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WHAT MOVES SOVEREIGN BOND MARKETS? THE EFFECT OF MACROECONOMIC INDICATORS AND BUSINESS SENTIMENT ON GERMANY BOND YIELDS

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Abstract: *Numerous economic information and economic indicators influence the movement of the financial market and are certainly sustained by the movement of government bond yields. Previous research has confirmed the impact of economic indices on yield trends and examines whether and to what extent economic indicators such as monetary policy measures, inflation, unemployment, oil prices, confidence indicators and stock markets affect the movement of yields on government German bonds. The focus was on two-year, five-year and ten-year German bonds. The research tests several hypotheses that claim that certain economic indicators: inflation in the EMU, oil prices, Sentix confidence index, stock market affect the movement of German yields. The results show that the observed factors have a more or less pronounced impact on the observed yields and that, as such, they should be used and analyzed when monitoring yield trends in the EMU market. Yields on government bonds are strongly influenced by numerous macro data, but also trust data, which is also shown in this research. It is clear that the factors analyzed in this research (inflation, monetary policy measures, stock market, oil and confidence) have a greater or lesser impact on yield trends and should certainly always be monitored when analyzing yields. However, it is noted that the observed factors will not always have the same impact. Macroeconomic factors, especially inflation, have different effects on longer and shorter yields. Statistically significant impact on all yields, regardless of whether they are biennial, five-year or ten-year, has monetary policy measures observed through the deposit facility, confidence index and stock market.*

Keywords: *investment, fixed income, yield, government bonds, economic indicators, confidence, Germany.*

INTRODUCTION

A government bond is a debt instrument issued by the government. When the government issue the debt instruments it is obligatory to pay an interest rate to the bond holder, for all periods that bonds exist. That is mean, government has to pay coupon payments and nominal value at bond maturity. Bonds are also linked to a rating that indicates the quality and safety of the bonds. The focus of this research is German government bonds, which have high credit ratings and are considered the safest investments in the eurozone bond market.

Considering the investor position, one of the most important factors in the bond markets are yields or interest rates. The interest rate is the best indicator of actual earnings on investing in a concrete bond. The most commonly used measure is the yield to maturity, which is interest that shows the present value of all future payments or cash inflows that the investor expects based on a particular bond. The interest rate or yield defined in this way is a measure that is mainly monitored on the financial market and on which investment decisions most often depend.

When analyzing government bonds, the focus shifts to the yield curve that is formed from the relationship of interest rates with different maturities. Interest rates of different maturities can move in parallel, but the movement can be different in the sense that there is a greater increase or decrease in the front or back of the yield curve or, the yield curve can be inverted (Simu, 2017; Utama & Agesy, 2016).

Changes in the yield curve come, logically, under the influence of changes in yield at different periods. These changes in yield are influenced by numerous macroeconomic factors, but also by other factors that are not primarily macroeconomic (consumer behaviour, economic expectations, etc.). Changes in monetary and fiscal policy may also be factors influencing the movement of government bond yields (Sihombing et al., 2013).

The subject of this paper is to examine which factors affect the bond market and the debt instruments market. The focus is on the German government bond market,

which is, in fact, the best representative of the EMU market. It is examined which factors and to what extent influence the movement of yields on the two-year, five-year and six-year yields of Germany.

This paper aims to examine the extent to which indicators of investor confidence and the extent to which economic indicators affect the movement of German government bond yields. It is known that macroeconomic indicators have an impact on these trends, but the impact of factors of a behavioural nature should certainly not be ruled out.

The paper is structured through several thematic units. In addition to the introduction which indicates based on the research, the subject and goal of the paper and the short structure of the research, the focus shifts to the review of the literature. Previous research is being investigated, based on which the hypotheses being tested are derived. After that, an overview of the research results is given, ie a statistical analysis of the results, followed by a discussion of the obtained research results. At the end of the paper, a list of used literature, a list of illustrations and an appendix are given.

1. LITERATURE REVIEW AND HYPOTHESIS

Monitoring trends in government bond yields is the most common indicator identifying changes in economic conditions. Considering that government bond yields are influenced by macroeconomic indicators but also confidence indicators, many authors have shifted the focus of their analysis to examine these effects.

1.1. Influence of reference interest rate on yields

The reference interest rate is a monetary policy instrument by which the central bank influences the amount of money in circulation and consequently the yields on government securities. Government bond yields are significantly influenced by monetary policy. These policies are policies implemented by each central bank such as the Fed, the ECB or any other regulatory body responsible for monetary policy management activities (Catalno, T., 2021: How Are Bond Yields Affected by Monetary Policy?). Monetary policy is reduced to determining the interest rate. Also, determining

the interest rate defines a risk-free interest rate. The risk-free interest rate has a significant impact on the demand for all types of financial instruments and certainly for government bonds. The link between interest rates and changes in central bank monetary policy and the impact on bond yields was also confirmed by Kurniasih and Restika (2015) and Sundoro (2018), who showed that restrictive monetary policy means lowering the reference interest rate which further leads to lower yields on government bonds. Likewise, Yuliawati and Suarjaya (2017) and Tjandrasa (2017) conclude that interest rates have a positive and statistically significant impact on government bond yields. Likewise, Pramana and Nachrowi (2016) as well as Santosa & Sihombing (2015) conclude that the central bank interest rate has a positive and statistically significant impact on government bond yields, with this relationship being examined in the Indonesian market. Gagnon and Jeanne (2020) also showed that changes in monetary policy, ie a reduction in the reference interest rate, affected the decline in government bond yields. Based on the above, the following hypothesis arises:

H1: The ECB reference interest rate has a positive effect on German government bond yields

1.2. Inflation on government bond yields

The bond market is generally influenced by economic conditions and changes in economic conditions, ie changes in macroeconomic variables, and they are certainly influenced by changes in inflation. In the event of rising inflation, interest rates also tend to rise. Therefore, when investors estimate inflation growth, they will ask for or demand such interest rates that will compensate them for inflation growth (Fabozzi, 2016).Hsing and Hsieh (2012) concluded in their research that inflation is one of the fundamental factors affecting bond yields. This claim was also supported by Tjandras (2017), who confirms that inflation has a positive and statistically significant impact on ten-year yields. Yusuf and Prasetyo (2019) conducted a study to examine the impact of USD bond yields, exchange rates and inflation on Indonesian government bond yields. Monthly data from January 2009 to December 2018 were used, and the results showed, among other things, the impact of inflation on yield trends. Hsing (2015) investigated the factors that influence the movement of Spanish government bond yields. He developed a model that measures various macroeconomic factors in the period from 1999 to 2014.

The results showed that Spain's government bond yields are positively related to debt / GDP ratio, short-term interest rates on treasury bills, and expected inflation.

Based on the above, the following hypothesis arises:

H2: Inflation has a positive effect on government bond yields

1.3. Oil price and bond yield

The impact of oil prices on bond yields has also been examined in previous research. Sihombing et al. (2014) and Arshada et al. (2018) conducted a study in which they showed that world oil prices have a significant impact on government bond yield movements. Paramita and Pangestuti (2016) also showed that world oil prices are positively related to government bond yields in the countries analyzed: Indonesia, Malaysia, Thailand, and the Philippines. Moreover, Siklos (2011) and Sundoro (2018) in their research develop a model of government bond yields and conclude that world oil prices have a significant impact on government bond yields.The link between oil prices and stock returns in China relies on policy uncertainty. Policymakers must organize such strategies to reduce the harmfulness of oil shocks in the financial market (Khan et al., 2019).

Based on the above, the following hypothesis arises:

H3: The oil price has a positive effect on the movement of bond yields

1.4. Investor's confidence and bond yield

Brown and Cliff (2004) show that investor confidence represents investor expectations of market conditions. According to these authors, sentiment indicates the level of irrational beliefs in the projection of future cash flows and risks of a particular security. When investors feel or expect the economy to deteriorate, they become anxious and afraid of losing money. In such circumstances, they will start selling their securities, bonds, which can be an additional incentive for the market to decline. Today, investors are bombarded with numerous financial news that affects their investment decisions. With a continuous and uninterrupted source of information that relies mainly on the

Internet, together with data from the media, mass media, this information directs investors to various investments according to the perception of investors

Previous research has shown that there is often incorrect pricing in the financial market (Shiller, 1981; Daniel and Titman, 1997; Wang 2006) and which is maintained at asset prices. Wrong prices are corrected when the basis of the economy emerges while confidence fades.

Therefore, the price correction leads to a negative relationship between investor mood and future returns. As a consequence, investor sentiment shows the power to predict returns (Chung, Hung, & Yeh, 2012).

Based on the above, the following hypothesis arises:

H4: Investor confidence has a statistically significant impact on bond yield movements

1.5. Stock market and bond yield

There is a close link between the stock market and the bond market, as previous research shows. Bonds affect the stock market because when bonds fall, stock prices tend to rise. The opposite happens: when bond prices rise, stock prices tend to fall. There is often some competition between bonds and stocks. Bonds are safer instruments than stocks but generally carry lower returns. Stocks tend to grow as their value increases when the economy is in a phase of expansion. When consumers buy more, companies make more money thanks to higher demand, and investors feel confident. One of the best ways to beat inflation is to sell bonds and buy stocks when the economy is growing. When the economy slows, consumers buy less, corporate profits fall, and stock prices fall.Then investors prefer regular interest payments guaranteed by bonds (Amadeo and Estevez, 2022).

Connolly, et al (2005) examine whether the time variation in changes in daily stock and bond yields can be related to measures of uncertainty in the stock market, particularly the implied volatility of stock index options and stock trading. From a forward-looking perspective, we find a negative link between uncertainty measures and the future correlation of stock and bond yields. At the same time, the authors show that bond yields tend to be high (low) relative to stock returns during the day when implied

volatility increases significantly (decreases) and during the day when stock turnover is unexpectedly high (low). The findings suggest that stock market uncertainty has an important impact on multi-market pricing and that the benefits of stock and bond diversification increase with stock market uncertainty.

Based on the above, the following hypothesis arises:

H5: The stock market has a statistically significant impact on bond yield movements

2. METHODOLOGY AND ANALYSIS

To examine what drives the bond market and what affects yields, a multiple linear regression model was developed that included several variables. Yields on German government bonds for 2, 5 and 10 years appear as dependent variables. The independent variables included in the model are confidence indices: ZEW index, Sentiyx index, Economics confidence. Then, data on inflation in the EMU, unemployment in the EMU, data on the ECB's monetary policy (Deposit facility and ECB balance sheet), the price of oil expressed in EUR and the movement of the EURO STOXX50 stock index are also included. In the first step, a descriptive analysis was performed, as shown in Table 1.

Table 1: Descriptive statistics from January 2015 until January 2022 (monthly data)

	N	Min.	Max.	Mean	Std. Deviation
10g Germany	85	-.70	.80	.05	.4071
5y	85	-.92	.13	-.40	.2567
2g	85	-.93	-.18	-.60	.1647
ZEW EMU	85	-49.50	84.00	23.59	29.7302
Inflation EMU	85	-.60	5.10	1.15	1.1553
Unemployment EMU	85	7.00	11.40	8.79	1.2566
Sentix EMU	85	-42.87	33.97	8.83	15.5094
Economic confidence	85	67.90	117.60	104.22	9.2964
Deposit facility	85	-.50	-.20	-.40	.0950
ECB balance sheet	85	2155.84	8622.58	4761.85	1751.7559

Oil in EUR	85	17.23	78.57	47.22	10.5326
EUR stock 50	85	2786.90	4298.41	3441.05	340.1951
Valid N (listwise)	85				

As can be seen, yields on German bonds had negative and positive territories, with yields at two and five years falling by as much as -0.93% while yields at ten years fell by -0.70%. The maximum yields during the observed period were 0.80% for 10 years and 0.13% and -0.18% for five and two years, respectively.

Also, data for other variables included in the analysis are presented. Based on the given data, three regression models were developed, which examined the effects on all three yields of the observed bonds (ten, five and three). In the first step, all data were included in the model, however, the results showed that there is a high degree of multicollinearity among beginners and the following variables were excluded from the analysis: ECB balance sheet, ZEW index, Economics confidence and unemployment in EMU. Other elements are retained in the analysis, ie in the model, and the following tables show the results of the research, ie regression models for examining the impact on yields of 10, 5 and 2 years in Germany. The model evaluation parameters are given in the appendix.

Table 2 shows regression analysis for 10y government bonds.

Table 2: Regression model, 10y German bond

	Parameters	Sig.	VIF
Constant (10y German)	2.299	.000	3.135
EMU Inflation	.072	.025	1.771
Sentix	.014	.000	1.725
Deposit Facility	2.280	.000	3.176
Oil	.004	.307	2.402
EUR stock 50	-.000	.000	
Dependent Variable: 10g GermanyR2 = 79,50%			
ANOVA F=61,394; Sig.= 0,00			

The regression model shows that the observed variables, namely: EMU inflation, Sentix index, deposit facility, oil price and Stoxx50 explain with 79.50% the change in

the movement of yields on ten-year German bonds. All observed regression parameters have a statistically significant effect on changes in the movement of yields of ten-year German bonds, except for oil, which has a positive effect on the movement of yield, but this effect is not statistically significant. The interest rate of the ECB deposit facility has the most pronounced positive impact. The stock index also has a statistically significant impact on the movement of ten-year bond yields.Projected 10y government German bond and realised yield is given in Figure 1.

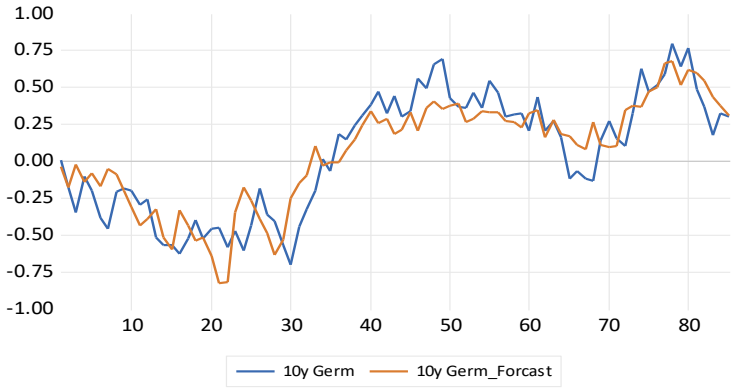


Figure 1: Projected and realised 10y German yield

The forecast of 10y German yields based on multiple linear regression that we developed in this study, shows that the model explains some trends in 10y yields movements. The results show that the analysed indicator (independent variables) explain in a quite significant level of 10y Germany yields movements.

In the next stage, we develop a linear regression model to examine the effect of observed factors on 5y Germany bonds movements. The results of the regression are given in Table 3.

Table 3: Regression model, 5y German bond

	Parameters	Sig.	VIF
Constant (5y German)	.596	.006	
EMU Inflation	.032	.186	3.135
Sentix	.005	.000	1.771
Deposit Facility	1.843	.000	1.725
Oil	.004	.161	3.176
EUR stock 50	-.000	.040	2.402
Dependent Variable: 5g GermanyR2 = 71,30%			
ANOVA F= 39,177; Sig.= 0,00			

As we can see, the observed variables: EMU inflation, Sentix index, deposit facility, oil price and Stoxx 50 explain 71.30% of the changes that occur on the yield side of five-year German bonds. The results of the regression indicate that inflation in the EMU, deposit facility, confidence index and oil prices have a positive impact on the movement of yields on five-year German bonds but stock markets have a negative bust statistical significant effect on 5y German bond yield. Inflation in EMU and oils price during the observed period has a positive impact on 5y bond yields but this effect is not statistically significant. Projected 5y government German bond and realised yield is given in Figure 2.

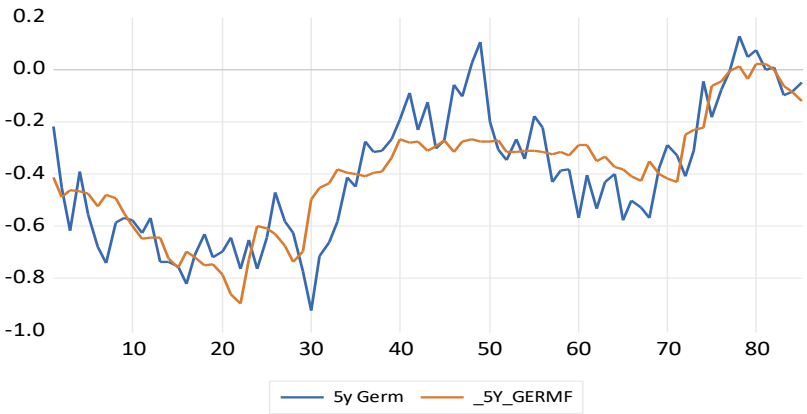


Figure 2: Projected and realised 5y German yield

The results show that the model of linear regression that forecast 5y bond yield has some value since the trend of projected yield is quite correct. We can see that the regression model, in some way, can be a good approximation for forecast 5y bond yield.

In the final step, we develop a regression model that exploresthe impact of observed variables ie EMU inflation, Sentix index, deposit facility, oil price and Stoxx 50 to 2y German bond yield. The regression model is given in Table 4.

Table 4: Regression model, 2y German bond

	Parameters	Sig.	VIF
Constant (2y German)	-.437	.002	
EMU Inflation	-.015	.323	3.135
Sentix	-.002	.037	1.771
Deposit Facility	1.543	.000	1.725
Oil	.001	.615	3.176
EUR stock 50	.000	.006	2.402
Dependent Variable: 5g Germany R2 = 70,0%			
ANOVA F=36,812; Sig.= 0,00			

The results of the regression model show that the observed variables explain 70% of the 2y yield movements. It is interesting to note that inflation in the EMU and the Sentix confidence index hurt the movement of two-year bond yields. The impact of inflation is negative but not statistically significant while the impact of the Sentix confidence index is negative and statistically significant. In this case, the ECB's monetary policy measure, the deposit facility, had a positive and statistically significant impact on the movement of German two-year bond yields.

Projected 2y government German bond and realised yield is given in Figure 3.

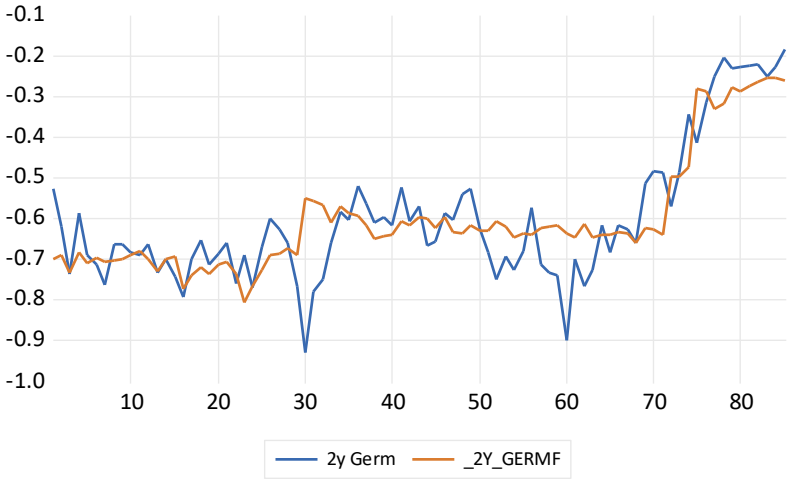


Figure 3: Projected and realised 2y German yield

DISCUSSION AND CONCLUSION

Economics indicators but also confidence indicators affect bond yields. Previous research shows that bond yields are affected by economic indicators, economic news buts also credit spread and confidence indicators. In this research we tested five hypotheses and came to a conclussion as follows:

The ECB reference interest rate has a positive effect on German government bond yields. This effect is positive and statistically significant to all observed yields ie 10y, 5y and 2y German bond. In this sense the first hypothesis is correct.

The regression results show that inflation has a positive impact on 10y bond yield but on 5y and 2y yields, the effect is not significant. Inflation has a positive but statistically insignificant effect on 5y yield, but a negative and statistically insignificant effect on 2y yield. In this sense, we can confirm that inflation has a positive effect on long term yields but in the medium and shorter-term this effect is not significant. So we rejected the hypothesis that inflation always has a positive effect on bond yield. The inflation impact depends on bond duration.

Previous research has shown that oil price has a significant and positive impact on bond yield. The results of this research show that oil price has a positive but statistically insignificant effect on bond yield. The results are quite the same for all observed yields ie 2y, 5y and 10y. In this sense, we reject the hypothesis and conclude that oil prices during the observed period (from January 2015 until January od 2022) did not have a significant effect on bond yield.

During the last 20y investor confidence become more interesting in the financial market and also the bond market. The results of this research show that confidence which was measured by the Sentix index has a positive and statistically significant effect of 5y and 10y yield, but a negative and statistically significant effect on 2y bond yields. We can conclude that confidence is an important factor in driving bond yield, but its effect is not always positive. So, we conclude that confidence has an effect ie a statistically significant effect on bond yiled and we accept the given hypothesis.

Stock market and bond market are probably the main parts of financial markets. We tested is there a significant effect stock market on bond yields during the observed period.

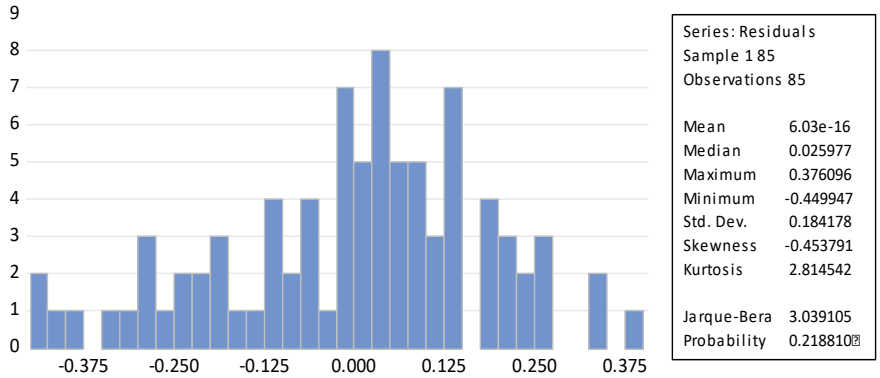
Considering the regression results we can conclude that the stock market has a statistically significant effect on bond yield for all periods (2y,5y and 10y) and we accept the given hypothesis.

Yields on government bonds are strongly influenced by numerous macro data, but also trust data, which is also shown in this research. It is clear that the factors analyzed in this research (inflation, monetary policy measures, stock market, oil and confidence) have a greater or lesser impact on yield trends and should certainly always be monitored when analyzing yields. However, it is noted that the observed factors will not always have the same impact. Macroeconomic factors, especially inflation, have different effects on longer and shorter yields. Statistically significant impact on all yields, regardless of whether they are biennial, five-year or ten-year, has monetary policy measures observed through the deposit facility, confidence index and stock market.

APPENDIX

Regression model, tested (10y yields)

Data normality: Jarque-Bera measurements:



Since we have p-value= 0,218810 >0,05, we condule that ata are normaly distributet.

The issue of serial correlation was eliminated by applying a VIF index is not higher than 5 considering any variables (See Table 2)

Heresodesity was measured by the Harvey test, as shown by the following result. The result shows that there is no homoskedasticity, and this assumption of regression is fulfilled.

Heteroskedasticity Test: Harvey
Null hypothesis: Homoskedasticity

F-statistic	0.690977	Prob. F(5,79)	0.6317
Obs*R-squared	3.561525	Prob. Chi-Square(5)	0.6141
Scaled explained SS	4.289536	Prob. Chi-Square(5)	0.5085

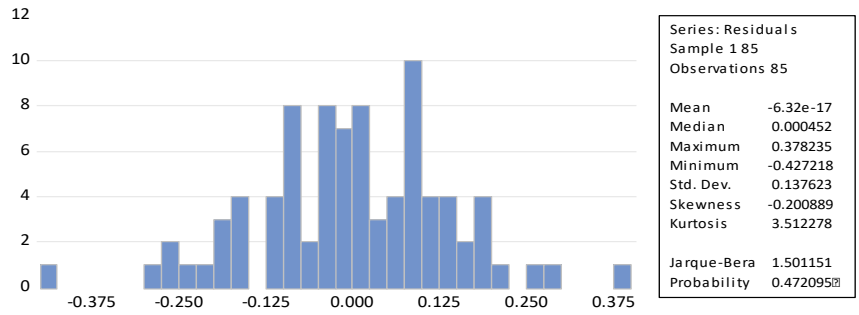
Test Equation:
Dependent Variable: LRESID2
Method: Least Squares
Date: 02/26/22 Time: 09:11
Sample: 1 85
Included observations: 85

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.693559	3.687135	-1.544169	0.1265
DEPOSIT FACILITY	-5.571642	3.734245	-1.492040	0.1397
EMU INFLATION	-0.358078	0.413873	-0.865187	0.3896
EUR STOCK 50	-0.000677	0.001230	-0.550281	0.5837
OIL IN EUR	0.028447	0.045695	0.622535	0.5354
SENTIX EMU	1.67E-05	0.023176	0.000723	0.9994

R-squared	0.041900	Mean dependent var	-4.838014
Adjusted R-squared	-0.018739	S.D. dependent var	2.452403
S.E. of regression	2.475274	Akaike info criterion	4.718553
Sum squared resid	484.0316	Schwarz criterion	4.890975
Log likelihood	-194.5385	Hannan-Quinn criter.	4.787906
F-statistic	0.690977	Durbin-Watson stat	1.923762
Prob(F-statistic)	0.631728		

Regression model, tested (5y yields)

Data normality: Jarque-Bera measurements:



Since we have p-value= 0,472095>0,05, we condule that data are normaly distributet.

The issue of serial correlation was eliminated by applying a VIF index that is not higher than in any of the variables 5 (See Table 3)

Heresodesity was measured by the Harvey test, as shown by the following result. The result shows that there is no homoskedasticity, and this assumption of regression is fulfilled.

Heteroskedasticity Test: Harvey
Null hypothesis: Homoskedasticity

F-statistic	1.477130	Prob. F(5,79)	0.2067
Obs*R-squared	7.267180	Prob. Chi-Square(5)	0.2015
Scaled explained SS	9.693688	Prob. Chi-Square(5)	0.0844

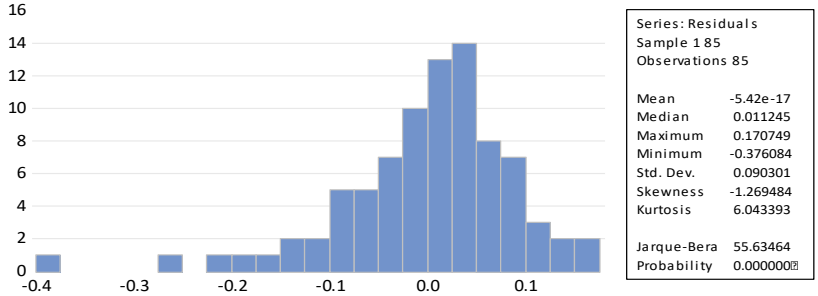
Test Equation:
Dependent Variable: LRESID2
Method: Least Squares
Date: 02/26/22 Time: 09:34
Sample: 1 85
Included observations: 85

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.974476	3.790974	-0.257052	0.7978
DEPOSIT_FACILITY	-5.066372	3.839411	-1.319570	0.1908
EMU_INFLATION	0.544428	0.425529	1.279415	0.2045
EUR_STOCK_50	-0.002085	0.001265	-1.648443	0.1032
OIL_IN_EUR	-0.000857	0.046982	-0.018237	0.9855
SENTIX_EMU	0.006475	0.023828	0.271751	0.7865

R-squared	0.085496	Mean dependent var	-5.454211
Adjusted R-squared	0.027616	S.D. dependent var	2.580871
S.E. of regression	2.544984	Akaike info criterion	4.774099
Sum squared resid	511.6786	Schwarz criterion	4.946521
Log likelihood	-196.8992	Hannan-Quinn criter.	4.843452
F-statistic	1.477130	Durbin-Watson stat	1.854853
Prob(F-statistic)	0.206705		

Regression model, tested (2y yields)

Data normality: Jarque-Bera measurements:



Since we have p-value= 0,0000 <0,05, we condule that data are not normaly distributet.

The issue of serial correlation was eliminated by applying a VIF index that is not higher than in any of the variables 5 (See Table 4)

Heresodesity was measured by the Harvey test, as shown by the following result. The result shows that there is no homoskedasticity, and this assumption of regression is fulfilled.

Heteroskedasticity Test: Harvey
Null hypothesis: Homoskedasticity

F-statistic	0.727755	Prob. F(5,79)	0.6047
Obs*R-squared	3.742747	Prob. Chi-Square(5)	0.5870
Scaled explained SS	4.084549	Prob. Chi-Square(5)	0.5373

Test Equation:
Dependent Variable: LRESID2
Method: Least Squares
Date: 02/26/22 Time: 09:36
Sample: 1 85
Included observations: 85

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.008453	3.505863	-0.572884	0.5684
DEPOSIT_FACILITY	5.292894	3.550657	1.490680	0.1400
EMU_INFLATION	0.407969	0.393526	1.036702	0.3030
EUR_STOCK_50	-0.000920	0.001170	-0.786181	0.4341
OIL_IN_EUR	0.010412	0.043449	0.239645	0.8112
SENTIX_EMU	-0.011480	0.022036	-0.520957	0.6039

R-squared	0.044032	Mean dependent var	-6.453997
Adjusted R-squared	-0.016472	S.D. dependent var	2.334433
S.E. of regression	2.353581	Akaike info criterion	4.617726
Sum squared resid	437.6082	Schwarz criterion	4.790149
Log likelihood	-190.2534	Hannan-Quinn criter.	4.687079
F-statistic	0.727755	Durbin-Watson stat	1.715645
Prob(F-statistic)	0.604674		

BIBLIOGRAPHY

1. Amadeo, K., Estevez, E., (2022): How Bonds Affect the Stock Market, The balanse, available: https://www.thebalance.com/how-bonds-affect-the-stock-market-3305603
2. Arshada, H., Mudab, R., & Ismah, O. (2018). Impact of exchange rate and oil price on the yield of sovereign bond and sukuk: Evidence from Malaysian capital market. Journal of Emerging Economies & Islamic Research, 5(4), 27–41. https://doi.org/10.24191/jeeir.v5i4.8834

3. Brown, G.W. and Cliff, M.T., 2004. Investor Sentiment and the Near-Term Stock Market. Journal of Empirical Finance, 11(1), pp.1-27
4. Chung, S.L., Hung, C.H. and Yeh, C.Y., 2012. When Does Investor Sentiment Predict Stock Returns? Journal of Empirical Finance, 19(2), pp.217-240
5. Connolly, R., Stivers, C., Sun, L., (2005): Stock Market Uncertainty and the Stock-Bond Return Relation, The Journal of Financial and Quantitative Analysis Vol. 40, No. 1 (Mar., 2005), pp. 161-194 (34 pages)
6. Daniel, K. and Titman, S., 1997. Evidence on the Characteristics of Cross Sectional Variadtion in Stock Returns. The Journal of Finance, 52(1), pp.1-33
7. Fabozzi, F. J. (2016). Bond markets, analysis, and strategies (9th ed.). Pearson Education.
8. Gagnon, J., Jeanne, O., (2020): 20-2 Central Bank Policy Sets the Lower Bound on Bond Yields, Peterson Institution for international economics,
9. Hsing, Y., & Hsieh, W. (2012). Impacts of macroeconomic variables on the stock market index in Poland: New Evidence. Journal of Business Economics and Management, 13(2), 334–343. https://doi.org/10.3846/16111699.2011.620133
10. Hsing, Y., (2015): Determinants of the Government Bond Yield in Spain: A Loanable Funds Model, Int. J. Financial Stud. 2015, 3, 342-350; doi:10.3390/ijfs3030342
11. Khan, M. K., Teng, J. Z., & Khan, M. I. (2019). Asymmetric impact of oil prices on stock returns in Shanghai stock exchange: Evidence from asymmetric ARDL model. PLoS ONE, 14(6), 1–14. https://doi.org/10.1371/journal.pone.0218289
12. Paramita, R. P., & Pangestuti, I. R. D. (2016). Determinan yield obligasi pemerintah tenor 5 tahun dengan menggunakan model EGARCH di Indonesia, Malaysia, Thailand dan Filipina. Diponegoro Journal of Management, 5(3), 1–14
13. Shiller, R.J., 1981. Do Stock Prices Move Too Much To Be Justified By Subsequent Changes In Dividends? American Economic Review. Vol. 71, pp.421-436
14. Sihombing, P., Siregar, H., Manurung, A., & Santosa, P. W. (2014). Determinants of the Indonesia government yield curve. International Journal of Information Technology and Business Management, 25(1), 22–35. https://www.jitbm.com/jitbmvolume25
15. Siklos, P. L. (2011). Emerging market yield spreads: Domestic, external determinants, and volatility spillovers. Global Finance Journal, 22(2), 83–100. https://doi.org/10.1016/j.gfj.2011.10.00

16. Sundoro, H. S. (2018). Pengaruh faktor makro ekonomi, faktor likuiditas dan faktor eksternal terhadap yield obligasi pemerintah Indonesia. Journal of Business & Applied Management, 11(1), 102–115. https://doi.org/10.30813/jbam.v11i1.1072
17. Tjandrasa, B. B. (2017). The effect of consumer expectation index, economic condition index and crude oil price on Indonesian government bond yield. Journal of Economics, Business & Accountancy Ventura, 20(1), 1–12
18. Wang, Y.H., Keswani, A. and Taylor, S.J., 2006. The Relationships between Sentiment, Returns and Volatility. International Journal of Fore casting, 22(1), pp.109-123
19. Yusuf, A., Prasetyo, A, D., (2019): The effect of inflation, US bond yield, and exchange rate on Indonesia bond yield, Jurnal Perspektif Pembiayaan dan Pembangunan Daerah Vol. 6. No. 6, May - June 2019