According to the question, this is a personal investment, the investment amount is small, so the investment decision should be in line with the general laws of the market to reduce risk and increase returns.

For gold trading, gold price is influenced by both short-term and long-term factors. Short-term factors have uncertainty and suddenness, so it is not recommended to go for timing in short time. Medium and long term timing models are influenced by the Fed's monetary policy and the nature of the economic cycle and are highly controllable. In contrast, the results can be judged visually, but these economic data are difficult to forecast in advance.

With the complex drivers, we recommend a long-term allocation so that no matter how time changes and how the factors behind different time phases change, we can end up with long-term gains and ultimately just give up some short-term gains that may or may not be volatile, gains that we do not recommend individual investors to engage in these short-term fluctuations. Therefore, for gold trading we recommend keeping a small position long-term allocation, i.e. 5% to 10%.

For bitcoin trading, we prefer the automatic investment plan. In the stock world, fixed investment has proven to be a suitable operating strategy for the average person. Buy in regular fixed amounts and invest less time and effort to get market average returns. We believe that fixed investment is also applicable to bitcoin, buying at regular intervals, effectively smoothing out the dramatic price fluctuations and reducing the cost of holding.

Therefore, we decided to build a multi-stage decision model to periodically change the percentage of gold bitcoin holdings and maintain that percentage the rest of the time and stop trading in order to achieve lower risk and higher returns.
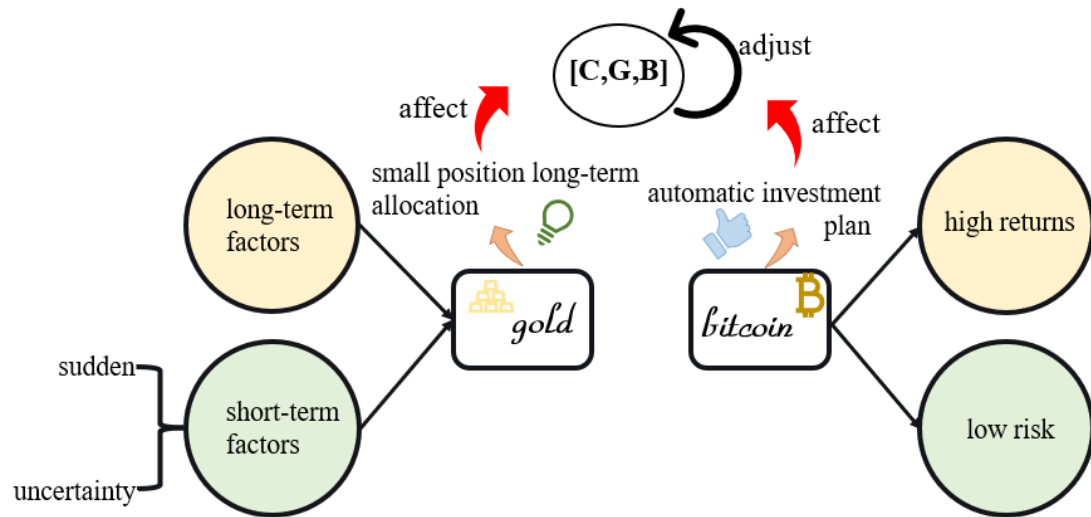
On the other hand, the securities market is a complex system with dynamic changes, and it is difficult for people to obtain overall information about securities returns; they can only make empirical estimates of the parameters or probability distributions of random returns based on historical information about securities, and securities returns can be considered as fuzzy variables rather than just random variables.

The trapezoidal fuzzy number has been shown to be an appropriate measure of security returns. Therefore, this paper uses this theory to predict returns and incorporates the "time inconsistency" of investment strategies into the research framework, proposing a multi-constrained (time, return, basis), multi-stage mean-standard semi-covariance fuzzy portfolio model and investigating its time-consistent optimal investment strategies. The model is a path-dependent mixed-integer semi-closed-loop dynamic optimization problem due to the presence of transaction cost, return demand, and basis constraints. We use a discrete approximation iterative algorithm to find its optimal time-consistent investment strategy.

To verify the sensitivity of the model to transaction costs, we let the commission drawdown increase at a tenfold rate starting at 0.0001 and stopping at 0.01. The sensitivity of the model is captured by the change in the transaction amount at each stage.

Considering that investors in real financial activities are "finite rational", the psychological factors of investors affect their investment behavior. We introduce a

specific measure of investor's psychology of "regret" to demonstrate that our model is the best model. The lower the level of trader regret, the more satisfying the decision provided by the model is to the trader, and the more successful the model is.

START

A Model of Investment Risk and Profit Based on Multi-objective Programming

Enter gold historical daily price

Enter Bitcoin historical daily price

Data Preprocessing

Calculate the Daily Yield of Gold

Calculate Bitcoin's Daily Yield

Multi-Objective Portfolio Optimization: Control risks+Maximize profit

Enter the planning model in Octave to get images of profit and risk functions

Find the total risk matrix

Find Total Return and Average Daily Return

Find the optimal investment point and risk value

Calculate the investment risk of gold and bitcoin separately based on Markowitz definition

Calculate gold and bitcoin daily returns separately

Substitute the risk value into the original planning model to obtain the investment proportion of gold and bitcoin

Begin multi-objective planning

END