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Analysis of ETF bid-ask spread components

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ABSTRACT

In this study we examine on intradaily basis (milliseconds) the largest 100 ETFs' bid-ask spread components in the period March 21, 2014 to April 17, 2014. We document that ETFs have lower proportion of adverse selection in the bid-ask spread relative to stocks, which also means that the order processing cost component is higher in ETFs. This suggests that uninformed investors prefer to trade ETFs relative to individual stocks. The data in our study also suggests a U-shaped form of the adverse selection component across four categories of ETF trading volume and not a monotone decreasing relation from lowest to highest trading volume ETFs. Fixed-income ETFs have the highest adverse selection component coefficient whereas real estate ETFs have the lowest. Additionally, mutual fund structured ETFs have lower adverse selection component coefficient than the trust structured ETFs. We also document that ETFs with more quotes have lower adverse selection; whereas ETFs with higher average bid price, higher expense ratio and trust structuring of the ETF have higher adverse selection component of the bid-ask spread.

1. Introduction

Exchange traded funds (ETFs) have gained popularity and exponential growth recently because of their similarity to stocks in terms of trading. However, ETFs are different from common stock in that they lack company specific information and that institutional investors primarily trade them. Therefore, it is natural to ask: is ETFs' adverse selection component of the bid-ask spread the same as stocks' and is this component the same across different ETFs and what factors influence it? In this study we examine on intradaily, milliseconds, basis the largest 100 ETFs' bid-ask spread components in the period March 21, 2014 to April 17, 2014. We chose the largest US based 100 ETFs by assets under management (AUM) because they hold approximately 85% of all assets in the industry. Currently, there are more than 1000 ETFs with approximately $1.6 trillion in assets under management. Interestingly, the largest 80 of these 100 ETFs hold approximately 80% of the assets in the industry.

The idea that the presence of uninformed investors in financial markets is a major factor in the price formation of a security has been developed in Kyle (1985). What that means is that uninformed investors will prefer to trade ETFs, rather than individual stocks because the likelihood of informed traders trading individual stocks is higher. Robert and Wheatley (1998), Clarke and Shastri (2001), Hegde and McDermott (2004) and Hamm (2011) study the shift of uninformed investors from trading stocks to baskets of securities and test the ideas developed by Kyle (1985). Robert and Wheatley (1998), and Clarke and Shastri (2001) study closed-end funds, Hegde and McDermott (2004) study the Cubes ETF and Hamm (2011) study ETFs. They all document that indeed adverse selection costs are lower in baskets of securities relative to stock adverse selection costs, which they interpret as indeed shifting of uninformed investors to trading baskets.

In the existing market microstructure literature there are two methods of identifying the components of a stock's bid-ask spread—trade indicator models and covariance models. Huang and Stoll (1997) propose a time-series market microstructure model, which encompasses both trade indicator models and covariance market microstructure models. We test whether uninformed investors will prefer to trade ETFs relative to stocks by examining individual ETFs adverse selection components and comparing them to the adverse selection component of individual stocks estimated in multiple previous studies. One might argue the previous studies on bid-ask spread components have been done too long ago and that more recent data should be used for the testing of the hypothesis. Therefore, the natural test on whether ETFs and stocks

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adverse selection components are equal or not is by comparing the ETFs and stocks components. We examine this by comparing the adverse selection of ETFs to the adverse selection components of stocks and closed-end funds identified in previous studies. We examine the adverse selection components of the largest 18 ETFs based on AUM in the US to the 18 stocks in the original Huang and Stoll (1997) study. Huang and Stoll (1997) study 20 stocks but two of them Eastman Kodak that went bankrupt and Mobil that merged with Exxon are no longer available.

When using more recent data we find that the average adverse selection component for these 18 ETFs is 0.0520 with a standard deviation of 0.0489 and that the average adverse selection component for the 18 stocks in the Huang and Stoll (1997) study is 0.0613 with a standard deviation of 0.4077 which is half of the originally found values by Huang and Stoll and a bit higher than the value for the 18 largest ETFs. A regression that controls for total assets suggests that the ETFs adverse selection is lower than stocks and statistically significant. Relative to previous studies, we also find that the average adverse selection component coefficient for the 100 largest ETFs in the examined period is 0.0704 whereas Huang and Stoll (1997) find that the adverse selection coefficient for the 20 most active stocks in 1992 is 0.1135; and that Hamm (2011) find that the adverse selection component for 8,420 firms in the period 2002 to 2008 is on average 0.1590.

It appears that ETFs have indeed lower proportion of adverse selection in the bid-ask spread, which also means that the order processing cost component is higher in ETFs. This is additional evidence that uninformed investors prefer to trade baskets relative to stocks. Naturally, the only reason we can draw this generalized conclusion across studies using different methodologies is because the methodology used in this study encompasses the methodologies used in the other studies. Logically, this study would be of great interest to both individual/non-sophisticated investors and institutional investors.

We also examine the factors influencing the components of the bid-ask spread. The univariate analysis across the 100 different ETFs for both the GMM and OLS results suggest that group of ETFs with second highest trading volume has the lowest average GMM adverse selection component coefficient of 0.0591, whereas the group with lowest trading volume has the highest GMM adverse selection component coefficient of 0.0761. Surprisingly, the group with highest trading volume does not have the lowest value with a coefficient of 0.0716, which is less than the value for the group with second lowest trading volume with an average adverse selection component coefficient of 0.0747, which suggests a U-shaped form of the adverse selection component across the four categories of volume and not a monotone decreasing relation. The fixed-income ETFs have the highest adverse selection component coefficient with value of 0.0867 whereas the real estate ETFs have the lowest adverse selection component with value of 0.0252. However, the real estate ETFs value needs to be interpreted with caution because there are only three ETFs of this kind in the sample. Mutual fund structured ETFs have lower adverse selection component coefficient than the trust structured ETFs with values of 0.0656 and 0.1150, respectively.

The multivariate analysis results imply that the number of quotes, the average bid price, the ETF expense ratio and trust structured ETFs are factors which consistently influence the adverse selection component. We document that the higher the number of quotes for an ETF the lower the adverse selection; the higher the average bid price, the higher the expense ratio and trust structuring of an ETF the higher the adverse selection component of the bid-ask spread.

The rest of the paper is organized as follows: the next section discusses prior literature, section three discusses the methodology used to identify the components of the bid-ask spread, section four discusses the data, section five contains the analysis and section six provides conclusions, discussion of limitations of the study and ideas for future research.

2. Literature review

2.1. Adverse selection models literature

In the existing market microstructure literature there are two methods of identifying the components of a stock's bid-ask spread—trade indicator models and covariance models. Trade indicator models are discussed in Glosten and Milgrom (1985), Kyle (1985), Harris (1986), Glosten (1987), Easley and O'Hara (1987), Glosten and Harris (1988), Lee and Ready (1991), Lin, Sanger, and Booth (1995), Madhavan, Richardson, and Roomans (1997), Ellis, Michaely, and O'Hara (2000) and Bessembinder (2003). Covariance models are discussed in Roll (1984), Choi, Salandro, and Shastri (1988), Stoll (1989), Hasbrouck (1988, 1991), and George, Kaul, and Nimalendran (1991).

Huang and Stoll (1997) propose a time-series market microstructure model, which encompasses both trade indicator models and covariance market microstructure models as specified above. The Huang and Stoll (1997) methodology allows for the decomposition of the bid-ask spread into two components—an adverse selection and an order processing cost component. The adverse selection component reflects the costs incurred by dealers due to the fact that some investors might be informed, whereas the order processing costs reflect the dealer's market liquidity role as counterparty to each trade. Huang and Stoll (1997) study 20 of the most actively traded stocks in the Major Market Index on intradaily basis for the entire 1992. They find that the average traded spread for these stocks is 0.1222 with a standard error of 0.0004 and an average adverse selection and inventory holding component coefficient, of 0.1135 with a standard error of 0.0024. The highest adverse selection coefficient is 0.2229 for MMM with a standard error of 0.0051 whereas the lowest is 0.0186 with a standard error of 0.0008 for *T*. Surprisingly, in a few instances Huang and Stoll (1997) find negative adverse selection and inventory holding components.

2.2. Prior studies on ETFs and closed-end funds bid-ask spread components

Hamm (2011) studies ETFs in the period 2002 to 2008 and starts with a sample of 63 ETFs in 2002 and ends with a sample of 273 ETFs in 2008. She uses NYSE TAQ intradaily data and documents that the average ETF adverse selection component in the entire sample is 0.159%. She uses the bid-ask spread decomposition methodology of Madhavan et al. (1997). Another study of ETF adverse selection costs is by Hegde and McDermott (2004). They study the Diamonds and Cubes ETFs and use the Madhavan et al. (1997) methodology. They find that the adverse selection component of the ETFs is less than the adverse selection components of the individual stocks in each ETF.

Chelley-Steeley and Park (2008) study the adverse selection component of baskets of securities by using 81 ETFs, matching stocks, NYSE TAQ data and by using five of the most popular methods of decomposing the bid-ask spread—Glosten and Harris (1988), George et al. (1991), Lin et al. (1995), Madhavan et al. (1997) and Huang and Stoll (1997) models. The period covered in the study is July to September 2005. They find that ETFs provide reasonable private information diversification benefits relative to individual stocks. They also find that the ETF adverse selection component is 0.4085 with a standard deviation of 0.0347 and no negative