

A study on the effect of exchange rates on the domestic stock market and countermeasures

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환율이 국내 증시에 미치는 영향과 대응방안 연구

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Abstract In the domestic stock market, the capital market opened in January 1992, and the proportion of foreign capital has steadily increased, accounting for 30% of the domestic market in Overall stock market trend infers that the domestic stock market is more influenced by foreign issues than domestic issues. The trading trend of foreign capital displays a similar flow to exchange rate fluctuations; thus, preparing an investment strategy by using the Pearson analyzing method the effect of exchange rates of foreign capital trading, fluctuations in exchange rates, and predicting one of the macroeconomic indicators will yield high returns in the stock market. Therefore, this research was conducted to help investment by predicting foreign variables comparing and analyzing exchange rates and foreign capital trading patterns, and predicting appropriate time for buying and selling.

Key Words : Exchange rate change, Stock price analysis, Foreign capital, Stock investment, Macro index analysis

요약 국내증시는 1992년 1월 자본시장이 개방되고, 외국 자본의 비율이 꾸준히 증가하여 2022년 현재 국내 시장의 30%를 차지하고 있다. 따라서 국내 증시는 국내의 이슈보다는 외국의 이슈에 더 많은 영향을 받고 있다. 외국자본의 매매 동향은 환율변동과 유사한 흐름을 보이고 있다. 환율이 외국자본의 매매에 미치는 영향을 피어슨 상관관계를 이용하여 분석하고, 환율변동에 따른 투자전략을 마련하고 거시경제지표 중 하나인 환율의 변동을 미리 예측하여 선제적으로 주식투자에 활용할 수 있다면 높은 수익률을 기대할 것으로 보인다. 따라서 본 연구에서는 환율과 외국자본의 매매 패턴을 비교 분석하여 국내증시 전반에 영향을 미치는 중요한 요인인 환율에 따른 외국인 변수를 예측하여 매수와 매매의 타이밍을 판단하여 투자에 도움을 주기 위해 본 연구를 진행하였다.

키워드 : 환율변화, 추가분석, 외국인자본, 주식투자, 거시지표분석

1. Microeconomics

Macroeconomic indicators refer to standards that can determine economic conditions affecting the country as a whole, such as national income, inflation rate, unemployment rate, exchange rate, currency growth rate, and

interest rate: the criteria for judging the overall national economy. The Federal Reserve System of the United States, abbreviated as the Federal Reserve (Fed), was established in 1913 as the central bank of the United States. One of the Fed's most important functions is the issuance of U.S. dollars, in addition to changing the

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reserve requirement ratio, regulating credit for stock trading and the interest rates on time deposits at member banks, and determining the discount rate for the Federal Reserve. In the case of the US dollar, a key currency, even if the currency is increased, it is circulated around the world, so the strength of the dollar tends to be maintained due to a shortage of currency. The US dollar continued to strengthen, and it was not well circulated. Recently, as the economic experienced great shut down due to Covid-19 in March 2020. As a result, the United states passed a US \$6 trillion (about 6700 trillion won) stimulus package in the Congress during the pandemic to bring back the economy. Of this, about 4 trillion dollars (about 4466 trillion won) has already been paid or used. This is about eight times the annual budget of Korea (558 trillion won as of 2021). In addition, according to the Organization for Economic Cooperation and Development (OECD), the size of corporate bonds issued by general companies, excluding financial companies, is \$9.6 trillion in the United States and \$13 trillion worldwide. The size of the \$13 trillion corporate bonds issued by companies around the world is twice of those of the 2008 global financial crisis. The stock price rebounded in a V-shape because of the US Federal Reserve's massive supply of dollars. Moreover, as the soaring stock price bubble burst, the prices of assets, including real estate, are returning to their original positions [1-5]. The difference between this study and previous studies is that it is possible to take a preemptive response by analyzing factors affecting the exchange rate.

2. Exchange Rate and KOSPI Index

When the exchange rate rises, the stock price seems to rise due to the improved performance

of companies in the export industry; however, there was a factor that affected the stock market more quickly and reliably than a good news from the company's perspective. It was the movement of foreign investors. Foreign investors lose money when the exchange rate rises. Foreign investors cannot help but become sensitive to exchange rate movements. When the exchange rate rises, the amount of money that can be converted to dollars when selling the stocks you hold decreases, so it is profitable for foreigners to sell stocks quickly and convert them into dollars. Considering that foreign investors account for about 30% of the domestic stock market, the KOSPI index falls as they sell their stocks. The stock price will fall regardless of the sales performance of individual stocks, and a representative example is Samsung Electronics. Samsung Electronics recorded sales approaching 78 trillion won in the first quarter of 2022, the highest since its inception. Operating profit recorded 14 trillion won, which is comparable to that of the semiconductor super boom. It is the record-breaking performance despite internal and external adverse factors, such as the prolonged Corona 19 and the increase in raw material prices due to the Russian invasion of Ukraine, the global supply chain crisis, and the controversy over the game optimization service (GOS). Samsung Electronics announced that it recorded 77.78 trillion won in sales and 14.12 trillion won in operating profit in the first quarter. Compared to the same period last year, sales and operating profit increased by 19.0% and 50.5%, respectively. Compared to the previous year, it increased by 1.6% and 1.9%. However, the recent share price of Samsung Electronics is trading at 63,800 won (as of 3:30 pm on June 10, 2022), the 52-week low. Due to the strong dollar, foreign selling has steadily

increased since January 2022, and has been steadily declining regardless of Samsung Electronics' performance. However, once the dollar's strength has calmed down and is falling, we can expect a rebound in domestic large-cap stocks, including Samsung Electronics. Fig. 4 is a 6-month exchange rate graph for the US dollar/won. The dollar has been on the rise since December of last year, and Fig. 2 is the KOSPI domestic stock market, which has been on a downward trend since December last year. Therefore, by predicting the exchange rate, it is possible to know the timing of buying and selling of the domestic stock market, and analyzing factors affecting the exchange rate is one of the ways to increase the return on stock investment [6-9].

3. Factors Affecting Exchange Rates

Factors that affect the exchange rate largely include the inflation rate, interest rates, balance of payments, national product competitiveness in the world market, speculative currency transactions and activities of financial institutions, and prices of energy and other raw materials. Since the formation of the exchange rate is a complex process of the interrelationship between the national economy and the world economy and the interrelationship of politics, these factors are considered when predicting various factors that can affect the exchange rate market.

- The inflation rate tends to lead to a decrease in the purchasing power of monetary units and a decrease in the exchange rate due to an increase in the domestic price level.
- The interest rate is the base rate, and central banks in various countries raise or lower interest rates to control the money supply. The exchange rate rises when interest rate rises are related to tightening monetary

policy, but when interest rates rise due to high inflation, the exchange rate tends to fall.

- Balance of payments: Cash flows received and paid by the state. When the balance of payments is activated, the demand for national currency increases, and the exchange rate also becomes stronger. When the balance of payments is passive, the demand for foreign currency increases and the national currency ratio decreases.
- A country's product competitiveness in the global market: High competitiveness affects a country's exports and consequent foreign currency inflow and interest rates in its own currency.
- Speculative currency trading and activity of financial institutions: If the exchange rate falls for any reason, its influence in the foreign exchange market becomes weaker as major financial institutions sell the currency in an attempt to remove currency risk.

Currencies were circulated around the world in order to secure abundant liquidity to prevent the economic recession caused by the corona virus. However, due to the sudden rise in raw material prices such as the sudden war in Ukraine and the rise in oil prices due to the corona virus, the exchange rate is not stable at the same time, so volatility is appearing in the stock market. In November 1997, the Korean government decided to request financial assistance from the International Monetary Fund, the International Monetary Fund, as it did not have 4 billion US dollars in foreign exchange reserves. As the left exchange rate decreases, the dollar almost tripled according to the principle of a market economy, making the Korean economy more difficult. However, as of November 2021, Korea's foreign exchange reserves stood at \$463.1 billion, which is a fairly large scale, the 8th largest in the world. It is

managed by the Foreign Investment Management Center of the Bank of Korea. It mainly invests directly in safe assets such as US Treasury bonds, and some assets are entrusted to domestic and foreign investment companies for management. In addition to the above purpose, it is also an accumulation of national wealth. It also invests in foreign exchange reserves of USD 10-15 billion annually in KIC, a sovereign wealth fund. At the time of the 1997 Asian financial crisis, Korea's foreign exchange reserves were officially only \$25.1 billion, and it is no exaggeration to say that the government does not have a single penny. Therefore, it is not expected that there will be a foreign exchange crisis like in 1997 due to the abundant foreign exchange reserves [10-13].

4. Exchange Rate Outlook

There are many factors that affect the exchange rate, but the most decisive factor is how many dollars are in circulation. If there is an excess of dollars in Korea, the exchange rate will fall, and if there is a shortage of dollars, the exchange rate will rise. If the amount of dollars circulating in Korea has a decisive influence on the exchange rate, it is too easy to predict the future of the exchange rate. This is because you can guess how many dollars will come into Korea in the future. If the dollar comes in too much, the exchange rate will fall, and if the dollar doesn't come in as it did when it received an IMF bailout, the exchange rate will rise. So, what should we do to predict whether a dollar bountiful year or a dollar scarcity will come to Korea? Of course, we have to look at the US economy. If the U.S. economy is doing well, exports will increase and a rich dollar will unfold. And as Korean companies make a lot of money from exports, foreigners will come to buy Korean stocks, and as a result, dollars will

come in. However, it is very difficult to predict the future of the US economy. I have a lot of other work to do, but I think I will have to spend a lot of time looking for a lot of economic indicators. However, in simple terms, we only need to look at long-term and short-term interest rates in the United States. Of course, a number of economic indicators are needed to make micro-level precise predictions, but if you want to forecast only long-term exchange rates, you do not need to look for numerous economic indicators, just look at US long-term and short-term interest rates. Looking at long-term and short-term interest rates in the United States, Fig. 3 and Fig. 4. An increase in interest rates means a decrease in the money supply, and a decrease in the interest rate means an increase in the money supply. As interest rates have reached their lowest point since mid-March 2020 and are gradually rising, the exchange rate is expected to rise due to a decrease in the money supply. It is also possible to predict that it will stop. Also, there has always been an economic crisis when the difference between long-term and short-term interest rates is close to zero or negative [14,15].

5. Correlation between exchange rate and domestic stock market

As shown in Fig. 6, the exchange rate and the domestic stock market have an opposite relationship. Foreign capital accounts for about 30% of the domestic stock market and foreign capitals are sensitive to exchange rates. In order to reduce foreign exchange losses, they sell whenever the exchange rate rises and buy when the exchange rate falls. is a huge force, so unlike an individual, it is possible to know a certain flow. Equation (1) is expressed as a Pearson correlation coefficient, and the terms

are explained in Table 1, Fig. 1 thru Fig. 4 show factors to effect on exchange rates.

Table 1. Terminology for Equation

Terminology	Description
\bar{x}	Sample Mean for KOSPI
S_x	Standard Deviation for KOSPI
\bar{y}	Sample Mean for USD-KRW
S_y	Standard Deviation for USD-KRW
n	number of n

$$p = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{(n - 1)S_x S_y} \dots\dots\dots(1)$$

Correlation between KOSPI and USD-KRW is - 0.927938488 from June 14, 2021 to June 14, 2022 based on Table 2. The correlation value means that KOSPI and USD-KRW are strong inverse relation.

Table 2. KOSPI vs. USD-KRW Comparison

Date	KOSPI	USD-KRW
6/14/2021	3267.929932	1134.25
6/21/2021	3302.840088	1126.33
6/28/2021	3281.780029	1129.27
7/5/2021	3217.949951	1143.81
7/12/2021	3276.909912	1141
7/19/2021	3254.419922	1150.22
7/26/2021	3202.320068	1150.63
8/2/2021	3270.360107	1144.14
8/9/2021	3171.290039	1161.08
8/16/2021	3060.51001	1173.18
...
6/13/2022	2504.51001	1278.28
6/14/2022	2492.969971	1290.61

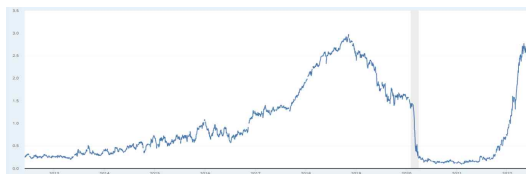


Fig. 1. 2-Year Constant Maturity, Quoted on an Investment Basis

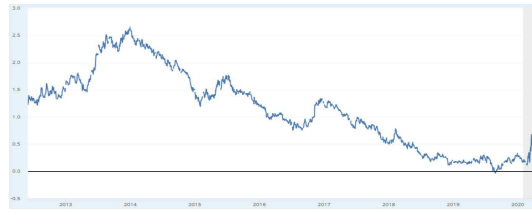


Fig. 2. 10-Year Treasury Constant Maturity Minus 2-Year Treasury Constant Maturity

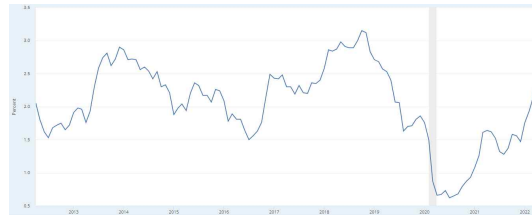


Fig. 3. Long-Term Government Bond Yields: 10-year: Main for the United States

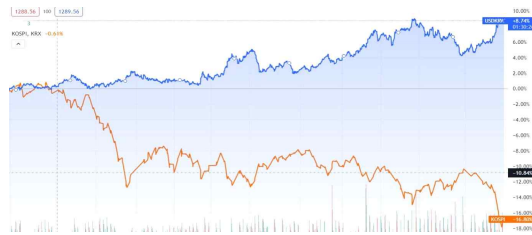


Fig. 4. US/KRW ratio vs. KOSPI Graph from June 2021 to June 2022 for 6 months

6. Conclusion

Predicting stock prices is one of the most difficult challenges, but in the case of the KOSPI, if you understand the flow of foreign capital, you will be able to increase your investment returns. Since foreign capital accounts for 30% of the domestic stock market, the flow of foreign capital has a great influence on the domestic stock market. Therefore, the influence of foreign capital is greatly affected by the exchange rate, and the exchange rate is affected by the long-term and short-term interest rates of the US economy. Therefore, in order to predict the Korean stock market, it is expected that higher investment returns can be

expected if the timing of buying and selling of domestic stocks is determined by predicting the long- and short-term interest rates of the US economy and understanding the supply and demand according to the circulation of dollars.

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