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Article

Investor sentiment and Euro area ETFs: an empirical analysis of consumer behaviour

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Abstract. The goal of this article is to study the relationship between investor sentiment and Euro area Exchange Traded Funds (ETFs), providing insights into the dynamics of market behaviour and the impact of consumer behaviour on investment patterns within the Eurozone. This paper has employed panel data analysis, correlation analysis, regression analysis, and the Granger causality test to investigate the relationship between ETFs and the consumer confidence index (CCI). Results suggest that CCI significantly negatively affects ETF pricing. While a weak positive correlation and regression relationship between iShares MSCI Eurozone ETF prices and CCI 19 Euro area markets have been found, the Granger causality test did not provide evidence of a causal relationship between the two variables. Other factors, such as financial stability, government regulations, and market-specific factors, may also affect ETF prices. The study concludes that, while CCI may be important, it should not be the only factor considered.

Keywords: markets; Euro area; confidence index; behavioural finance; European Exchange Traded Fund.
JEL classification: E22; G14

1. Introduction

The Exchange Traded Fund (ETF) is a popular investment vehicle (open-end investment fund traded on the stock exchange) with the main purpose of serving as a proxy for a reference index (benchmark), and its performance is usually measured through a comparison with the underline benchmark's performance (Henriques et al., 2022). ETF includes all securities (usually stocks or bonds) that make up an index. However, there are a few ETFs that track indices using derivatives. The main benefit of ETFs is the opportunity to get exposure to a basket of different securities, such as stocks, bonds, and cryptocurrencies, without having to deal with information costs, transaction costs, or regulatory differences. Marta and Riva (2022) explain the incredible success of ETFs in the investment industry through their advantages relating to diversification, transparency, tax efficiency, management fees, and liquidity.

In this paper, the authors specifically investigate only stock ETFs for several reasons. ETFs are a convenient way to assess the overall performance of a particular market since they represent a

basket of different securities. Limiting the choice of ETFs to specific markets enables better isolation of consumer confidence effects. Having in mind that the ETFs in question are market-specific, i.e., ETFs are composed of companies' stocks within a certain market, they are more sensitive to consumer confidence within the country's market. Finally, stock ETFs are the most popular kind of ETF, as they are highly available to different types of investors all around the globe and are publicly traded on the main platforms.

Exchange-traded funds have already transformed from a quite unfamiliar investment instrument at the beginning of 2000 to a traditional structured security with trillions of dollars in value twenty years later. According to data from ETFGI (2023), the global ETF market has $9.6 trillion worth of assets. It has been constantly growing since 2000 (except for 2018 and 2022), with an annual growth rate of ca. 17% over the last 13 years. In 2017, the rate of growth hit a record of 38% per year. However, in 2021, the total value of the global ETF market has dropped by 10%, from $10 trillion to $9 trillion. In 2023, the global market has witnessed a growth of 6.5%. It is essential to note that the USA accounts for the dominant share of the global ETF market. As of 2023, the US market has the largest share (ca. 70%) in global ETFs, accounting for $6.765 trillion, while the European ETF market accounts only for $1.454 trillion (ca. 15%). More detailed information on the ETF values' dynamics for different regions can be found in Appendix A.

The second independent variable in this analysis is the consumer confidence index (CCI), which is a generally available and widely used index that tracks consumers' expectations of the economy and finance. The version of the CCI applied in the paper has been developed by the Organisation for Economic Cooperation and Development (OECD). The OECD (2023) indicates that the CCI is a tool used to forecast the future trends of households' consumption and saving habits. It is based on households' responses related to their financial situation, economic sentiment, unemployment, and savings potential. If the index value is over 100, it means that consumers have a positive outlook towards the future economy, which may lead to increased spending on major purchases in the coming year. Contrary to that, if the value is below 100, consumers may be pessimistic about the economy, resulting in a higher tendency to save and a lower willingness to consume.

Zurowska (2022) suggests that the increasing attractiveness of ETFs for investors can be explained through instant (i.e., intraday) liquidity as well as a convenient tool for hedging and speculative trading. Among other benefits of ETF investing, Cumming and Monteiro (2023) argue that an ETF is a liquid and diversified investment that could be tailored to an investment strategy. Henriques et al. (2022) ground the growing interest in ETFs on the opportunities for better portfolio diversification and the convenience of trading individual stocks. However, the specified benefits of ETFs require further research since the global financial markets transform and face new challenges. Despite all the opportunities, ETFs may have their dark side. As Singh (2022) puts forward, cryptocurrency ETFs might be fraught with misleading, opaque structures and eccentric risk and performance reporting frameworks. Li and Zhu (2022) point out that one of the main ETF drawbacks is the transmission mechanism of non-fundamental demand shocks to the index components. Brown et al. (2021) also emphasise the significant impact of non-fundamental shocks on ETFs. Moreover, due to the spillover effects, underlying stocks may also face increased volatility.

Since the authors of the paper investigate the relationship between ETFs and investor

sentiment, it is necessary to outline the basics of the investor sentiment concept. According to the effective market hypothesis and random walk theory (Malkiel & Fama, 1970; Fama, 1965), employed by the traditional approach to studying finance, there are no opportunities for investors to use all publicly available information to discover securities with excess returns. Although the traditional approach has failed to explain variations in stock returns from the fundamental factors' positions. The same pertains to ETFs' pricing specifics (Hong et al., 2022). On the other hand, from a behavioural finance perspective, investors' opinions in the form of sentiment can impact asset returns. Therefore, investor sentiment is one of the main research topics in behavioural finance, and there is a large strand of literature covering the investors' sentiment impact on global markets (Akçay, 2022; Loang, 2022; Vuong & Suzuki, 2022).

In simple terms, investor sentiment is the anticipation of securities prices by an investor. Investor sentiment can also be presented in the form of factors that impact investors' decisions and drive stock prices away from their fundamental values (Piccoli & Chaudhury, 2018; Loang, 2022; Liepert, 2024). However, the concept of investor sentiment is quite complex and elusive in nature, and it is possible to outline two main reasons for understanding investor sentiment. Firstly, sentiment can drive prices away from underlying fundamentals, making it important for investment managers to monitor their portfolios for changes in sentiment (Ahmed, 2020). Investor sentiment can cause deviations in securities' prices from their intrinsic values and promote ineffective pricing mechanisms in the market (De Long et al., 1990). Vuong and Suzuki (2022) emphasise that many scientists have questioned and investigated how investor sentiment impacts securities returns, with some researchers arguing that investor sentiment has a significant impact on stock returns while others consider this relationship to be negligible. Moreover, investor sentiment may cause significant spillover effects that can quickly spread throughout the market, impacting investor risk aversion and portfolio selection regardless of fundamental value (Ahmed, 2020). Therefore, investment sentiment presents a challenge not only for academics and practitioners but has become an important indicator for policymakers to follow trends that might disrupt the normal course of financial market development.

Examining the association between investor sentiment, as shown by the CCI and the European ETF price is the primary goal of the research. The principal aim of this study is to examine if consumer confidence levels in the Euro area markets influence market-specific ETF pricing. The paper investigated two hypotheses. The main hypothesis suggests a significant relationship exists between consumer confidence levels in the Euro area markets and the pricing of EA market-specific ETFs. The sub-hypothesis focuses specifically on the iShares MSCI Eurozone ETF and the impact of CCI 19 Euro area markets (EA19) on its pricing.

2. Literature Review

The literature review section analyses three sets of papers that discuss various topics related to this research. The first set of papers explores the impact of consumer confidence on stock valuation. These papers can be divided into two groups based on their arguments. The first group presents arguments supporting the idea that consumer confidence affects stock prices. For instance, Hsu et al.

(2011) conducted a study investigating investor sentiment developments in stock markets. The researchers found a two-way causal relationship between consumer confidence and the stock market, indicating that changes in stock returns impact changes in consumer confidence, and vice versa. The authors suggest that stock returns can act as leading indicators of future economic development, influencing investors' behaviour. They also propose that consumer confidence is a useful tool for predicting stock returns, especially for small-cap stocks.

In contrast to that, the second group of papers, which focuses on the relationship between ETFs and investor sentiment, provides opposing arguments, suggesting that there is no significant positive correlation between consumer confidence and stocks. Bremmer (2008) examined the relationship between consumer confidence and stock prices and found that while stock prices impact consumer confidence in the short run, there is no long-run relationship between the two. The author also identified that unexpected changes in consumer confidence have a direct relationship with stock prices, while expected changes have no effect. These findings deviate from previous studies and complement the efficient market hypothesis (Malkiel & Fama, 1970).

Unlike the first set, this set presents quite consistent opinions, suggesting that consumer confidence has an impact on ETF performance. Ben-David et al. (2023) investigated exchange-traded funds and their performance over time. The scientists found that basic, inclusive ETFs are associated with low-cost diversification, while specialised ETFs that follow popular investment trends often include overvalued stocks and, therefore, perform poorly. The authors suggest that the underperformance of specialised ETFs is caused by providers targeting investors' overoptimistic beliefs by launching ETFs after the peak of excitement around popular investment lines. The conclusion is that investor sentiment may be positively correlated with specialised ETFs' pricing.

Tseng and Lee (2016) explored the features of the ETF market in Asia and examined the relationship between investor sentiment, ETF liquidity, and each other. The researchers employed the Generalised Autoregressive Conditional Heteroscedastic (GARCH) model to analyse ETFs from different Asian markets. The authors found that investor sentiment has a significant impact on ETF liquidity. Notably, trading volume and investor sentiment were identified as significant factors for ETF liquidity. This finding emphasises the importance of considering investor sentiment when making investment decisions and adjusting investment portfolios using ETFs.

Several other studies in this set also support the idea that investor sentiment, as measured by consumer confidence, influences ETF performance. Ma et al. (2018) examined the relationship between market sentiment and the price deviations of Asian ETFs from their underlying fundamentals. The researchers confirmed that investor overreaction may cause ETF prices to deviate from their intrinsic value, with sentiment playing a significant role. Bahadar et al. (2019) demonstrated the significance of the behavioural approach in understanding the peculiarities of ETF trading. The authors found strong herding behaviour among investors in the leveraged exchange-traded funds (LETFs) market, particularly during bear markets and the global financial crisis.

The third set of literature focuses on the ETF markets in Europe. Yiannaki (2015) concludes that European ETFs closely track their benchmarks without significant deviation. Feder-Sempach and Miziołek (2023) support this conclusion and demonstrate that tracking errors in European ETFs are generally low. However, Zawadzki (2020) presents contrasting arguments, analysing the performance of iShares ETFs in relation to their specific benchmarks. The author finds that ETFs do

not consistently follow the performance of their benchmarks, and the level of discrepancies varies across different regions and markets.

3. Materials and Methods

In this study, the authors have performed several methods of data analysis to investigate the relationship between the ETFs and the CCI in the Euro area. The first method employed in the paper is panel data analysis, a widely used approach in empirical research to investigate the impact of independent variables over time. Panel data regression models are useful for examining correlations between variables in situations where the data contains both a cross-sectional and a time-series component. By taking into consideration the temporal dynamics within each market, this method enables the researchers to account for potential variability across the various markets. The panel data model includes 7 Euro area developed markets such as Austria, Belgium, France, Germany, Italy, the Netherlands, and Spain. The analysis of this study covers the time period from March 1st, 2015, to March 1st, 2023. This time period has been chosen to capture the recent trends in the economic development of the markets in question. It allows for the model to examine the relationship between the ETFs and CCI over a dynamic time frame that may provide new insights into significant trends in the data.

This panel model uses data on specific ETFs' prices for each market. The prices of the following ETFs have been used in the model: iShares ATX UCITS ETF (DE) (EX01) for Austria, Lyxor UCITS BEL 20 TR (BEL) for Belgium, iShares Core DAX® UCITS ETF (DE) EUR (Acc) (GDAXIEX) for Germany, Accion IBEX 35 Cotizado Armonizado FI (BBVAI) for Spain, Lyxor UCITS CAC 40 (DR) D-EUR (CAC) for France, Lyxor UCITS FTSE MIB (ETFMIB) for Italy, iShares AEX UCITS (IAEX) for the Netherlands. These models offer thorough historical pricing data for their exchange-traded funds, which helped the researchers gather a large dataset encompassing the markets of interest in the Euro area. The independent variable in the model is the CCI value for each of the seven markets that have been extracted from the OECD database. The OECD is a well-established international organisation that collects and publishes a wide range of economic and social indicators, including the CCI, which is a widely recognised measure of consumer sentiment. The study guarantees the accuracy and legitimacy of the data utilised in the analysis by utilising these reputable data sources. The values for ETF price dynamics and CCI dynamics for each market can be found in Appendix B and Appendix C.

After conducting the panel data analysis, the authors of this study have decided to look at the hypothesis from another perspective and investigate the relationship between the iShares MSCI Eurozone ETF and the CCI EA19, employing additional methods such as correlation analysis, regression analysis, and the Granger causality test. Time series plots for both iShares MSCI Eurozone ETF prices and values of CCI EA19 can be found in Appendix D and Appendix E. Correlation analysis has been used to explore the linear association and measure the strength and direction of the relationship between the two variables. This type of analysis is useful for understanding the extent to which the ETF and CCI are related and identifying any potential patterns in their relationship. Regression analysis has been performed to estimate the impact of CCI on the iShares MSCI Eurozone ETF. Regression analysis helps to better understand the extent to which the CCI might affect the

iShares MSCI Eurozone ETF. Finally, Granger causality tests have been performed to investigate the direction of causality between the ETF and the CCI. Granger causality tests are common means of data investigation that help determine whether the CCI causes changes in the iShares ETF or vice versa. The combination of econometric methods in question should help explore the nature of the relationship between consumer confidence and ETF pricing in the markets of the Euro area in a comprehensive and robust manner.

It is necessary to note that the methods employed in this paper have several limitations. The authors only investigate the relationship between CCI and ETF in the Euro area markets, limiting the paper's findings only to one region. Also, the researchers only consider stock ETFs, ignoring other types of ETFs such as bond, commodity, or currency ETFs, which may behave differently in terms of consumer confidence. In addition, a single independent variable is employed, the consumer confidence index, to explain the pricing of ETFs, while other factors that may affect ETF pricing, such as interest rates, macroeconomic indicators, or political events, are omitted. Finally, the time period may also limit the generalisability of the findings, as it only covers a specific period, not considering trends or cyclical patterns for the longer time period.

4. Results

4.1 Comprehensive analysis of the relationship between investor sentiment and European ETF pricing

The study has employed a random effects panel regression with ETF Prices as the dependent variable and CCI Values as the independent variable. This sample comprises seven markets (Austria, Belgium, France, Germany, Italy, the Netherlands, and Spain) and 678 observations. The following scatterplot demonstrates the relationship between the ETF price and the CCI value for each market (Table 1, Figure 1).

Table 1. Panel data analysis results.

	Dependent variable:	
	ETF_Price	
	Model 1	**Model 2**
CCI_Value	-0.491*** (0.18)	-0.49*** (0.18)
Constant		97.027*** (22.343)
Observations	678	678
R2	0.011	0.011
Adjusted R2	0.001	0.009
F Statistic	7.451*** (df=1; 670)	7.452***

Note: *p<0.1; **p<0.05; ***p<0.01. *Source*: compiled by the authors.

Figure 1. The ETFs prices and CCI values for 7 countries. *Source:* compiled by the authors.

The results of the test demonstrate that consumer confidence has a significant negative effect on ETF pricing. Model 1 and Model 2 show that for every one-unit increase in the CCI value, the ETF price decreases by approximately 0.491 units. This result may have important implications for investors who wish to trade ETFs. A higher level of consumer confidence might suggest that the market is overpriced, and a market correction may occur soon. As a result, investors may think about decreasing their exposure to ETF holdings in their investment portfolios under such circumstances. The standard errors are the same for both models, and the p-values show the coefficients' statistical significance level. The constant term is also statistically significant in Model 2, indicating that there are other factors besides CCI that affect ETF prices. The R-squared values are low, indicating that levels of consumer confidence explain only a small portion of the variation in ETF prices. This leads to the conclusion that there should be other factors that may influence ETF prices, such as financial stability, government regulations, political instability, or other market developments. It should be noted that these factors may be market-specific. In general, these results imply that consumer confidence might be an important factor to consider when analysing Euro area ETFs' pricing, but it should not be the only factor considered. For example, investors should be aware of political and economic developments in each market that may affect ETF prices. By considering both the market's consumer confidence and market-specific factors, investors can make more informed decisions and potentially improve their investment performance (Tkachenko et al., 2023; Shubalyi, 2023).

The impact of investor emotion on investment choices is one possible reason for this inverse relationship. A low level of consumer confidence may be an indication of greater economic uncertainty and household despair. Investors may adopt a more risk-averse strategy as a result of this mindset, and they may be more likely to shift their holdings away from riskier assets like equities

and ETFs and towards safer alternatives. The peculiarities of exchange-traded funds may also exacerbate the detrimental impact of customer confidence on ETF pricing. ETFs are frequently utilised by investors as a practical and affordable means of obtaining broad market exposure. The demand for ETFs that track certain sectors or the overall market may decline as consumer confidence declines, indicating a more pessimistic shift in investor sentiment and consequent pressure on ETF prices.

It is noteworthy that the findings of the panel data analysis show that the CCI only partially explains the volatility in ETF prices, indicating that other factors are probably more essential in determining how well ETFs perform. The pricing of ETFs in the Euro area markets may be influenced by regulatory changes, industry-specific dynamics, macroeconomic conditions, and other investor-related variables.

The study proceeds by examining the link between the iShares MSCI Eurozone ETF and the CCI EA19. It further employs various techniques, including correlation analysis, regression analysis, and the Granger causality test, to investigate this relationship (Table 2).

Table 2. Correlation analysis matrix

	ETF_Price	**CCI_Value**
ETF_Price	1.0000000	0.2232225
CCI_Value	0.2232225	1.0000000

Source: compiled by the authors.

A correlation coefficient of 0.223 indicates a weak positive correlation between the iShares MSCI Eurozone ETF prices and the CCI. It implies that there is a tendency for the two variables to increase or decrease together, but the strength of this relationship is relatively weak. This weak correlation may be attributed to other economic and/or financial causes that may affect this specific ETF price or to the possibility of reverse causality. Although the positive correlation indicates that slight gains in the price of the Eurozone ETF may be linked to improvements in overall consumer sentiment, the relationship's limited strength emphasises the significance of a more comprehensive approach to ETF dynamics analysis. Further research is required to investigate these factors and their potential impact on ETF investments. In general, changes in consumer confidence levels could influence investment decisions related to iShares ETFs to some extent, but it is important to consider other factors as well to make effective investment decisions (Figure 2).

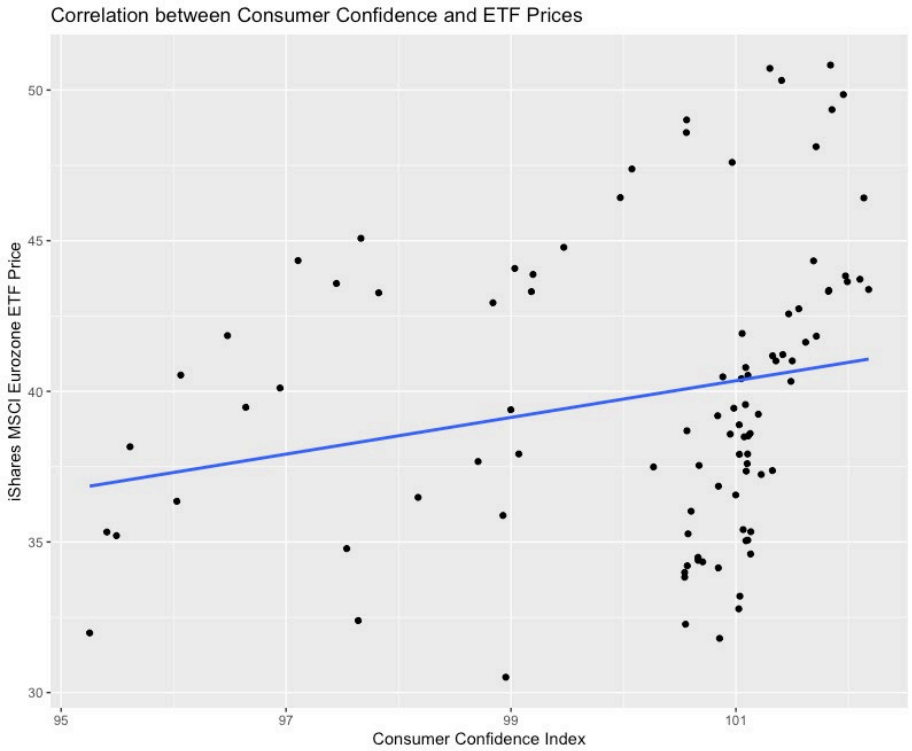

Figure 2. Correlation between CCI EA19 and iShares MSCI Eurozone ETF. *Source:* compiled by the authors.

The conclusions from the correlation study are supported by the scatterplot in Figure 2, which shows the linear relationship between the two variables graphically. There is observable dispersion and a lack of tight clustering around the fitted line, which highlights the relatively weak correlation further in the scatter of data points surrounding the regression line.

There are several potential reasons for the observed weak correlation. In the context of the European ETF market, the CCI could not be a comprehensive enough indicator of investor mood. The CCI is intended to represent household spending intentions and the overall economic outlook, but it might not accurately represent the nuanced behavioural patterns and complicated motivations of the wide range of investors taking part in the Eurozone ETF market. ETF trading is frequently heavily impacted by institutional investors, such as asset managers and pension funds, whose choices on what to buy may be influenced by more than just market mood. The member nations of the Euro area have differing degrees of political stability, economic development, and financial market maturity. The CCI data's aggregation to the Eurozone level might ignore significant country-specific variations in how investor sentiment influences the ETF price. Another possible explanation for the weak correlation could be the averaging out of these processes at the national level. The possible temporal lags and indirect impacts in the relationship between consumer confidence and ETF performance must also be taken into account. ETF price changes may not reflect shifts in consumer mood right away because it can take time for investors to modify their trading plans and portfolios.

By quantifying the possible effects of changes in the CCI EA19 on the iShares MSCI Eurozone ETF's price in this subsection, the authors aim to provide additional insights into the dynamics of the relationship between investor mood and this important European exchange-traded fund. Regression analysis enables a more comprehensive examination of data, including the strength and direction of the relationship and accounting for other potential factors that may have an impact. Regression

analysis may provide more insight into the factors that affect ETF prices and guide more effective investment decisions. The results of the test are exhibited in Table 3 and Figure 3.

Table 3. Regression analysis matrix

Residuals				
Min	**1Q**	**Median**	**3Q**	**Max**
-8.5953	-3.2488	-0.8432	2.8852	10.1847
Coefficients				
	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**
(Intercept)	-21.163	27.3437	-0.774	0.441
CCI_EA19_Value	0.6091	0.2729	2.232	0.028*

Note: Residual standard error: 4.746 on 95 degrees of freedom; Multiple R-squared: 0.04983, Adjusted R-squared: 0.03983; F-statistic: 4.982 on 1 and 95 DF, *p-value: 0.02796. *Source:* compiled by the authors.

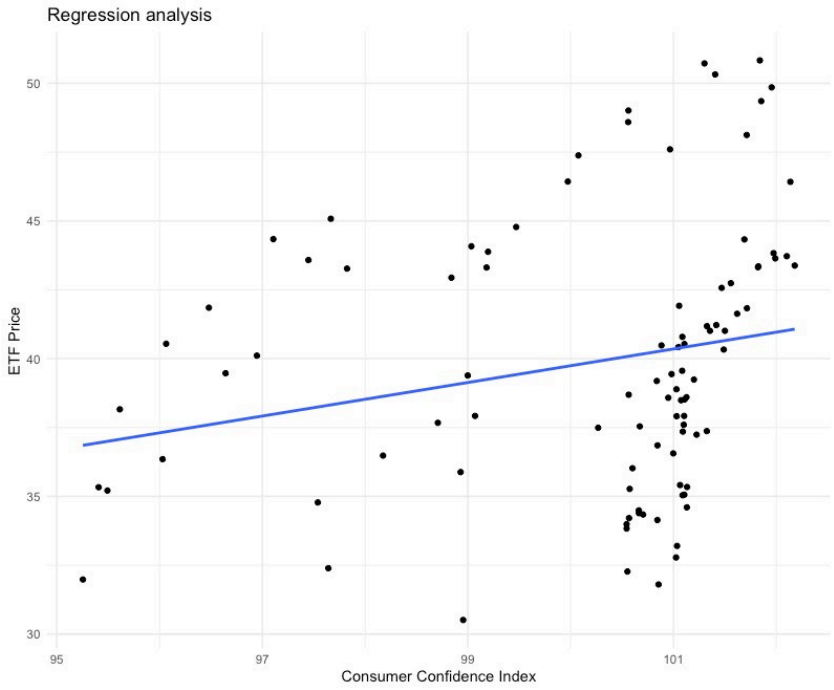

Figure 3. Regression between CCI EA19 and iShares MSCI Eurozone ETF. *Source:* compiled by the authors.

The intercept term in the model represents the expected value of the dependent variable (iShares MSCI Eurozone ETF prices) when the independent variable (CCI) is equal to zero, which is not a realistic scenario, and therefore this result does not have any practical significance. The coefficient of the independent variable (CCI_EA19_Value) suggests that for each unit increase in the CCI, the iShares MSCI Eurozone ETF prices are expected, ceteris paribus, to increase by 0.6091 units. The p-value associated with the independent variable is less than the significance level of 0.05, indicating that there is a significant relationship between the two variables. Even though the intercept coefficient is statistically significant, it is relatively small and implies a weak positive relationship between the two variables. In addition, the adjusted R-squared value demonstrates that only about 3.98% of the variation in iShares MSCI Eurozone ETF prices can be explained by changes in the

consumer confidence index. This relatively weak explanatory power of the CCI may be attributed to the complex and multifaceted nature of the factors influencing ETF pricing in the Euro area. In general, while the results of the regression analysis provide some insight into the relationship between the CCI and iShares MSCI Eurozone ETF prices, they do not paint a clear picture of all the factors that might affect ETF prices. Therefore, it is necessary to explore other factors that might impact the prices of the iShares MSCI Eurozone ETF in addition to the CCI for more comprehensive guidance for investment decisions related to Euro area ETFs.

The Granger causality test results demonstrate no evidence of Granger causality between the iShares MSCI Eurozone ETF prices (Value.x) and the CCI (Value.y). In the first model, which tests whether lagged values of both variables can predict changes in Value.x, the p-value is greater than 0.05, which means one cannot reject the null hypothesis that lagged values of Value.y do not Granger-cause Value.x (Table 4).

Table 4. Granger causality test results

Model	Res. Df	Df	F	PR(>F)
Value.x does Granger Cause Value.y	94	1	0.337	0.563
Value.y does Granger Cause Value.x	94	1	0.001	0.97

Source: compiled by the authors.

Similarly, in the second model, which tests whether lagged values of both variables can predict changes in Value.y, the p-value is greater than 0.05, which means one cannot reject the null hypothesis that lagged values of Value.x do not Granger-cause Value.y. Therefore, based on the Granger causality test results, it may not be concluded that changes in the Euro area markets' consumer confidence influence the iShares MSCI Eurozone ETF prices. Granger causality's absence indicates that a complex network of interrelated factors is likely influencing the relationship between these variables rather than a straightforward, unidirectional one. In addition, it is important to note that the results of the Granger causality test complement the results of the previous tests and, therefore, help come to quite convincing conclusions on the hypothesis.

4.2 The impact of the external factors and behavioural patterns of investors in the Euro area

As was previously indicated, various external factors can have a substantial impact on the relationship between consumer confidence and ETF pricing in the Euro region. Establishing a stable and consistent relationship between investor sentiment and ETF performance might be difficult due to the potential breaks or shifts in the dynamics caused by them. For example, consumer confidence can be significantly impacted by global events. Increased geopolitical tensions, unstable political environments, or significant international conflicts might reduce investor and household optimism, which can lower the consumer confidence index (Kudrina & Ivchenko, 2023). Equity-based ETFs may see a decline as a result of this shift in attitude, which may also cause a flight to safety and heightened risk aversion.

In a similar way, the relationship between the CCI and ETF performance in the Euro region can also be influenced by broader global economic trends. Prolonged periods of robust economic expansion and growth in large economies, like the US or China, can positively influence consumer confidence and investor attitudes within the Eurozone. The demand for ETFs based in the Eurozone may rise as a result, which might reinforce the favourable relationship between ETF prices and the CCI. Nevertheless, even when the core fundamentals of the member companies of European ETFs stay reasonably consistent, global economic downturns or recessions have the potential to undermine consumer confidence and adversely affect the pricing of these products. Monetary policy changes also have a significant impact. Demand for Euro area ETFs, for instance, may increase if expansionary monetary policies like interest rate reductions or quantitative easing are implemented. These measures can also increase consumer confidence. At the same time, the implementation of contractionary measures like the rise in interest rates may cause investors to become more risk-apprehensive, which in turn may cause consumer confidence to weaken and ETF prices to fall.

Even though the data point to a narrow direct correlation between the CCI and European ETF performance, it is still vital to take into account the more nuanced and indirect ways that investor emotion may affect both market dynamics and investment choices. According to behavioural finance theory, social circumstances, emotions, and cognitive biases can all have an impact on an investor's decision-making process, and they do not always act in a perfectly rational way. Changes in consumer confidence within the Euro region may set off specific behavioural patterns that have an effect on ETF trading and price.

For instance, times of high consumer confidence may encourage retail investors to engage in more speculative and risky activity. They may also be more likely to allocate capital to riskier assets, such as specialised or sector-specific ETFs. This may increase demand and raise costs for specific ETFs, irrespective of their underlying principles. On the other hand, if investor confidence wanes, it could result in a widespread flight to safety and additional selling pressure on ETFs, even in cases where the underlying companies' long-term prospects remain unchanged. Furthermore, shifts in consumer opinion may also have an impact on institutional investors' behavioural habits. Even though the CCI is not the only factor influencing their choices, these bigger players might modify the allocations and holdings of ETFs they own depending on how they see the state of the market. Such behavioural modifications may have repercussions throughout the European ETF market, adding to the intricate dynamics shown in the findings.

4.3 Comparison of the relationship of the CCI and ETFs in Europe to those in the US and Asia

There are several intriguing parallels and distinctions between the relationship between consumer confidence and ETF pricing in the Euro region and other significant financial markets, like the US and Asia. A substantial amount of research has examined the relationship between exchange-traded fund performance and investor sentiment in the United States, with consumer confidence indexes frequently serving as proxies. In comparison to the findings from the Euro area described in this research, studies conducted in the US have generally revealed a more significant association between

these characteristics.

For instance, Chen et al. (2017) looked at how investor sentiment affected the performance of national ETFs in the US market. Higher consumer mood levels were linked to better ETF performance, according to the authors, especially for ETFs that track industries that are vulnerable to shifts in household spending and the state of the economy. This is in line with the behavioural finance viewpoint, which contends that rising demand and inflows into equity-based investment products can be caused by a positive investor attitude. Studies conducted in Asian markets have also demonstrated the importance of investor emotion in influencing the dynamics of exchange-traded funds. Tseng and Lee (2016) showed that trading volume and other sentiment proxies, which measure investor sentiment, had a significant effect on ETF liquidity in their examination of the Asian ETF market. This implies that, in the Asian setting, exchange-traded fund demand patterns and pricing dynamics may alter in response to shifts in investor mood and expectations.

On the other hand, the Euro area analysis is finding of a relatively weak correlation between consumer confidence and ETF price may point to a more intricate and varied set of factors affecting the European ETF market. As the article discusses, the impact of investor mood alone on ETF performance in the Eurozone is probably not as great as that of macroeconomic conditions, regulatory changes, and other market-specific developments. These inconsistent results across several regional markets highlight how crucial it is to take into account the distinctive traits and structural variations of every financial ecosystem when evaluating the factors that influence ETF pricing. The variable degree and nature of the relationship between consumer confidence and ETF performance can be attributed to various factors, including the age of the ETF market, the makeup and diversity of the investor base, and the general economic and political situation (Lin, 2015).

The results of this study provide valuable insights into the relationship between investor sentiment, specifically measured as CCI, and the European ETF market. The analysis employed panel data techniques and other methods to investigate the relationship between ETFs and the CCI. The results indicate that consumer confidence has a significant negative impact on ETF pricing, suggesting that as consumer confidence decreases, ETF prices tend to decline. However, it is important to note that the influence of consumer confidence on ETF pricing explains only a small portion of the overall variation. This implies that while consumer confidence plays a role in shaping ETF prices, it is not the sole determinant of their movement. The study reveals a weak positive correlation and regression relationship between iShares MSCI Eurozone ETF prices and the CCI EA19. This suggests that there is a certain degree of association between the two variables, indicating that as consumer confidence improves, there is a tendency for Eurozone ETF prices to increase. Although the analysis did not find evidence of a causal relationship between the CCI and ETF prices, the Granger causality test did not provide significant results. This reveals that there are other factors at play that impact ETF prices beyond the influence of consumer confidence.

5. Discussion

The reviewed studies examine this relationship from a number of angles, such as the impact of macroeconomic variables, the dynamics within particular market sectors and geographical areas,

and the feelings of foreign, domestic, and global investors. These results emphasise how complex the relationship between sentiment and ETF return is and how crucial it is to take a variety of factors into account when examining the pricing and performance of ETFs. In the following discussion, the authors will summarise the most important takeaways from the literature, point out areas where research has converged and diverged, and go over the practical ramifications for traders and investors who want to use sentiment analysis in their ETF investment strategy.

The paper by Yakubovskiy et al. (2020) supports the idea that the US financial markets have a significant impact on the global financial environment. For instance, the researchers argue that outward investments from the USA are more profitable for US investors than the profitability of inward investments in the USA for foreign investors. The paper by Dziuba et al. (2022) discusses the relationship between levels of international diversification and the risk/return ratio. The authors conclude that a higher level of international diversification in a specific market does not imply a higher return on investment. The scientists argue that the most effective risk-return ratio can be found in markets with an average level of international diversification. Therefore, there is more evidence in support of the idea that the international nature of ETFs may imply a low correlation between ETFs and local impact factors, such as the consumer confidence of local investors. Zadoia et al. (2022) investigate the topic of market convergence within the EU environment. The researchers argue that, in some cases, several EU markets fall behind their European partners in terms of economic development. For instance, the authors found significant discrepancies between the euro's real purchasing power and that of EU countries. Therefore, aggregate consumer confidence across EU markets may lead to misleading results.

Chen et al. (2017) provide valuable insights into the relationship between investor sentiments, economic freedom, and the returns of country-specific exchange-traded funds. The author utilises unbalanced panel data from 27 iShares MSCI country-specific ETFs and employs quantile regression to examine the influence of global, foreign, and US investor sentiments on ETF returns. It is highlighted in the findings that investor sentiments, as well as the ETF expense ratio, significantly determine the returns of the ETFs traded in the US markets. The quantile regression approach reveals nuanced relationships between investor sentiments and ETF returns across different quantiles. High-return ETFs show positive sensitivity to changes in global sentiment, such as market turnover, VIX (a measure of market volatility), and the US federal funds rate. Furthermore, the author uncovers interesting findings regarding the effects of market volatility and foreign inflation on ETF returns. The results indicate a reversal in the relationship, where returns from lower quantiles show a negative association with VIX and foreign inflation, while higher quantiles exhibit a positive relation. This suggests that the impact of market volatility and foreign inflation on ETF returns varies across different levels of returns. The scientist also highlights that not all components of economic freedom have equal effects on ETF returns. The specific components of economic freedom that are examined in this study likely have varying impacts on the returns of the ETFs studied, underscoring the importance of considering specific aspects of economic freedom when analysing ETF performance.

Yang and Chi (2023) provide additional insights on this topic, with a focus on the Chinese market. The researchers examined the impact of investor sentiment on the volatility of ETFs in China. The Shanghai Stock Exchange Composite Index and the Investor Confidence Index, two sentiment

measures, were used by the authors to determine the strong association between investor sentiment and ETF volatility. In particular, the findings imply that while negative sentiment is linked to increased volatility, a positive mood among investors is linked to lower volatility in ETF prices. These results align with the behavioural finance viewpoint presented in the current work, which holds that asset prices, including those of ETFs, can be driven by investor mood away from their intrinsic values. Optimistic investors might be more likely to purchase ETFs, which would raise demand and possibly reduce volatility. Meanwhile, ETFs may face selling pressure during times of pessimism and risk aversion, which would increase the volatility of their prices. This supports the findings of the current paper by emphasising how crucial it is to take investor mood into account when analysing the dynamics of ETF performance in the European context as well as in other international financial markets. Investors in ETFs and other market participants can use this data to guide their investing strategies and practices related to risk management.

The scientists Naeem et al. (2022) examine the relationship between investor sentiment and the returns of exchange-traded funds in different sectors of the European market. In the theoretical part of the work, the authors provide a comprehensive understanding of market sentiment, including its measures and their applications. In the practical part of the work, the relationship between sentiment and returns of sector ETFs is examined using the analysis of the impulse response function (IRF). The combined IRF is constructed for the European Sentiment Indicator (ESI), which serves as a proxy for general European sentiment and the returns of sector ETFs. Furthermore, the IRF is employed for two specialised sentiment proxies – the Financial Services Indicator and the Consumer Indicator – and the corresponding ETF returns. The results of the analysis are reviewed, and recommendations are proposed for the successful use of sentiment indicators when trading specific sector stocks. This suggests that the work not only aims to investigate the relationship between sentiment and ETF returns but also offers practical guidance on utilising sentiment indicators in the context of sector-based trading. By examining the relationship between investor sentiment and ETF returns in different sectors of the European market, this work contributes to the understanding of market dynamics and the potential predictive power of sentiment indicators. The findings can be valuable for investors and traders who seek to incorporate sentiment analysis into their investment strategies, particularly when focusing on sector-specific ETFs.

Goel and Dash (2022) focus on the impact of macroeconomic variables and investor sentiment on ETF returns. Through a comprehensive analysis of panel data, the authors explore the effects of variables such as GDP growth, inflation rate, and interest rates on the relationship between investor sentiment and ETF returns. The researchers suggest in the findings that the influence of investor sentiment on ETF returns varies depending on the prevailing macroeconomic conditions. Specifically, during periods of high GDP growth and low inflation rates, investor sentiment exhibits a stronger positive effect on ETF returns. Conversely, in times of economic downturn and higher inflation, the impact of investor sentiment on ETF returns is diminished. This analysis provides valuable insights for investors, highlighting the importance of considering macroeconomic factors when interpreting the relationship between sentiment and ETF performance.

Cullen (2023) delves into the role of investor sentiment in sector-specific ETFs. By examining the performance of ETFs across different sectors, the author uncovers the effects of sentiment on sector-based ETF returns. The findings reveal that the relationship between investor sentiment and

ETF performance varies significantly across sectors. Sectors that are more sensitive to consumer spending, such as retail and consumer goods, demonstrate a stronger positive correlation between sentiment and ETF returns. Conversely, sectors influenced by macroeconomic factors, such as manufacturing and industrial sectors, exhibit a weaker or even inverse relationship between sentiment and ETF returns. These results highlight the importance of considering sector-specific dynamics when analysing the impact of investor sentiment on ETF performance.

Fang et al. (2021) adopt a cross-country perspective to analyse the effects of investor sentiment on international ETF returns. By examining a broad range of ETFs across different countries and regions, the authors investigate how local and global investor sentiment interact to shape ETF performance. The findings suggest that the impact of investor sentiment on ETF returns is influenced by both local and global sentiment factors. In regions where local sentiment aligns with global sentiment, the effect on ETF returns is amplified. Conversely, in regions where local sentiment diverges from global sentiment, the impact on ETF returns is attenuated or even reversed. This analysis highlights the significance of considering both local and global sentiment factors when assessing the relationship between investor sentiment and international ETF returns.

Overall, the researchers underscore the complex and multifaceted nature of the relationship between investor sentiment and ETF returns. These findings offer valuable insights for investors and traders, enabling them to make more informed decisions by considering specific factors and conditions that shape the impact of investor sentiment on ETF performance. By leveraging such knowledge, market participants can enhance their investment strategies and navigate the dynamic landscape of ETFs more effectively. The authors highlight the importance of considering other factors when analysing ETF pricing. Factors such as financial stability, government regulations, and market-specific factors may also exert an influence on ETF prices. These additional factors may explain the remaining variation in ETF pricing that is not accounted for by consumer confidence alone. Therefore, while consumer confidence is an important aspect to consider, it should not be the sole focus when assessing ETF pricing dynamics. It is worth noting that this study has its limitations. The analysis relies on panel data and other methods, which have inherent limitations and may not capture the full complexity of the relationship between investor sentiment and ETF pricing. Additionally, the study focuses on the European ETF market and may not be fully generalisable to other regions or asset classes.

6. Conclusions

This paper is devoted to the analysis of the relationship between investor sentiment in the form of a CCI and the European ETF market. The results of the panel data analysis demonstrate that consumer confidence has a significant negative effect on ETF pricing, with a beta of -0.491 and $p<0.01$. The R-squared values are low (0.011), indicating that levels of consumer confidence explain only a small portion of the variation in ETF prices. This suggests that other factors may influence ETF prices. Having regard to the previous studies, such factors may include financial stability, government regulations, political instability, or other market developments. The results of the panel analysis do not provide evidence in support of this hypothesis.

The correlation coefficient of 0.223 indicates a weak positive correlation between the two variables, so the two variables may increase or decrease together, but the strength of this relationship is relatively weak. The regression analysis results show a weak positive relationship between the two variables, with each unit increase in the CCI leading to an expected increase of 0.6091 units in ETF prices. The p-value of the independent variable is less than 0.05, indicating a significant relationship. The adjusted R-squared value of 0.03983 suggests that only 3.98% of the variation in ETF prices can be explained by changes in the CCI. The Granger causality test results indicate that there is no evidence of Granger causality between the two variables. This means that lagged values of the CCI do not predict changes in the iShares MSCI Eurozone ETF prices, and lagged values of the ETF prices do not predict changes in the consumer confidence index. The p-values obtained from the test were greater than 0.05, which suggests that the null hypothesis cannot be rejected.

While analysing Euro area ETFs, consumer confidence may be a significant consideration, but it shouldn't be the only one. Aside from the variables listed above, investors and financial analysts should also look into other aspects of the market, including inflation, interest rates, government laws, financial stability, and market dynamics. Investors might potentially enhance their investing performance in the European ETF market by adopting a more thorough approach and accounting for a wider range of variables. It is imperative for policymakers to acknowledge the intricate correlation between investor attitude and ETF pricing. Additionally, they should contemplate the potential impact of alterations in consumer confidence and other macroeconomic elements on the stability and growth of the European ETF market.

Though the main hypothesis has not been supported by the panel analysis results, the weak positive relationship found between iShares MSCI Eurozone ETF prices and the CCI suggests that consumer confidence may still be an important factor to consider when analysing Euro area ETFs' pricing, but it should not be the only factor. The Granger causality test also did not provide evidence of a causal relationship between the two variables. Therefore, it is important to investigate other factors that may affect ETF prices, such as financial stability, government regulations, interest rates, inflation rates, or foreign exchange rates.

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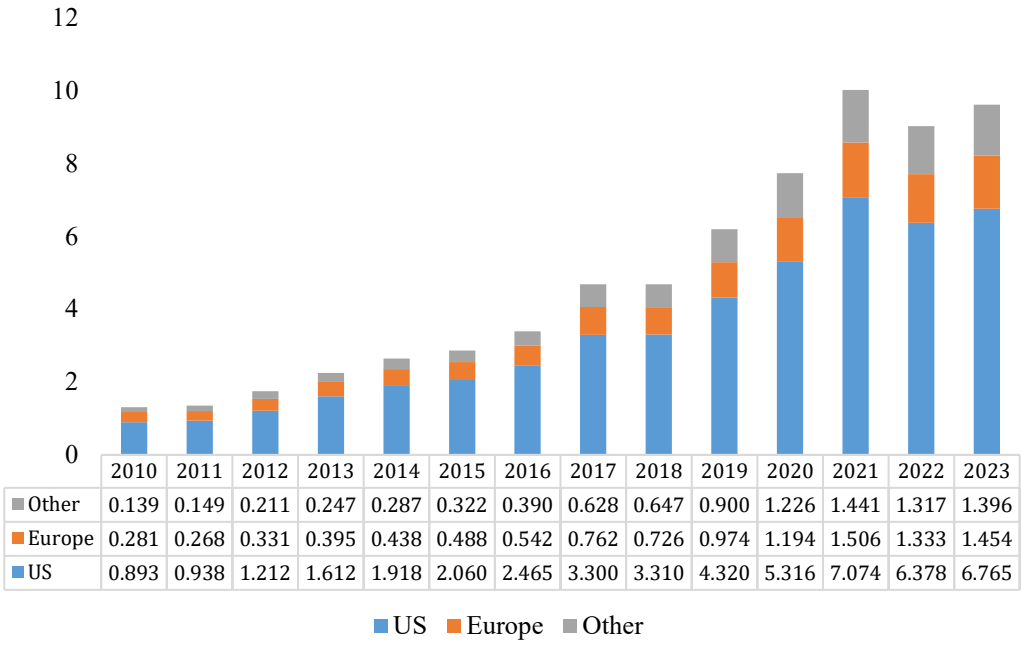
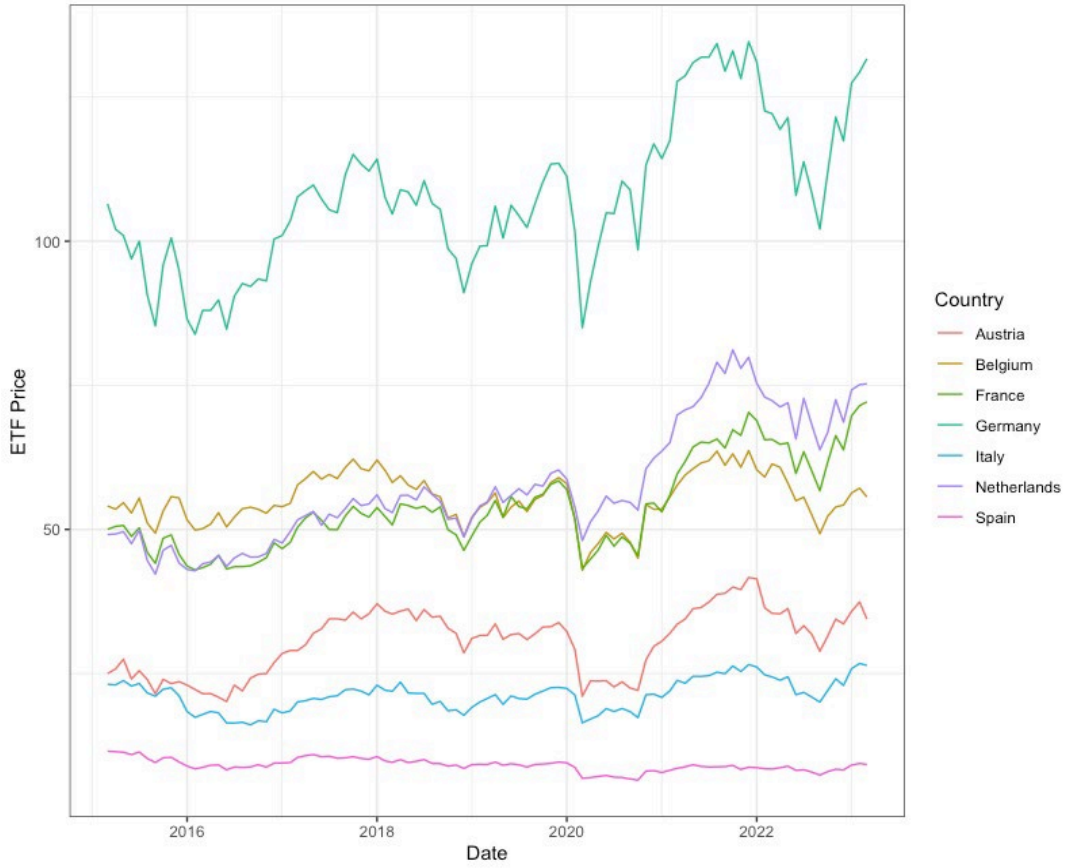
Appendix A



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Other	0.139	0.149	0.211	0.247	0.287	0.322	0.390	0.628	0.647	0.900	1.226	1.441	1.317	1.396
Europe	0.281	0.268	0.331	0.395	0.438	0.488	0.542	0.762	0.726	0.974	1.194	1.506	1.333	1.454
US	0.893	0.938	1.212	1.612	1.918	2.060	2.465	3.300	3.310	4.320	5.316	7.074	6.378	6.765

AUM's values dynamics for three markets (USA market, European market, and other markets) for the period from 2010 to 2023. The worth of these AUMs in trillions

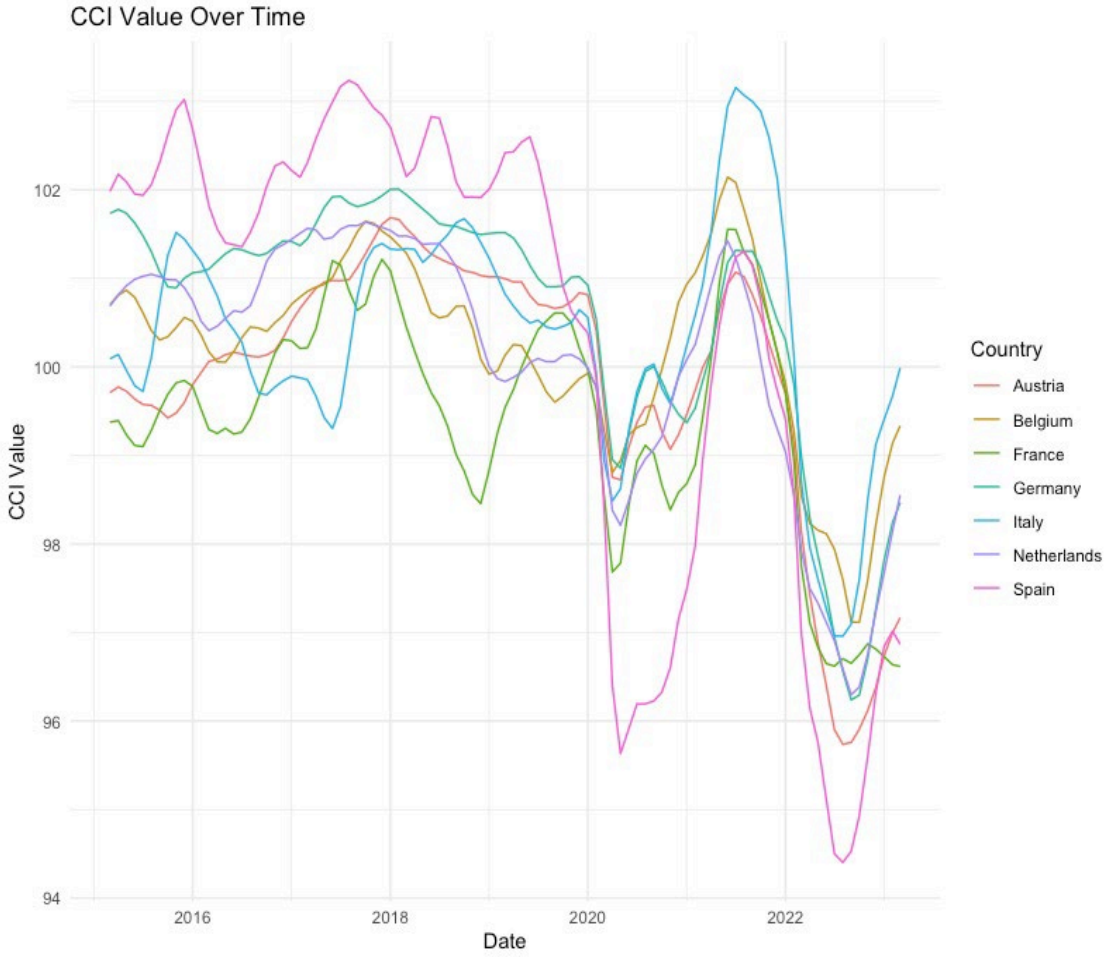
Appendix B



The country-specific ETFs' price dynamics for seven countries for the period from March 1st, 2015, to March 1st, 2023, denominated in EUR

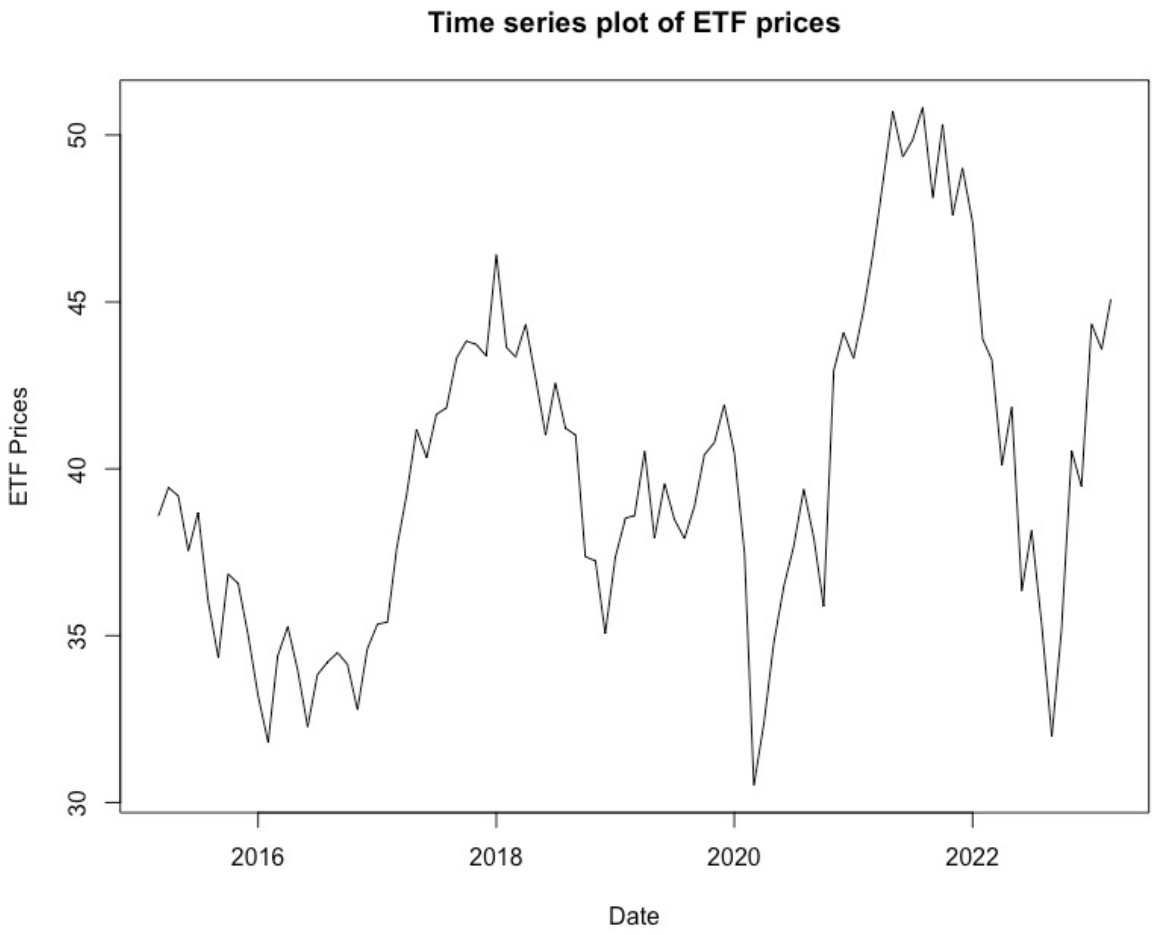
Note: The prices of the following ETFs have been used in the model such as iShares ATX UCITS ETF (DE) (EX01) for Austria, Lyxor UCITS BEL 20 TR (BEL) for Belgium, iShares Core DAX® UCITS ETF (DE) EUR (Acc) (GDAXIEX) for Germany, Accion IBEX 35 Cotizado Armonizado FI (BBVAI) for Spain, Lyxor UCITS CAC 40 (DR) D-EUR (CAC) for France, Lyxor UCITS FTSE MIB (ETFMIB) for Italy, iShares AEX UCITS (IAEX) for the Netherlands. *Source:* compiled by the authors based on Investing.com (2023).

Appendix C



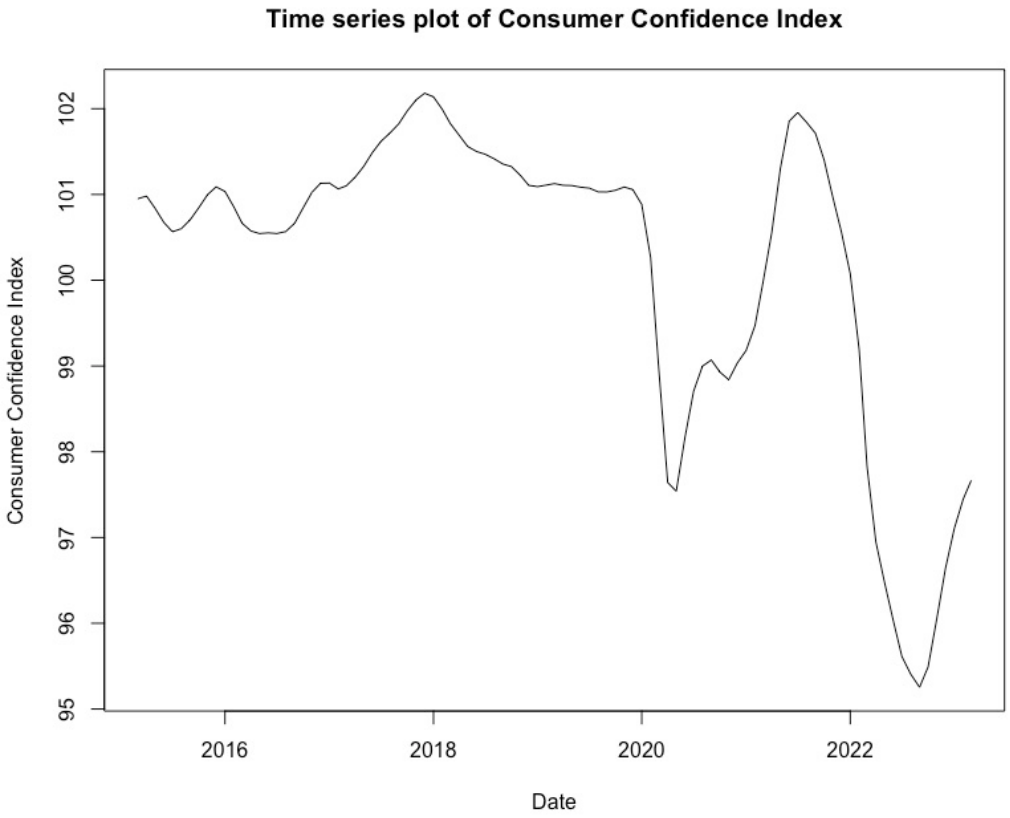
The country-specific CCI value dynamics for seven countries for the period from March 1st, 2015, to March 1st, 2023. *Source:* compiled by the authors based on OECD (2023).

Appendix D



Time series plot of iShares MSCI Eurozone ETF prices for the period from March 1st, 2015, to March 1st, 2023, denominated in USD. *Source:* compiled by the authors based on Investing.com (2023).

Appendix E



Time series plot of aggregate consumer confidence index values for 19 Euro area markets for the period from March 1st, 2015, to March 1st, 2023. *Source:* compiled by the authors based on OECD (2023).