



BEREAJOY CAPITAL LIMITED

Business Plan

Directory

Preface	1
Company introduction	2
Project introduction	3
Strategy identification	4
Back-testing	6
The delivery system	8
Risk management	11
The advantage of project	12
Foreign exchange market sees new space and opportunity	12
Institutional investors: Lower transaction costs	13
Huge potential brokerage business market	13
Conclusion	15
The resources	16

Preface

The foreign exchange market is the most traded and largest financial market in the world. The average daily trading volume in the global foreign exchange market has been rising rapidly, with the annual average trading volume reaching \$16.6 trillion in 2021, up 27.1% from \$12.1 trillion in 2019, according to statistics from the Bank for International Settlements.

The foreign exchange market is divided into the exchange market and the over-the-counter market. At present, the international foreign exchange market is still dominated by the over-the-counter trade, which accounts for up to 97% of the trading volume. The rapid development of the foreign exchange market from three aspects, one is the exchange itself become a tradable commodity, can be applied to quantitative strategy, carry trades and momentum trading, simpler can also according to the change of exchange rate to determine whether a currency is undervalued or overvalued, to buy or sell currency trading, reap the benefits. Second, countries are more closely connected. In order to hedge foreign exchange risks, import and export enterprises choose to use foreign exchange trading tools to avoid partial losses when they expand into the international market. Third, the threshold of foreign exchange trading is not high. Besides institutions, it attracts many individual investors and many participants, which improves the liquidity of the foreign exchange market and promotes the development of the market.

Company introduction



By consistently expanding its ecosystem, BEREJOY.COM is dedicated to providing users with the most secure, trusted, and hassle-free digital asset trading services. Our exchange is built from a desire to give everyone access to digital assets regardless where you are.

Founded in 2018, BEREJOY.COM now serves more than 6 million registered users, over 500,000+ monthly active users and 40+ million users in the ecosystem. Covering a rich variety of trading categories together with a NFT aggregated marketplace, our platform strives to cater to its large user base by providing a secure, trusted and intuitive trading experience.

As the world's first social-infused digital assets trading platform, BEREJOY.COM also supports social networking platform based transactions to make our crypto services more accessible to users all over the world. Furthermore, to ensure optimal data integrity and security, we see user security as our top priority at BEREJOY.COM.

Project introduction

There are diversified trading instruments in the foreign exchange market, including spot, forward, swap, currency swap, option and some structured derivatives. There are foreign exchange futures and options in the exchange market.

Why did BEREAJLOY CAPITAL LIMITED use quantitative trading in the FX market? Indeed, even if you have never heard of quantitative trading, it is possible to become a good fx investor through our firm.

A quantitative trading system consists of four main parts:

1. Strategy identification: search strategy, mining advantages, determine transaction frequency.
2. Back-testing: capture data, analyze strategy performance, and eliminate bias.
3. Delivery system: Connects brokers, automates trading and minimizes trading costs.
4. Risk management: Optimal allocation of capital, optimal bet or Kelly criterion, trading psychology.

Strategy identification

All quantitative transaction processes began with an initial study. This research process includes searching for a strategy, examining whether it fits with the strategy mix you may be working on, obtaining the data you needed to test any strategy, and trying to optimize the strategy to make it more profitable and or less risky. If you are a "retail" trader, make sure you know whether you are adequately funded and how trading costs affect on your strategy.

The strategy of monetizing all kinds of public data searches is actually quite simple, not as difficult as you might think. Research scholars regularly publish theoretical transaction results (Although most of them are the total transaction costs) Some quantitative finance posts will also discuss strategies in detail. The trading journals will also profile some of the strategies used by fund management companies.

You might ask how individuals and companies can possibly want to talk about their profitable strategy, especially when they know that if others "copy the same strategy", it will eventually fail in the long run. The reason is that they usually don't disclose the exact parameters and tuning methods they use, and these tuning skills are the key skills needed to turn a mediocre strategy into a highly rewarding one. In fact, one of the best ways to create your own unique strategy is to find a similar methods and then implement your own optimization program.

All strategies can be classified into mean reversion trading strategy, trend following or momentum trading strategy. Mean-reversion strategies attempt to take advantage of the fact that there is a long-term mean in a "price series" and that short-term deviations from that mean will eventually return. Momentum trading strategies attempt to "catch the ride of the market trend", using investment psychology and information about the structure of large funds to build momentum in one direction and follow the trend and return.

Another important aspect of quantitative trading is the frequency of trading strategies. LFT (Low Frequency Trading) typically refers to a strategy that holds an asset for more than one trading day. Accordingly, High Frequency Trading (HFT) usually refers to the strategy of holding asset for one trading day. Ultra high Frequency Trading (UHFT) refers to the strategy of holding assets in seconds and milliseconds.



Back-testing

The goal of backtracking testing is to provide evidence that the strategy determined through the above process can be profitable whether applied to historical (training) data or test data (Note 5). It can reflect the expected future performance of the strategy in the "real world." For various of reasons, backtracking does not guarantee success. This is perhaps the most subtle aspect of quanta trading, as it involves a large number of biases that must be carefully scrutinized and eliminated as best we can. We will discuss several common types of bias, including peep bias, survivor bias, and optimization bias (Also known as "data peep bias"). Several other important aspects of back-testing include the availability and cleanliness of historical data, true transaction costs, and decisions made on a reliable back-testing platform. We will discuss transaction costs in more detail in the subsequent "delivery systems" section.

Once the strategy is determined, we need to capture historical data from which to test it. If possible, we can improve the strategy. There's a lot of selling data right now and including data of all asset types. Generally, the price of data varies with the quality, depth and time interval. Beginning quantitative traders (at least at the retail level) initially use free data from. I would like to focus on the problems often encountered in processing historical data.

For historical data, major concerns include data accuracy or cleanliness, survivor bias, and adjustments to corporate behavior such as dividends and stock splits.

Accuracy is related to the overall quality of the data, whether or not the data contains errors. Sometimes errors are easy to identify, such as using a narrowband filter to find "narrow bands" in time series data and correct them. At other times errors are difficult to identify, and often need to be compared and checked according to the data provided by multiple data suppliers.

Survivor bias is usually a feature of free or cheap data sets. For a data set with survivor bias, it does not contain data on assets that are no longer traded. A security that no longer trades represents the stock of a delisted or bankrupt company. If the data set contains such biases, strategies may perform better in tests on this data set than in the

"real world", where historical "winners" have been pre-screened for use as training data.

Corporate behavior is the "logical" activity of a company that often causes changes in the echelon of the original price, which should not be included in price gains. Dividends and stock splits are two common practices that trigger corrections, and either requires a "callback" process. We must be careful not to confuse stock splits with real earnings adjustments. Many traders have hit a brick wall when dealing with corporate behavior!

In order to carry out backtracking testing, we must use a software platform. You can choose a special back test software, such as TradeStation, a numerical platform, such as Excel or MATLAB, or a platform that is fully implemented by Python or C++.



The delivery system

A delivery system is a collection of methods that control the delivery of a trade list generated by a trading strategy and the delivery behavior of a broker. In fact, transactions can be semi-automatic or even fully automatic, while the execution mechanism can be manual, semi-automatic or fully automatic. Nevertheless for LFT strategy, manual and semi-automatic technology are more common; For HFT strategy, a fully automatic delivery mechanism must be created. Due to the interdependence of strategy and technology, it is often closely connected with the transaction instruction generator.

When setting up the delivery system, we need to consider several key factors: the interface to the broker, the minimization of transaction costs (including commissions, sliding spreads and spreads), and difference between the performance of the real-time system and the system during back-testing.

There are many ways to contact a broker, either directly by phone or through a fully automated high-performance application Programming interface (API). Ideally, you want the delivery of transactions to be as automated as possible. In this way, not only can you step back and focus on in-depth research, but you can also run multiple strategies, even HFT strategies. The common backtracking software mentioned earlier, such as MATLAB, Excel, and Trade-station, is a good choice for either LFT or simple strategies. However, to do a true HFT, you have to build an internal delivery system written in a high-performance language such as C++. To give you my personal experience, when I was employed by a fund management company. We had a 10-minute "trading cycle" where we downloaded new market data every 10 minutes and made delivery based on the 10-minute information. An optimized Python script is used here. For any job dealing with minute or second frequency data. I believe C/C++ is better.

Another important issue that belongs to the delivery systems is minimization of transaction costs .Generally speaking, transaction costs consist of three parts: commission, loss and spread.Commissions are fees paid to brokers, exchanges and the SECURITIES and Exchange Commission (The sliding spread is the difference between your expected delivery price and the actual delivery price;spreads are the difference between the selling price and the buying price of the securities to be traded.Note that the spreads are not constant and depend on the current liquidity of the market.

Transaction costs are the key to determining whether a strategy is highly profitable with a high sharpe ratio, or highly profitable with a low sharpe ratio.It can be challenging to accurately predict future transaction costs based on backtracking tests, and you need to obtain historical trade data with ask and bid prices information in a timely manner, based on strategy frequency.To that end, entire quant trading teams at large fund managers focus on delivery optimisation.When fund managers need to sell a lot of trades, flooding the market with shares can drive prices down so quickly that they may not even be able to deliver at the optimal price.Thus, even at the risk of loss, the fund management formula chooses to use algorithmic trading to "drip" orders into the market.In addition, other strategies can take advantage of the market if they "capture" these imperatives.This is the content of structural arbitrage of funds.

The final major issue with the delivery system relates to the difference in real-time versus back-test performance of policies.This difference is due to a number of factors, such as the forward-looking bias and optimization bias discussed in depth in the section "Back-testing."However, for some policies, these biases are not easily detected prior to deployment.This is most common with HFT.Both the delivery system and the trading strategies themselves can have bugs that show up in real-time trading but don't show up in back-testing.The market can be affected by a coup following the deployment of a trading strategy, while the new regulatory environment, investor sentiment and macroeconomic changes can all lead to differences in actual

market performance and back-testing performance, resulting in divergence in strategy profitability.



Risk management

The last piece of the quantitative trading maze is the risk management process. Risk involves all the deviations we talked about before. It includes technical risks, such as a sudden hard drive failure on all the servers at the exchange. In short, it covers almost all the factors that can interfere with the realization of a transaction, and their sources are different. At present, the complete sets of books on risk management of quantitative trading strategies, and I will not go into detail on all possible sources of risk.

Risk management also includes a branch of portfolio theory known as "optimal capital allocation", which deals with how capital is allocated to a set of strategies and how capital is allocated to different trades within the strategy. This is a complex field that depends on some advanced mathematical knowledge. Optimal capital allocation is linked to strategic leverage through an industry standard known as the Kelly Criterion. This article is a primer, and I won't go into the calculation here. The Kelly rule makes some assumptions about the statistical nature of strategic returns, but they do not always hold true in financial markets, so traders often have reservations about implementing them. Another key component of risk management involves dealing with traders' own psychological factors. Although everyone agrees that algorithmic trading is less likely to go wrong without human intervention. Traders can still inject a lot of cognitive biases into their trading when they're not paying attention. A common deviation is aversion aversion, when people find that the loss is a foregone conclusion, the pain it brings, may paralyze people's behavior, can not do timely selling stop loss. Similarly, people may sell too early to take profits because they are so worried about losing gains they already have. Another common bias is the so-called near-term bias: traders put too much weight on recent events rather than taking a long-term view. And, of course, there's the classic emotional bias of "fear and greed." These two biases often lead to either too little or too much leverage, resulting in blowouts or shrinking earnings.

The advantage of project



Foreign exchange market sees new space and opportunity

No matter what investment strategy you adopt, as with everything else, one of the most important factors in determining success or failure is the competition you face. Everyone is a value investor, everyone is studying financial statements, everyone is researching companies. Clearly, the competition for value investing has intensified. At the same time, quantitative trading is still in its infancy, and while there are a few attempts at it, overall it is still fairly small and there is a lot of room for entry. Especially after the introduction of stock index futures and margin trading, the application of quantitative trading strategy has greatly expanded the space and provided new possibilities. It can be said that quantitative exchanges in foreign exchange market face relatively little competition, which provides space for quantitative traders to play.

Messrs. Buffett and Munger seem to have nothing to do with quantitative trading, but to some extent, they themselves are human flesh quantitative trading machines. Buffett has always stressed that the most important thing about investing is to be rational and not let your emotions influence your investment decisions. Munger emphasizes making investment judgments in the form of "checklists." These are principles similar to quantitative trading. When you haven't developed the rational judgment skills of Messrs. Buffett and Munger, understanding the principles of quantitative trading can effectively help you improve the rationality of your current investment strategy.

In fact, some studies have shown that trading strategies based on objectivity criteria generate more excess returns overall than trading strategies based on human judgment. That's not to say you should give up judgment altogether. Some things are hard to quantify. But by understanding quantitative trading strategies, you can help you rethink the parts of your existing investment strategy that can be more objective and less subjective. It also gives you a clearer idea of what really depends on your judgment.

Institutional investors: Lower transaction costs

For institutional investors, in addition to the two reasons that are applicable to all investors, there is a more direct reason that quantitative trading strategy can help institutional investors effectively reduce their trading costs.

For institutional investors with large funds, the liquidity cost caused by their own buying and selling orders impacting the market is an important transaction cost. One of the important functions of quantitative trading is to effectively reduce the impact of one's own buying and selling orders on the market through specific algorithmic trading, so as to reduce their trading costs.

Huge potential brokerage business market

An estimated 73% of trading volume in U.S. equities is accounted for by "high frequency trading" (A type of quantitative trading). At present, the proportion of quantitative trading in the foreign exchange market is still very low and almost negligible.

In terms of transaction means alone, the foreign exchange market was not completely electronic at the beginning, which was very suitable for quantitative automatic trading. Now, stock index futures and margin trading have been launched in the

market, which greatly enrich the trading strategies available and provide a broad space for the development of quantitative trading. In the increasingly competitive forex brokerage market, if forex companies can seize the opportunity to provide effective trading tools, analysis tools, and education for the quantitative trading market, they will have great development space.

As clients of foreign exchange companies, quant investors are very attractive. First, these clients tend to trade more frequently and therefore more frequently; Second, these clients often need margin financing to generate income for the company beyond the commission. In addition, many of these clients use a strategy known as market neutral, maintaining an active trading frequency in both bull and bear markets.

Conclusion



The quantitative trading is an interesting but extremely complex area of quantitative finance. The company has full confidence in this project. Prior to applying for forex quantitative trading, the company has carried out extensive basic research, as well as extensive knowledge of statistics and econometrics. As well as extensive experience using Solidity, MATLAB, Python or R programming languages. If dealing with a more complex high-frequency end strategy. We will also use Linux kernel modification, C/C++, assembly programming and network delay optimization to provide more stability and technical support for our customers.

The resources

- (01). <Quantitative Finance> Also known as financial Engineering or Financial Mathematics, provides a variety of financial derivatives for the financial market through Quantitative analysis of financial products through advanced mathematical theories.
- (02). <Exploiting an Edge> Exploiting advantages in Exploiting an Edge is to compare and select the best one for use by Exploiting an Edge.
- (03).<Technology Stack> Technology Stack actually refers to the various technologies used by the system providing application services. Viewed from a hierarchical perspective, various technologies are stacked and cooperate with each other, like a "Stack".A Full Stack Engineer is someone who knows a lot about a variety of technologies.
- (04). <Optimisation Bias> Optimisation Bias, also known as "data-snooping Bias", is over-fitting and over-optimization from the perspective of machine learning.
- (05). <MF Global> MF Global was once one of the world's largest commodity futures brokers.