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Comparison of Profitability of Speculation in the Foreign Exchange Market and Investment in Tehran Stock Exchange During Iran's Currency Crisis Using Conditional Sharpe Ratio

Mohsen Mehrara, Saeid Tajdini*

Department of Theoretical Economics, Faculty of Economics, University of Tehran, Tehran, Iran

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ABSTRACT

In the first nine months of 2018, the triple increase of dollar price made the stock market an attractive place for speculation, especially for non-professional investors. Hence, this study was aimed to investigate the profitability of speculation in the foreign exchange market (dollar) and to compare it with investment in three indices of sugar, oil products, and basic metals. First, the conditional Sharpe ratio was calculated separately for these four assets. Then, six investment portfolios were developed for these four assets. The results showed although dollar speculation with mean daily return of 0.6% had the highest return among the ten investment assets, dollar speculation was ranked last, or tenth (0.096) in terms of performance and profitability by considering the standard deviation or daily conditional risk using conditional Sharpe ratio. Moreover, the results indicated that from among the six portfolios with equal weight, three investment portfolios consisting of merely Tehran Stock Exchange indices had a better performance than three investment portfolios comprising dollar speculation and each stock exchange index. It was also found that the risk of lack of capital diversification by investors was higher than that of accepting a higher-level risk.

1 Introduction

Ranking different assets and measuring their performance relative to each other can be a positive step in measuring and evaluating their performance and making better choices in investing and related activities. Returns on assets vary over time with no consistent trend. Therefore, volatility is an integral part of any asset's return over time. The yields of future periods are also unreliable because of volatility. Uncertainty about the future returns of stocks puts investment at risk. Investors are always trying to reduce risk and increase return with confidence [30]. Although volatility tends to be a fixed value in the long run, which is an unconditional variance, it is one of the most important concepts of investment decisions in financial markets and an important input for portfolio management, and pricing of financial assets is the rules and conduct of the security market [4]. But at times, the market is more volatile due to shocks, so conditional variance should be used until there is a shock effect [29]. The main purpose of this study is "a comparative study of the profitability of transactions in Tehran Stock Exchange and Tehran Currency Market". Since the word investment can have short-term goals such as speculation or longer-term goals such as buy and hold strategies and also because of the nature of the profit of stock, including dividends and accumulated profits, the word "investment" was used for the stock market and the word "speculation"

* ***Corresponding author Tel.:*** +989101668893
E-mail address: saeidtajdini@ut.ac.ir

for the foreign exchange market. In this study, considering the high volatility of Tehran foreign exchange market during 2018 and in line with the purpose of this study, we aimed to compare the profitability of transactions in Tehran Stock Exchange and Tehran Foreign Exchange Market to examine the concurrent reconciliation of return and risk on four assets, including 100% of assets relating to currency or dollar and investing in three selected indices of Tehran Stock Exchange, including sugar indices, oil products, and basic metals. The basis of selection of the three indices was balanced selection of two offensive indices and one of Tehran Stock Exchange defensive indices based on the principle of balanced selection. Therefore, the three selected indicators of Tehran Stock Exchange with speculative operations of the foreign exchange market were selected to compare risk and return. In the second step, 6 paired portfolios were used consisting of these 4 assets from 2018-03-21 to 2018-09-21 using conditional risk or conditional standard deviation to measure conditional Sharp ratio of the 6 portfolios [38]. Moreover, another purpose of this study was to investigate the dynamic conditional correlation coefficient between baskets, including these four assets and the potential risk reduction due to the formation of these investment portfolios. So far, several studies, including those by Falehi et al [17], Abbasinejad et al. [1], and Moghaddam and Sezavar [24] in Iran have compared the profitability performance of baskets based on different indices. The advantage of this study is that it coincides with the currency crisis of 2018, providing us with the new data to compare the profitability of speculation on foreign currency compared to stock market. Indeed, investors in such crises are tempted to protect their assets by buying foreign currency. This research answers the important question of whether it is still reasonable to advise investors to invest in the stock market in a currency crisis. In addition to the GARCH model, other leverage models of the GARCH family (GJR-GARCH, EGARCH and DCC) were also used in this study to measure the conditional risk more precisely. Hence, the hypothesis formulated in this study was that merely the so high return of an asset would imply its high profitability. This research was aimed to compare the profitability of a portfolio consisting of an asset of a high Sharpe ratio and an asset of a low Sharpe ratio with the profitability of an asset of a high Sharpe ratio. The second part of the paper is devoted to the theoretical and empirical foundations. The third section introduces the research methodology and risk modeling conditional correlations. Section four presents the empirical results of the study. In the last section, these topics are summarized and concluded.

2 Literature

2.1 Literature of Conditional Risk

Engle [20] in an empirical study linked the variance to the performance impulse (news) of earlier periods and presented the conditional variance and the Autoregressive Conditional Heteroscedasticity model (ARCH) that describes the variance of the current error term or innovation as a function of the actual sizes of the previous time periods' error terms. By introducing the generalized ARCH model, or GARCH, Bollerslev [11] showed that current Conditional variance depends on the variance of previous periods in addition to previous time periods' error of returns. All of the above achievements have been extended by Bollerslev [12] based on GARCH multivariate models such as Constant Conditional Correlation (CCC). Development of this model by Longin and Solnik [31] and Tse and Tsui [49] and Engle and Sheppard [20] and Engle [19] with the introduction of conditional correlation model. Dynamic expanded. They have shown in their studies that the correlation between return on assets is not constant and tends to

change over time. In subsequent studies, such as Hwang [27] and Syriopoulos and Roumpis [47] and Constanza and Manuel [16] and Celık [14] and Park et al. [37] and Yoshihiko et al. [51] and Mohammadi et al. [32] and Moghaddam and Sezavar [33] and Abbasinejad et al. [1], the effects of the dynamic conditional correlation model were confirmed.

2.2 Literature of Leverage Effect and Dynamic Condition Correlation

Zhang [52] used moving average model, exponential moving average, random walk, and various GARCH models to predict Shanghai and Shenzhen indices in the stock exchange of China. He concluded no single model could have the best performance in all conditions. For example, asymmetric models like GJRGARCH and EGARCH in Shenzhen index had a better performance than other GARCH models, but asymmetric models were not appropriate for conditional risk forecast in the Shanghai index. Abdelaal [2] investigated the Egyptian stock exchange from 1998 to 2009, he found that EGARCH model predicted volatility better than other models. Liu et al. [30] tested EGARCH, GARCH, ARCH, and GJR-GARCH models in S&P index and reported that asymmetric models such as GJR-GARCH and EGARCH were more important than the type of error distribution for more accurate prediction of volatility. Dritsaki [17] studied the daily returns of stock in Stockholm stock exchange and concluded that asymmetric GARCH models like EGARCH with student distribution along with ARIMA (0, 0, 1) model provided a more precise prediction of GARCH models. Cristina and Stelian [3] investigated volatility in Euro exchange rate versus the Romanian currency and found that asymmetric EGARCH and PGARCH models were more powerful than symmetric GARCH models for estimation of risk and return. The results of studies by Guo [24, 25] on Hong Kong stock exchange, Sarkar and Banerjee [42], Intaz et al. [26] on Netherlands stock exchange, Coffie et al. [15] on North and East Africa stock exchange, and Dritsaki [17] on the daily return of stock in Stockholm stock exchange indicated that asymmetric GARCH modes like GJR-GARCH as well as the other models considering leverage effects for prediction of risk had a better performance than symmetric GARCH models in prediction of risk. Muntazir et al. [34] examined oil price and exchange rate changes in twelve Asian countries. Their empirical results showed a weak negative relationship between oil prices and exchange rates for most Asian countries. Yoshihiko et al. [51] examine the correlation between East Asian Stocks Markets such as Japan, Singapore and Hong Kong and US Stocks Market using the Dynamic Conditional Compensation Model, They concluded that the markets in Singapore and Hong Kong have a significant correlation with the global markets particularly, the US market and the Japanese market has little impact on East Asian markets. Robiyanto [40, 41]. The dynamic correlation between ASEAN-5 stock markets and world oil prices and Indonesian Stock Market's Dynamic Integration with Asian Stock Markets and World stock markets, studied.

2.3 The Sharpe Ratio

In a series of papers, Sharpe [43, 44, 45] introduced and developed risk-adjusted measure of investment's performance. This measure, generally known as the Sharpe ratio (SR), and is used to help investors understand the return of an investment compared to its risk. In finance, the Sharpe ratio (also known as the Sharpe index, the Sharpe measure, and the reward-to-variability ratio) is a method to examine the performance of an investment by adjusting for its risk. The ratio measures the excess return (or risk premium) per unit of deviation in an investment asset or a trading strategy, typically referred to as risk, named after him. Performance measurement is an integral part of investment analysis and risk

management. The Sharpe ratio is one of the most prominently used measures for performance evaluation of an investment with respect to return and risk. The Sharpe ratio is calculated by subtracting the risk-free rate from the return of the stock and dividing that result by the standard deviation of the stock's excess return.

$$\boldsymbol{SR_i = \frac{R_i - R_f}{\overline{\sigma}_i}} \tag{1}$$

where R_i is return of stock and R_f is risk-Free rate and σ_i is standard deviation of the portfolio's excess return. Bailey and López de Prado [7] showed that Sharpe ratios tend to be overstated in the case of hedge funds with short track records. These authors have proposed a probabilistic version of the Sharpe ratio that takes into account the asymmetry and fat-tails of the return distribution. With regard to the selection of portfolio managers on the basis of their Sharpe ratios, these authors have proposed a Sharpe ratio indifference curve (Bailey and Lopez de Prado [5]. This curve illustrates the fact that it is efficient to hire portfolio managers with low and even negative Sharpe ratios as long as their correlation to the other portfolio managers is sufficiently low. Because it is a dimensionless ratio, laypeople find it difficult to interpret the Sharpe ratios of different investments. For example, how much better is an investment with a Sharpe ratio of 0.5 than one with a Sharpe ratio of -0.2? This weakness was well addressed by the development of the Modigliani risk-adjusted performance measure, which is in units of percent return – universally understandable by virtually all investors. In some settings, the Kelly criterion can be used to convert the Sharpe ratio into a rate of return. The Kelly criterion gives the ideal size of the investment, which when adjusted by the period and expected rate of return per unit, gives the rate of return. In the literature it has shown that CSR is able to discriminate the downside performance of funds, something that the conventional Sharpe ratio generally fails to do. A large out-of-sample analysis of US mutual fund shows that CSR has predictability for future portfolio performance. Jones and O'Steen [28] evaluated time-varying correlations between multiple asset classes using an asymmetric-DCC GARCH model. Specifically, they focused on the changes in these correlations during quantitative easing. They then used these conditional correlations along with conditional means and variances to find optimal investment portfolios using Markowitz mean-variance minimization. Lastly, they computed time-varying Sharpe ratios. Their results showed increasing Sharpe ratios during the period of quantitative easing, suggesting that the Federal Reserve's programs were successful in increasing the returns and minimizing the risk – i.e. volatility across several asset classes during the financial crisis.

Barillas et al. [6] showed how to conduct asymptotically valid tests of model comparison when the extent of model mispricing is gauged by the squared Sharpe ratio improvement measure. This is equivalent to the ranking models on their maximum Sharpe ratios, effectively extending the GRS test to accommodate the comparison of non-nested models. Mimicking portfolios can be substituted for any nontraded model factors, and estimation error in the portfolio weights is taken into account in the statistical inference. Tajdini et al. [48] by developing the Sharpe ratio, examines the behavior of stock indexes in two periods of boom and recession and introduced the double-sided balanced conditional Sharpe Ratio instead of the Sharpe Ratio to perform a more accurate evaluation of assets, the results of their study showed that the best performance for the insurance index with a double-sided balanced conditional Sharpe ratio of 0.123 and later for the metallic minerals index with a measure of 0.1215. Moreover, on the basis of the double-sided balanced conditional Sharpe ratio, the food except for sugar index with a measure of 0.035 showed the worst performance.

3 Methodology

The conditional Heterogeneity Variance model of econometric tool is studied to estimate and predict volatility and turbulence of asset returns with ARCH models.

The model (GARCH (p, q), in which p shows σ_{t-1}^2 order or variance of the previous day, and q shows the power of ε_{t-1} or the disruptive component of the previous day in this model.

$$\boldsymbol{\sigma_t^2 = \omega + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-i} + \sum_{i=1}^{p} \beta_i \sigma_{t-i}^2} \tag{2}$$

Using GJR-GARCH model, we can model the leverage effects proposed by Black [10] and French et al [22]. The Glosten-Jagannathan-Runkle GARCH (GJR-GARCH) model by Glosten, Jagannathan and Runkle [23] also models asymmetry in the ARCH process. The leverage effect is modeled in the GARCH process. If $\varepsilon_{t-1} > 0$, then I = 0 and if $\varepsilon_{t-1} < 0$, then I = 1 and leverage effects can be tested assuming $\gamma > 0$.

$$\boldsymbol{\sigma_t = \omega + \sum_{i=1}^{p} (\alpha_i + \gamma_i I(\varepsilon_{t-1}))\varepsilon_{t-j} + \sum_{j=1}^{q} \beta_j \sigma_{t-j}} \tag{3}$$

The exponential generalized autoregressive conditional heteroskedastic (EGARCH) model by Nelson and Cao [35] is another form of the GARCH model. Formally, an EGARCH(p,q):
If $\gamma \neq 0$ is significant, then the effects of the shocks on the conditional variance are asymmetric. In this model, leverage effects can be tested assuming $\gamma < 0$.

$$\boldsymbol{\log(\sigma_t^2) = \omega + \alpha_1 |\frac{\varepsilon_{t-1}}{\sigma_{t-1}}| + \gamma(\frac{\varepsilon_{t-1}}{\sigma_{t-1}}) + \beta_1 \log(\sigma_{t-1}^2)} \tag{4}$$

Conditional Covariance
Constant Conditional Correlation (CCC)
Initially, the conditional variance of assets is calculated using the GARCH model.
Standardization of returns by dividing returns to their standard conditional deviations and then calculating constant conditional correlation coefficient between assets using standardized returns.

$$\boldsymbol{\rho_{ij} = \frac{q_{ij}}{\sqrt{q_{ii} q_{jj}}}} \tag{5}$$

Dynamic Condition Correlation (DCC)

Initially, the conditional variance of assets is calculated using the GARCH model.
Standardization of returns by dividing returns on their standard conditional deviations and then calculating dynamic conditional correlation coefficient between assets using standardized returns and using the following equation:

$$\boldsymbol{\rho_{ij,t+1}} = \frac{\boldsymbol{q_{ij,t+1}}}{\sqrt{\boldsymbol{q_{ii,t+1}q_{jj,t+1}}}} \tag{6}$$

To calculate the dynamic conditional covariance, $q_{ij,\,t+1}$, one can use the exponential method or GARCH model.

$$\begin{aligned} \boldsymbol{q_{11,t}} &= \boldsymbol{(1-\lambda)(z_{1,t-1}z_{1,t-1}) + \lambda q_{11,t-1}} \\ \boldsymbol{q_{22,t}} &= \boldsymbol{(1-\lambda)(z_{2,t-1}z_{2,t-1}) + \lambda q_{22,t-1}} \\ \boldsymbol{q_{12}} &= \boldsymbol{(1-\lambda)(z_{1,t-1}z_{2,t-1}) + \lambda q_{12,t-1}} \end{aligned} \tag{7}$$

To find the coefficients, the MLE method can be utilized via following target function:

$$\boldsymbol{L_C} = -\frac{\boldsymbol{1}}{\boldsymbol{2}}\sum^{\boldsymbol{T}}(\boldsymbol{\ln(1-\rho_{12,t}^2)} + \frac{\boldsymbol{(z_{1,t}^2 + z_{2,t}^2 - 2\rho_{12,t}z_{1,t}z_{2,t})}}{\boldsymbol{(1-\rho_{12,t}^2)}}) \tag{8}$$

Where dynamic conditional correlation coefficient is calculated using the following equation.

$$\boldsymbol{\rho_{12,t}} = \frac{\boldsymbol{q_{12,t}}}{\sqrt{\boldsymbol{q_{11,t}q_{22,t}}}} \tag{9}$$

4 Conditional Sharpe Ratio

Although volatility tends towards a constant amount in the long run, which is the same as unconditional variance, sometimes shocking the market causes more volatility, and in order to consider the shock effect, the conditional variance should be used. Also, the standard deviation assumes that price movements in either direction are equally risky, due to these problems, instead of the standard deviation from the conditional standard deviation and instead of the traditional Sharpe ratio (unconditional Sharpe ratios) from the conditional Sharpe ratio was used.

To measure this ratio, we first reduce the risk-free rate of interest in one day from the daily average return of an index. Then, we divide the output by the average conditional standard deviation of the return of that index in the review period.

$$\boldsymbol{CSR_i} = \frac{\boldsymbol{\overline{R_i} - R_f}}{\boldsymbol{\overline{\sigma}_{i,t}}} \tag{10}$$

where CSR_i is Conditional

Sharpe Ratio of any index and $\overline{R}_i$ is daily average return of an index and R_f is risk-free rate and $\overline{\sigma}_{i,t}$ denotes average conditional standard deviation of any index.

5 Data Collection Methods

Data were collected through library method by referring to the libraries and stock exchange. The data collection instruments were computer, internet and content analysis, i.e. study and analysis of the content of the books and studies carried out by others in this regard, which could be useful in this research. Finally, two basic and important principles were taken into account in preparation of statistics and data. And for the market price of dollar, observation instruments included the gold, coin, and currency information network of Tehran during the period 2018-03-21 to 2018-09-21. Also, the data were analyzed using Eviews 8 and Matlab software.

6 Results

As indicated in columns 2 and 4 of Table 1, gamma coefficient (γ) is negative for the GJR-GARCH model and positive for the EGARCH model (i.e. good news or positive returns have more effect on volatility than bad news or negative returns). Therefore, GARCH model was used to measure conditional risk in these four assets.

Table 1: Gamma coefficient in the model of the GARCH family

Asset	GJRGARCH	*P-value*	EGARCH	*P-value*
dollar speculation	-0.35	0.000	0.34	0.000
sugar index	-0.21	0.000	0.2	0.000
oil products index	-0.25	0.000	0.24	0.000
basic metals index	-0.28	0.000	0.27	0.000

According to the results of this study shown in Table 2, in a 182-day period from 2018-03-21 to 2018-09-21, the highest average daily return was 0.6% on dollar speculation and the lowest average daily return was 0.198% on the sugar index. The highest unconditional standard deviation or unconditional risk was related to dollar speculation (0.046%) and the lowest risk standard deviation was found for the sugar index (0.013). Using formula 8, the unconditional Sharp ratio for each of these assets is shown in the fourth column of Table 2.

According to the unconditional Sharpe ratio, the best asset for investing in the basic metals index was 0.167, followed by oil products index (0.154), dollar speculation (0.12), and sugar index (0.115) respectively. Also, after calculating the conditional risk of each of these assets, shown in Fig 1 and the fifth column of Table 1, the highest average conditional standard deviation or average conditional risk related to the dollar speculation was 0.057 and the lowest average conditional standard deviation or average conditional risk related to the sugar index was 0.0134. Also, as shown in the column 6 of Table 2, the profitability of investing in these four assets improved the performance. Based on the conditional Sharpe ratio, basic metals index was 0.155, oil products index was 0.155, sugar index was 0.11, and the speculative dollar or dollar trading was 0.096.

In addition, 6 pairs of portfolios (1-portfolio of dollar speculative-sugar index, 2-portfolio of dollar speculative-oil product index, 3-portfolio of dollar speculative-basic metals index, 4-portfolio of sugar index-oil products index, 5-portfolio of sugar index-basic metals index, and 6-portfolio of oil products index-basic metals index) with equal weight were formed by the Combinations and Counting Principles

in math to allow for a more precise comparison of these four assets using the dynamic conditional correlation. Also as shown in Table 3 and Figures 2-7, the highest daily average return (0.48%) is related to the dollar speculative-index of basic metals and the lowest daily average return (0.27%) is found for the portfolio consisting of sugar index-oil products.

Table 2: Statistics of each asset separately

Asset	average daily return	unconditional standard deviation	unconditional Sharpe ratio	conditional standard deviation	conditional Sharpe ratio	Performance Ranking
dollar speculation	0.006	0.0463	0.12	0.057	0.096	4
sugar index	0.00198	0.013	0.115	0.0134	0.11	3
oil products index	0.00335	0.019	0.154	0.021	0.135	2
basic metals index	0.00353	0.01814	0.167	0.0195	0.155	1

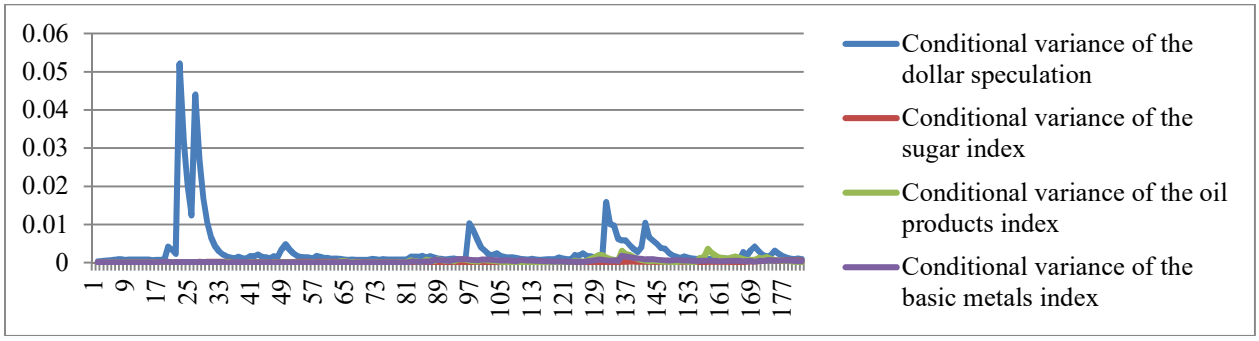

Fig 1: Conditional variance of the four assets

As shown in the column 3 of Table 3, the highest dynamic conditional correlation coefficients (0.24) were related to the portfolio of oil products index- basic metals index, the portfolio of dollar speculative-sugar index (0.199), and the portfolio of dollar speculative-basic metals index (0.136). Moreover, the portfolio of dollar speculative-oil product index was 0.11, the sugar-based metals index was 0.083, and the portfolio of sugar index-oil products index was -0.1.

Also, as shown in the column 4 of Table 3, the highest conditional deviation (0.0274) was related to the portfolio of dollar speculative-oil product index, followed by the portfolio of dollar speculative-basic metals index (0.0271), the portfolio of dollar speculative-sugar index (0.0258), the portfolio of oil products index- basic metals index (0.0151), the portfolio of sugar index-basic metals index (0.012), and finally the portfolio of the sugar index-oil products index (0.0115). In addition, as shown in the column 5 of Table 3, using the conditional Sharpe ratio, the performance superiorities were related to the portfolio of oil products index-basic metals index (0.195), the portfolio of sugar index-oil products index (0.191), the portfolio of sugar index-basic metals index (0.188), the portfolio of dollar speculative-basic metals index (0.159), the portfolio of dollar speculative-oil product index (0.153), and the portfolio of dollar speculative-sugar index (0.0136) respectively.

As shown in Fig 2, the highest dynamic conditional correlation is related to the portfolio of oil products index-basic metals index and the lowest dynamic conditional correlation is related to the portfolio of sugar index-oil products index.

Table 3: Statistics of Portfolio consisting of 4 assets

portfolio	average daily return	dynamic conditional correlation	conditional standard deviation of each portfolio	conditional Sharpe ratio of each portfolio	Performance Ranking
dollar speculative-sugar index	0.004	0.199	0.0258	0.136	6
dollar speculative-oil product index	0.0047	0.11	0.0274	0.153	5
dollar speculative-basic metals index	0.0048	0.136	0.0271	0.159	4
sugar index-oil products index	0.0027	-0.1	0.0115	0.191	2
sugar index-basic metals index	0.00276	0/012	0.012	0.188	3
oil products index-basic metals index	0.00344	0/0151	0.0151	0.195	1

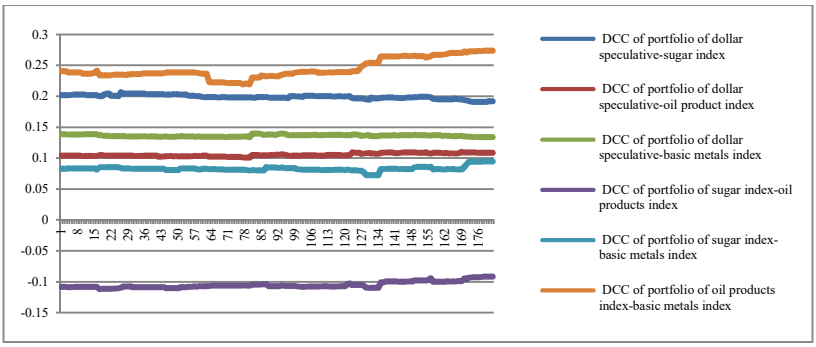

Fig 2: Dynamic Conditional Correlation

As shown in Fig 3, the highest conditional standard deviation is found for the portfolio of dollar speculative-basic metals index and the lowest conditional standard deviation is reported for the portfolio of sugar index-oil products index.

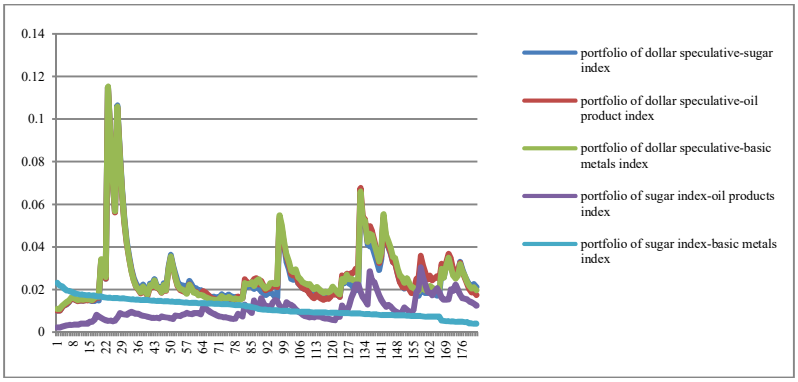

Fig 3: Conditional standard deviation

In order to more accurately compare the 10 investment alternatives in this study, the results of Tables 1 and 2 were integrated in Table 4. As can be seen in Table 4, out of 10 investment alternatives, including 4 separate assets as well as 6 paired investment portfolios consisting of these 4 assets, dollar speculation had the lowest conditional Sharp ratio of 0.096 despite having the highest return among these 10

investment alternatives. Also, the portfolio of oil products index- basic metals index (0.195) and the portfolio of sugar index-oil products index (0.191) had the best performance based on the conditional Sharpe ratio

Table 4: Comparison of the performance of 10 investment modes in Tehran stock exchange and dollar speculation

asset separately or portfolio	average daily return	conditional standard deviation	conditional Sharpe ratio	Performance Ranking
dollar speculative	0.006	0.057	0.096	10
sugar index	0.00198	0.0134	0.11	9
oil product index	0.00335	0.021	0.135	8
basic metals index	0.00353	0.0195	0.155	6
dollar speculative-sugar index	0.004	0.0258	0.136	7
dollar speculative-oil product index	0.0047	0.0274	0.153	5
dollar speculative-basic metals index	0.0048	0.0271	0.159	4
sugar index-oil products index	0.0027	0.0115	0.191	2
sugar index-basic metals index	0.00276	0.012	0.188	3
oil products index-basic metals index	0.00344	0.0151	0.195	1

7 Conclusion and Suggestions

As a result of a nearly three-fold increase in the value of exchange rate or dollar and a sharp decline in the value of Rials in the first nine months of 2018, followed by high inflation in Iran, people worried about a severe decline in the value of their wealth and naturally how to invest in assets. It feels very different. Undoubtedly, the goal of any rational investor, and in general, any investment program is to gain more profit and lower risk tolerance. The purpose of this study was to investigate and compare the profitability of four types of investment, including exchange rate and three Tehran Stock Exchange indices (Sugar, Oil Products, and Basic Metals) during from 2018-03-21 to 2018-09-21. Speculation in the foreign exchange market showed an average daily return of 0.6% compared to the three Tehran Stock Exchange indexes:, including sugar index (with an average daily return of 0.198%), oil products index (with an average daily return of 0.335%), and basic metals index (with an average daily return of 0.353%). But the conditional Sharpe ratio of the exchange rate (0.096) was much lower than other indices such as sugar index (0.11), oil products index (0. 135), and basic metals index (0.155). Then, by creating two-by-two baskets consisting of four assets, including speculative operations and the three Tehran Stock Exchange indices, six portfolios were obtained, namely, portfolio of dollar speculative-sugar index with average daily return of 0.4% and conditional Sharp ratio of 0.136, portfolio of dollar speculative-oil product index with a daily average return of 0.48% and conditional Sharp ratio of 0.159, portfolio of dollar speculative-basic metals index with average daily return of 0.4% and conditional Sharp ratio of 0.136, and portfolio of sugar index-oil products index with average daily return of 0.27% and conditional Sharp ratio of 0.191, portfolio of sugar index-basic metals index with daily average return of 0.276% and conditional Sharp ratio of 0.188, and finally the portfolio of oil products index-basic metals index with daily average return of 0.344% and conditional Sharp ratio of 0.198.

The results of this study showed that return on investment in 100% dollar or speculative commodities in Tehran currency market with average daily return of 0.6% had the highest daily return among these four assets. At first glance, it is the best mode of investment among these ten forms of investment, but taking into account the investment risk and using the conditional Sharp ratio to examine these four assets separately, it is in the fourth position and generally in the tenth or last place. It was also found that

diversification of investment is generally better than investing only in one asset or one index and even diversification of investment on bad investment alternatives (in terms of return and risk) like dollar speculation with good investment alternatives (such as sugar index and oil products index) has a better performance than a single investment. Moreover, as the most important achievement of this study, it was found that the danger of investors' lack of diversification in investment is higher than the danger of accepting a certain level of risk. However, investors are advised to diversify their capital by investing in Tehran Stock Exchange indexes and avoid investing in risky assets. Overall, the results of this study, similar to those of Falehi et al [17], showed that Tehran Stock Exchange is one of the best alternatives for investment, even during currency crisis as happened in 2018. Indeed, the main advantage of this research is its pragmatic and beneficial results for investors and the public to protect their wealth using stock market during crisis as Rials depreciated sharply against Dollar. In other words, while some traders may think that the best investment in the turbulent conditions of foreign exchange rates is speculative trading in the foreign exchange market, the results of this study showed that using the conditional Sharpe ratio is the best investment method for investment in the stock market.

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