How Did MiFID Affect Systemic Underperformance in the European Equity Market? A Tracking Error based Approach

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Keywords: MiFID, Tracking Error, Market Quality, Market Efficiency, Benchmark.

Abstract: Using a new methodology based on the decomposition of tracking error, we show that the implementation of MiFID improved the quality of European equity markets. The latter was favorable to the European equity investors' ability to reach their investment objectives as measured by the systemic downside tracking error. In other words, after the implementation of the MiFID directive, investors were less likely to underperform due to unfavorable market characteristics. The results were statistically significant at the 95% significance level.

1 INTRODUCTION

The implementation of MiFID was supposed to bring a higher level of market quality through improved liquidity and higher efficiency by fostering trade transparency and competition between trading venues. The implementation of MiFID did foster competition; however, it seems many of its negative aspects were unanticipated.

Gomber and Pierron (2010) show that trading activity reported as OTC activity is very different from its description in the MiFID. MiFID characterizes OTC as transactions that cumulatively fulfill the requirements of being ad hoc and irregular, carried out with wholesale counterparties, above standard market size, and conducted outside systems used for systematic internalization. However, their results show that a significant share of OTC transactions are neither above standard market sizes nor would they face market impact if concluded on open, public order books. The authors also show that the adoption of new trading technologies has dramatically increased the sensitivity of market data. The reduction of average transaction sizes in the various liquidity pools and the implementation of high-frequency trading have reinforced the willingness of buy-side firms to hide their trading strategy by limiting information leakage while capturing as much information about the trading patterns of their counterparts as possible. This situation conjugated with the desire to decrease execution cost explains the rise of dark pools in the European market.

Degryse et al., (2015), for instance, show that fragmentation is beneficial in visible order books through improved global liquidity, whereas the effect of dark trading is detrimental.

Buti et al., (2011) show that the existence of dark pools in illiquid markets tends to widen bid-ask spreads, decrease the market depth, and deteriorate overall welfare. In more liquid markets, only large traders see their situation improve while small traders are still worse off.

Our study aims to investigate whether these adverse developments after the implementation of the MiFID did have a negative impact or not on market participants' ability to reach their investment goals in the European equity market. In other words, how did the MiFID affect the likeliness of fund managers displaying underperformance only due to market factors?

In section 1, we review the related literature. We dedicated Part 2 to the explanation of the methodology. Section 3 presents the data used for the study. Section 4 presents the statistical analysis, and we comment on the results in part 5.

2 LITERATURE REVIEW

Academic research has widely documented underperformance by equity mutual funds. Many

Niang, C. and Kanyinda-Kasanda, A.
How Did MiFID Affect Systemic Underperformance in the European Equity Market? A Tracking Error based Approach.
DOI: 10.5220/0008772000570062
In *Proceedings of the 2nd International Conference on Finance, Economics, Management and IT Business (FEMIB 2020)*, pages 57-62
ISBN: 978-989-758-422-0

factors are significant in explaining portfolio underperformance.

Day et al. focused on the impact of portfolio composition and the excess turnover on fund performance. Using standard portfolio optimization techniques, they showed that the portfolio weights for the stocks selected by fund managers are, on average inefficient. They suggest that while fund managers may possess superior stock selection skills, we could achieve substantial gains by improving the efficiency of the allocation of mutual fund assets. They also present evidence suggesting that mutual fund turnover is excessive and that fund managers may rely too heavily on stock price momentum.

Cremers and Pareek (2015) confirmed these findings. They show that among high active Share portfolios, only those with patient investment strategies (withholding durations of over two years), on average, outperform, over 2% per year. Funds trading frequently generally underperform, including those with high Active Share.

Gastineau (2004) claims that ETFs underperform their index fund competitors. Specifically, Gastineau suggests that, at least in part, the deficiency in an ETF's underperformance is due to the ETF managers' reluctance to adjust the portfolio before the official moment of the index adjustment.

Hu et al., (2008) found that a fund's performance is negatively related to its age. Blitz et al. (2012) find the explanatory power of dividend withholding taxes for fund underperformance relative to its benchmark to be at least on par with fund expenses. Applying these findings, Blitz and Huij (2012) show that emerging market equity ETFs' expected returns are equal to their respective gross benchmark index returns minus expense ratio and dividend taxes.

Charupat and Miu (2013) find that all other things being equal, the higher the expense ratio of a fund, the more an ETF can be expected to underperform its underlying index.). Many articles support this view: Elton et al. (2002), Lin and Chou (2006), Rompotis (2006, 2011), Agapova (2011), and Blitz et al. (2012).

Plyakha et al. (2015) find that the weighting scheme is an essential factor in explaining fund performance. They find that, on average, value-weighted funds tend to underperform when compared with equal-weighted funds. They find an excess yearly mean return of 2.71% for the equal-weighted portfolio over the value-weighted portfolio. According to their findings, 58% of the excess return comes from the excess systematic component, while 42% comes from the difference in alphas. Additionally, the higher systematic return of the equal-weighted portfolio arises from its higher exposure to market, size, and value factors, which is determined by the equal initial weights. However, the higher alpha of the equal-weighted portfolio arises from the monthly rebalancing to maintain constant loads.

Our work will have as an objective to assess the impact of MiFID through its possible negative impact on the systemic component, as described by Plykha et al.

In fact, since the implementation of the MiFID Directive, we observed many possible adverse developments. Some believe that the implementation of the MiFID has exacerbated opacity in the financial markets. This opacity materializes in the growth of dark pools in Europe. Moreover, it fostered information asymmetries between different market participants and, most notably, between high-frequency traders and low-frequency traders (Lenglet and Riva, 2013).

These developments put into question the integrity of financial markets and more to the point; they cast doubt on the information content of stock prices in the markets where the MiFID directive applies. Many facts over the past years are suggesting market manipulation. For instance, the French financial market authority revealed that the execution of orders in Europe is at an interval between 1% and 5%.

While one of the primary objectives of MiFID implementation is to increase transparency, Bloomfield and O'Hara showed that there are no discernible effects of transparency on the market performance, based on a simulation of three markets that have different transparency levels. In the same way, Porter and Weaver (2005) examined the effect of changes in information disclosure rules on the Toronto Stock Exchange. By making comparisons in market performances before and after the reform, they found that increased pre-trade transparency decreased liquidity, increased execution costs, and market volatility.

By using a new approach, our paper will assess equity investor's likeliness to underperform relative to their benchmarks due to unfavorable systemic factors induced by the implementation of the MiFID. We present our methodology in the following section.

3 METHODOLOGY

In our study, we would like to determine the effect of the implementation of MiFID on portfolio managers' ability to reach their investment objectives, through the impact of MiFID on market quality.

Tracking error is the most prominent metric to measure the deviation of portfolios from there announced benchmark.

You can find here below the equation of tracking error.

$$TE_i = R_{Pi} - R_{Bi} \quad (1)$$

Where:

- TEi is the Tracking Error for the period i
- RPi is the return of the portfolio for the period i
- RBi is the return of the benchmark for the period i

The tracking error of a given portfolio is influenced both by idiosyncratic factors (number of stocks in the portfolio, number of non-benchmark stocks in the portfolio, the degree of leverage) and non-idiosyncratic factors (most notably volatility of the benchmark and market quality) (Vardharaj et al., 2004).

Larsen and Resnick (1998) show that the tracking error is affected by market capitalization. Large capitalization portfolios have lower volatility and tracking error than low capitalization portfolios.

Frino and Gallagher (2001) identify the expenses, the dividend payments arising from the underlying stocks that compose an index, and the timing of index rebalancing as being factors affecting the size of tracking error.

According to Kostovetsky (2003), the tracking error of index funds is affected by the bid-ask spreads of the portfolio's underlying stocks, the dividend distribution policies, and the transaction costs.

Osterhoff and Kaserer (2015) find that daily tracking error significantly depends on the liquidity of the underlying stocks.

This result confirms the findings of several studies suggesting a positive effect of spreads on tracking error. For instance, Milonas and Rompotis (2006), Delcoure, and Zhong (2007) all verify that a fund's tracking error is positively affected by the bid-ask spread.

Frino et al. (2004) use monthly data for the years 1994-1999 and show that tracking error in index mutual funds for the S&P 500 is significantly related to index revisions, share issuances, spin-offs, share repurchases, index replication strategy, and fund size. Gastineau (2002) finds for equity index funds tracking the Russell 2000 and S&P 500 indices that changes in index composition have a significant effect on tracking error due to the transaction cost involved in the necessary rebalancing of the underlying portfolio.

Kundisch and Klein (2009) observe the daily returns and tracking ability of several DAX certificates and one DAX ETF for the period 2001-2006 and show that the trading volume of the ETF negatively correlates with its tracking error.

Elton et al. presented the non-reinvestment of dividends as a significant factor affecting the tracking error of SPDRs.

The contribution of each factor to tracking error is called the "Marginal Contribution to Tracking Error" (MCTE).

In our model, we hypothesize that the effect of the MiFID on the investors' ability to match their benchmark is included in the Residual MCTE (RMCTE). RMCTE is the MCTE once we consider the MCTE of all the factors except the market quality. Hence, the difference between the RMCTE of the Pre-MiFID and the Post-MiFID periods will account for the effect of the directive on market quality. Thus, our study periods will be October 2003 – June 2007 serving as a reference period before implementation and January 2009 – November 2011 after the MiFID entered in vigor. We intentionally skip the interval of time between July 2007 and December 2008 due to the subprime crisis and the bias it could introduce in the data.

The methodology consisting of a comparison of the period before the implementation of a policy to the period after the application of the latter is standard in the literature for assessing newly implemented regulations (See, for instance, Gresse 2011, Porter and Weaver (2005), etc.).

To determine the effect of the MiFID directive on systemic underperformance (the part of managers' underperformance only related to market factors, namely volatility and market quality), we will examine a metric that we call the downside tracking error that we note "DTE." The tracking error is a metric that treats all types of deviation from the benchmark in the same way. However, underperformance and outperformance do not have the same implications in terms of portfolio management. This is the rationale behind the calculation of the DTE. We calculate it as the negative deviations from the benchmark.

We will extract the idiosyncratic downside tracking error by creating an extensive portfolio of portfolios composed of 21 different ETFs and Mutual Funds randomly chosen in the universe of investable funds in the European Markets and displaying an average negative tracking error during the study period.

As in a single portfolio, the risk related to a portfolio of portfolios is inversely associated with the number of portfolios included. Hence, by creating such a collection of portfolios, we will eliminate all

the idiosyncratic tracking error (Vardharaj et al., 2004).

Once we have the systemic downside tracking error, we can then split the non-idiosyncratic part of the tracking error into two parts. The first part will be related to volatility, and the remaining one will be related to market quality, which includes the effect of the implementation of the MIFID.

To isolate the part related to volatility, we will run a univariate regression model using the market volatility as the explanatory variable and the downside tracking error of the diversified portfolio of portfolios as the explained variables. We had to transform the downside tracking error by taking its absolute value so that we could use its logarithmic form.

We show the downside regression equation here below:

$$ln \mid DTE_{dpt} \mid - ln \mid DTE_{dpt-1} \mid = \mu\,(lnV_{it} - lnV_{it-1}) + \varepsilon_{it} \quad (2)$$

Where:

- DTE_{dp} is the downside systemic tracking error
- μ is the elasticity of DTE_{dp} related to volatility
- V_{it} is the volatility of the benchmark

The part of the downside systemic tracking error explained by volatility corresponds to the coefficient of determination in the regression model obtained in equation 2 above and is noted MCVDTE (Marginal Contribution of Volatility to Downside Tracking Error).

We will deduct the part accounted for by market quality (including the implementation of MIFID) by subtracting the MCVDTE to 1 (See equation 3 below).

$$RMCDTE = 1 - MCVDTE \quad (3)$$

Where:

- RMCDTE is the Residual Marginal Contribution to Downside Tracking Error.
- MCVDTE is the part of the downside tracking error of the diversified portfolio explained by the volatility of the benchmark.

We will use the criteria below to see if the MIFID has affected the investor's ability to match their benchmark. Additionally, we also consider the elasticity μ to confirm the effect of volatility on systemic downside tracking error.

We are evaluating the impact of MiFID on downside tracking error.

If the RMCDTE before the MiFID is higher than the RMCDTE after MiFID, then market quality issues played a less critical role before MiFID implementation in explaining downside systemic tracking error, which would mean a better market quality.

If the RMCDTE before the MiFID is lower than the RMCDTE after MiFID, then market quality issues played a more critical role in explaining downside systemic tracking errors after the implementation, which would mean a lower market quality.

In fact, in a perfectly efficient market (maximum market quality), all participants should be able to match their benchmark perfectly (no underperformance due to market frictions and no outperformance due to market mispricing).

We made regressions on 167 weekly observations for the Pre-MiFID period and 179 weekly observations for the Post-MiFID period.

We will examine the RMCDTE at a 95% significance level to ensure the statistical significance of the results.

4 NOTE ON DATA TREATMENT AND ANALYSIS PROCEDURE

Due to the peculiarity of the study period, we have performed a CUSUM squared test on the data for the period running from October 24th, 2003 to November 29th, 2013, to ensure that our results are not sensitive to the effects of the subprime crises. The results of the test showed parameter stability for the whole period. It seems that the impact of the subprime crises on the downside systemic tracking error was minimal. The details of the CUSUM squared analysis are available in the appendix.

The data for the Post-MIFID period did not display perfect homoskedasticity. Hence, all regressions used robust standard errors. Additionally, the data showed positive autocorrelation. To deal with it, we first differenced all variables and performed the Dickey-Fuller test on their respective first differences. This process revealed that the first differences were stationary. Hence the data follows an AR (1) stationary process. This condition is necessary to apply the Prais Winsten process with robust standard errors to correct for autocorrelation and heteroskedasticity.

Finally, we performed the Dickey-Fuller test for all variables. None of them is stationary except the tracking error for the Pre-MiFID period. However, performing the Johansen test of the variables shows

that the variables are cointegrated. As a result, despite the non-stationary variables, the results from our regression model are valid.

5 COMMENT ON THE RESULTS

We created a diversified portfolio of portfolios randomly selected from the universe of investable equity portfolios in the European markets and displaying an average negative tracking error during our study period.

Our analysis has permitted to highlight a significant difference between the Pre MiFID and the Post-MiFID periods. We observe that factors related to market quality account for 25% in the explanation of the systemic downside tracking error in the Post-MiFID period while they explained all the systemic downside tracking error in the Pre-MiFID period since market volatility was not a significant variable in the Pre-MiFID period.

The coefficient of market volatility confirms this finding; the latter is significant and equal to 0.63 in the Post-MiFID period, while it is not significant in the Pre-MiFID period.

These results would point towards a decisive role of MiFID and a better market quality after its implementation.

However, these results do not tell us the effect of MiFID of systemic outperformance. Its impact on the latter can be different from the effect found on systemic underperformance. To have a complete study, we would need to investigate the impact of MiFID on systemic outperformance through its effect on market quality. Our future research will extend the methodology used in this article on a different data set.

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