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EXCHANGE RATES AND CAPITAL MARKET INSTRUMENTS – ANALYSIS BASED ON THE EXAMPLE OF SWITZERLAND BEFORE AND DURING THE COVID-19 PANDEMIC

Cezary Bolek[*], **Monika Bolek**[**]

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EXCHANGE RATES AND CAPITAL MARKET INSTRUMENTS – ANALYSIS BASED ON THE EXAMPLE OF SWITZERLAND BEFORE AND DURING THE COVID-19 PANDEMIC

ABSTRACT

The purpose of the article. The aim of the article is to present factors influencing foreign exchange rates and to examine the relationship between them and stock and bond indices in Switzerland in the period before and during the COVID-19 pandemic. The hypothesis that the studied relationships changed as a result of the turmoil caused by the pandemic crisis was verified.

Methodology. To verify the hypothesis, linear and non-linear functions were analyzed, and Pearson's correlation indices between the examined instruments were calculated.

Results of the research. As a result of the analysis, it was found that the relationship between the CHF exchange rate index and stock indices is non-linear, and the relationship between the CHF exchange rate index and bond indices is linear. Correlation coefficients before the pandemic indicated strong relationships between the CHF exchange rate index and the examined capital market indices, and moreover, the relationship with stock indices was positive and with bond indices negative. It was found that during the pandemic, the correlation with bond indices changed and became positive. The motivation of the analysis is related to the spotlight on a Swiss franc as a result of numerous financial decisions related to this currency.

Keywords: exchange rate, stock index, bond yield, correlation, COVID-19.

JEL Class: D53, F21, F31.

[*] Dr, Kolegium Medyczno-Przyrodniczo-Techniczne, Akademia Nauk Stosowanych Stefana Batorego, e-mail: cbolek@ansb.pl https://orcid.org/0000-0002-4509-8262

[**] Dr hab., prof. UŁ, Wydział Ekonomiczno-Socjologiczny, Uniwersytet Łódzki, e-mail: monika.bolek@uni.lodz.pl https://orcid.org/0000-0001-9376-1105

INTRODUCTION

The exchange rate is linked to the condition of a given country's economy, just like stock rates of return and bond yields. Stock prices, and therefore stock indices, are mostly influenced by the same factors that affect exchange rates and bonds. Taking the above into account, it should be expected that the behavior of financial instruments will be strongly correlated with each other, which is beyond doubt, but these links may have changed in direction and strength during the COVID-19 pandemic. Due to the goal specified by the authors, in the presented article, factors influencing changes in ex rates, stock and bond indices will be discussed, and the functions and correlations between selected instruments before the outbreak and during the COVID-19 pandemic in Switzerland will be analyzed. The motivation to undertake the research was the interest in the Swiss franc due to numerous financial decisions on a market in this currency.

Stock prices and rates of return are determined by many factors, including macroeconomic, market, sectoral and individual determinants related to a given company. Macroeconomic factors such as the unemployment rate, inflation and GDP can impact the overall health of the economy because they influence investor's decisions. Market factors such as demand, supply and exchange rates can also determine stock prices. Sectoral factors such as competition and government regulation can impact financial performance and prospects. Individual company factors such as financial performance, dividend policy and shareholder structure may also influence share prices and rates of return.

Factors affecting bond profitability are related to the economic situation of the issuer, the domestic market and variables related to the situation on a global economy (Csonto and Ivaschenko, 2013: 4). The economic situation of the issuer is characterized by variables representing the condition of public finances – the state budget balance, the size and structure of debt (e.g., the size of debt in percentage of GDP, the size of foreign debt, the size of debt maturing in the coming year), variables representing a given country's external balance and solvency – current account balance, international investment position, foreign exchange reserves, inflation, economic growth, industrial production, unemployment, exchange rate, interest rates, trade openness, and GDP per capita. Inventory levels, order volumes, labor costs, consumer spending and consumer confidence characterize the issuer's solvency risk or country risk, which are provided by rating agencies. The second group of data, called global factors, most frequently are related to variables that indicate international risk factors. Factors representing the possibilities of obtaining financing on international markets include stock indices of the most important stock exchanges, measures of the liquidity of the international bond market, interest rates exogenous to a given country (e.g. ECB), the spread between Baa and Aaa rated corporate bonds for

companies. Finally, it should be noted that a lot of attention is paid to variables characterizing bond market, including primarily market liquidity, i.e., transaction spread (Kujawski et al., 2015: 23–24).

Forex rates and their changes are also influenced by various factors (Pszczółka, 2011: 20). Economic factors are divided into structural factors such as the level of development and structure of the economy, the level of competitiveness of the economy, and the situation in the balance of payments. Technical factors, in turn, include the intensity and structure of technical changes and the level of development of the technological base for the functioning of markets. Cyclical factors include the GDP growth rate, the inflation rate and changes in interest rates. Non-economic factors include political factors such as the degree of political stabilization, degree of political risk, political shocks, institutional factors such as appropriate systemic solutions, degree of market liberalization, appropriate monetary and fiscal policy, frequency and methods of central bank intervention, psychological factors such as expectations and a level of financial risk.

The impact of economic factors on exchange rates may have the following consequences. The trade balance affects the currency rate, and high demand for goods and services provided in a specific currency affects its appreciation. Growing inflation reduces the purchasing power of a given currency, which reduces its attractiveness and, consequently, its depreciation (Świder, 2018: 29). Gross Domestic Product (GDP) and its growth are led by, among others, to upward trends in investment and exports, due to the indication of the good condition of the economy. This, in turn, becomes a factor leading to an increase in demand for the currency, and therefore an increase in demand for it, and ultimately to the appreciation of the national currency. Subsequent increases in interest rates by the authorities, caused by inflationary pressure, will additionally strengthen the domestic currency in the short term. A good labor market and low unemployment favor investments in a given country, thanks to which the national currency increases its value. The fewer conflicts in society, and therefore the higher the level of stability of the institutional environment, the greater the incentive for investors to invest in that country, which increases the value of the national currency. Central banks can take various actions to shape currency rates. First of all, they can sell or buy currencies on the currency market and shape interest rates.

Psychological factors are based on expectations and speculations that may relate to the economic and institutional factors. Speculators try to predict, for example, GDP dynamics, future interest rates or central bank interventions. These factors are related to behavioral finance based on investor psychology. Technical analysis is also important here, and involves creating reference points in the minds of investors based on the development of price charts in the past.

Parity relations can be defined as connections between selected macroeconomic variables, i.e., interest rate, inflation rate, spot exchange rate and forward exchange rate (Sobański, 2018: 73). The condition for the existence of parity relations is the preservation of the law of one price, which states that a given good or financial asset must be available at the same price on the markets of different countries. The parities occurring on the currency market include purchasing power parity, interest rate parity, the Fisher effect, the international Fisher effect and the prediction effect.

Purchasing power parity (PPP) refers to the relationship between the inflation rate and the spot exchange rate. According to it, the difference between inflation for the base currency and inflation for the quote currency determines changes in the exchange rate. The currency of the country with a relatively higher inflation rate should lose value, i.e., depreciate, and the currency of the country with a relatively lower inflation rate should gain value, i.e., appreciate. Interest rate parity shows how nominal interest rates affect the level of the forward exchange rate. According to interest rate parity, the forward rate depends on the current spot rate, the interest rate for the quotation currency and this rate for the base currency. Currencies with relatively higher interest rates should be quoted at a discount, while those with relatively lower interest rates should be quoted at a premium. The Fisher effect shows the relationship between inflation and the nominal interest rate. The relationship between these values is positive, therefore, according to the assumptions of the effect, higher inflation for a given currency should correspond to a higher nominal interest rate for the same currency, so that the increase in inflation resulting in a decrease in the purchasing power of money is compensated by an increase in the nominal interest rate. The international Fisher effect indicates the interdependence of the nominal interest rate and changes in the exchange rate. Currencies with relatively higher interest rates should depreciate and those with relatively lower interest rates should appreciate. There should also be equality of rates of return on investments in the money market in domestic and foreign currencies. The prediction effect is a combination of parities showing the relationship between the level of interest rates and another variable – interest rate parity and the international Fisher effect. Ultimately, the prediction effect indicates the interdependence of the future spot rate and the current forward rate. This interdependence results from the influence of interest rates on both of these factors.

It should be added that the high value of the Swiss franc has a negative impact on economies such as Poland due to the high value of mortgage loans denominated in this currency. Yet, the same is also true for the Swiss economy, which is characterized by high internationalization and for which a strong domestic currency means lower profits related to operations in the global markets. The reputation of the franc is very good and dates back to World War II, when the

capital of countries at war found refuge in this neutral country. Additionally, this currency is used by other countries to maintain reserves and is characterized by a stable low interest rate. This means that the Swiss franc area is considered a "safe port" for capital during periods of crises affecting the global market. The behavior of this currency during the pandemic in the context of stock and bond markets is a study that can show what is happening in the so-called a "safe port" when the market becomes a place for storing and protecting the world's financial resources.

The article will further present literature related to the analyzed problem, data and research methods, research results and final conclusions.

1. LITERATURE

In the literature on the subject, authors often discuss factors influencing prices of financial instruments and exchange rates, and examine the relationships between them. In the currency market, the vast majority of trades involve professional financial intermediaries – banks, brokers, but also corporations and individual clients (Cwynar and Patena, 2010: 68). The currency market is a decentralized market, which allows for reducing the costs of foreign exchange (Jarno, 2014: 61). Activities on the currency market can be divided into trade and investments (Świder, 2018: 27–28).

An important problem related to transactions on the currency market is forecasting exchange rates. Fundamental analysis is used to obtain long-term forecasts regarding exchange rates and involves a thorough examination of changes in economic and political factors affecting the volume of demand and supply on the currency market, and thus on future exchange rate fluctuations (Miciuła 2013: 253). In practice, however, such a forecast is much more complicated, because the general theory of purchasing power parity is based, among others, on the existence of perfect competition, no transaction costs and freedom in international trade (no trade barriers). Hence, the application of this theory to predict exchange rates is most often not confirmed in reality because the modern market does not meet the previously mentioned assumptions (Salamaga, 2009: 150). The literature presents, for example, what factors determine and how strongly they influence the development of the USD/EUR exchange rate and it is stated that the USD/EUR exchange rate is determined in an economically and statistically significant way by: the M1 money supply in the euro zone and the USA and changes in the length of forward yields, treasury bonds to maturity in the euro zone and the USA (Bukowski and Bukowska, 2016: 175).

The most important risk factors associated with investing in bonds highlighted in the literature include credit risk along with insolvency risk, as well as liquidity risk. All empirical research emphasizes the importance of macroeconomic variables. Within this group of studies, the following are analyzed primarily:

the situation in public finances, foreign debt, economic growth, interest rates, inflation, and the current account balance. This approach focuses on variables related to the economic situation of the issuer (Kujawski et al., 2015: 11).

The amount of capital that will flow to the domestic market depends on the size of direct investments made by foreign investors, transfers, loans and the difference between exports and imports of goods in a given country (Gurgul and Kłęk, 2009: 82–83). Because values on currency markets are constantly changing, it is difficult to accurately forecast daily exchange rates (Dunis, 2001: 86).

Referring to stock exchange indices and their behavior, it was found that the correlation between the dynamics of changes in the main stock exchange indices of the WSE and the dynamics of changes in GDP in Poland was positive (Widz, 2016: 155). The expected rate of return and risk are among the basic criteria for making decisions by investors on the capital market. They strive to maximize the expected rate of return for a given risk or to minimize the risk for a given expected rate of return. The analysis of companies' sector may be one of the important factors determining the selection of public companies for the investment portfolio (Szewc-Rogalska, 2014: 165). When considering the possibility of purchasing stocks of a company, investors are guided by, among others, fundamental or technical analysis, an assessment of the company's current potential and expected development opportunities, and macroeconomic parameters (Batóg and Batóg, 2012: 387).

In the study of the relationship between exchange rates and stock exchange indices, it was found that they were not co-integrated with each other, which means that the long-term relationship between these instruments on the Polish market cannot be said to be stable. The literature also addresses the problem of long-term balance between exchange rates and the WIG20 index (Buszkowska, 2014: 5). The dependence of exchange rates on the stock exchange was discussed, among others, in the work by Doman and Doman (2011), which analyzed the impact of exchange rate dynamics on the global capital market. The relationship between exchange rate fluctuations and the stock market situation was also examined by analyzing the relationship between the change in the exchange rate in a given year and the real rate of change in exports in the next year and between the rate of return on the stock exchange index and the change in the exchange rate of the domestic currency against foreign currencies, on the example of 16 OECD countries (Łon, 2005: 25). The influence of exchange rates on global prices of strategic raw materials on Polish stock exchange indices is also visible (Młynarczyk, 2016). Additionally another study confirmed the intuitive assumption about the interdependence of stock markets and exchange rates. In more cases, exchange rates depend on changes in indices, and not the other way around, which is a direct result of investors' tendency to generate profits. When supply dominates on the trading floor and company prices decline, players

withdraw their capital and invest it in a foreign currency, hence the changes in stock indices and currency rates are usually negatively correlated (Chruściński, 2009).

Numerous empirical studies emphasize that in the short term the exchange rate behaves like a financial variable, similarly to, for example, interest rates or prices of financial assets – stocks or bonds (Wdowiński, 2005: 109). The literature also presents an analysis of the correlation between various currency rate indicators against the euro and various measures of the interest rate in a given country. The research has identified cases of countries and interest rates where there is a particularly strong relationship with the exchange rate of the national currency against the euro. Regardless of the type and method of presenting the interest rate, high interdependence occurs in the Czech Republic, Hungary and Sweden, in Great Britain it is characteristic only for the real interest rate – both short- and long-term, and in the case of Poland– only for the long-term nominal rate (Michalczyk, 2017: 105). The literature also includes an analysis of correlation and cointegration between the stock market, the government bond market and the currency market in the Czech Republic, Poland and Hungary. The studies found correlations between variables, but they were unstable between subperiods (Sekuła, 2020: 21).

2. DATA AND METHODS

To analyze the relationship between the CHF exchange rate and capital market instruments in Switzerland, the Swiss franc exchange rate index, stock market indices and indexes of 5- and 20-year bonds issued by the Swiss Federation were selected. The specifics of the selected variables are presented below. Daily data covering the period 30/11/2000–15/6/2022 was taken from the official website of Swiss National Bank. Research was conducted for the period before the outbreak of the COVID-19 pandemic and after that date, taking 16/3/2020 as the breakthrough date.

Exchange rate indices (NOI – Nominal Overall Index was analyzed in the study) serve as an indicator of the country's price competitiveness. They are calculated on the basis of bilateral rates, information on trade flows and – in the case of real indicators – information on price developments. Changes in the Swiss franc exchange rate against the currencies of Switzerland's most important trading partners are measured using the nominal effective Swiss franc exchange rate index. The increase in the value of the index indicates that the Swiss franc has become more expensive in nominal terms (expressed in foreign currency units). When it falls, it means that the Swiss franc has become cheaper in nominal terms. The method of weighing currency indices is based on the approach of the International Monetary Fund (IMF), and the weights are calculated on the basis of

trade in goods and services (including precious metals) and take into account export and import flows and the so-called third market effects. The index formula used is the Törnqvist chain index.

The Swiss Performance Index (SPI) is a broad total return index that mimics stocks primarily listed on the SIX Swiss Exchange. The SPI is used as a benchmark for mutual funds, index funds and ETFs, and as an underlying index for derivative financial instruments such as options, futures and structured products. The Swiss Market Index (SMI) is an index of the largest and most liquid shares listed on the stock exchanges in Geneva, Zurich and Basel.

Yields for Swiss Confederation fixed-maturity bonds are based on the term structure of interest rates. Spot rates are the rates of return on zero-coupon bonds, i.e., discount bonds. Since very few zero-coupon bonds are issued in the Swiss capital market and interest and principal payments on coupon bonds are not made separately, spot rates must be based on coupon bond prices. For this purpose, the SNB uses the extended Nelson-Siegel-Svensson model. The calculated interest rates should be understood as the yield on synthetic discount bonds.

In the research part, two theses will be verified:

1) the correlation between the CHF currency index and Swiss capital market instruments is strong, statistically significant and linear;

2) during the COVID-19 pandemic, the tested compounds have changed.

Table 1 presents the statistics of the analyzed variables.

Table 1. Statistics of variables used in the study

	NOI	**SPI**	**SMI**	**5-year bonds**	**20-year bonds**
The period before the outbreak of the pandemic					
Mean	128.43	6 796.86	7 352.09	0.98	1.95
Std. Dev.	20.70	2 428.59	1 509.21	1.31	1.36
No of observations	4 854	4 854	4 854	4 854	4 854
The period after the outbreak of the pandemic					
Mean	166.84	14 113.31	11 159.93	–0.46	–0.02
Std. Dev.	2.28	1 475.29	1 009.70	0.34	0.39
No of observations	570	570	570	570	570

Source: own study.

3. RESULTS

The study was conducted in two periods, the first of which concerns the time when markets operated in normal condition, and the second is the period of the COVID-19 pandemic. The analysis and its results will show the essence and effects of these disorders.

3.1. Analysis in the pre-pandemic period

First, a correlation analysis was performed between the NOI Swiss Franc Exchange Rate Index and the SPI Index. Due to the nature and specificity of the data, they were transformed, and a correlation analysis of the transformed NOI variable was performed based on a second-degree polynomial regression model in order to determine the nature of this relationship more precisely. The results of the analysis are presented in Figure 1.

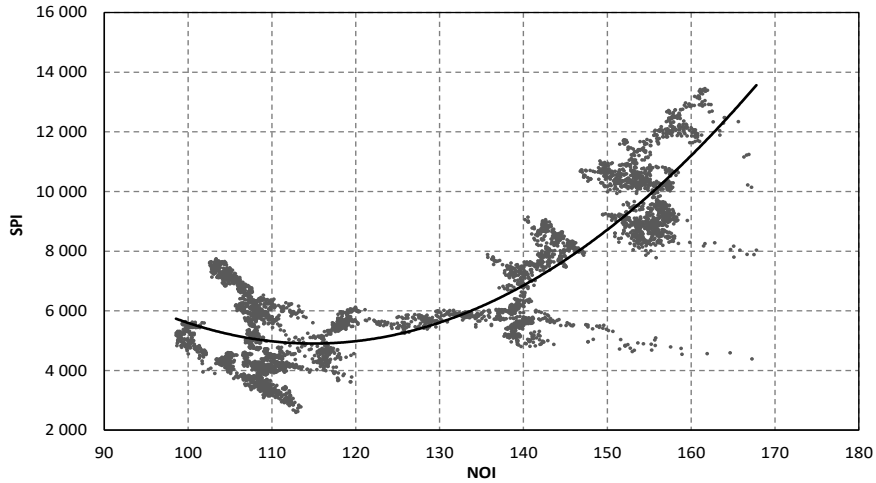

Figure 1. Correlogram between the CHF Index and the SPI Index – second-degree polynomial relationship

Source: own study.

The Pearson correlation coefficient of the polynomial function for the studied variables is 0.86 (statistical significance p value = 0.0000 confirms the strength of this relationship), which shows a non-linear and strong relationship between NOI and SPI. The non-linearity of the relationship shows that at a lower CHF price the relationship between stock exchange and currency indices is negative, only at a higher level of price this relationship changes to positive.

Then, a correlation analysis was performed between the Swiss Franc NOI Price Competitiveness Index and the SMI Index. Also in this case, due to the specificity of the data, they were transformed, and a correlation analysis based on a second-degree polynomial regression model was performed. The results of the analysis are presented in Figure 2.

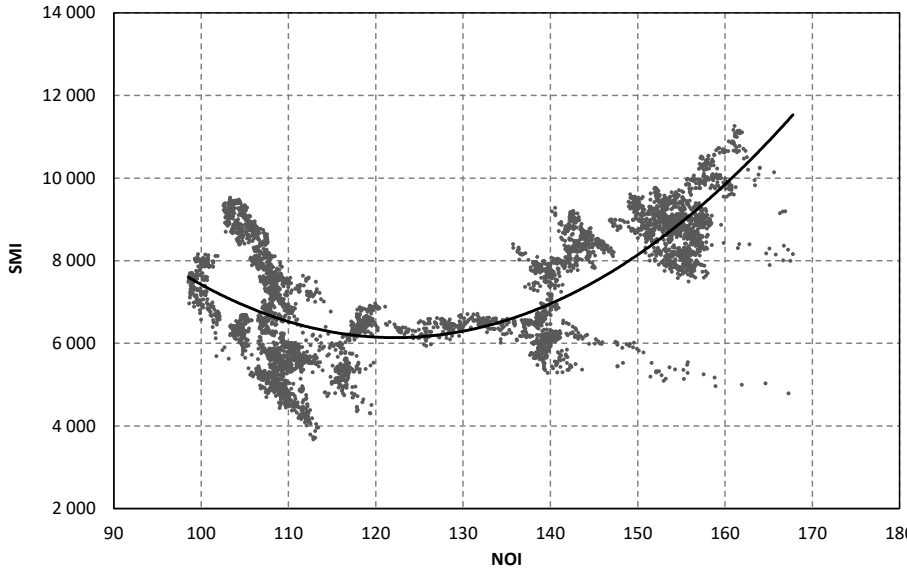

Figure 2. Correlogram between the CHF Index and the SMI Index – second-degree polynomial relationship

Source: own study.

The Pearson correlation coefficient of the quadratic function for the studied variables is 0.71 (statistical significance p value = 0.0000 confirms the strength of this relationship), which shows a non-linear and strong relationship between NOI and SMI, similar in shape to the correlation determined for the SPI index, but weaker.

Then, a correlation analysis was carried out between the Swiss franc NOI exchange rate index and the yield rates of 5-year bonds. Figure 3 shows a linear analysis of this relationship.

The correlation between the Swiss franc NOI exchange rate index and interest rates on 5-year bonds is strong and negative, amounting to 0.96 (the statistical significance of p value = 0.0000 confirms the strength of this relationship). This relationship, unlike in the case of share prices, is linear and confirms that the CHF price is strongly related to the interest rate.

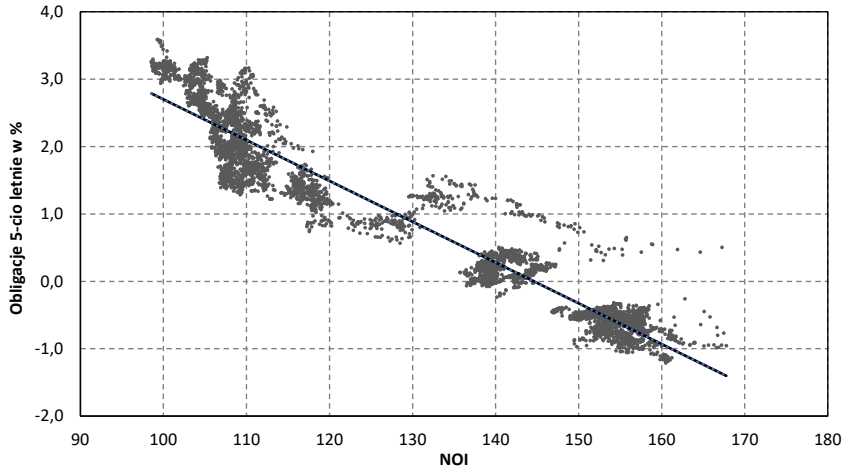

Figure 3. Correlogram between the CHF Index and the interest rate on 5-year bonds – linear relationship

Source: own study.

Then, a correlation analysis was carried out between the Swiss franc NOI exchange rate index and the interest rates on 20-year bonds. Figure 4 presents an analysis of this relationship.

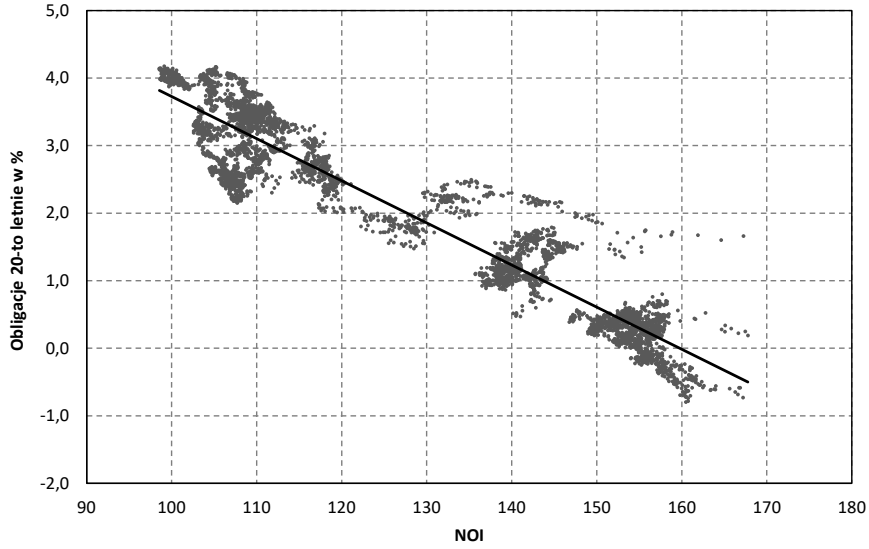

Figure 4. Correlogram between the CHF Index and the interest rate on 20-year bonds – linear relationship

Source: own study.

The correlation between the Swiss franc rate index NOI and the interest rate on 20-year bonds is strong and negative, amounting to 0.95 (the statistical significance of p value = 0.0000 confirms the strength of this linear relationship).

3.2. Analysis during the COVID-19 pandemic

A correlation analysis was carried out between the Swiss franc NOI exchange rate index and the SPI Index. As in the previous study of the earlier period, due to the nature and specificity of the data, they were transformed, and a correlation analysis of the transformed NOI variable was performed based on a second-degree polynomial regression model. The results of the analysis are presented in Figure 5.

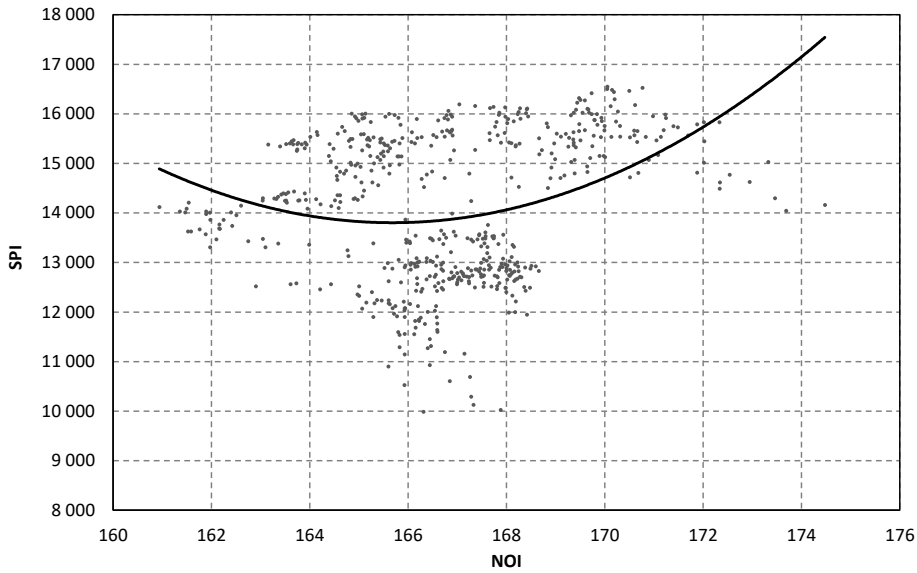

Figure 5. Correlogram between the CHF Index and the SPI Index – second-degree polynomial relationship (period of the COVID 19 pandemic)

Source: own study.

The Pearson correlation coefficient of the polynomial function for the studied variables is 0.32 (statistical significance p value = 0.0000 confirms the strength of this relationship), which shows a non-linear and much weaker relationship between NOI and SPI than in the period before the outbreak of the pandemic. One can see that the cloud of correlations between observations is less concentrated. Market behavior began to deviate from predictability and investors made decisions in a more chaotic manner.

Then, a correlation analysis was performed between the Swiss Franc NOI Index and the SMI Index. As in the previous study, due to the specificity of the data, they were transformed, and a correlation analysis was performed based on a second-degree polynomial regression model. The results of the analysis are presented in Figure 6.

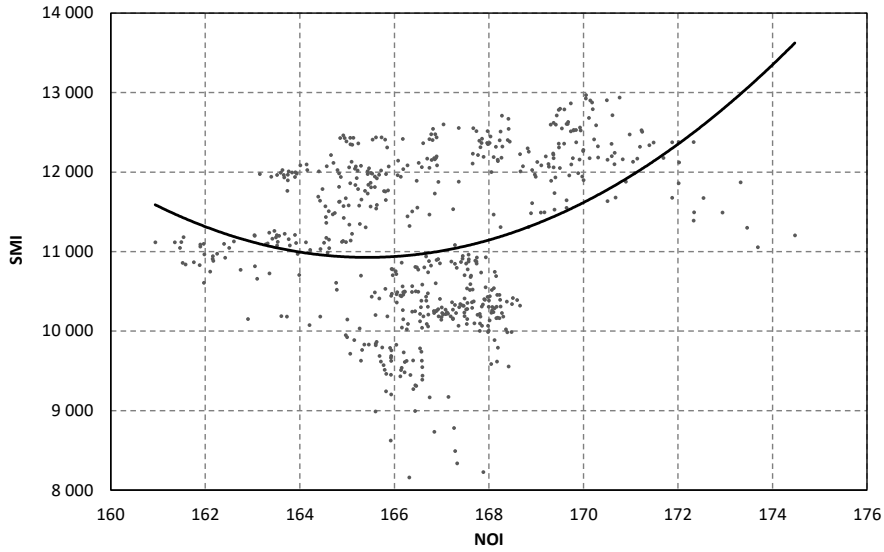

Figure 6. Correlogram between the CHF Index and the SMI Index – second-degree polynomial relationship (period of the COVID 19 pandemic)

Source: own study.

The Pearson correlation coefficient of the quadratic function for the studied variables is 0.35 (statistical significance p value = 0.0000 confirms the strength of this relationship), which shows a non-linear and much weaker relationship between NOI and SMI.

Then, a correlation analysis was carried out between the Swiss franc NOI exchange rate index and interest rates on 5-year bonds. Figure 7 presents a linear analysis of this relationship.

The correlation between the Swiss franc NOI exchange rate index and the yield rates on 5-year bonds is positive, amounting to 0.42 (the statistical significance of p value = 0.0000 confirms the strength of this relationship). The correlation became weaker and changed its sign to positive. The increase in interest rates was accompanied by an increase in the price of CHF.

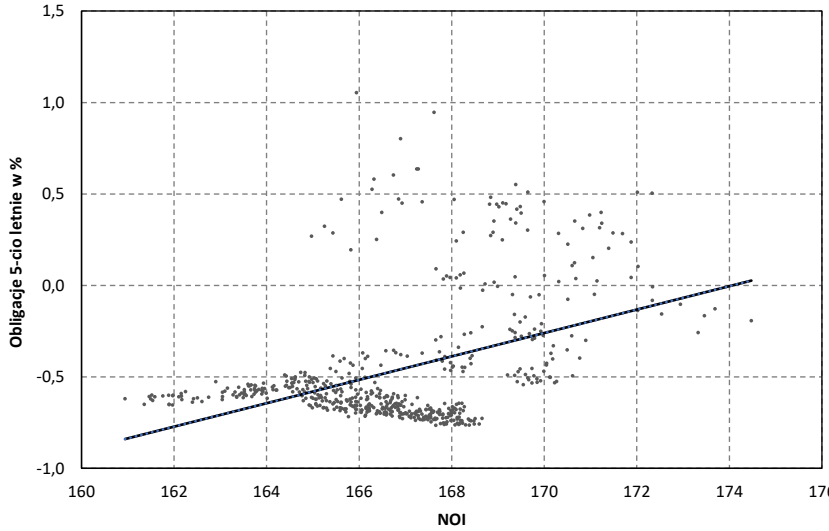

Figure 7. Correlogram between the CHF Index and the interest rate on 5-year bonds – linear relationship (period of the COVID 19 pandemic)

Source: own study.

Then, a correlation analysis was carried out between the Swiss franc NOI exchange rate index and the interest rates on 20-year bonds. Figure 8 presents an analysis of this relationship.

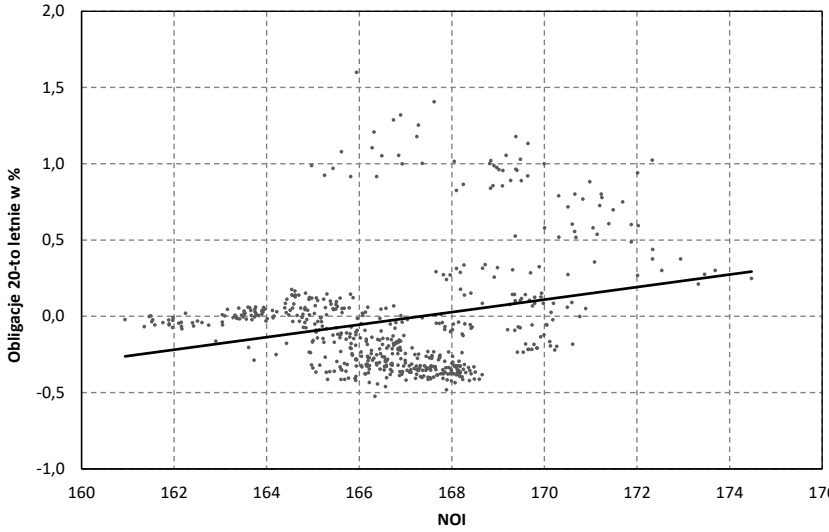

Figure 8. Correlogram between the CHF Index and the interest rate on 20-year bonds – linear relationship

Source: own study.

The correlation between the Swiss franc NOI exchange rate index and the yield on 20-year bonds is positive, amounting to 0.24 (the statistical significance of p value = 0.0000 confirms the strength of this relationship). Again, the correlation became weaker and changed its sign to positive. The increase in interest rates was accompanied by an increase in the price of CHF.

Table 2 presents a summary of the results obtained from the correlation analysis of the studied variables.

Table 2. Summary of correlation analysis results (COVID-19 pandemic period)

	SPI	**SMI**	**5-year bonds**	**20-year bonds**
The period before the outbreak of the pandemic				
Correlation	0.86	0.71	–0.96	–0.95
p-value	0.0000	0.0000	0.0000	0.0000
No of observations	4 854	4 854	4 854	4 854
The period after the outbreak of the pandemic				
Correlation	0.32	0.35	0.42	0.24
p-value	0.0000	0.0000	0.0000	0.0000
No of observations	570	570	570	570

Source: own study.

CONCLUSIONS

The article presents a synthesis of factors influencing currency rates and the prices and behavior of capital market instruments. It was found that these factors are similar and therefore the behavior of currency and capital markets should be strongly correlated. Two theses were verified, stating that the correlation between the CHF currency index and stock indices is non-linear, and with the bond indices it is linear. During the COVID-19 pandemic, the examined relationships weakened, and the direction of these relations changed in the case of bonds, but the type of functions describing the given relationships did not change.

Before the outbreak of the pandemic, the values of correlation measures between currency rates and capital market instruments were significantly higher than during the pandemic. The change in the sign of the bond yield correlation coefficient is important. While before the outbreak of the pandemic the correlation was negative and almost perfect, confirming the assumptions of interest rate

parity, during the pandemic the correlation became not only weak, but also positive.

The results of the conducted analyses are part of the trend of research on the impact of interest rates and stock markets on the exchange rates and vice versa. Parity analysis shows that higher interest rates weaken the currency. However, other studies show that in the long term, in the event of a decline in interest rates (caused by the need to increase the pace of economic development), the domestic currency should weaken due to the outflow of capital from abroad. During the pandemic, the CHF exchange rate was determined by capital flows, which was reflected in a positive correlation between the interest rates of issued bonds and the Swiss currency exchange rate. The incoming capital was also invested on the stock exchange, which is confirmed by the positive correlation of the currency exchange rate strength with stock exchange rates, which weakened but did not change its pre-pandemic character.

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KURSY WALUT I INSTRUMENTY RYNKU KAPITAŁOWEGO – ANALIZA NA PRZYKŁADZIE SZWAJCARII PRZED I PODCZAS PANDEMII COVID-19

Cel artykułu. Celem artykułu jest przedstawienie czynników wpływających na kursy walut oraz zbadanie związku między nimi i indeksami akcji oraz obligacji w Szwajcarii w okresie przed I w trakcie trwania pandemii Covid-19. Zweryfikowano w związku z powyższym hipotezę, że badane związki uległy zmianie w wyniku zawirowań wywołanych kryzysem pandemicznym.

Metoda badawcza. Do zweryfikowania postawionej hipotezy wykorzystano analizę funkcji liniowych i nieliniowych oraz obliczono wskaźniki korelacji Pearsona między badanymi instrumentami.

Wyniki badań. W wyniku przeprowadzonej analizy stwierdzono, że związek indeksu kursu CHF I indeksów giełdowych jest nieliniowy, a związek indeksu kursu CHF z indeksami obligacji liniowy. Korelacje przed pandemią wskazywały na silne związki indeksu kursu CHF z badanymi indeksami z tym, że związek z indeksami akcji był pozytywny, a z indeksami obligacji negatywny, w okresie pandemii korelacja z indeksami obligacji uległa zmianie i była dodatnia.

Słowa kluczowe: kurs walutowy, indeks giełdowy, rentowność obligacji, korelacja, COVID-19.

JEL Class: D53, F21, F31.

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