Exchange traded Funded started trading in the United States in1993 with the launch of the S&P 500 Trust ETF (‘SPDR”) by State Street Global Investors and have become some of the most popular investment vehicles over the last 25 years. Initially created to provide institutional investors the ability to executive sophisticated trading strategies ETFs now provide financial advisor, portfolio managers, and individual investors investment options to satisfy a variety of money management strategies. The ETF market has evolved over time in terms of the number of ETFs offered, the types of ETFS being offered, and the amount of assets being invested in Funds. According to Global X Funds using Bloomberg and Morningstar data, U.S ETF assets under management increased from under $500 billion to over $2.5 trillion from 2003 to 2016. Over time, Funds have become mor sophisticated and specialized. IN 2002, the first bond ETF wad introduced while in 2004 the first commodity ETF was formed as a non-1940 Act legal structure. B 2008, the first actively managed ETF was created, opening the door for greater market offerings. Today investors can trade passive and active ETFs that track indexes, bonds, commodities, and other alternative assets with returns that are leveraged or unleveraged.

An Exchange Traded Fund in its most basic form is an asset basket tracking security that canbe traded on exchange. An ETF can track a basket of assets, an index, or a commodity like corn or gasoline. The Fund holds the assets and creates shares where investors can invest in the Fund instead of having to invest in the underlying assets to get exposure to various markets. Many investors find ETFs advantageous as they can choose their desired level of exposure, can typically take lower exposure to the underlying assets than with traditional investment vehicles, may have lower management costs than mutual funds, and generally have higher liquidity than mutual funds.

Commodity ETFs are a subcategory of the Exchange Traded Fund marketplace that have benchmarks related to agricultural products, energies, metals, and other commodities. As of August 2017, commodity ETFs make up 2% of total market shared with 122 Funds having $63.4 billion assets under management, according to Global X Funds using Morningstar data. Commodity ETFs provide investors with flexibility and convenience that where not available in the traditional investment tolls. One of the main benefits of ETFs is the ability to gain exposure to certain assets, like commodities, which have traditionally been too expensive or unfeasible for some investors. Owning shares of a commodity ETF with futures market asset baskets allow investors to gain commodity exposure without being subjected to potentially expensive margin accounts that are marked-to-market daily.

ETF trading allows an investor to choose their desired level of shares of the Funds’ assets to hold which may be well below the quantity that one futures contract represents. For example, one corn futures contract is equivalent to trading 5,000 bushels of corn while one CORN ETF Share represents a percentage of the corn futures assets held by the Fund. As seen in Table 1, the value of one ETF share for the Funds in this study is considerably less than the value of one futures contract which gives investors a greater opportunity to gain exposure to commodity markets. Another benefit of ETFs is their liquidity compared to mutual funds, as noted above. ETFs are tradeable through the trading day like stocks, while closed end mutual funds are only convertible at the end of the trading da. Finally, lower costs of trading and small expense ratios have attracted investors to gain exposure to markets through ETFs. These benefits have helped the ETFs in this study grow their volume by an average of 134% from 2013 to 2016.

While Exchange Traded Funds offer some advantageous benefits to investors, it is important to consider the risks associated with trading ETFs as well. The first and most obvious risk is flat price risk to investors as they are not protected from price fluctuations or market volatility. Additionally, many ETFs, including the ones in this study, have no bank guarantee and are not FDIC insured. Another risk associated with ETFs is the potential mispricing between the Net Asset Value (NAV) and market price. Mispricing occurs when ETF shares are traded at a premium or discount to their respective NAV. Along with mispricing, tracing error is a concern for Exchange Traded Funds. If the Fund is not replicating the asset basket it is tracking, returns may differ from that of holding the underlying assets. The existence of a primary and secondary market exposures Funds to mispricing and tracing error risk. IN theory, arbitrage opportunities should keep both measures from become large, but this is not always the case. Finally, there is the risk that certain ETFs may be less liquid than others. Increased illiquidity causes the bid-ask spready to widen which leads to higher trading costs and diminishes the price discovery mechanism in the market.

Unfortunately, academic literature provides little guidance on the extent of tracking errors and mispricing issues in commodity ETFs. Most of the previous literature analyzes stock index ETFs with only a few studies evaluating commodity ETFs. Therefore, the objective of this study is to examine the ability of selected agricultural and energy commodity ETFs in tracking the movements of their respective futures-based asset baskets. Specifically, the study will focus on the performance of CORN, OSYB, and WEAT in the agricultural sectors and on USO and UGA among energy ETFS over the period of January 2012 through October 2017. CORN, SOYB, and WEAT track a weighted basket of corn, soybean, and wheat futures, respectively, listed on the Chicago Mercantile Exchange (CME). USO and UGA track the movements of front month WTI crude oil and RBOB gasoline futures listed on the New York Mercantile Exchange (NYMEX). While these funds commenced operation between 2006 and 2009, a “buffer zone” was established to account for any issues that may have occurred with the mergence of new Funds. Tracking ability for this study is defined as the ability of the ETF to replicate the returns of the respective asset basket held by the Fund. Specifically, we will look at the mean absolute difference in tracking error, bias, systematic risk, and an OLD regression to examine how various factors impact the size of tracking errors. Additionally, this study will conduct a mispricing analysis as an alternative measure of tracking ability.

Analyzing the tracking ability of ETFS is an important issue as any deviations in tracking could have adverse impacts on portfolio returns. The findings of this study will provide much needed evidence on the tracking ability of commodity ETFS that is currently not available in the academic literature. Our investigation of factors that affect tracing performance will provide guidance for potential improvements and arbitrage opportunities. Thus, this study will be particularly useful for institutional investors, portfolio managers, and individual investors/traders trying to gain exposure to commodity markets and looking for ways to improve decision making in regard to trading this relatively new asset class.