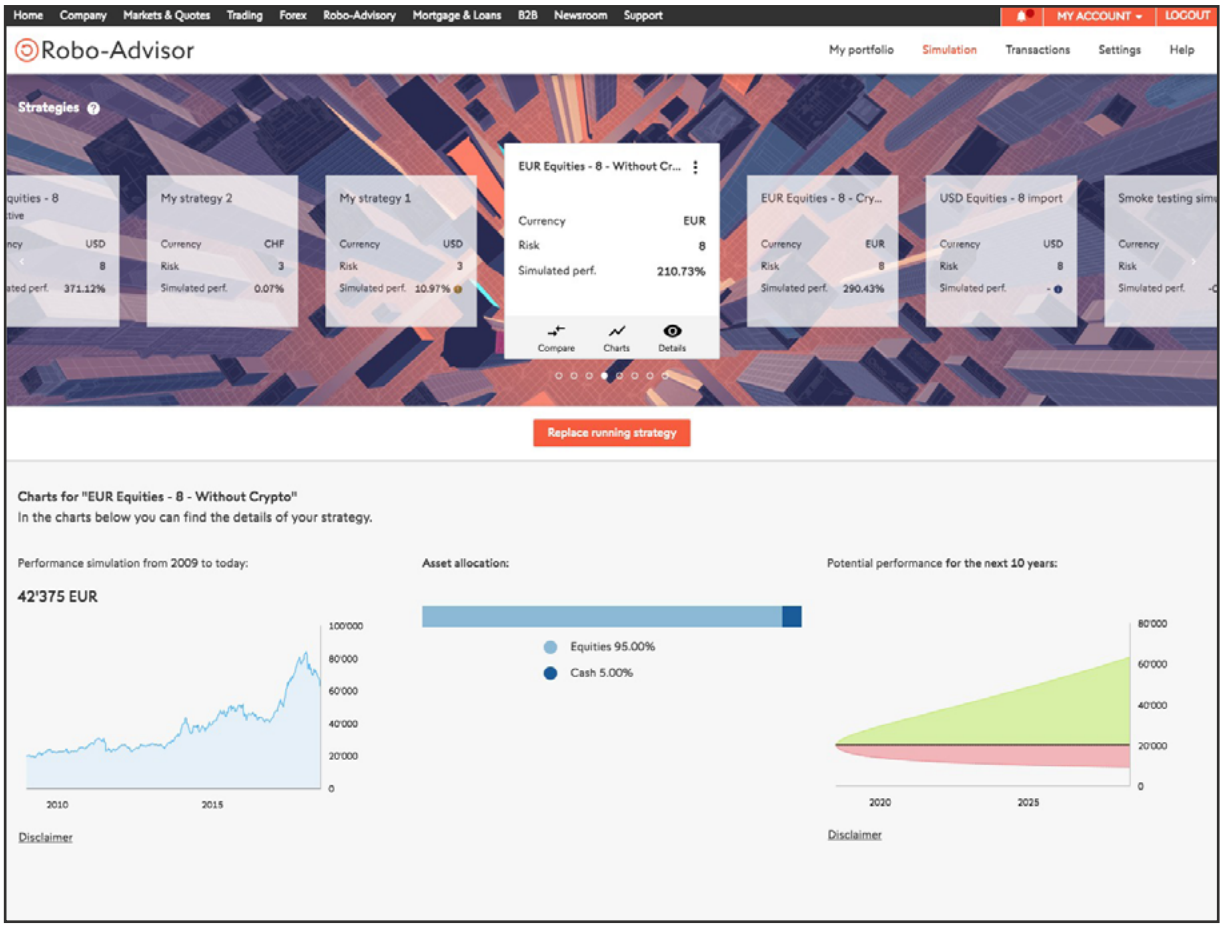
Create a new strategy

The Simulation screen is the place to start building your first strategy, by clicking on the card "Create new strategy".



At this stage, a new default strategy is created. An overview of the strategy will be displayed, where you can see:

- The backtesting of your strategy (if it is computed)
- The asset allocation defined for your strategy
- The potential performance for this specific strategy



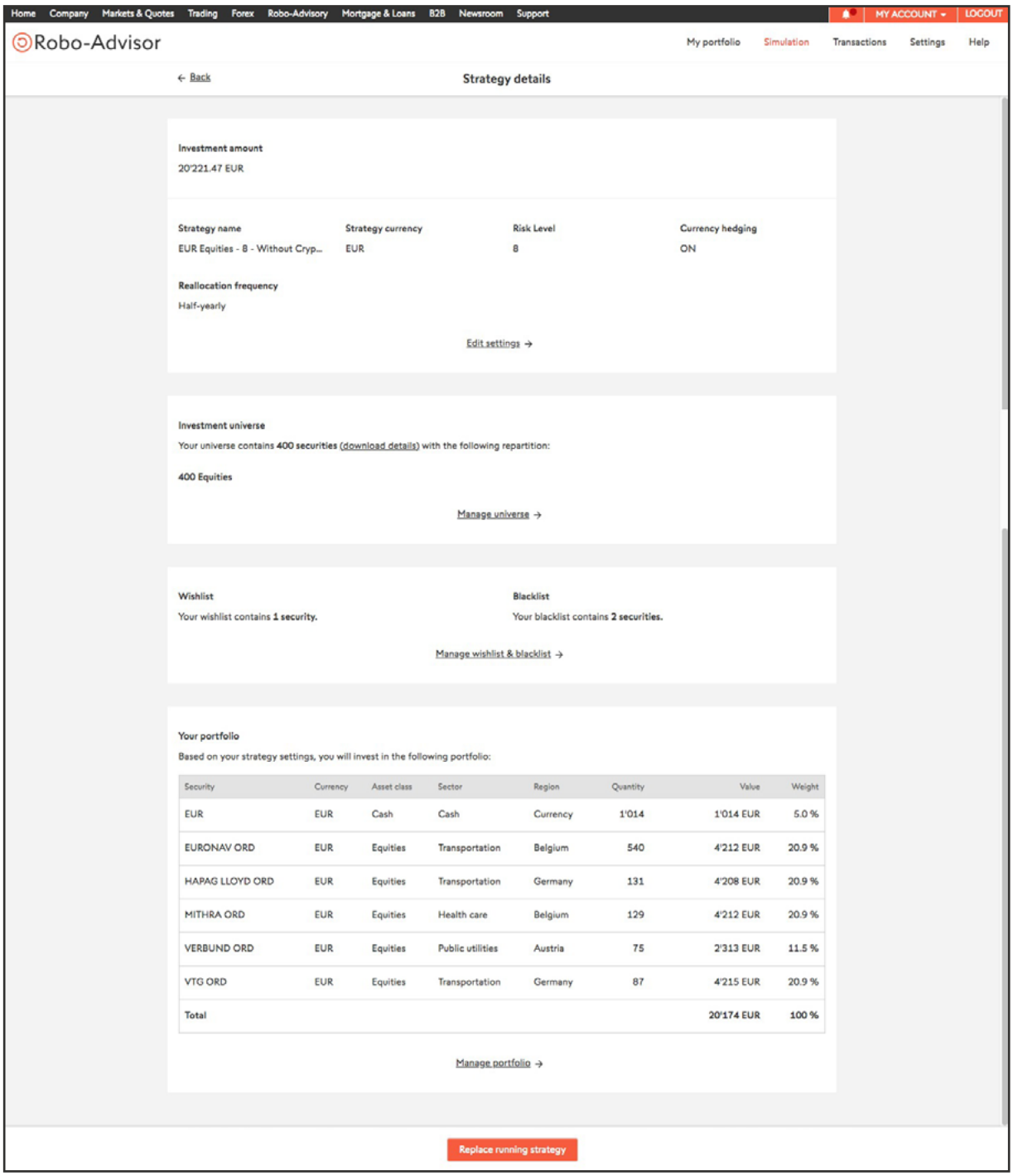
From the Simulation screen you can also:

- Compare your strategy to other strategy or indices
- Access larger, more detailed charts
- Edit the details of your strategies
- Invest in a strategy (with a minimum of CHF 10,000)
- Delete a strategy card
- Duplicate a strategy card
- Import/export a strategy card

Edit a strategy

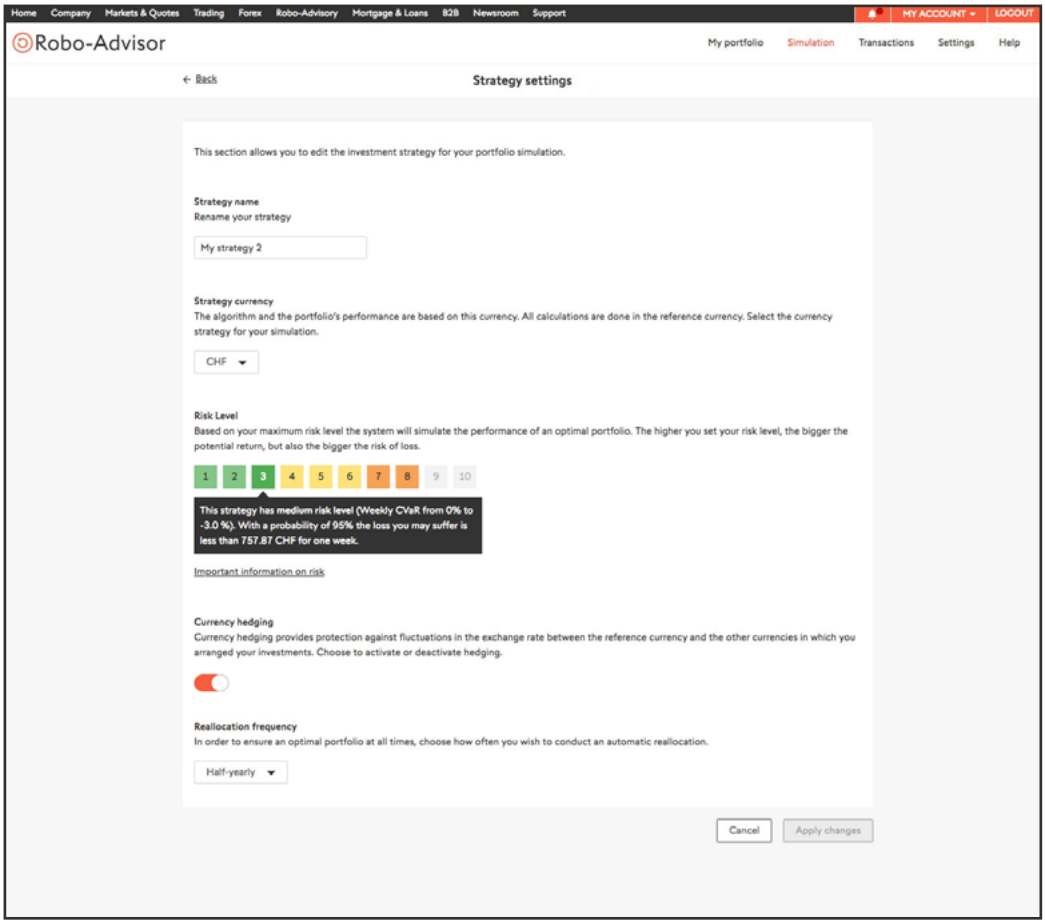
In the "Details" menu of a strategy you will be able to access four main sections:

1. Basic settings: strategy name, strategy currency, risk level, currency hedging, reallocation frequency
2. Composition of the investment universe
3. Definition of wishlist and blacklist
4. Portfolio proposal and management



Strategy settings

In this menu, you can edit the name of your strategy, define the strategy currency, define the maximum risk level of your strategy, enable or disable currency hedging, define the frequency of reallocation.



Reference currency

The reference currency is the currency in which all calculations are made. For positions denominated in a different currency to the reference currency, the historical data is converted into the reference currency for all calculations and simulations.

Maximum risk level

The maximum risk level can be defined by moving the cursor from the left (lower risk) or to the right (higher risk). This risk from 1 to 10 corresponds to the measure of Condition Value at Risk (CVaR) associated to the strategy.

A higher maximum risk level is generally accompanied by a higher potential return but also a more significant risk of loss. The maximum level of risk represents an upper limit. The actual risk may be lower, for example if the algorithm shows that it is possible to avoid excessive reallocations or to generate higher gains with a lower level of risk.

Some numbers might be grayed out, it means that you are limited in your risk selection.

Currency hedging

Exchange rate hedging gives protection against fluctuations in the exchange rate between the reference currency and the other currencies in which investments are denominated. Deactivating the exchange rate hedging means you will save money in fees but accept an exchange rate risk. If your reference currency appreciates against the currency in which a portfolio position is denominated, the value of the portfolio will decline even if the security in question remains stable.

Frequency of reallocation

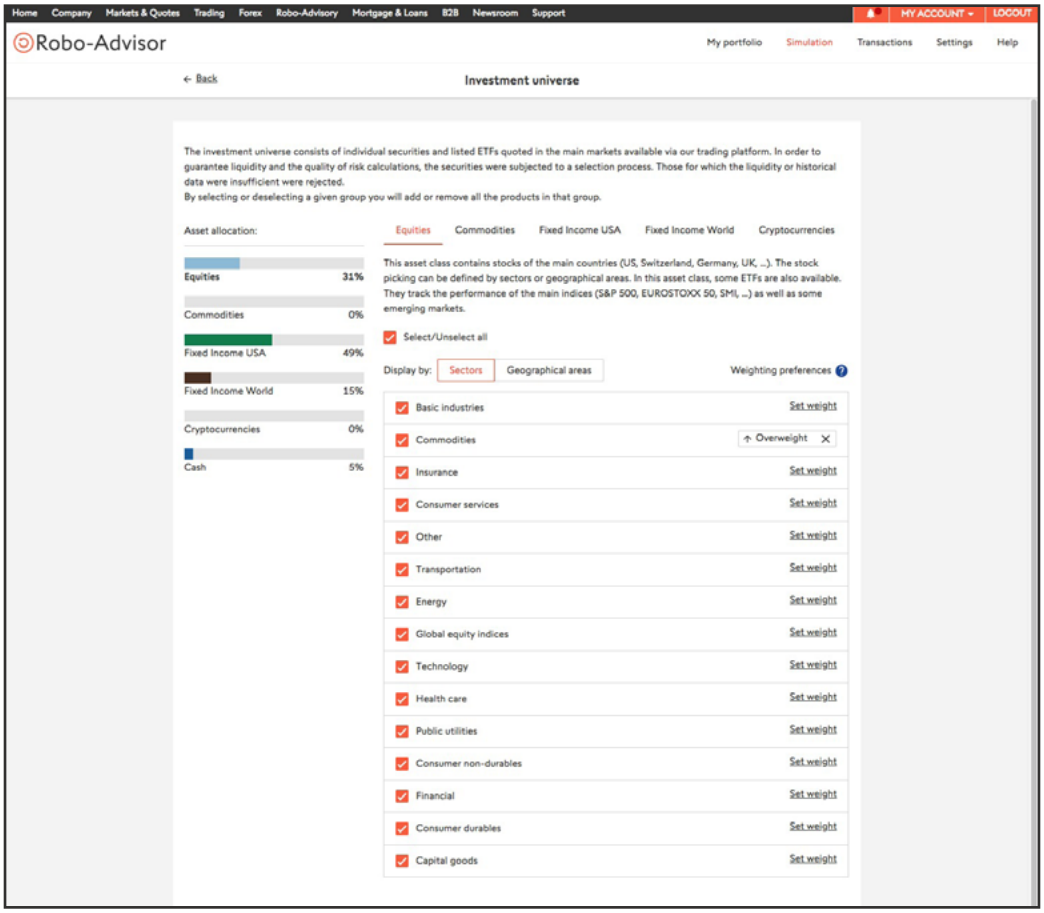
Periodic frequency of reallocation to ensure an optimal portfolio.

Investment universe

In this menu, you can manage the composition of the universe of your strategy by defining the asset classes you want.

The left-hand graph indicates in real time the allocations to different asset classes in the investment universe as defined in the current settings. It also displays the percentage of the overall universe represented by these securities.

You have the option of completely excluding one or several asset classes from the investment universe by unchecking the relevant boxes in the list. You can also define your preferences in more detail for each of the four asset classes by clicking on them.



Equities

When you click on the equities asset class, the sectors and geographical regions – broken down into sub-sectors and sub-regions, are displayed below. To define the investment universe for equities, you can simply check or uncheck the sectors and regions of your choice.

You can also personalise the investment universe for equities by using the weighting preferences on the right part of each line. By clicking on "Set weight", you can choose "Underweight" or "Overweight".

US fixed-income securities

As with equities, you can specify your investment universe for US fixed-income securities by checking and unchecking the sub-categories that are displayed when you click on the asset class.

Non-US fixed-income securities

As with equities, you can specify your investment universe for non-US fixed-income securities by checking and unchecking the sub-categories that are displayed when you click on the asset class.

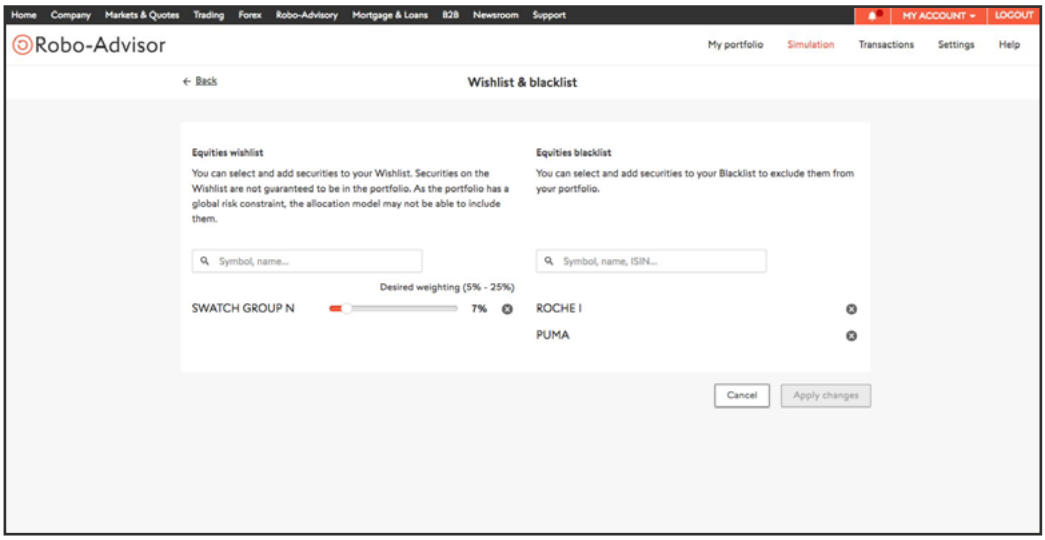
Commodities

As with equities, you can specify your investment universe for commodities by checking and unchecking the sub-sectors that are displayed when you click on the asset class. Once you have finished personalising your investment universe, click on "Next" to move on to the next step.

Wishlist and blacklist

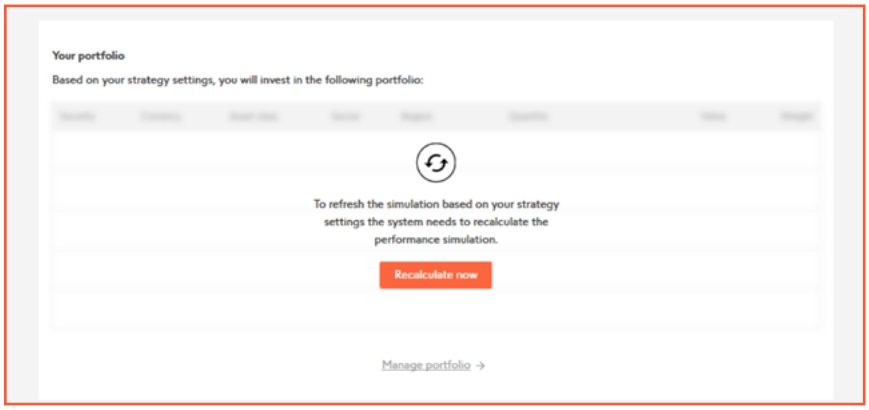
The wishlist is the list of securities that you want to include in your portfolio. You can define precisely the weight of security you would like to have in it. Please note that it is impossible to guarantee that the securities on the wishlist will actually be included in the portfolio, it may be impossible for the algorithm to find an optimal solution that includes all the securities from the wishlist.

The blacklist enables you to draw up a list of individual securities to exclude from your portfolio.

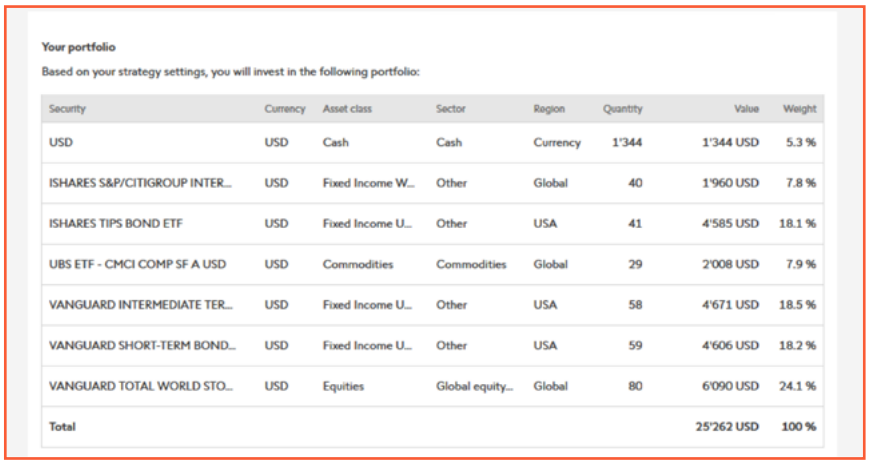


Portfolio proposal

When you edit one of the previous elements of your strategy, the portfolio and the backtesting chart become outdated. You are then prompted to launch manually the recalculation of the portfolio or the backtesting.



After the calculation, a portfolio proposal is displayed, based on your parameters and the portfolio value of your Robo-Advisor account.

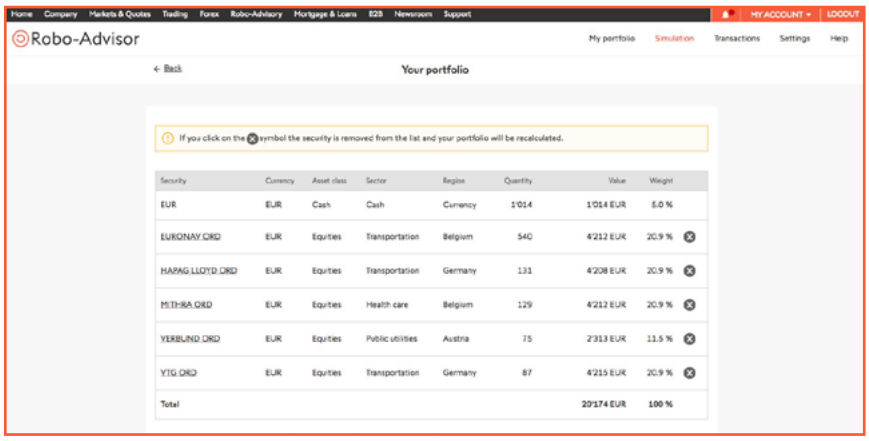


Your portfolio

Based on your strategy settings, you will invest in the following portfolio:

Security	Currency	Asset class	Sector	Region	Quantity	Value	Weight
USD	USD	Cash	Cash	Currency	1'344	1'344 USD	5.3 %
ISHARES S&P/CITIGROUP INTER...	USD	Fixed Income W...	Other	Global	40	1'960 USD	7.8 %
ISHARES TIPS BOND ETF	USD	Fixed Income U...	Other	USA	41	4'585 USD	18.1 %
UBS ETF - CMCI COMP SF A USD	USD	Commodities	Commodities	Global	29	2'008 USD	7.9 %
VANGUARD INTERMEDIATE TER...	USD	Fixed Income U...	Other	USA	58	4'671 USD	18.5 %
VANGUARD SHORT-TERM BOND...	USD	Fixed Income U...	Other	USA	59	4'606 USD	18.2 %
VANGUARD TOTAL WORLD STO...	USD	Equities	Global equity...	Global	80	6'090 USD	24.1 %
Total						25'262 USD	100 %

At this point, you can click on "Manage portfolio" to fine-tune the portfolio based on your personal preferences.



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Your portfolio

If you click on the ⊗ symbol the security is removed from the list and your portfolio will be recalculated.

Security	Currency	Asset class	Sector	Region	Quantity	Value	Weight
EUR	EUR	Cash	Cash	Currency	1'014	1'014 EUR	5.0 %
EURONAV ORD	EUR	Equities	Transportation	Belgium	540	4'212 EUR	20.9 %
HAPAG LLOYD ORD	EUR	Equities	Transportation	Germany	131	4'208 EUR	20.9 %
MITHRA ORD	EUR	Equities	Health care	Belgium	129	4'212 EUR	20.9 %
VERBUND ORD	EUR	Equities	Public utilities	Austria	75	2'313 EUR	11.5 %
VTG ORD	EUR	Equities	Transportation	Germany	87	4'215 EUR	20.9 %
Total						20'174 EUR	100 %

The cross on the right allows you to remove a security from the portfolio proposal. The Robo-Advisor will then suggest a new portfolio accordingly.

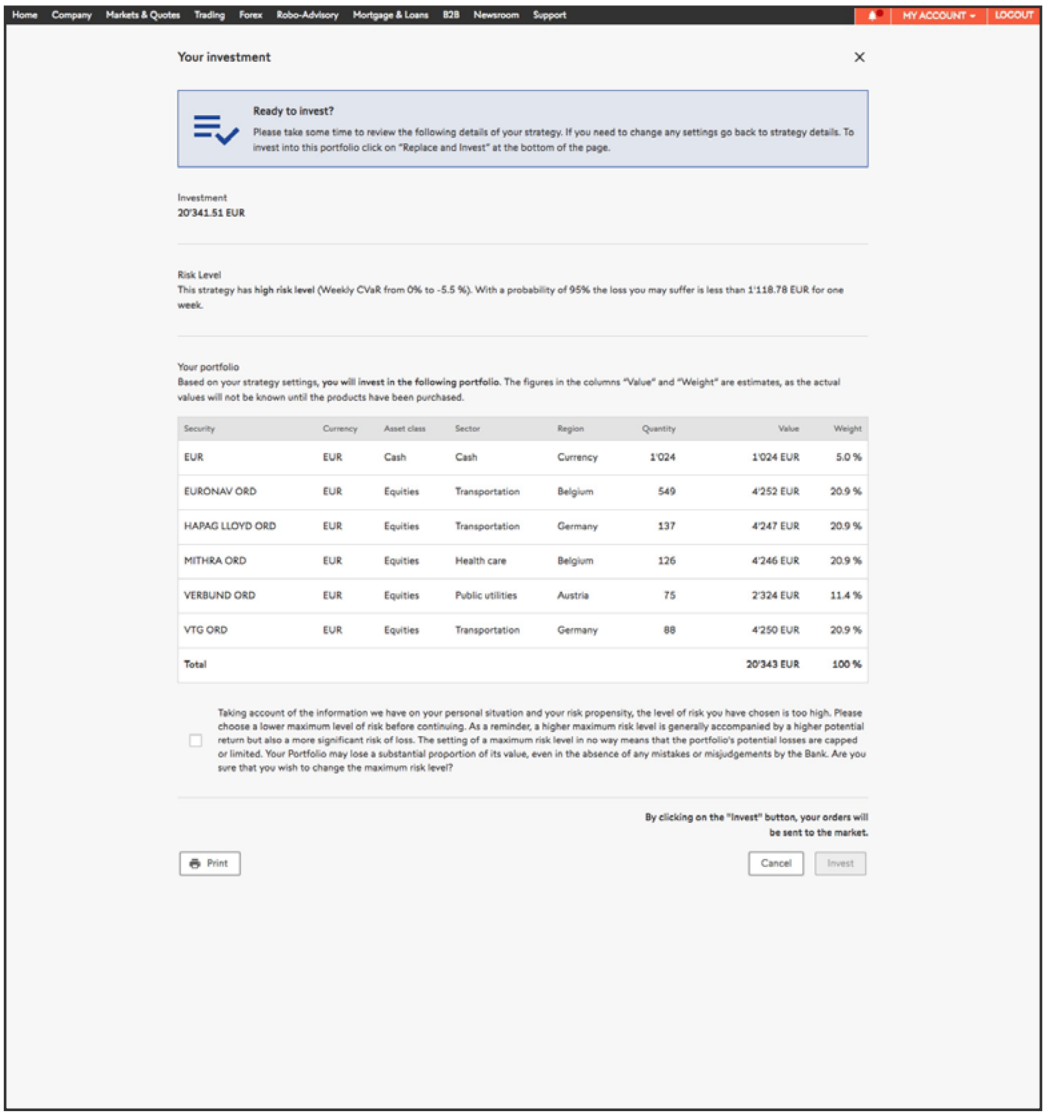
Invest in a new strategy

When all the parameters are set and the portfolio proposal calculated, you can invest in a strategy by clicking on the button “Invest” or “Replace running strategy”.

You can return to previous stages by clicking on X at the top right corner or “Cancel”.

“Invest” will implement the strategy and launch electronic management of the portfolio. The system will then place the relevant orders for your account. Orders are generally executed within 48 hours, but may sometimes take longer. The configuration cannot be changed while orders are being placed.

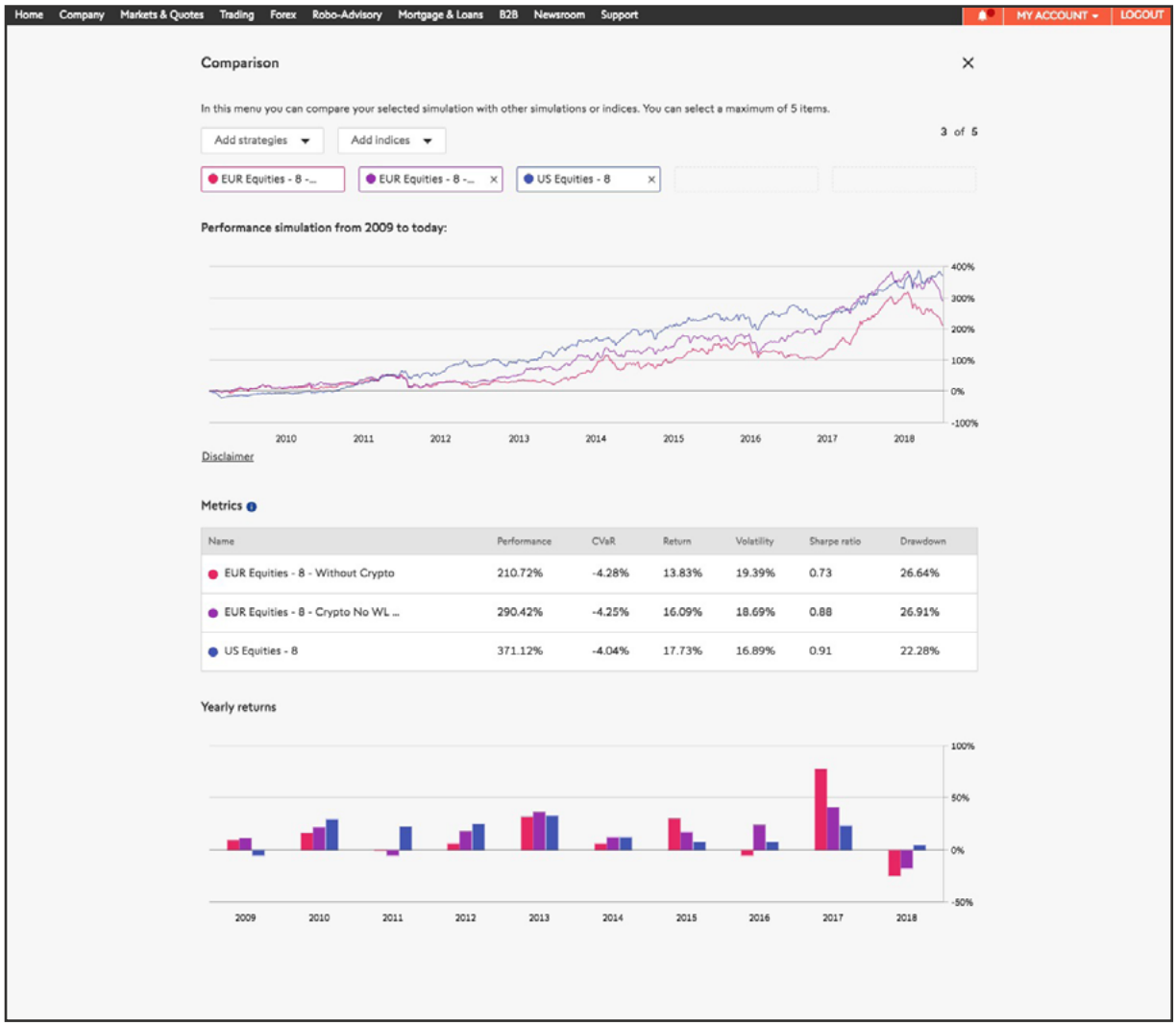
Once this step is done the menu “My Portfolio” becomes available.



Security	Currency	Asset class	Sector	Region	Quantity	Value	Weight
EUR	EUR	Cash	Cash	Currency	1'024	1'024 EUR	5.0 %
EURONAV ORD	EUR	Equities	Transportation	Belgium	549	4'252 EUR	20.9 %
HAPAG LLOYD ORD	EUR	Equities	Transportation	Germany	137	4'247 EUR	20.9 %
MITHRA ORD	EUR	Equities	Health care	Belgium	126	4'246 EUR	20.9 %
VERBUND ORD	EUR	Equities	Public utilities	Austria	75	2'324 EUR	11.4 %
VTG ORD	EUR	Equities	Transportation	Germany	88	4'250 EUR	20.9 %
Total						20'343 EUR	100 %

Comparing strategies

A dedicated menu is available to provide comparisons between your strategy cards and indices. A strategy can only be compared if the calculation of the backtesting and the portfolio is done. The comparisons take into account backtesting charts, yearly returns and selected metrics.



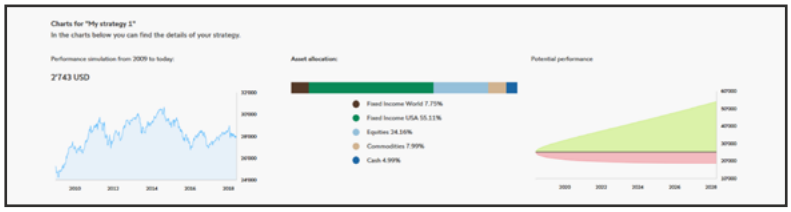
The comparison metrics are:

- **Performance:** Overall performance of the strategy since the start date of the backtest.
- **CVaR ("Conditional Value at Risk"):** a more conservative measure of the risk of loss than the value-at-risk (VaR). The VaR indicates the market risk of the portfolio. For example, a VaR (95% over one week) of -2% indicates that the losses that may be suffered in one week are less than 2% with a probability of 95%. The CVaR indicates the average losses suffered beyond the VaR.
- **Return:** Weekly average return of the strategy based on the maximum defined level of risk.
- **Volatility:** Annualised standard deviation of the weekly changes in the value of the strategy.
- **Sharpe ratio:** Return of the strategy in relation to its volatility. The higher the Sharpe ratio, the better the return on the investment in question for the risk taken.
- **Drawdown:** Maximum strategy loss during the period of the backtest.

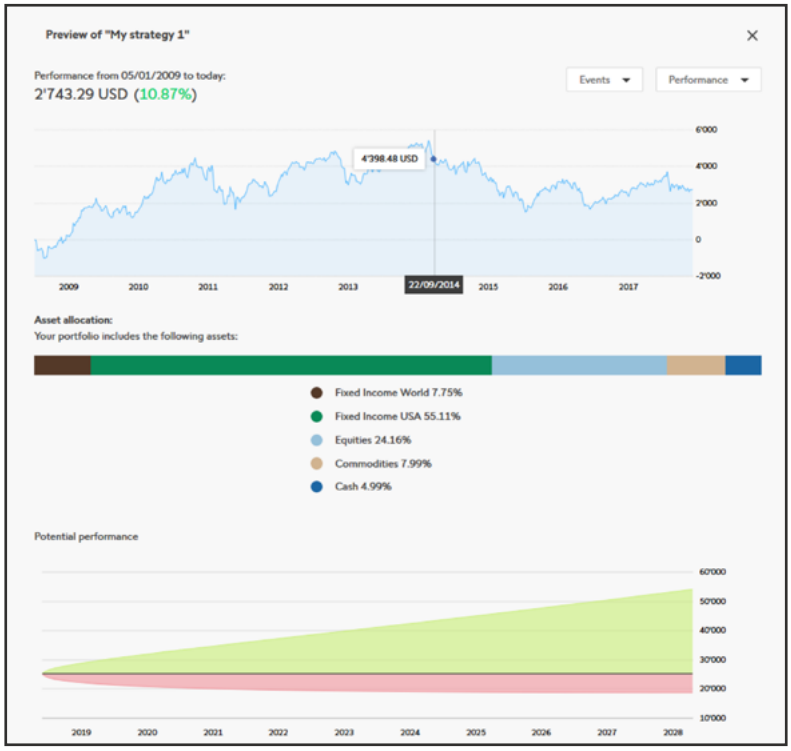
Charts

Several types of charts are displayed on different pages.

Main menu:



Charts page:



Backtest

The system constructs the optimal portfolio and calculates the past performance of the strategy based on the parameters and the investment universe defined by the user. This backtest goes as far back in time as the historical data will allow.

You can display the events linked to the strategy during the backtest period (events dropdown).

For each event, you can also see the composition of the portfolio at the date of the event.

The dropdown on the right allows you to choose between different types of backtests:
based on performance, CVaR or historical asset allocation.

Portfolio allocation

The center bar chart indicates the allocations to different asset classes in the overall universe from which the Robo-Advisor constructs the optimal portfolio.

Potential performance

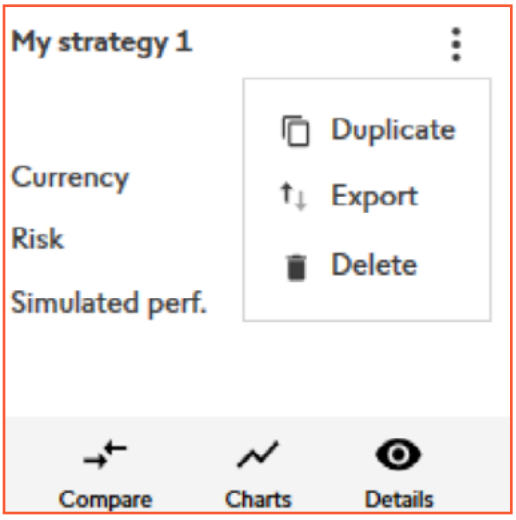
The diagram of potential performance indicates the potential gains and risk of losses, based on the risk level selected. By moving the cursor towards the left or right, you can display the probability of generating a gain or suffering a loss over a given investment horizon.

Import/export strategies

To facilitate the exchange of strategies between accounts,
the import/export of strategies is available.

Strategy export

The export of strategy is available through the "three dots" menu on each strategy card. The file generated through the export can be shared to other accounts.



Strategy import

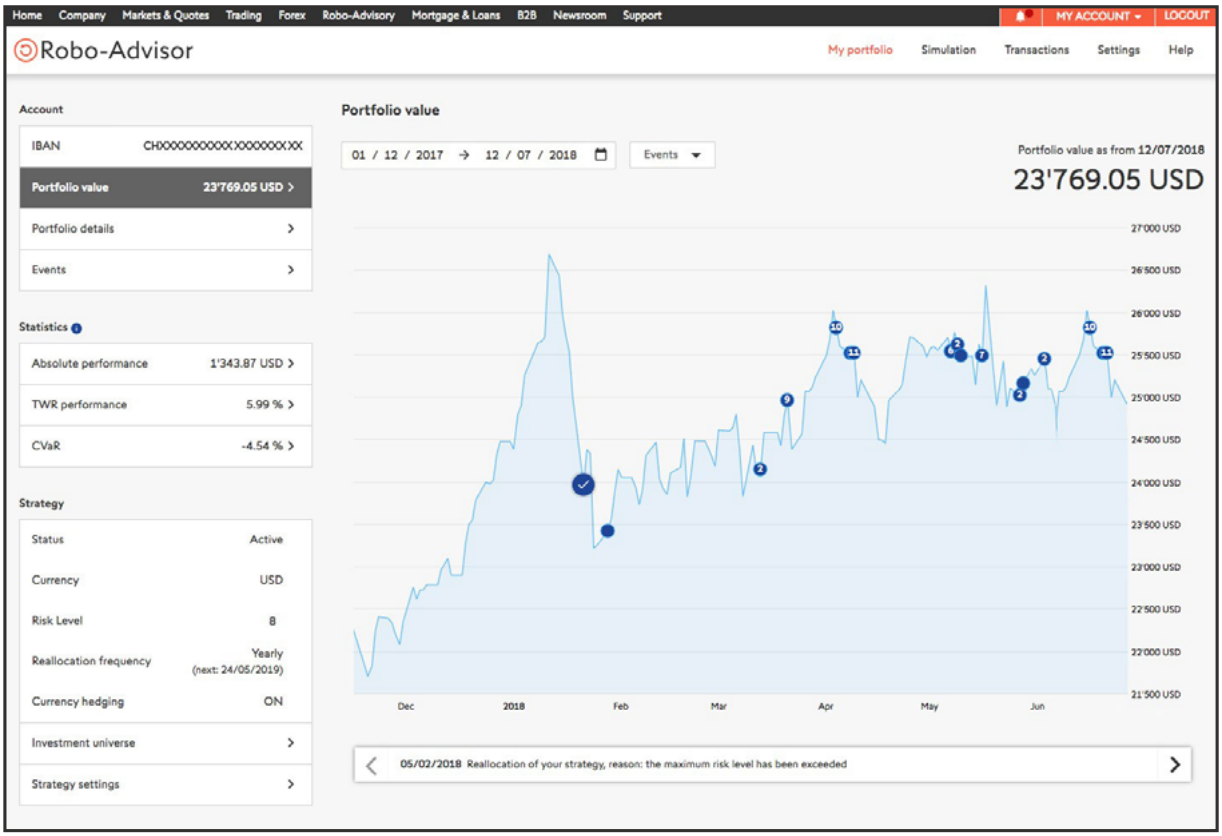
To import a strategy, you first need to have a strategy export file.
On the "Create new strategy" card, you have the link to import the strategy.
Click on it, then select the file of the strategy you want to import.

My portfolio menu

This menu allows you to monitor and manage your running strategy.

Monitoring features

Portfolio value chart



Portfolio details: cash table and position table

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Account

IBAN	CHXXXXXXXXXXXXXXXXXXXX
Portfolio value	23'769.05 USD >
Portfolio details	>
Events	>

Statistics

Absolute performance	1'343.87 USD >
TWR performance	5.99 % >
CVaR	-4.54 % >

Strategy

Status	Active
Currency	USD
Risk Level	8
Reallocation frequency	Yearly (next: 24/05/2019)
Currency hedging	ON
Investment universe	>
Strategy settings	>

Portfolio details

Refresh Print

Asset Allocation

Equities 85.84% Cash 14.16%

Cash

Currency	Rate	Cash Balance	Securities value	Total
CHF	1.00506	0.00	0.00	0.00
EUR	1.16877	0.00	0.00	0.00
GBP	1.32211	0.00	0.00	0.00
USD	1.00000	3'366.00	20'403.05	23'769.05
Total in USD		3'366.00	20'403.05	23'769.05

Securities

Name	Quantity	Unit Cost	Last Price	Total Value	Gain/Loss
Equities					
▲ ADOBE SYSTEM ORD (ADBE)	16.0	241.68	248.12	3'969.92 USD	103.04 USD (2.66%)
▲ BEST BUY ORD (BBY)	38.0	69.78	74.28	2'822.64 USD	171.00 USD (6.45%)
▲ EDWARDS LIFESCIENCES ORD (EW)	10.0	137.00	144.65	1'446.50 USD	76.52 USD (5.59%)
▼ NRG ENERGY ORD (NRG)	41.0	33.62	30.67	1'257.47 USD	-120.95 USD (-8.77%)
▲ NVIDIA ORD (NVDA)	16.0	241.61	247.53	3'960.48 USD	94.72 USD (2.45%)
▼ RED HAT ORD (RHT)	23.0	161.85	145.00	3'335.00 USD	-387.55 USD (-10.41%)
▼ SVB FINANCIAL GROUP ORD (SIVB)	12.0	325.96	300.92	3'611.04 USD	-300.48 USD (-7.68%)
			Equities subtotal in USD	20'403.05	-363.70
			Total in USD	20'403.05	-363.70

Events of the strategy

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Account

IBAN	CHXXXXXXXXXXXXXXXXXXXX
Portfolio value	23'769.05 USD >
Portfolio details	>
Events	>

Statistics

Absolute performance	1'343.87 USD >
TWR performance	5.99 % >
CVaR	-4.54 % >

Strategy

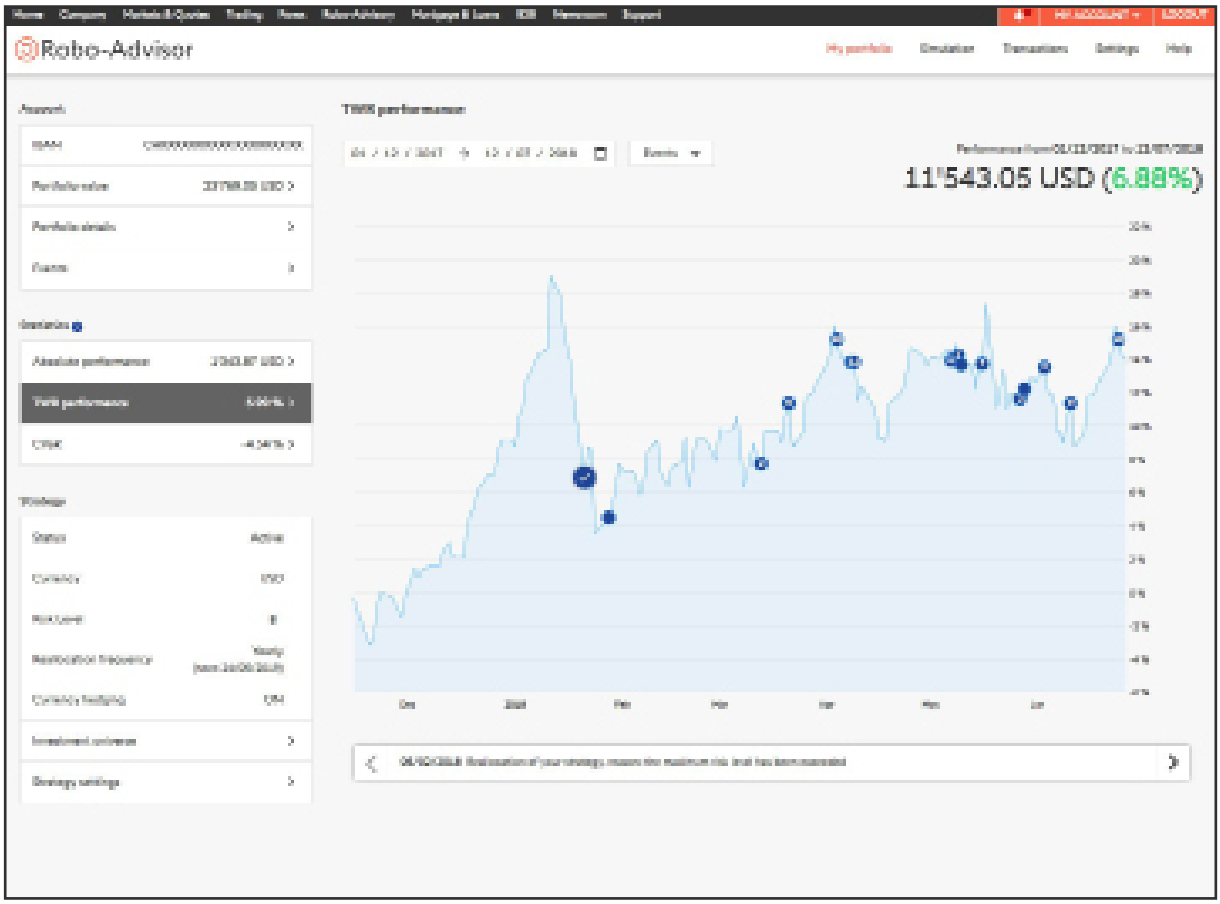
Status	Active
Currency	USD
Risk Level	8
Reallocation frequency	Yearly (next: 24/05/2019)
Currency hedging	ON
Investment universe	>
Strategy settings	>

Events

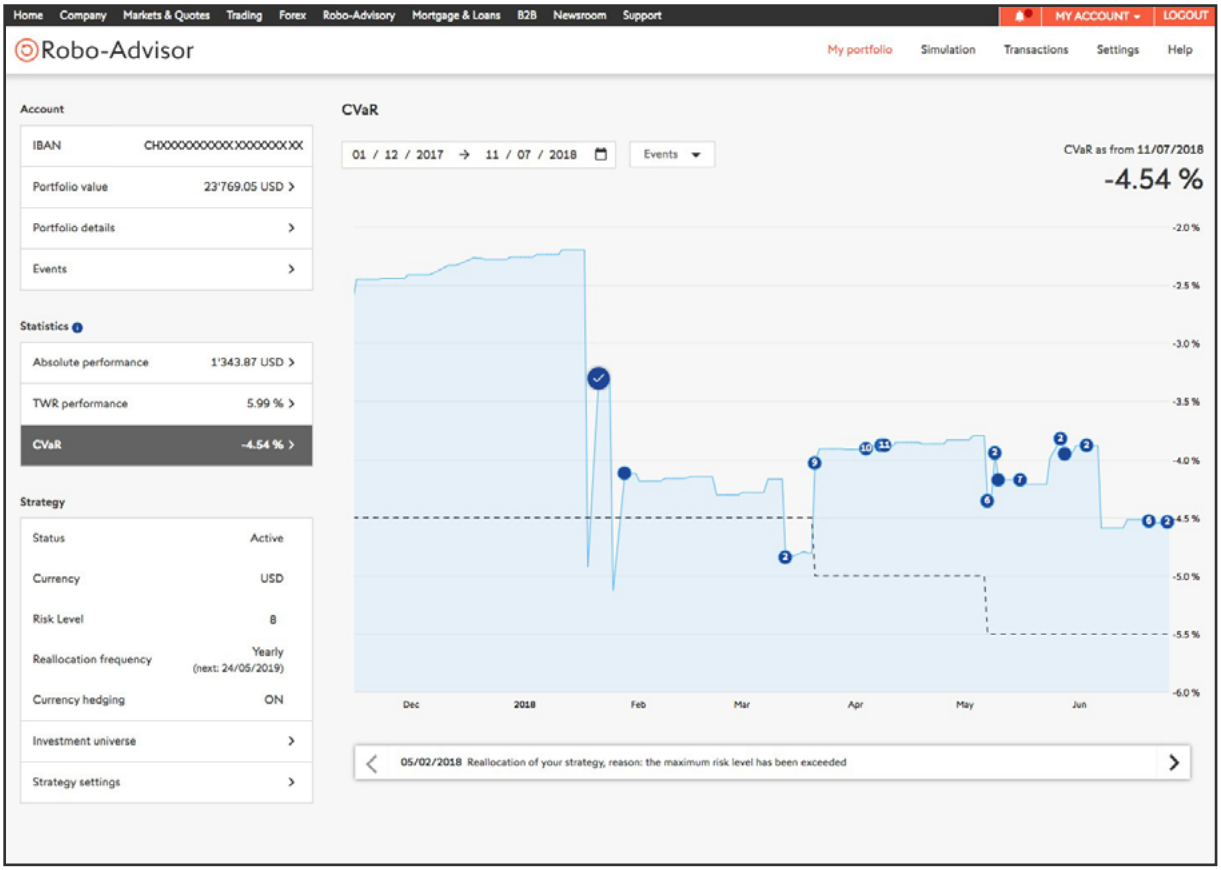
01 / 12 / 2017 → 12 / 07 / 2018 Events

Type	Date	Description
Cash input	12/06/2018	Investment with regard to your cash funds level
Manual sale of a security	11/06/2018	You have sold the following security manually : NEKTAR THERAPEUTICS ORD (ITH)
Manual sale of a security	24/05/2018	You have sold the following security manually : CONOCOPHILLIPS (COP)
Reactivation of the strategy	05/04/2018	You have reactivated your strategy
Cessation of the strategy	05/04/2018	Your strategy has been stopped
Manual sale of a security	28/03/2018	You have sold the following security manually : DR PEPPER SNAPPLE GROUP ORD (DPS)
Reallocation due to CVaR	12/02/2018	Reallocation of your strategy, reason: the maximum risk level has been exceeded
Reallocation due to CVaR	05/02/2018	Reallocation of your strategy, reason: the maximum risk level has been exceeded

Portfolio details: TWR performance



CVaR chart

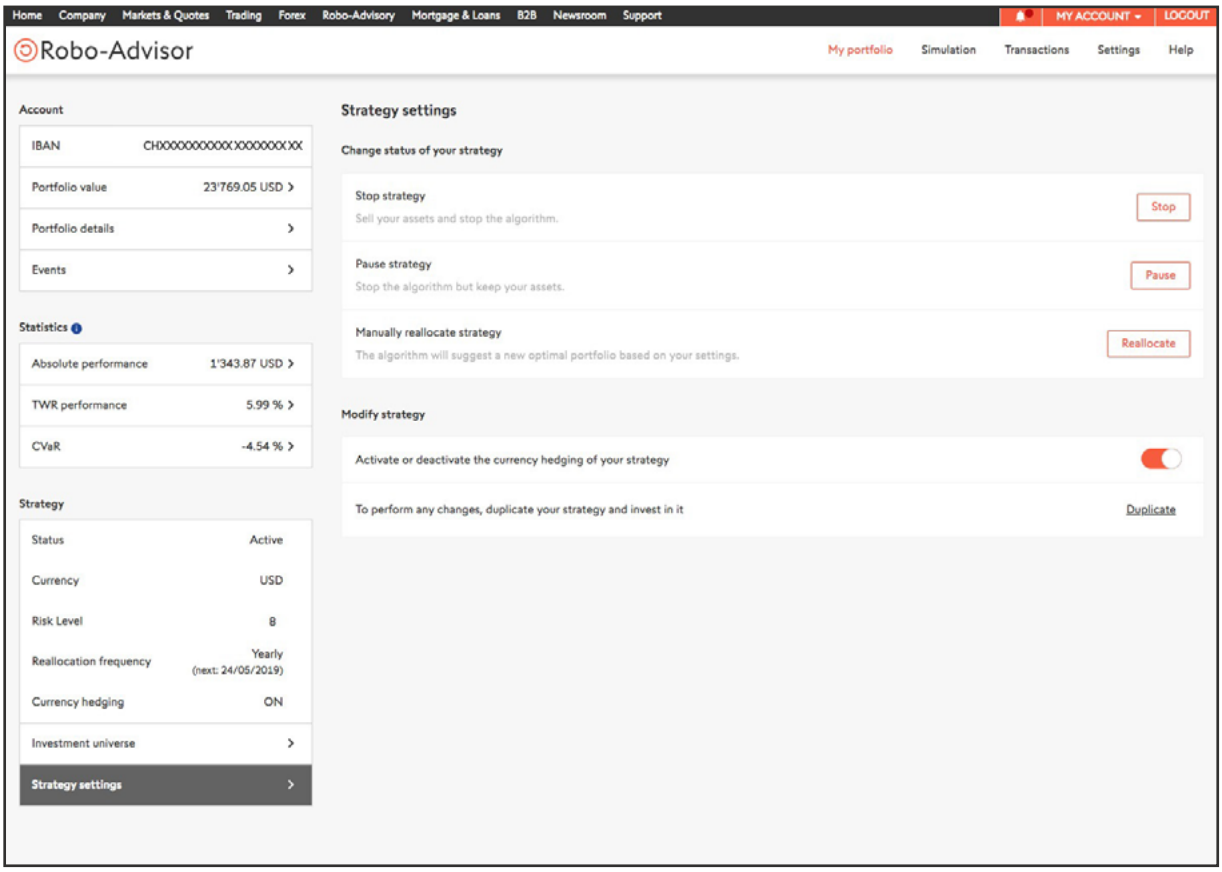


Management features

You can make the following changes on your running strategy:

- Stop the strategy
- Pause the strategy
- Manually reallocate the strategy
- Activate or deactivate the currency hedging
- Duplicate the running strategy

Note: the "Duplicate" feature is particularly useful if you want to modify a few parameters and see how your new strategy would behave by comparing it against your running strategy. You can then choose to make the new strategy your running strategy.



Transactions menu

This menu contains the list of the transactions made on the account.

Settings menu

This menu contains the account settings that you can modify:

- Performance since date: date used to initialize the chart for the computation of the performance.
- Reference currency: currency used for the display of all the financial information linked to the account. It does not have any impact on the actual currency used by the strategy.
- Investment profile: during the account opening, you answered some questions to define your risk profile. This risk profile defines the risk level available during the strategy creation process. You can change your risk profile in this menu.

Help menu

For more information or if you require assistance, the Help menu is a good place to start. Alternatively, feel free to contact our dedicated Robo-Advisory support team for questions related specifically to your Robo-Advisor, or our Customer Care Centre for more general questions about your account.

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