1. After reading the paper, explain the trading strategy in your own words.

Overview of the Pairs Trading Strategy:

Finding two equities that have moved in tandem historically is the first step in the pairs trading strategy. The plan is to profit on brief price differences between them. The approach is predicated on the idea that these two equities' prices would eventually converge once more.

Selecting a Pair:

The first step in the procedure is to choose stock pairings based on past price movements. The shortest gap between normalised historical prices is used to match stocks. This entails identifying equities that have historically traded in tandem.

Trading Guidelines:

The method suggests acting contrarian when the prices of the chosen pair diverge, or spread wider. Buy the stock that has lost value and short the one that has increased in value. The idea behind this is that their prices would eventually return to the historical average.

Mechanism of Profit:

The approach seeks to capitalise on these closely connected equities' transient mispricing. The trader is profitable if history repeats itself and the prices converge as expected.

Elements of Performance:

According to the study, this pairs trading method produced annualised excess returns of up to 11 percent on average.

The technique appears to beat conservative transaction cost predictions, and the profitability is attributable to variables other than simple mean reversion.

Testing for Robustness:

The efficacy of the approach is evaluated in relation to a range of risk variables, encompassing both macro-level and micro-level aspects like bid-ask bounce, short-selling expenses, and processing costs. The findings imply that pairs trading is still successful even when these factors are taken into account.

2. Pick a main industry in which you want to find a pair. Pick an industry which is related to this main industry. While picking the related industry, you might want to choose an industry which has similar trend as the main industry. In the example, steel and automobiles are related industries. When the price of steel increases, the price of automobiles also increases.

Picking an Industry for the Main Pair Industry: Choose the technology industry. Apple Inc. (AAPL) and Microsoft Corporation (MSFT) as the main pair. Picking a Related Industry for the Second Pair Related Industry: Select a related industry, like semiconductor manufacturing. Stocks: Intel Corporation (INTC) from the semiconductor industry and pairing it with Cisco Systems, Inc. (CSCO).

3. List down all the stocks in the industry that you picked. Collect the last one year stock price data for these listed stocks. Calculate the historical distance measure between all the possible pairs of stocks. From these find the pair with the smallest historical distance measure.

I am have Primary Sector :- Real Estate (Industry :- Real Estate—Development)

I have taken stock from yfinance and these are there symbols

DLF.BO

DBREALTY.NS

PENINLAND.BO

OMAXE.BO

AJMERA.BO

ARVSMART.BO

SHRIRAMPPS.BO

BRIGADE.BO

ALEMBICLTD.BO

MARATHON.BO

i took display(pair_value_1['DLF.BO']['ARVSMART.BO'])

and all futhur the code is in zip file.

4. List down all the stocks in the related industry. Collect the last one year stock price data for these listed stocks. Make all possible pairs with one stock from the main industry and another stock from the related industry. If there are 3 stocks in main industry and 4 stocks in the related industry, then we will have a total of 3 * 4 pairs. For these pairs, calculate the historical distance measure and pick the pair with the lowest historical distance measure.

Secondary Sector(Related Industry) :- Financial Service (Industry :- Mortgage Finance)

LICHSGFIN.NS

PNBHOUSING.NS

APTUS.BO

AAVAS.BO

CANFINHOME.BO

IBULHSGFIN.BO

HOMEFIRST.BO

REPCOHOME.BO

GICHSGFIN.BO

TFL.BO

display(pair_value_1['HOMEFIRST.BO']['DLF.BO'])

5. Use a period of 12 months for the pair formation. The trading period starts immediately after the ‘pair formation’ period. Make rules for how you are going to trade.

Z-Value Rules Strategies

To confirm when to enter and exit a position of pairs trading, mean spread and standard deviation of formation period should be calculated first, based on this data, calculate each day’s price spread and Z-Score.

Entry: When the absolute value of Z-Score more than 1.

Exit: When the absolute value of Z-Score less than -1.

6. Calculate

the performance of the two pairs picked. Use the various performance measures explained in the course.

i have calculated these measures on risk free rate rf = 0.03

Sharpe Ratio: -2.343407552273569

Pair-Trading and NIFTY50

Beta: -0.014275

Alpha: 0.000143

R-Squared: -0.017784

p-value: 0.780934

Standard Error: 0.051273

Definition for each term:

Alpha: Alpha represents the excess return of a fund or stock compared to its benchmark index. A positive alpha of 1.0 indicates outperformance by 1 percent, while a negative alpha of 1.0 signifies underperformance by 1 percent. A beta of less than 1 suggests that the security is less volatile than the market. (Source: CNBC)

Beta: Beta is a measure of a stock's volatility relative to the market. The market has a beta of 1.0 by definition, and individual stocks are ranked based on their deviation from the market. If a stock moves less than the market, its beta is less than 1.0. (Source: Investopedia)

R-Squared: R-squared is a statistical measure indicating the proportion of variance in a dependent variable explained by an independent variable. In investing, R-squared represents the percentage of a fund or security's movements explained by changes in a benchmark index. (Source: Investopedia)

p-value: A commonly used p-value is 0.05. If the investor determines that the p-value is less than 0.05, there is strong evidence against the null hypothesis. (Source: Investopedia)

Standard Error (Volatility): The standard deviation of a security reflects the variance between each price and the mean. A higher standard deviation indicates a larger price range, signifying greater volatility. For instance, a volatile stock has a high standard deviation, while a stable blue-chip stock typically has a low deviation. (Source: Investopedia)

Sharpe Ratio: The Sharpe ratio calculates the average return earned in excess of the risk-free rate per unit of volatility or total risk. By subtracting the risk-free rate from the mean return, it isolates the performance associated with risk-taking activities. Developed by William Sharpe, the Sharpe ratio is a well-regarded measure of risk-adjusted return used to evaluate the overall performance of an investment portfolio or an individual stock. (Source: Investopedia)