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Are Passive Funds Negatively Impacting the Stock Market?

By **Goethe University Frankfurt** - December 13, 2023

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Passive investing has grown rapidly over the last decade, largely driven by widespread adoption of ETFs. In 2022, ETF trading volumes were over $53 Trillion, their highest levels on record, up from $41 Trillion in 2021. Passive funds are popular among retail as well as institutional investors since they are easily tradable, offer liquidity, and can serve as a tool for gaining or hedging market exposure at relatively low cost.

However, many debate the effects of passive investing on financial markets. Some suggest ETFs and other passive instruments might make markets more fragile, with potential for price dislocations and noise, deteriorating liquidity and encouraging short-term speculation. The IMF Global Financial Stability Report, for example, suggests in its October 2022 report, "The growing role of passive investing that offers daily redemptions to retail investors, coupled with signs of increased herding and concentration, has made market liquidity more vulnerable to rapid changes in sentiment. Moreover, the ability of arbitrageurs such as hedge funds to take advantage of temporary price dislocations in asset markets, and therefore act as liquidity providers, may be limited."

Conversely, some others suggest passive investing might increase market efficiency. They point to lower transaction costs, the ability to facilitate short selling, and even faster incorporation of information into prices. However, to date the academic literature is inconclusive.

This was the motivation for our recent research, Passive Investing and Market Quality. Together with Christian Schlag and Maik Schmeling from Goethe University, I examine how passive ETF ownership affects market quality, liquidity and likelihood of extreme price movements and how new information is impounded into stock prices.

Passive Investing and Short-term Reversals

As a starting point, we first seek to understand the impact of passive ETF ownership (or PO) on stock liquidity through the lens of short-term reversals.

It is well known in academic research that, overall, stock prices tend to revert over a short-term horizon (first documented by Jegadeesh, 1990). When stock returns go up significantly in the previous month, they tend to revert back in the subsequent month. Prior literature finds that size and speed of these reversals can be informative about market-making capacity and the profits to liquidity provision (according to Nagel, 2012). Consequently, a lack of liquidity can cause stock prices to bounce back and forth even if there are no fundamental news about a company.

To examine PO and return reversal, we go long (short) stocks with low (high) returns over a recent period, separately for stocks with high and low PO. We include all common stocks traded on major US exchanges from 1997 to 2021, but our portfolios are value weighted to mitigate the influence of very small stocks. We find that stocks with high passive ETF ownership have much stronger reversal than those with low passive ETF ownership, suggesting that stocks with more passive ETF ownership are more susceptible to noise and offer higher returns to liquidity provision.We surmise that because passive products tend to trade in the same direction, the stocks that they hold may experience more price pressure. Buying (selling) pressure by ETFs tending to include (exclude) similar stocks might lead to demand (supply) pressure in the stock market temporarily driving prices up (down). Since this type of move is non-fundamental, prices are likely to go back down (up) again in the next month.

We next look at annual reconstitutions of the Russell indices, focusing on stocks close to the index cutoffs (stocks at the bottom of the Russell 1000 and at the top of the Russell 2000). We observe that stocks allocated to the bottom of the Russell 1000 receive relatively lower index weights and PO compared with stocks at the top of the Russell 2000. Using this setup, our evidence confirms that PO causes higher bid-ask spreads, decreased liquidity, and higher idiosyncratic volatility.

Does Passive Ownership Decrease Price Informativeness?

To understand the mechanism driving these results, we investigate the effects

of passive ownership on the importance of different types of information. A well-known paper by Ben-David et al., "Do ETFs Increase Volatility?", shows that ETFs increase overall stock price swings. We seek to understand why this is the case: is it because of more noise, information from the market, or information from the underlying firm?

We identify noise as innovations in the stock price that are non-permanent. "Noise" may, for example, appear due to shifts in investor sentiment, overshooting of stock prices after the arrival of news, or as a result of market participants being slow in processing information. Conversely, "information" is what remains in the stock price and does not revert back. Information can be either market-wide or firm-specific. Firm-specific information is fundamental news about the underlying company, such as earnings announcements or sophisticated analysis by active investors.

Our analysis shows that higher passive ETF ownership reduces the importance of firm-specific information in stock returns. This finding is in line with the common argument that passive investors pay less attention to single securities, resulting in prices which do not fully reflect all available information. Passive ETF ownership also increases the importance of transitory noise and a firm's exposure to market-wide sentiment shocks, supporting our hypothesis that non-fundamental information is introduced into prices through trading of passive products.

We see little effects of PO on the importance of market-wide information in the underlying stocks. This may be a bit surprising, as passive products make it easier to act on market news. While we do see a contemporaneous impact of market wide information on stocks with high passive ownership, these impacts are insignificant in the longer term.

Overall, our findings highlight potential implications of market efficiency and the role of active investors in processing fundamental information.

Passive Investments and Jump Risk

Finally, we seek to examine the risks of sudden price movements (or "jumps") in underlying stocks following an increase in ownership by passive ETFs.

We look to the options market to determine if higher tail risk is priced in as a response to higher passive ETF ownership. In particular, we examine short

maturity deep out-of-the-money options, which can be viewed as insurances against extreme price movements. Intuitively, short maturity deep out-of-the-money options only gain in value when there is an extreme price movement in the underlying stock, indicating that the market expects the price of the underlying stock to go up or down significantly.

We use data on single options with 30 days to expiration from volatility surface files, provided by OptionMetrics IvyDB US. Implied volatilities are calculated in the dataset using a binomial tree model which accommodates the early exercise premium. We find the data to be very convenient, as OptionMetrics provides preprocessed trade data, already cleaned and standardized. With its availability on WRDS, we use the cloud to process the large data set. Data from OptionMetrics is matched to CRSP using the linking file in WRDS.

We examine two different measures—left and right tail risk. The left (right) tail represents the size and likelihood of extremely negative (positive) returns. We use deep out-of-the-money put options to measure left tail, and deep out-of-the-money call options to measure right tail risk. This offers a forward-looking measure of what the option market expects regarding extreme price movements and tail risk.

Again, we use stocks at the bottom of the Russell 1000 index and at the top of the Russell 2000 index to find the effects induced by different levels of PO. We see that for firms with higher passive ETF ownership the tail risks are higher. This means that their deep-out-of-the-money options cost more in the options market. We also look at more simple realized jump measures for each stock by measuring within a year how often an extreme price movement occurs. To do this, we note the frequency of the daily return being above 10% or below minus 10%. Again, we observe an increase in realized jumps in stock returns for firms with higher passive ownership. These results have important implications for market making, since, in contrast to diffusive volatility, unpredictable jumps cannot be easily hedged.

In addition to looking at ETFs, we examine passive index funds which also offer low fees and can be redeemed at the end of the trading day and observe similar results.

Takeaways for Investors and Regulators

While acknowledging overall improvements in price informativeness during the last decades (as shown by Brogaard et al., 2022), our research is a step further in understanding the impact of passive ETF ownership on stock return dynamics and market efficiency. The findings—highlighting how passive ETF ownership increases short-term reversals, decreases the informativeness of stock prices – by increasing non-fundamental return noise and reducing the contribution of firm-specific information—are significant for both investors and regulators.

We think regulators, concerned about market quality and extreme stock price movements, will find the insights interesting. With the rise of passive investing, policymakers might need to trade-off the benefits—lower transaction costs, ease of investing—against potential costs—increased tail risk, lower liquidity, reduced efficiency of asset prices and market-making capacity. While we do not argue that passive products should be eliminated, we think policymakers can use this information to find the right balance.

Active investors might also benefit from these insights. However, exploiting inefficiencies in stocks with high passive ownership can be unattractive because they tend to offer lower returns (as shown by Pavlova and Sikorskaya, 2023). In fact, another recent study indicates that active investors do not step in to fully compensate the direct impact of an increase in passive investing.

Furthermore, liquidity providers or market makers might act as contrarian traders and invest when passive funds look to sell, profiting from reversals. However, this strategy appears to come with an increased risk of noise and price jumps among stocks with more passive ownership.

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