



Wiley Finance Series

The **ETF** Handbook

*How to Value and Trade
Exchange-Traded Funds*

Second Edition

DAVID J. ABNER

WILEY

The ETF Handbook

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For Mom and Dad

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Preface

The number of available exchange-traded funds (ETFs) and the quantity of assets underlying them has been growing exponentially in recent years. For the future growth of the industry it is important for new users of these products to understand how to execute trades in the broad range of ETFs. Educating a new and expanding client base has become a universal endeavor among ETF issuers. Even the largest ETF providers in the industry have products that do not trade the high volumes of the few most popular products. In order for the client base to utilize the broader range of available products, it needs to understand how efficient executions are achieved. Understanding the proper methods of valuing and trading ETFs will enable investors to expand their product usage. It will enable the trading community to provide the services necessary to nurture the future growth of this young industry. *The ETF Handbook* presents both the tools necessary for valuing these funds and the concepts required for trading and executing ETF order flow. This information is important for traders and for the investor base.

ETFs IN THE REAL WORLD

Recently I encountered two examples that clearly demonstrate the need for this information. In the first, I received a call from a client seeking help in executing ETF order flow. The client's initial comments were: "I've been trying to buy two of your ETFs and the intraday volume is very light. I have been bidding for the shares for about a week, and I haven't been getting any executions. Can you help me?" This was not the first time I had heard this request. The adoption of the ETF product by an expanding user base has created a flood of such client calls to product issuers. I have been dealing with similar inquiries for the past 15 years. In the early years, the questions involved helping the new product adopters, primarily institutions and hedge funds, to achieve desired liquidity.

Lately, I have found myself in the role of champion of the smaller investor, helping advisors and our broader client base to achieve their desired executions in a more complete suite of ETFs. First, I attempt to understand what the clients have been doing so far and what their investment goals are. In this case, the client was an advisor trying to buy

50,000 shares each of two of our ETFs that each trade approximately 15,000 shares daily. The typical market that would be quoted on the ETFs is roughly 10 cents wide with approximately 500 shares on either side of the market. Without a solid understanding of how the ETF market works, one might think this would be a multiday trading adventure or, worse, a hopeless situation. It is far from that, however, and I was able to help the client achieve a very satisfactory execution. I learned that the client was placing very small limit orders on the bid side of the market. Then, every time the market started moving down, he would lower his order price. By doing this, he never let liquidity providers see any real size to buy in the ETFs; and he never let his order get near the value of the ETF, where opposing liquidity would be provided. This is the same as setting out in a boat to go fishing but never actually dropping a line in the water with a hook and some bait. You may be out fishing, but you will not catch any fish!

The client and I then had a conversation about his investment goals. I explained to him how the valuation of an ETF is determined. I explained that, in a low-volume ETF, most of the trading will take place against a liquidity provider. It is important to let the provider know you are willing to trade at a price close to the ETF value for the provider to be willing to offer the desired liquidity. With that understanding in mind, we calculated that the fair value for each of the ETFs was approximately three cents inside the offer side of the market at the time. So we did something that seemed very radical to the client: We decided to show our whole hand electronically. Instead of bidding for just 500 shares at a time, the client put a bid in each ETF into the system for all 50,000 shares at the price he was willing to pay that was in line with the valuation of the ETF.

The ETF marketplace has grown so broad that you sometimes need to trigger the alerts on trading systems in order to trade. This is analogous to a bell being attached to the door of a store so the proprietor can hear clients coming in and out. When the large bid showed up in ETFs that did not trade very much daily volume, the liquidity providers were alerted via their systems. Sometimes, if I see a large bid or offer show up in one of my products, I will call the liquidity providers myself to make sure they are aware of this trading opportunity. We did not adjust our price based on small market movements, interpreting them as noise within our strategy. This client's intention was to place a longer-term trade with a significant upside goal. He was indifferent as to whether he paid \$30.10 or \$30.07, but he had been adjusting his pricing as the market moved around. This kept him constantly under the fair value level that would enable his order to be satisfied. The upshot of this situation was that both of his large orders were filled almost immediately.

His executions make sense for several reasons. For one, he was bidding a level in the ETF that was considered to be fair value by the liquidity-providing community. He also showed enough size to attract some attention. The client was very satisfied with the executions. He had achieved the exposure he was looking for in the ETFs at a price that he was comfortable paying. He had not initially understood where the liquidity came from but was now comfortable with a method that he could use to get in and out of his positions in an acceptable manner. There are many intricate details to learn to achieve executions in your ETF orders. What is even more important to understand, however, are the concepts of what is happening in the marketplace. You will find all of those details in this *ETF Handbook*.

The second example shows the client achieving exposure via an alternative solution. This time, I received a call from a very large institution indicating that it liked the methodology behind our ETFs and wanted to make some purchases. It had heard about the potential liquidity available in ETFs and wanted to learn more about the ways of executing orders to achieve institutional goals. The caller was concerned because the ETFs they were interested in were trading with very low average daily volume. Since this was a large institution, it wanted to buy several hundred thousand shares of several ETFs that tended to trade fewer than 50,000 shares per day. Its investment horizon was longer term, and it was indifferent as to whether it traded today, the following day, or even over a few days if required.

This type of order flow utilizes one of the most important facets of the ETF structure: the creation and redemption mechanism. This client had a trading relationship with a large broker-dealer who happened to be an authorized participant (AP). Being an AP enables the broker-dealer to interact directly with the ETF issuer in the creation of new ETF shares. To achieve the desired execution, the client gave the AP the order to buy the ETFs at a price based on the net asset value (NAV). The AP went into the markets, purchased the shares underlying the ETF, and delivered them to the issuer. In turn, the issuer delivered new ETF shares to the AP, who then delivered them to the client. The client was able to achieve an execution in line with the net asset value of the funds without having an impact on the ETF price in the marketplace. In this scenario, the average daily volume of the ETF was irrelevant because the client never actually traded the shares in the secondary market. Executions of very large size can be accommodated in the ETF structure utilizing this method; this ability has helped to facilitate their growth. Executions of smaller size, however, can also be executed this way by accessing the liquidity aggregators and understanding how that business works. The details of creations and redemptions and utilizing liquidity providers are found throughout this handbook because they are critical functions of the entire ETF structure.

WHAT YOU WILL FIND IN THIS BOOK

This book has three main parts that will appeal to different sections of the ETF universe. Part One introduces the various structures of exchange-traded products, the methodologies underlying those products, and the ways of bringing them to the marketplace. Part One is written from the perspective of my role within an ETF issuer. I have been working at an issuer for almost ten years at the time of the writing of this book. I had been trading ETFs for more than ten years prior to deciding to move to the other side of the fence. A brief history of my interaction with the ETF product may be helpful to you.

Throughout the mid-to-late 1990s, I was running the closed-end fund business at Bear Stearns in midtown Manhattan. I was facilitating customer order flow and running a proprietary trading strategy pursuing discount arbitrage opportunities. I was also a frequent user of the Country Webs products available at the time. Those products later became the basis for the iShares single-country ETF product set. One day a salesman on the desk stood up and said to me, “I’ve got an order in a strange fund I’ve never heard of, can you make a market?” Since that was my role at the time, I agreed. I was not well versed in the product but made a market in the QQQs (Nasdaq 100 Index Tracker) to satisfy the client’s request. Almost immediately I lost a very large amount of money in my trading portfolio. In researching what went wrong, I learned much more about the product and became enthusiastic about this newer investment vehicle. It was then that I began to realize the potential of this unique product for the trading community and started to build an ETF business at Bear Stearns. I never expected the volume and asset explosion we have experienced in the last few years.

At that time I had my entire career leveraged to the markets and to my trading performance. I had always been a basket or fund trader and was never very comfortable buying single-company stocks. To manage my personal portfolio, I invested in mutual funds, mostly plain vanilla ones. I was diligently dollar cost averaging a small amount every month and watching it grow. When I got married in 2000 and my wife and I proceeded to buy a house, I sold all of my mutual fund positions to provide a significant down payment on the property. Two years later, when I had more money to invest and the ETF trading business began to soar, I decided I would never buy a mutual fund again but would utilize only ETFs for investing. I realized that this product makes great sense for the investor. I wanted to be involved in helping bring ETFs to market and helping investors utilize them for their investing goals. That is what planted the seed for my move to a seat at a young and innovative ETF issuer several years later.

Part One of this book presents many of the concepts related to bringing ETFs to market and how they fit into the investing landscape. I have avoided presenting more than a brief history of the ETF or reviewing every detail of the product mechanics, since those topics are well covered by other books. I focus on topics and concepts that have not been previously discussed in detail and may not have been fully understood unless the reader worked for a product issuer or had been a liquidity provider in the products. I bring the insider's perspective to the investor with the hope of creating a broader understanding for all interested parties.

We are living through a revolution in the way people invest. Never before have so many different investment products been available to investors at the click of a mouse via an electronic brokerage account. A leveling of the investing landscape is taking place that is bringing the tools of the institutional universe to the masses. As with any material shift in mindset or new product adoption, there are learning curves involved. The techniques for executing order flow in this investment vehicle are still not widely known and understood. Yet they are crucial because a main feature of the product is its availability on an exchange like an ordinary stock.

Part Two goes into an unappreciated core of the ETF ecosystem: trading. It is amazing how little some investors, large and small, know about the trading mechanism underlying the product that might make up their entire portfolio. I go deeper than ever before into the trading mechanism of the products, their underlying liquidity, and providing new ways for investors to rank products for usage within their portfolios by a detailed presentation of implied liquidity and my EBILS ranking system for ETFs. I also introduce you to all the different types of players in the ETF ecosystem.

In Part Three I discuss the mechanics of calculating the fair value for the products. I explain why an international ETF might be trading away from its intraday indicative value (IIV) during the trading day. Part Three also details the types of products available in the commodities category and the varying structures of the currency ETFs. Part Three presents a framework for understanding how to value those products to build the foundation for effectively executing ETF order flow. I often speak with people who are interested in getting into the ETF business; this will help them understand how the valuation process works. When an exchange-traded product moves to a premium, for instance, if you understand its underlying mechanism, you will know why this may have occurred and what may happen in the future.

Incredible growth and change is occurring in the universe of exchange-traded products every day. At the end of the book, I provide appendices that will lead you to some information about the industry. There is a guide to using Bloomberg for ETFs. I provide a list of issuers and their web page

addresses. There are some details on global ETF markets in Japan and Europe to touch upon what is happening in the industry beyond the borders of the United States.

TRADING TIP

Throughout the book you will see highlighted sections to bring attention to specific points regarding trading ETFs in the market.

AS YOU BEGIN

This book is not the first book on ETFs. I bring to the reader, however, an insider's view of what is behind the curtain. The book is unique both in its content and in its perspective. It will help as a guide to the proper utilization of ETFs. The investing public deserves to know and understand the details of how the products work. The trading community needs to build an infrastructure capable of handling the avalanche of ETF order flow to come. It is my hope that readers will take advantage of the features of ETFs and use them for many years of profitable investing and trading.

DISCLAIMER

The concepts and ideas in this book are my own. I am in no way representing WisdomTree Asset Management with anything represented in this book. There are risks involved with investing, including possible loss of principal. In addition to the normal risks of investing, foreign investing involves currency, political, and economic risk. Funds focusing on a single country or sector and/or funds that emphasize investments in smaller companies may experience greater price volatility. Investors should consider the investment objectives, risks, charges, and expenses of the fund(s) carefully before investing. Please seek the counsel of your accountant for any tax-related matters, as no tax guidance is presented in this book.

Acknowledgments

I had no idea of the difficulty that lay ahead of me when I agreed to update *The ETF Handbook* for a second edition. In a way, writing books is similar to having babies. Having watched my wife go through childbirth three times, I am amazed that anyone would willingly choose to do it even once, let alone multiple times. But when you look at the child you have created, those difficult hours are almost completely erased from your brain. I am not implying that writing books is as difficult as having babies, but when you see that book in print, the agony of the work is forgotten! So when I decided to rewrite for the second edition, I could scarcely remember the hard work of the first. There was still demand for the information provided, and I felt duty-bound to provide the necessary updates.

I learned three things from this updating process:

1. Much of the core ETF mechanics information provided in the first edition is still relevant today and will be throughout the lifespan of the product set.
2. The ETF industry has more than doubled in five years and thus there is a tremendous influx of new industry participants for whom this information is very important.
3. The people who were happy to contribute to the first edition generally made themselves scarce if they noticed me looking for assistance with the current work!

Only two people helped me with both editions of the handbook. Anita Rausch has been a friend of mine for longer than I care to recall. She is also a tremendous asset to the WisdomTree team as she guides the efforts of our Capital Markets group. She has read every word of both editions, which are immeasurably better because of her contributions. Our daily conversations about the industry have greatly influenced my thinking. And my mother-in-law, Lynne Cohen, has read every word of both ETF handbooks and even the *Visual Guide to ETFs* and rearranged my words into actual sentences that make sense. Anyone who makes it through this text should thank her personally for enhancing their reading experience. Alissa Kleinman assisted by bringing those changes into the digital world.

In the beginning of this endeavor I took on the assistance of an intern. Benjamin Hershkowitz, a student at Yeshiva University, was the driving force

behind much of the organization of the information in Part One. In the short time we had together, he displayed the passion that a “millennial” can have for the ETF industry.

Since my books focus on the mechanics and trading of ETFs, it makes sense that the Capital Markets people in my office are always offering their opinions. Zach Hascoe, Michael Barrer, and Paige Corbin were ready, willing, and able to help. Not only do they bring a wealth of knowledge, they also exhibit positive energy unrivalled among competitors. I was able to tap the next generation of Fixed Income ETF information in Ambar Bajaj. He reviewed and improved the fixed income chapter. Rebecca Sheehan is also deep in the thick of the ETF industry. She helped with a variety of components of the book and I can’t thank her enough for that assistance. Ryan Louvar applied his structural mastery to the section explaining those facets of the industry. That chapter is much tighter thanks to his work. The appendix on Europe was assembled by Rafi Aviav and Nathan Jiang. The appendix on Japan was assembled by Masafumi Watanabe.

The team at WisdomTree is amazing. Hungry for ETF information that can be distributed to investors, they push every day to explain the mechanics better, to help investors gain a better understanding, and to innovate beyond compare in the financial products arena. Every day I am honored to be working alongside this team.

I am always amazed at how many friendships I have developed in the industry. One friend in particular, Julie Abbett, is passionate about this industry and brought her vast experience to bear on reviewing pieces of the book. I can’t thank her enough for the help she provided.

I didn’t imagine when I agreed to write the second edition how dramatically my life would change during the process. I became deeply involved with our firm’s global expansion that caused me to travel more than I expected. My wife and children are so supportive it’s sometimes unbelievable that they are not furious with me! But they’re not. They want me to finish up and spend more time with them, but they also seem genuinely proud and consider themselves fellow soldiers in the ETF revolution. Lin-Manuel Miranda summed it up perfectly for them in the words of *Hamilton*, “This is not a moment, it’s the movement”! And they are *not* throwing away their shot!

Introduction

Exchange-traded funds (ETFs) are the most interesting products in the financial industry today. In the same way that Lego building blocks are used by both children and adults to make creations of all sizes, ETFs are the portfolio building blocks of the modern age, usable by investors of all sizes and for a variety of portfolio demands. Small investors are enthralled with the lower fees, ease of use, and exchange listing standardization of ETFs, while large institutions can benefit from innovative products and advanced portfolio management tools, coupled with lower fees and greater transparency.

The most frequently cited chart in the ETF industry is shown in Exhibit I.1, demonstrating ETF asset growth over time.

This is one important way to look at ETFs. Assets under management show the amount of dollars committed by investors to the strategies, enabling industry observers to understand the top-line revenues of the industry participants. Another way to look at ETFs is via industry trading volumes over time. You can see the evolution of trading volumes in ETFs in Exhibit I.2.

From the percentage of volume trading in the markets on a daily basis, you can observe how important ETF products have become to the entire ecosystem of market participants and the markets in general.

Over the years, I have answered many questions about ETFs. I have spoken at conferences, I have had thousands of individual meetings with investors of all sizes, and I have written two books explaining these products. You are holding the second edition of the first book I wrote about this industry in 2010. After writing my first book, I realized that there are two main types of investors interested in ETFs: One type of investor wants to ask in-depth questions, read articles and books, and have meetings. The other type of investor would rather read something brief that explains just the salient points. In this second edition, I will help both types of investors. I hope this makes *The ETF Handbook, Second Edition* more accessible for all types of readers and investors, no matter how deep they want to dive into the subject.

To begin, I will first lay out some important and frequently asked questions about the industry, providing answers to each. The following questions and answers will give you a strong foundation for understanding the industry and will be useful as a reference tool as you navigate your way through using the products.

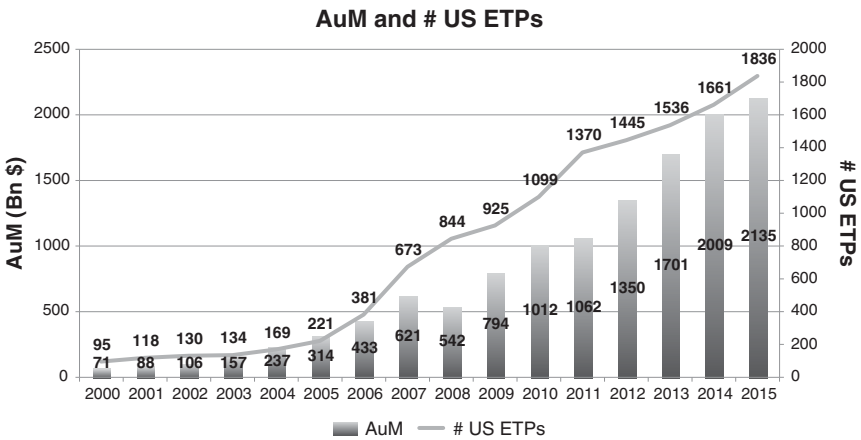


EXHIBIT I.1 Asset Growth Chart
Source: BlackRock, Bloomberg

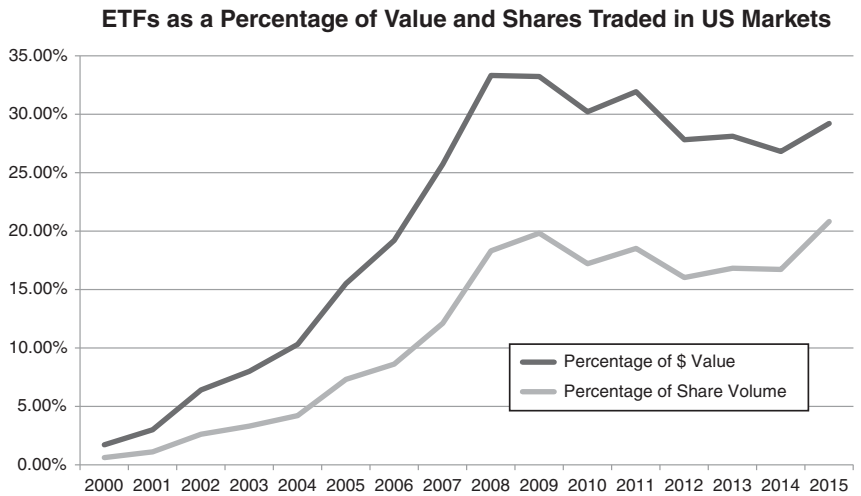


EXHIBIT I.2 Trading Volume Growth
Source: Credit Suisse Trading Strategy Group

QUESTIONS ASKED ABOUT ETFs

1. What are the main differences between an ETF and a mutual fund?

An ETF can be considered to be part of the mutual fund product set. Both products are pooled investment trusts launched under the Investment Company Act of 1940. The markets have changed dramatically since the 1940s and there are pieces of the 1940 Act that are not as imperative in a more modern age.

The main features of an ETF that are different from a mutual fund are:

- i. Exchange listing—This leads to standardized product use across the investor spectrum, the ability to trade throughout the day, and enhanced liquidity as compared to traditional mutual funds.
- ii. Daily transparency of holdings—This enables all investors to understand the fund holdings every day. This facilitates the arbitrage functionality ensuring that the ETF and the underlying assets can trade in a manner that is independent yet related.
- iii. Tax advantages—Many ETFs pay out much lower capital gains distributions than a corresponding mutual fund. This is due to the nature of the creation and redemption mechanism enabling the ETF to transfer assets into and out of the fund without generating tax consequences across all investors.
- iv. Lower fees—This is a feature of ETFs that is often debated because we are in a period of dramatic fee compression across all funds. What is not debatable is that removing the execution process from the fund management process leads to lower expenses to investors being passed through the mechanism. Investors are not disadvantaged by the actions of other investors in the same ETF. This is critical because whether you are the only holder of an ETF, or one of millions, you are not impacted by the actions of other investors entering and exiting the funds. This is very different from a mutual fund that passes those fees of executing asset changes across the investor base.

Two key differences are that an ETF has to be listed on an exchange and an ETF takes in assets and disburses assets through a process known as creation and redemption. Trading on an exchange enables the ETF to act independently from the actual basket of underlying assets while still being tethered to that basket by the creation and redemption mechanism. This tethering structure is often referred to as arbitrage whereby you can exchange the underlying basket of assets for the ETF shares and vice versa. This keeps the price of the ETF shares to be trading always in relation to the assets for which they can be exchanged. In a sense, the ETF shares act as a transference mechanism delivering both the performance

and the liquidity of the underlying assets to the holder of the ETF in a convenient wrapper. If the underlying assets were the only form of liquidity for an ETF, then the liquidity would be the same as an ordinary mutual fund. Instead, exchange listing adds another entire component to the liquidity infrastructure. Because an ETF is listed on an exchange and trades throughout the trading day, it enables a wide variety of market participants to apply the principles of modern markets to the products. In order to be listed on the exchange the ETF is very transparent, making its holdings available on a daily basis, and in the U.S. markets ETFs have only a single share class, causing all investors to come together in the same product on the exchange. This is a big difference from many mutual funds that have multiple share classes for different investors typically at different prices depending on their status. The confluence of a variety of different investors all trading the same product on exchange for different reasons creates an additional layer of liquidity for ETFs that goes beyond the underlying assets. This is liquidity from the marketplace that develops in the form of participants using the ETFs for a wide variety of trading strategies, and being able to develop highly sophisticated mechanisms for trading the ETFs against other products. This has led to a marketplace where ETF liquidity is greater than the liquidity that might become available in a similar mutual fund. This is explained in more depth in the next question.

2. How is the liquidity of an ETF different from the liquidity of a mutual fund?

At the base level, an ETF and a mutual fund (MF) present the same amount of minimum liquidity. Investors in a MF can send almost any size check to the manager, and they will receive shares in the fund. In this case the money is going directly to the manager, and the managers are interacting with the brokerage community to purchase the necessary assets representative of the increase in assets of the MF. In the case of an ETF, instead of delivering a check to the manager, you are typically purchasing your shares directly through a broker in the secondary market. It is their job to purchase the underlying assets and deliver those to the ETF manager, in the form of a “creation unit.” If you are an institutional-sized investor, your broker can utilize the creation mechanism on your behalf to help you enter your ETF position at net asset value (NAV) plus expenses. While the terminology may be different, the concepts are similar: New money flowing into both structures gets allocated to the underlying assets, and new shares are issued. ETF investors use a measure called “implied liquidity” to assess how much money can be invested into a given ETF on a daily basis. This measure is used to try to prevent market impact from investments. A similar measure is used by

the trading teams at mutual funds to determine how to trade when they are tasked with purchasing the assets for new investments; that measure is called transaction cost analysis (TCA). So, the first step in thinking about liquidity in ETFs versus mutual funds is that if they are based on the same underlying assets, their base liquidity will be the same.

The ETF, however, has an advantage in liquidity terms because of the unitary fee structure, single share class, and daily transparency of its basket. Because an ETF trades on an exchange and its holdings are published daily, a wider variety of potential users can be utilizing the fund on any given day. These additional users can be creating excess liquidity in the ETF that works to the benefit of all other investors in the ETF. The most pure example of this is the SPDR S&P 500 ETF Trust (SPY). If you look at the implied liquidity of the underlying basket, it displays the potential to trade 35 million shares per day in ETF terms, while being no more than 25 percent of the average daily volume (ADV) in any of the underlying stocks. This is equivalent to a potential notional of approximately 7.35 billion USD daily. The average daily volume of that fund is approximately 105 million shares per day, or a notional of 22 billion daily. This excess liquidity that you see in the ETF develops because of the variety of other trading strategies for which people use the ETF: things like index arbitrage against the futures, options trades, high-frequency trading strategies, and others. So the ETF presents an additional amount of liquidity that a mutual fund never can because of the wider variety of market participants all interacting in the same structure, and at the same pricing, on the exchange. We can see this additional liquidity in many ETFs, especially those in international markets. Many ETFs actually trade more in the U.S. markets than would be expected if you were only trading the underlying basket. This is the case for those ETFs tracking countries like India and Japan. Interestingly, several of the Europe-focused ETFs could trade many more potential shares on a daily basis if you examine their implied liquidity as compared to their average daily volume.

3. Can institutional investors seed ETFs?

Any investor can seed an ETF. To “seed” an ETF is really just to make the first investment into the fund. That typically takes place in the size of one creation unit (approximately 2.5 million USD) or greater. The process by which an ETF receives assets into the portfolio is known as the “creation process.” This is when a counterparty, known as an authorized participant (AP), delivers the underlying basket of assets to the ETF issuer in the proper weights, after which new shares of the ETF are issued to begin trading on the exchange. In the United States, seeders do not typically receive any benefit versus other investors in the ETF.

The main benefit is that when you deliver the first tranche of assets to the fund, you receive the exact initial NAV of the fund. While this is the same for all creations, it is very clear when it is being done for the first time. Often when institutions work with ETF issuers to design products around particular investment specifications, those institutions are the initial investors (seeders) of the fund. This process is great for the growth of the ETF because it immediately shows other investors that the underlying investment theme has been designed around a current target. While it is not necessary for the institutional investor to have other investors in the ETF, that growth provides a sense that they are not alone in their investment thesis. Another benefit of working with ETF issuers to develop and seed ETFs is the potential marketing and public relations opportunities around the ETF launch.

4. How do I know if an ETF is going to close?

Every year many ETFs close for a variety of reasons. Typically, the ETFs close because of a lack of progress in gaining assets, coupled with a change in strategy from the ETF issuer. Many smaller ETF issuers have limited resources for running the business; therefore, the expenses of keeping ETFs without assets in the markets become too much to bear. The larger ETF issuers generally keep ETFs with smaller amounts of assets in the markets for longer time periods, as long as they still believe the investment mandate underlying the fund will become valuable to investors at some point in the future. ETFs are usually closed because of business restructurings around the corporate entity, or a desire to take the product suite in different directions. I have never seen an ETF close that had significant assets (over \$50 Million USD) or that had an anchor investor for whom the ETF position was an integral part of their portfolio. In the scenario where there is a large institutional anchor investor in an ETF, it would most likely be a part of the distribution teams' responsibilities to communicate with that investor when appropriate if the ETF they held was going to undergo changes or delisting.

5. What happens if my ETF closes?

The closing processes of an ETF and a mutual fund are extremely similar. If an ETF is going to close, it will announce to all shareholders in advance: typically, within a window of a stated number of days. Investors then have the ability to sell their shares, utilizing either the secondary market or the primary market (if they are trading in large blocks). If you choose to hold your ETF position until it stops trading on the exchange, at that point the ETF's underlying assets will be sold in the market. The value of those assets will be distributed to all remaining investors. In the case of investors remaining in the fund upon its closure, the costs of selling the remaining fund assets will be

distributed among all the investors in the fund, which is different than you bearing only the costs of your own execution when you make sales in the ETF independently.

6. Is there a risk to being the largest investor in an ETF?

Often investors are concerned about being the largest or only investor in an ETF. This is a misplaced concern. The structure of an ETF enables investors to control the execution of their position outside of the actual fund structure. If you were the only investor in an ETF, it would function the same way a separately managed account would function, and its asset valuation and base liquidity would present similarly as if the ETF was widely held. An important point to keep in mind is that movements by investors do not impact the positions of other investors in the fund. It is completely viable to be the only holder of an ETF, and you will maintain all of the ability to enter into and out of the fund without any additional fees or restrictions.

Typically, an ETF is launched with a small amount of seed capital. This initial investment is usually provided by the market-making community, which is then using that initial position to provide base initial liquidity in the ETF to facilitate the first trading in the ETF. Seed money comes into an ETF in exactly the same fashion as all other creations. ETF creations happen in block amounts of typically 50,000 shares. Redemptions happen in the same manner. If you are an institutional-sized investor and you have a 100,000-share position in an ETF, you can liaise with your standard broker and have them redeem your ETF position every day. Or you can choose to sell it on the secondary market. Since ETFs are traded on an exchange, the initial shares of an ETF typically become widely held among investors; thus, even an ETF with small assets can have many holders. If you were to accumulate all the shares in the ETF by purchasing them on the secondary market, however, you could continue to hold your position. The ETF valuation would be unaffected. And if you chose not to sell any shares, but other buyers came into the market to purchase, the ETF liquidity-providing community would facilitate that order flow by shorting shares to the new buyers, and then processing creations to flatten their portfolios. The ETF could grow and you would be able to maintain your position with no changes. In addition, you can be a small percentage of an ETF, but for some reason other investors may choose to sell their shares. If they sell enough shares, the ETF liquidity providers will redeem shares, and at some point you can end up as the only holder with 100 percent of the ETF. This also would have no impact on the valuation of the underlying assets or the functioning of your ETF position. So there is no additional risk to being the only investor, or even the largest investor, in an ETF.

7. Why is an ETF more tax efficient than a mutual fund?

When investors position in an ETF, they bear the costs of execution, both when they enter into the position and when they exit the position. When an investor positions in a mutual fund, the costs of that execution are spread among all fund holders. Let's walk through the process of investing in a mutual fund and an ETF:

- i. You place an order and send money to the mutual fund manager. Their traders then need to go into the markets and purchase the underlying assets. The costs of purchasing those assets impact the entire fund, not just your execution, because you are executing at NAV. The NAV of the fund will reflect the cost of bringing those new positions into the fund. When it is time to unwind your position, the trading team at the fund manager will sell a slice of assets from the fund portfolio, and they will return your investment proceeds. Because the trading was done within the fund, any impact to the portfolio will have to be distributed among all investors in the fund. So even if you had no activity within your own position, you are impacted by the activities of other investors in the fund. Also, the NAV is subject to the expenses related to other investors coming into and out of the fund.
- ii. This process is very different for an ETF. When you purchase an ETF, you are typically buying shares via a secondary market trade, which leads to a creation. That creation involves the broker purchasing the basket of underlying assets and delivering them to the ETF issuer. The same happens in reverse when you sell shares: The ETF issuer delivers out a slice of the underlying assets of the fund. The ETF issuer is not trading the assets in the markets, so any gains that would have been generated from a purchase and sale are not occurring in the fund. This leads to generally lower distributions of capital gains in equity index-based ETFs, typically none. Additionally, any activity by investors is happening in the shares on the secondary market, outside the fund, and only those investors are bearing the costs of those transactions. Execution costs for investors' moves do not flow into the NAV and impact all investors. The actions of other fund investors do not impact your position like they would in a mutual fund.

8. Does the number of authorized participants in an ETF aid in the liquidity of the fund?

The authorized participants (APs) are typically large ETF market-making businesses at the investment banks and trading firms. For practical purposes, they all sign up to be APs in all ETFs, so they do not have to turn order flow away. There are specialized trading

firms that only trade certain funds, and in turn they do not sign up at every issuer; this is what drives a slightly proprietary nature to the AP list. Approximately 90 percent of the APs are the same at all issuers, except for the few specialized firms. This leads to an important point about ETF liquidity and APs: People often assume that the ETF liquidity provider is the AP, and vice versa. This is not the case. The act of processing creations and redemptions in ETFs is done by APs. To provide liquidity in ETFs, you simply need to be able to trade the products on exchange. There are many cases in which an ETF trading firm provides liquidity in ETFs throughout the day, and then has their creations and redemptions processed by their custodian. The custodian is the AP and undertakes stock delivery and receipt responsibilities. The same thing is also possible in reverse. That same custodian might not have an ETF liquidity business in which they trade the ETFs providing markets to the street or their customer base. An example of this is an ETF trading firm based in Singapore with offices around the world. They trade a large percentage of the ADV of U.S. ETFs, and they use one of their U.S. custodians to process their creations and redemptions. They pay a small transaction fee for the service, which outweighs being an AP. The act of creation and redemption is merely an operational procedure of delivering and receiving ETFs and baskets.

This is important because people often make the mistake of thinking that the number of APs equates to an amount of liquidity available in the products of that issuer. This is incorrect. There is an entire ecosystem of ETF liquidity providers that are trading ETFs, making markets, and providing liquidity. Indeed, the number of ETF traders is many times higher than the number of ETF APs. The capital markets teams are constantly cultivating relationships with firms that trade ETFs and ensuring that they are well prepared to provide liquidity in their products. This helps products to trade better, with tighter spreads and more liquidity.

9. Does the amount of assets in an ETF affect the investor experience?

Often in the ETF industry you hear of investors who want to invest in a particular ETF but are waiting until the ETF reaches a certain asset threshold. Even many wealth management platforms use asset minimums as criteria before allowing ETFs onto the platform. These restrictions are based on a misunderstanding of the ETF structure. One significant misconception is the fear that if you try to execute a large trade in an ETF with small assets, you will impact the price. This is simply incorrect. ETF prices are dictated by the value of the underlying assets and broad market events at the time. Take a domestic equity ETF: If you wanted to execute \$100 million worth of a U.S. large-cap ETF that only had \$10 million in assets, the ETF liquidity ecosystem would

work to transfer the liquidity of the underlying assets from the stocks into the ETF to facilitate that transaction. This happens seamlessly every day in thousands of ETFs. Another misconception is that being a large percentage of the fund holdings restricts your ability to enter and exit the fund. This is also incorrect. All investors are able to go to the secondary market to enter and exit ETF positions. On the back end of that procedure, ETF liquidity providers will utilize the primary market to grow and shrink the assets, similar to the way just-in-time inventory management works. As a shareholder in an ETF—a product launched under the Investment Company Act of 1940—whether you hold 80 percent or 1 percent of an ETF you enjoy the same protections of all fund shareholders. Your percentage of holdings makes no difference in your ability to freely enter and exit the fund, without impacting price, on a daily basis. As the product set has grown we have seen many sophisticated institutions working with ETF issuers to help launch funds based on bespoke strategies. Frequently these product launches are accompanied by significant investments into the ETF by the institution. They have gained an understanding of the structure and have no fears about being the only holder of an ETF in large size. This is a sign of the education that has taken place in the industry over the last decade.

10. What are the best trading practices for ETFs?

When trading ETFs there are some best practices to keep in mind. First and foremost is that you should understand what the ETF price is telling you about the marketplace. An ETF price is like a window into the views of the entire market. It represents what the market thinks is the current value of the underlying assets in the fund. In an ETF with underlying equity assets that are trading at the same time as the ETF, the price is usually tracking right along with the basket value. For investors paying close attention to market structure, you may notice whether that ETF price is trading on the bid side of the underlying assets or on the offer side. This provides a slight indication of market pressures at the moment of trading. In an ETF with underlying equity assets from markets that are closed while the ETF is trading, the price of the fund represents the consolidated views of where market participants believe those assets will be valued when they next begin trading. For example, in a fund with Japanese equities that is trading below the most recent value of its underlying assets, the fund price tells investors that the market is expecting those stocks to open lower when they next begin to trade. The fund price represents what the market believes to be the fair value of those assets at the given time. The fixed-income arena has become a very important place for fund investors to gain insight into what has historically been a very opaque market. ETFs that hold fixed income assets tend to be

real-time pricing mechanisms for bonds that may trade infrequently and with unclear pricing. The ETF industry has created a real-time pricing mechanism for bonds. Understanding what the price is telling you about the market is the first step in executing ETFs efficiently.

Learning how to deal on an exchange with the various order types and other market participants is the next set of important concepts to understand when executing in ETFs. When you invest using ETFs, you have the benefit of independently controlling your execution throughout the trading day, in exchange for the complicating factor of having to negotiate in the open market to acquire or sell shares. An entire ecosystem of ETF market participants who facilitate ETF executions has thus emerged. There are those that provide ETF liquidity on exchange for investors to interact with electronically, and there are those that work on an institutional basis in a form of off-exchange trading, which is then printed to the exchange tape. In recent years, we have also seen the development of request-for-quote systems, which people can use to interact with other ETF users to trade shares away from the exchange. There are also a wide variety of order types that investors can use to execute all types of orders via the electronic systems. “The Ten Keys to Trading ETFs” discussed later in this book will help guide you with all your ETF trade execution questions.

PART One

Introduction to the ETF Market Place

It is hard to believe it all started under a buttonwood tree. The Buttonwood Agreement was signed on May 17, 1792, creating the New York Stock and Exchange Board, now the NYSE. It was a humble beginning for an industry that would guide the evolution of business for many years to come. Two hundred years later the first U.S. ETF was listed on an exchange. Investing was about to change again and become democratized for investors. A wide variety of asset classes and investments from around the globe has become available to any investor. The prices are reasonable and the degree of transparency unprecedented.

This is a book about change. The use of Exchange-Traded Funds is indeed a revolutionary change both for investors and for those in the financial services industry. Never before have investors had the transparency, liquidity, or access now available in the form of ETFs. The products have packaged new and old indices, and all variety of asset classes, neatly into one-trade tools usable by all levels of investors. ETFs are enabling financial advisors to broaden client portfolios, tailor them to better manage risk, and bring down the costs for their investors. And investors are ever more eager to bring ETFs into their portfolios to take advantage of these benefits. This book is written for investors of all sizes. There will be information useful for institutions needing methods of implementing large-size portfolios in the products, and there will be information valuable for the smallest retail investor who needs to understand this revolutionary new product.

This updated edition is split into three parts, which increase in complexity, starting from history proceeding through advanced ETF valuation.

PART ONE

Part One of this book is split into three chapters:

Chapter 1 takes a brief stroll through history, highlighting milestones that crafted the modern financial system. The structure and features of mutual funds and closed-end funds are discussed as they are the two other major products in the investment landscape. The chapter then delves into the distinct ETF structure and the purpose of its introduction into the modern-day portfolio. It will be valuable to look at the advantages of ETFs in comparison to other products to determine what fits best in a portfolio. The chapter ends in an examination of the benefits of this growing investment tool.

Chapter 2 maps out the process of building an ETF. This includes the development of the underlying basket of assets and the screening of its underlying constituents for proper liquidity. It will help investors understand the *why* and the *how* of product development. The chapter also explains the basic nature of the creation and redemption process of ETFs.

Chapter 3 discusses the intricacies that come with bringing a product to market. This chapter focuses on how all the moving pieces have to work in unison for optimal success. It includes the importance of the relationship with partners and exchanges to lift an ETF off the ground, ensure proper functionality, and keep it growing and working well for its investors. The chapter ends with reasons why an ETF may close and how that may affect investor portfolios.

Exchange-traded funds have now been available as an investment product for more than 20 years. The low fees are the first feature that comes to mind when ETFs are mentioned by investors. Although this alone can be enough of a reason for investors to enter into the ETF marketplace, it can be subordinate to the other benefits of this product. Part One of *The ETF Handbook, Second Edition*, shows the evolution of the product structure and the variety of benefits these new tools bring to investors. The evolution of the financial markets through technology has helped to make these products available to investors. They have proven to be exactly right for building portfolios in the modern era!

After explaining the evolution and characteristics of the products in Part One, I dive deeply into the actual trading of the products in Part Two. One of the most important benefits of the products is their exchange listing and the myriad benefits that brings to investors, so it is at the core of this book and should be the core of investor knowledge.

In Part Three we will explore how to value ETFs, and the mechanics of calculating Net Asset Value. This section will get into the inner mechanics of the products, enabling an understanding of what is actually happening within them to provide the exposure and returns desired by investors.

How Did We End Up Here?

By the end of 2014, U.S.-registered investment companies exceeded \$18.22 trillion in managed assets. The three largest categories were mutual funds (MF: \$15.85 trillion), exchange-traded funds (including non-1940 Act funds, ETFs: \$1.98 trillion), and closed-end funds (CEFs: \$289 billion).¹ Every investor—from small households to large institutions—utilizes funds. In the year 2000, mutual funds accounted for more than 95 percent of assets invested in funds, with nearly \$7 trillion in assets spread throughout 8,370 investment companies. At that time, ETFs accounted for less than 1 percent of the \$7 trillion dollar market, with just 80 ETF investment companies sharing the \$66 billion in assets. Fast-forward to the end of 2014 and U.S. ETFs are nearing \$2 trillion in assets. This accounts for roughly 11 percent of all fund assets in the United States. Over 1,500 investment strategies are now vying for the ETF investor with a wide array of evolving products. We must ask ourselves important questions: How did we get here? Where are we going?

We live in a generation that demands innovation at rapid speeds. That new flat-screen television purchased yesterday is outdated before being removed from the box. The financial markets are not immune to such revolutionary demands of quick and efficient access to everything. What worked yesterday does not necessarily work today. Smart investors should always be looking for the optimal products and techniques to remain on top. The creation of the ETF is a prime example of successful financial market disruption.

Prior to the establishment of the ETF, investors did not have the exposure and access to the financial instruments, benchmarks, and investment strategies that the ETF now makes possible. Looking at new issuances and assets under management (AUM) among ETFs, CEFs, and mutual funds over the last decade, the numbers indicate that mutual funds may be losing their stranglehold on the industry. Exhibit 1.1 displays the new issuance in asset terms of the two major competing products, mutual funds and ETFs.

This can be contrasted with the flows into ETFs as compared to the flows out of Mutual Funds presented in Exhibit.1.2.

This chapter looks at the broad similarities and differences among mutual funds, closed-end funds, and exchange-traded funds. It examines

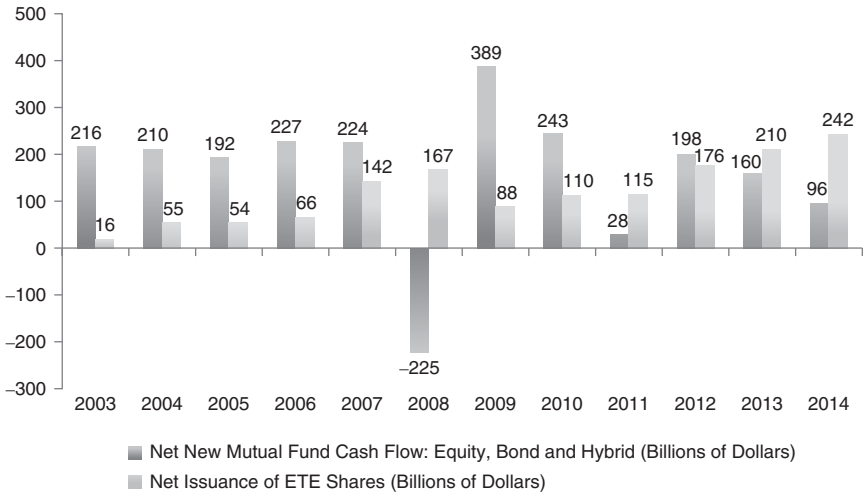


EXHIBIT 1.1 New Issuance of ETFs and New Cash Flow to Mutual Funds, 2003–2014, Billions of Dollars
Source: ICI Factbook 2015

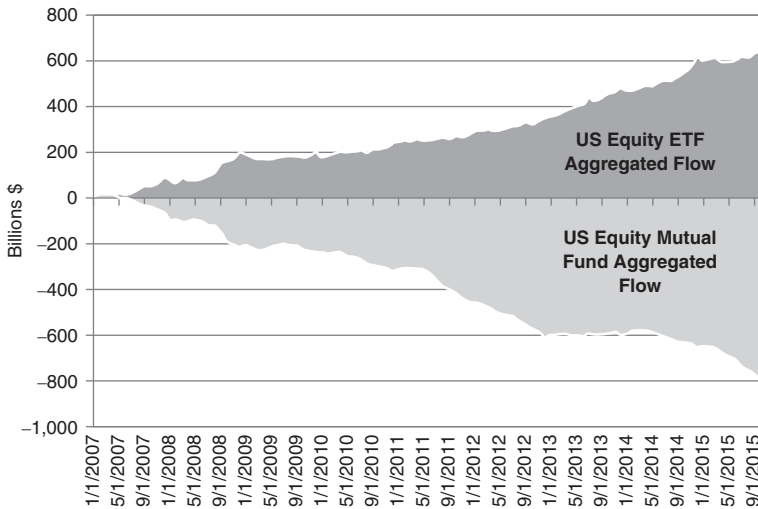


EXHIBIT 1.2 Flows into ETFs and out of Mutual Funds, 2007–2015, Billions of Dollars
Source: KCG 2016

why the different features that ETFs possess have enabled them to experience rapid growth over the last several years. We take a brief look at the origin of ETFs and their rapid adoption. Finally, we will discuss what the future holds for this young product structure. Understanding the inception and development of these investment products is imperative before delving into the complexities of these new investment vehicles. In the next few chapters I will delineate how ETFs are initially developed and the ways they are brought to market. Part Two presents strategies for how to position them within your portfolio through efficient trading and understanding of the market. Part Three explains the more technical aspects of how to value ETFs.

THE HISTORY OF INVESTMENT PRODUCTS

This is a book about change. The use of exchange-traded funds is a revolutionary change for investors and for those in the investing business. Modern technology continues to shrink our world. The development of financial instruments is occurring at lightning speed. It is a challenging task to keep informed of the latest techniques and tactics. How did we arrive at modern investment products? A brief walk through history will deepen our understanding of available financial products and how they evolved.

The Birth of Money

The concept of securing wealth for the future by means of investment has always been relevant. The Code of Hammurabi, dating back to 1,750 BC, provides a legal framework for investing. This law aimed to classify the rights of debtors and creditors alike. Long before the invention of money, the barter system was in place. Bartering is the oldest method of trading; it is the concept of exchanging goods and services for other goods and services. It is recorded that ancient peoples have been bartering since 6,000 BC. This allowed for a wide array of products to be distributed across the globe without money. The exchange system of barter, however, had many shortcomings. It required two traders to have products or services of equal value who were also willing to trade at a given time. Another complication was establishing trust between traders and the products or services they offered. As society advanced, the limitations of the barter system yielded to the creation of currency and money.

Currency started by using popular commodities that had the ability to be split into portions. This allowed the accrual of currency in the form of livestock, wheat, beads, clay, bits of metals, and so on. Manufacturers and consumers could now hold commodities that could be traded at a later date.

As society advanced, the limitations of this system became magnified. Commodity currency was in limited supply and was often complicated to access for trade. The creation of coins was the next step in the advancement of monetary transactions. The first manufactured coins date back to China, India, and the Aegean Sea between 700–500 BC. As the demand for financial advancement grew larger, it served as the backbone of an advancing society. Stability increased with the issuance of gold and silver coins that maintained an innate value. It was not until the seventeenth century in London that modern banking was truly born.

Goldsmith Bankers

Banking in its modern form developed from the paper credit–money issued by the goldsmiths in London. It began as owners of gold and other valuables feared thievery from pillagers. In the 1640s, the outbreak of a civil war in England sent the masses searching for a reliable storage of wealth. The goldsmiths, who could appraise and safely store valuables, saw an opportunity for business. The goldsmiths started storing the gold in their vaults, charging a fee for this service. They issued a receipt to the depositor, which stated the amount of their holdings in the gold vault. The possibility of withdrawing gold with the issued receipt resulted in the creation of paper money and the modern banknote. As merchants feared traveling with gold, the goldsmiths issued notes to be used in its place. The record keeping and simplicity of these transactions laid the foundation for modern banking.

It was not long until the goldsmiths realized another opportunity for profit. The majority of gold, backed by notes, remained in the vault. The goldsmiths started loaning the gold of others, using the interest to fund the required withdrawals. Now, receipts were issued to those who borrowed money as well. The receipts of both the debtors and creditors of the goldsmith became widely accepted. The modern banknote had come into existence. The goldsmiths accumulated large amounts of wealth for supplementing the exchange of metallic money. It did not take long before the notes in circulation exceeded the stored gold and coins. The money supply of the capitalist economic system was no longer restricted by precious metals as a trust in paper currency propelled financial expansion.

The Inception of Investment Products

As the world technologically evolved, the opportunity to develop finance was sparked from a deeper trust in paper money and the banks that backed them. Investors were looking for new ways to grow wealth. The origin of the first investment trust seems to have been created by a Dutch merchant, Adriaan van Ketwich, in 1774. The name of Ketwich's fund, "Eendragt

Maakt Magt,” translates to “unity creates strength.” His idea was simple. He would pool together funds from small investors. This concept of combined minimal capital that offered immense diversification had significant appeal. This idea of pooling resources and spreading risk set the groundwork for early structures of the mutual funds and closed-end investment companies. King William I of the Netherlands is credited with the first mutual fund, recorded in 1822.

This early structure was implemented in the Switzerland Investment Trust in 1849. Scottish investors rapidly adopted this style of investing in the 1880s. This conceptually simple design of investing found its way to France and Great Britain shortly after, and ultimately took root in the United States at the end of the nineteenth century. In those early days, mutual funds were called “stock trusts.” Stock trusts evolved into “investment companies.” The New York Stock Trust first debuted in 1889. The Boston Personal Property Trust, formed in 1893, was the first closed-end fund in the United States. The modern-day mutual fund was created in 1924 and launched in 1928.

As investors tinkered with the structure, design, and purpose of investment products, fund classification was born. An “investment company” is a company that issues securities and is primarily engaged in the business of investing in securities. An investment company invests the money it receives from investors on a collective basis, and each investor shares in the profits and losses in proportion to the investor’s interest in the investment company. The performance of the investment company will be based on (but not identical to) the performance of the securities and other assets that the investment company owns.²

The three largest types of investment products that fit the definition of investment companies are the mutual funds, exchange-traded funds, and closed-end funds. Exchange-traded funds are the newest and fastest growing category, and currently second largest in asset terms. We will examine the unique structure of each product, highlighting the benefits as well as the complications that they pose. Understanding the alternatives in the investment fund space will allow us to comprehend the multitude of needs that ETFs can satisfy in a given portfolio. It also enables us to understand how the ETF has evolved to encompass some of the useful features of earlier products while at the same time improving some of their structural drawbacks.

IN THE BEGINNING, THERE WERE CLOSED-END FUNDS

The first of the three investment companies we will speak about is the closed-end fund (CEF). The popularity of CEFs can be traced back to the British Investment Trust in the 1860s. CEFs were used in England to invest

in the infrastructure of the developing United States. This investment vehicle provided capital for the creation of U.S railroads through its shares offered. The ability to pool investments and access more difficult-to-reach exposures quickly drew American interest to this investment vehicle. The Boston Personal Property Trust, formed in 1893, was the first CEF in the United States. As the Roaring Twenties rolled in, CEFs supported the economic prosperity. Investors of all scales flocked to advisory firms to take part in the action. CEFs allowed small amounts of capital to be collected to participate in large enterprises. Closed-end funds held a large percentage of total market capitalization at this time, with 4.5 billion in assets. As the sky seemed the limit, uninformed investors came rushing in, chasing the instant riches of the roaring stock market. These novice purchasers were susceptible to fraud, as many bought into CEFs with no viable investment objective. Significant manipulation transpired from the lenient regulations. Insiders inflated share prices, creating large profits as they sold their overvalued shares. Excessive speculation and the deception of insiders would ultimately contribute to the most devastating stock market crash in the history of United States.

The Wall Street Crash of 1929 ultimately ushered in the Great Depression. Closed-end funds were among the victims of the Great Crash. Extensive leverage, over-speculation, and lack of regulation were the sources of their demise. The Crash of 1929 opened the eyes of the public. Regulatory laws were created, and the Securities and Exchange Commission (SEC) formed in 1934 to enforce, create, and protect these rules. The Securities Act of 1933, the Exchange Act of 1934, and the Investment Company Act of 1940 regulated the closed-end fund investment company. The laws helped to protect all investors from fraud and other dangerous practices such as excessive leverage. Even with a new regulatory body and new guidelines, the title “closed-end fund” was severely tainted. The CEF structure would lay dormant for decades to come. The open-end mutual fund saw dramatic growth in the 1940s as investors steered clear from CEFs. It was not until 1984 that CEFs were reawakened. A few key structural factors distinguish CEFs.

Distinguishing Features of CEFs

The SEC outlines some of the traditional and distinguishing characteristics of closed-end funds:

- Closed-end funds generally do not continuously offer their shares for sale. Rather, they sell a fixed number of shares at one time (in an initial public offering), after which the shares typically trade on a secondary market, such as the New York Stock Exchange or the Nasdaq Stock Market.

- The price of closed-end fund shares that trade on a secondary market after their initial public offering is determined by the market and may be greater or less than the shares' net asset value (NAV).
- Closed-end fund shares generally are not redeemable. That is, a closed-end fund is not required to buy its shares back from investors upon request. Some closed-end funds, commonly referred to as interval funds, offer to repurchase their shares at specified intervals.
- The investment portfolios of closed-end funds generally are managed by separate entities known as "investment advisors" that are registered with the SEC.
- Closed-end funds are permitted to invest in a greater amount of "illiquid" securities than are mutual funds. (An illiquid security generally is considered to be a security that cannot be sold within seven days at the approximate price used by the fund in determining NAV.) Because of this feature, funds that seek to invest in markets where the securities tend to be more illiquid are typically organized as closed-end funds.

Closed-end funds come in many varieties. They can have different investment objectives, strategies, and investment portfolios. They also can be subject to different risks, volatility, and fees and expenses. Closed-end funds are subject to SEC registration and regulation, which subjects them to numerous requirements imposed for the protection of investors. Closed-end funds are regulated primarily under the Investment Company Act of 1940 and the rules adopted under that Act. Closed-end funds are also subject to the Securities Act of 1933 and the Securities Exchange Act of 1934.³

How CEFs Differ from ETFs

In the marketplace many comparisons between ETFs and mutual funds are made. This comparison is based on asset size. The large shift of investment assets to the more modern ETF structure has investors rethinking the dominant mutual fund market. The structure of ETFs, however, is more comparable to that of a closed-end fund. When one makes an investment decision, the conversation would not be complete without examining the closed-end fund segment of the market.

The way that closed-end funds trade is most relevant for their comparison with ETFs. This is where investors most often become confused. The critical difference between the two product types is in their creation and redemption feature. Although they both trade on exchanges in the secondary markets, CEFs issue a fixed number of shares only upon their IPO. ETFs, on the other hand, are designed for continuous issuance of new shares. As explained in the name, CEFs are closed-ended. This means that

a fixed number of shares are outstanding, whereas ETFs are considered to be open-ended and shares can be created and redeemed by the issuer at will.

A closed-end fund has a portfolio of constituents. Managers invest in a desired portfolio with the capital raised from the sale of shares at the IPO. The capital structure of a CEF determines if it will be leveraged. Leverage acts as a magnifier of the performance in a portfolio. As each CEF objective is distinct, the underlying constituents and the leverage will differ as will the return it yields. Leverage turns out higher returns in a winning portfolio but deepens the losses of failed investments. The combination of a portfolio's return with the assumed leverage it undertakes minus liabilities gives us net asset value (NAV). Net asset value is the value of an entity's assets after subtracting the value of the liabilities. Generally, closed-end funds *do not* trade at their NAV. The *inability* to exchange CEFs for the underlying basket of constituents they represent forces price determination based on the laws of supply and demand. Price is determined by the desire of buyers and seller to possess the portfolio, leverage, and cash flow management a particular CEF offers. The price is said to be at a "premium" or "discount" to the NAV when it is trading above or below the NAV, respectively. Premiums indicate the market's confidence in the basket of underlying securities to yield above-average returns or the confidence in the investment manager. Discounts signal the investor's doubts in the structure of the product. High fund fees, excessive leverage, lack of liquidity, and irrelevance to buyers usually cause discounts among closed-end funds.

The key distinction between a CEF and ETF is their relationship with the underlying basket of securities. In its simplest form, one would be indifferent to holding the ETF shares versus the underlying basket it represents. This distinct function is referred to as being fungible. "Fungibility" is the condition of being able to exchange two assets for each other. The fact that you can buy ETF shares and sell its basket creates perfect arbitrage. One asset equals the other, allowing ETFs to trade at NAV. The ETF structure economically represents the positions of the underlying basket of securities. This consistently serves to narrow any discount that would potentially develop between the two assets. I will discuss ETF discounts and premiums as well as the power of this fungible investment later.

This ability to exchange assets does not exist in CEFs. It is not arbitrage when you are trading a closed-end fund versus its underlying basket. They are not fungible. Nor is the exact underlying basket of the CEF published daily like in an ETF. There is no direct conversion of one for the other that would enable you to actually capture the spread. If a market anomaly causes an ETF to trade away from its basket value, the investment community refers to the ETF as trading like a closed-end fund.

People typically pursue four types of trades in the CEF arena when they are trying to achieve outsized market returns:

1. Discount trading and investing
2. Following activist investors
3. CEF/ETF conversion trades (spread trades)
4. High yield/distribution capture

Discounts and Premiums of CEFs

Typically the discounts or premiums of a CEF are long term and are related to the nuances of the product structure. The fixed number of shares issued at the IPO means that price of the CEF will typically trade at a premium or discount. Investor demand for the limited supply of CEF determines the market price of the underlying asset class. There is almost nothing that the average investor can do about the discount or premium except to trade intelligently. Many retail investors have grown comfortable with the CEF product type over the years, drawn into the products by deep discounts. A deep discount, however, does not help performance unless there is some form of discount-narrowing event. And many investors have come into the CEF product type in an IPO at a price slightly above NAV only to see those products move to a discount to NAV and remain there. Exhibit 1.3 shows you the long-term discount that might exist throughout the life of a closed-end fund. In the chart you can see the long-term discount averaging between 5 and 10 percent over the last 15 years. This is for equity CEFs listed in the United States.

The persistent fact that the majority of CEFs are trading at a discount is solved for investors via the entrance of the ETF to the markets. The structure

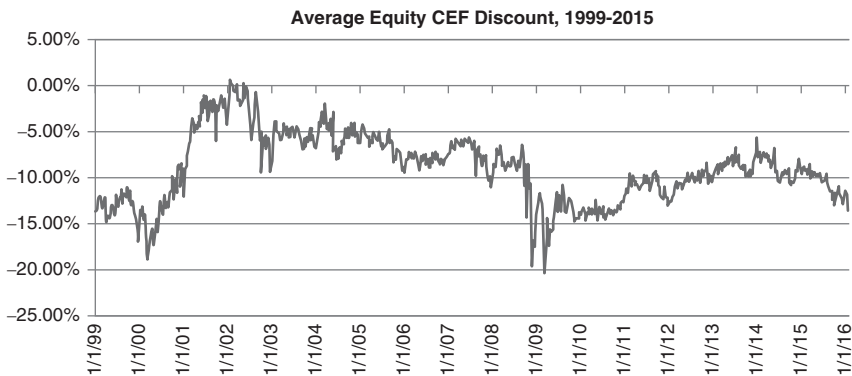


EXHIBIT 1.3 Average Equity CEF Discounts

Source: WallachBeth Capital, Bloomberg

of an ETF allows for arbitrage pressure when it is trading at a different value than the underlying, forcing away discounts and premiums. This is because an ETF can be exchanged for its underlying basket. This feature of the ETF protects investors from its trading away from the NAV of its underlying basket. This is why ETFs continue to trade around NAV. CEFs do not have this protective feature. Investors need to be compensated for undertaking the risk of a CEF trading at a discount. CEF investors should therefore only be willing to pay a discount for the CEF security. Currently, some equity CEFs are seeing consistent discounts as deep as 15 percent. If a CEF and ETF offered the same exposure at the same price per share, all else being equal, an investor should choose an ETF. This is because the structure of an ETF contains less risk of dislocation from the value of the underlying assets. Later in the book I go into the detail of creation and redemption and of trading arbitrage with an ETF.

Now that we understand why a large percentage of CEFs trade at a discount, how do we explain the ones that trade at a premium? Currently about 20 percent of CEFs trade above their NAV. To clarify what that means, a fund having \$100 worth of assets might be trading at \$130 in the secondary market (on the exchange). So an investor buying the fund is paying 30 percent more to buy the shares of the fund as opposed to buying its underlying basket of securities. Trading at a premium can occur from the investor's desire for high yield and distribution. CEFs often are associated with high yield, as leverage is implemented in the capital structure. When the market appears to have no ceiling, investors flock to exchanges to buy limited shares of leveraged CEFs. Premiums can have a snowball effect, as market sentiment can drag premiums dangerously high. Distribution and yield are not always the same with CEFs. Distribution among CEFs is returned capital to investors, even when the fund is not producing income from the underlying basket of securities.

Conclusions about CEFs

The closed-end fund market still offers some benefits. Discounts, premiums, leverage, and distribution, however, make it hard for the average investor to gauge the risks of this type of investment company. Many users of CEFs were also early adopters of the ETF structure. Some similarities were recognized in the ETF, but their added benefits are diametrically altering the marketplace. The explosion of ETF types pursuing active management, leverage, and hard-to-reach asset classes is now putting forth a full attack on the CEF market. The asset numbers in CEFs, as displayed in Exhibit 1.4, show stagnation and tell a tale about the potential future of that product set.

With only approximately 289 billion in CEF assets spread over approximately 568 funds, a very large convergence trade will continue to play out

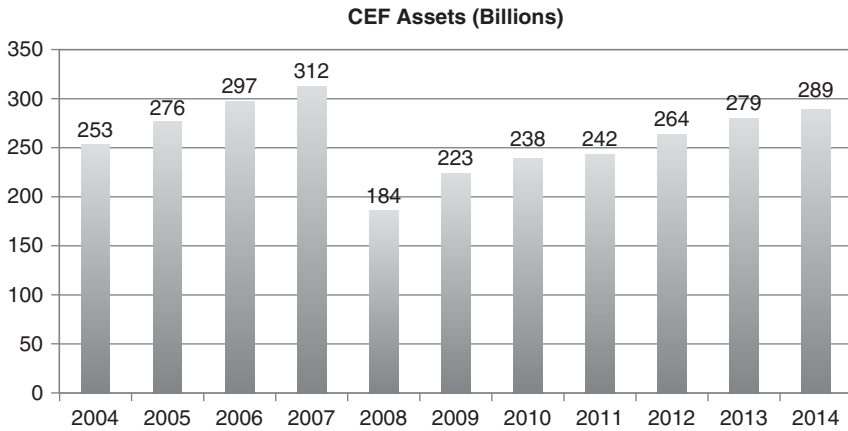


EXHIBIT 1.4 Total Assets in CEFs (Billions)

Source: ICI Factbook 2015

over the next decade as the two products become even more closely intermingled. I would expect many assets to continue to shift from the CEF structure into that of the ETF.

There are some discounts and premiums that move with a high degree of volatility and those that are more stable. In Exhibit 1.5, I show an example of a fund that trades at a persistent premium over time. You can see the premium and discount chart for the closed-end fund over the past ten years. The fund moved to a small and then growing premium over time since launch. There has been some volatility in that premium, even moving to a small discount at times; but, in general, a buyer of the fund would have to pay a significant premium to the value of the assets to buy shares of the fund.

Some discounts also seem to be reasonably stable and would therefore offer investors a small measure of comfort only to break down at some point. This is the greatest risk if you are attempting to take advantage of discount anomalies in CEFs: that something may occur in a fund and a discount may move against you dramatically. In Exhibit 1.6 you can see a fund that was trading at a slight discount in 2006 move to a more dramatic discount throughout the end of 2007 into 2009. The fund has basically never recovered and has traded at a deeper discount through 2015. If you had been long the fund and perhaps short some form of hedge that was designed to mimic the movements of the NAV of the fund, you would be losing significantly due to the underperformance of the fund price.

Due to the growth and expansion of the ETF market, many new opportunities have arisen to trade the two asset classes against each other. Several

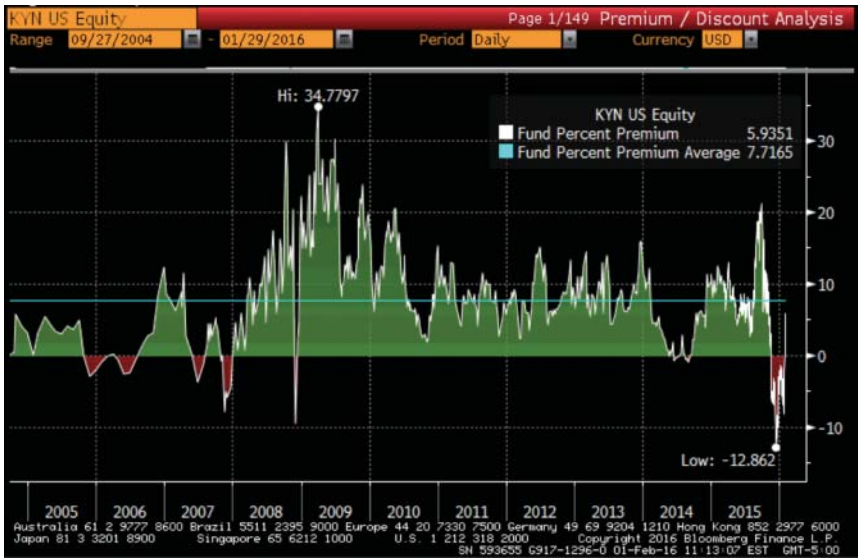


EXHIBIT 1.5 A CEF Trading at a Premium
Source: Bloomberg

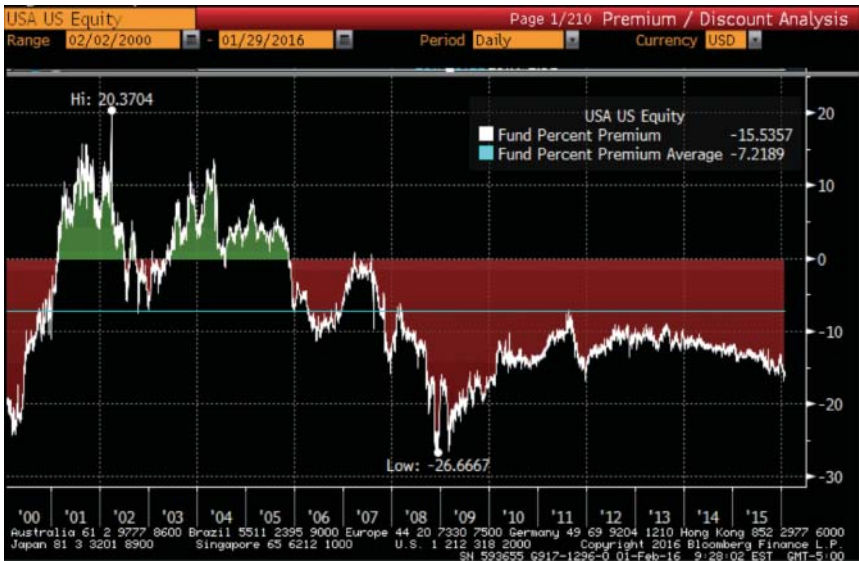


EXHIBIT 1.6 A CEF Trading at a Discount
Source: Bloomberg

examples of CEFs converting to the ETF structure exist, and likely many more are forthcoming. In 1996 Morgan Stanley and Barclays teamed up and listed 17 products called World Equity Benchmark Shares (WEBS) on the American Stock Exchange (Amex). The June 1996 issue of *Derivatives Strategy* magazine wrote: “WEBS’ exchange-traded index funds represent a clear assault on offshore single-country funds (closed or open).”⁴ Those products still exist but have been rebranded as a part of the iShares suite of ETFs and have experienced great asset growth. One of the notable funds in the beginning of this convergence trade was the Claymore Raymond James SB-1 Fund (RYJ). This was a CEF issued by Claymore Advisors (one of the few issuers of both ETFs and CEFs) with a statement in its prospectus that mandated a conversion vote to an ETF if the fund traded at a discount greater than 10 percent over a specific time period. This fund has since converted to the ETF structure and has become a case study for how the same fund works in both structures. That fund conversion helped to significantly and permanently reduce the persistent discount of the CEF and was closely watched as a model for potential future conversions.

This is important because there are many opportunities to trade ETFs and CEFs in conjunction with each other. For those CEF specialists who were pursuing strategies in which they tried to capture discount moves, the ETF was a great initial hedging tool. An educated investor or advisor was able to build portfolios combining both wrappers in the early days of ETFs, while the product offerings were still limited. This is true even today. You can pursue arbitrage opportunities between the two asset classes or rotate positions between the two for investment purposes.

Given the similarities, it makes sense that recent developments in technology and changes in mindset that have driven growth in ETFs have helped the CEF marketplace to grow as well. This trend, however, is beginning to reverse.

MUTUAL FUNDS

The Massachusetts Investors Trust is credited with the inception of the first modern mutual fund in 1924. Again, it focused on pooled investing to reduce risk by diversification. The structure, however, notably distinguished it from the popular CEF of the time. The open-ended mutual fund required the buy-back of shares from investors at the end of each trading day. The mutual fund had humble beginnings with only 19 funds compared to the 700 CEFs in 1929. The market crash of 1929 followed by the Great Depression halted investment companies. As the SEC instituted safeguards to protect investors, confidence in the market and its products slowly returned. Then came the

Investment Company Act of 1940, which established rules and regulations around mutual funds and those that managed them. The legislations sparked a dramatic rise in the popularity of the open-ended fund. It became the investment tool of choice as investors lost confidence in the CEF, as it was associated with the Great Depression.

The economy surged after World War II, and 100 mutual funds existed by 1951. The 1960s mutual funds aimed to capture the high-tech stock with aggressive growth funds. During this period mutual funds held approximately 90 percent of their assets in stocks. By 1970 there were approximately 350 mutual funds with 48 billion in assets. The combination of high inflation and a bearish market in the early 1970s made these stock-driven mutual funds less attractive, and assets shrunk from investor redemptions. Financial innovators were now challenged to create new varieties of mutual funds to appeal to investors in transforming markets. Bruce Bent created the first money market fund, the Reverse Fund, in 1971. The money market funds invested in short-term debt securities such as U.S. treasury bills and commercial paper. Savers and investors alike were given access to high money market yields in the high interest rate environment. Next, Vanguard's John Bogle launched the first index fund, First Index Investment Trust, in 1976. It tracked the S&P 500 and is currently functioning as the Vanguard 500 Index Fund with about 200 billion in assets. Index mutual funds allowed investors of all sizes to match or track the components of a market index. Soon after came municipal bond mutual funds that offered tax exemptions. The evolution and modernization of mutual funds allowed for their continued success. In 1982, the mutual fund assets comprised 76 percent of assets in money market funds, 8 percent in bond funds, and 16 percent in stock funds.⁵ The 1980s brought IRA and 401(k) corporate retirement plans that were largely powered by mutual funds. The 1990s had money managers scrambling to implement unique strategies in the mutual fund world to continue to grow the product set. Wider arrays of products were born, with elite managers controlling billions of dollars each. In the year 2000, mutual funds were owned by 49 percent of U.S. households with more than 8,000 funds having a combined seven trillion in assets under management.

Mutual funds still have the largest assets under management of any type of investment company: At the end of 2014 almost \$16 trillion in assets spread across 9,260 mutual funds, according to the Investment Company Institute. There are four broad categories of mutual funds: equity, bond, money market, and hybrid. According to the ICI, approximately 89 percent of fund assets are held by households referred to as "retail investors." In the chart in Exhibit 1.7 you can see the breakdown of where the assets are in the mutual fund product set.

Over half (52 percent) of U.S. mutual fund assets are in equity funds. Bond funds consist of 22 percent of assets, and money markets account for

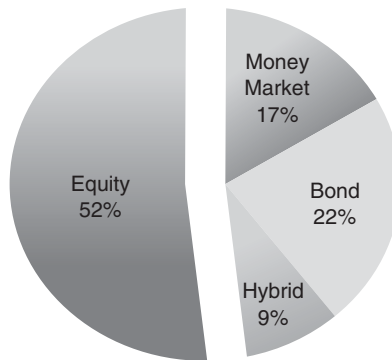


EXHIBIT 1.7 Mutual Fund Assets
Source: ICI Factbook 2015

17 percent. The remaining 9 percent are in hybrid funds that invest in a mix of stocks and bonds. There are essentially two types of mutual funds from a fund management perspective: actively managed or index linked. Actively managed funds represent a significant majority of the industry, with funds guided by portfolio managers whose aim is to guide the portfolio to generate alpha for investors. “Alpha” in the context of mutual fund performance is the percent of outperformance a fund attains over its benchmark. Index funds, as implied in the name, are funds with the sole goal of replicating an index. Unlike actively managed funds, the management nature of an index fund is passive. Once fabricated, an index fund simply offers exposure to the return of a given index. A frictionless index fund would yield the exact same return of the index it replicated, for better or worse. Mutual funds have experienced popularity in funds that track an index. At the end of 2014, 2.1 trillion of net assets were spread across 382 index mutual funds with 148 billion in net new cash flow comprised of 61 B in domestic equity, 38 B in world equity, and 49 B in bond and hybrid. Keep in mind that since 2000, the percentage of index equity mutual funds has doubled. Index equity mutual funds accounted for only 20 percent of all mutual fund assets at the end of 2014. It is important to note the popularity of index-based investment vehicles, as we begin to see the introduction and growth of ETFs.

Index and Actively Managed MFs

Investors need to understand that the 2T ETF market will not engulf the entire 18T MF market overnight. The appropriate comparison to be made, however, is between index mutual funds against the ETF market. The ETF

market has evolved very differently, with significant majority, more than 90 percent of the outstanding funds being index based and focused on equities. The maturity of the mutual fund market gives some indication of where the growth will be in ETFs going forward. The majority of ETFs are index-linked funds with significant benefits compared to the traditional index-based mutual fund. In 2016 we see index-based ETF assets roughly equal to those of index-based mutual funds. As assets in those products continue to grow, I would expect to see the overwhelming majority to adapt to the ETF structure going forward.

ETFs have only recently been allowed to pursue forms of active management within portfolios. Investor preferences have changed, contributing to the growth of index-based funds both as a percent of the mutual fund market and as ETFs. There is still a significant amount of actively managed assets in the mutual fund arena that, if brought to market in an ETF wrapper, could provide unique benefits to investors. We should continue to see several paths of growth over coming years: the fixed income ETF space, the actively managed space, and the liquid alternatives space, which will all encroach on assets in actively managed mutual funds. We will now examine some of the characteristics of mutual funds to understand the beneficial changes that ETFs bring to investors.

What Is a Mutual Fund?

A mutual fund is an investment company that pools the money of investors to collectively purchase a collection of stocks, bonds, and other securities. The basket of underlying constituents is referred to as a portfolio. The companies that issue these mutual funds appoint a manager to administer the investments. The simple idea is to provide smaller amounts of capital access to easy diversification with a single purchase. An investor is buying a stake in a portfolio of his choice. One might be able to access once hard-to-reach exposures and the replication of a superstar manager's portfolio. Mutual funds allow smaller investors to partake in the action of the global markets. Minimum investments can get one a portfolio consisting of a hundred companies throughout the world.

From an investor's standpoint the mutual fund is easy. They simply send in a dollar investment to the mutual fund company. They then see shares of that mutual fund show up in their account, if they used a brokerage account, or they get a statement directly from the company showing their fund position. The portfolio manager of the fund takes in the new cash and allocates it across the portfolio to purchase new assets. The costs of that trading go into the fund, and all investors in the fund impact the NAV. This is important to understand: Both when entering and exiting mutual funds, the actions of

any one investor can impact the other investors in the fund because of the impact to NAV that occurs.

Your mutual fund position is marked once daily at the closing price of the underlying assets, the NAV. All investors in the fund have the same price (NAV) for daily marking purposes. When you come into and out of the fund, you also get that same daily NAV as your execution price. When cash is coming into or out of the fund, the mutual fund manager tries to convert that cash to underlying assets by making purchases and sales at the close of the market so as not to impact tracking of the fund. This can have two impacts: In a volatile market, if you choose to get out of your mutual fund in the morning, you are still going to get the closing day's price of the assets, NAV, so you are not able to tailor your position intraday; in addition, during volatile markets, mutual fund portfolio managers will typically try to move large amounts of assets near the closing bell so as to not generate tracking within the fund. This can lead to large imbalances at a time of day when liquidity and pricing are more volatile.

THE CREATION OF THE ETF

ETFs are essentially a form of mutual fund that includes a variety of more modern features. This notion is sometimes overlooked by investors who voice concerns about moving from the comfort of the mutual funds they know and love. To me it seems akin to holding onto your black-and-white television because you've had it for a while instead of embracing those new-fangled color models.

Exchange-traded funds are a relatively new type of investment fund compared to the CEF and MF we discussed. The ETF in the United States was listed in 1993 on the NYSE. It was named the SPDR S&P 500 Trust, and it was designed to track the S&P 500. At the writing of this book at the end of 2015, there were more than 1,800 ETFs in the United States and 4,400 globally, with just more than two trillion in assets in the United States and almost three trillion invested in the products globally. An exchange-traded fund is a pooled investment vehicle that is listed on a stock exchange; this allows its shares to be bought and sold at a market-determined price throughout the entire trading day. They are governed by the same rules as any listed stock and provide transparency and a central gathering place for all their underlying asset classes. One of the main attractions of ETFs is the ability to provide exposure to areas that were previously too expensive and/or difficult to reach. ETFs can track the performance of an underlying index, commodity, or basket of assets. If you want to track a specific index, you no longer have to purchase shares in each of the constituent companies.

This avoids large dealing costs. Now, with ETFs, you simply purchase a single share that will track the fortunes of the entire index. This structure can be applied to investing in precious metals, commodities, and other unique assets. ETFs combine many of the benefits of funds and shares alike. As ETFs trade on the stock market, you can buy and sell the shares throughout the day. It trades similar to an ordinary stock, as supply and demand fluctuates the price. Like a fund, an ETF invests in a selection of assets on your behalf, but no longer does one need to toil over recreating of indexes for a portfolio. An investor simply has to pick an ETF that offers the desired exposure required. Most ETFs in the market today track a particular market index, but that is evolving toward products unlinked to indexes. ETFs package an investment strategy neatly into one exchange-listed security.

The growth of assets in exchange-traded products and the development of the ecosystem of businesses supporting that growth have been stunning in recent years. Numerous factors have contributed to this growth, from the Wall Street marketing engines to the regulatory changes providing for significant structural advantages to the growth of electronic trading. What is rarely mentioned, however, is that investors have simply been demanding a way to invest that is easy to understand and at a lower fee. The main tranche of the ETF market provides this, along with a level of transparency and other benefits unavailable in previous products. The market for financial products was ripe for disruption and ETFs are a tool for satisfying that demand.

Let's look at the characteristics of this product structure and why it is taking the investment world by storm. In Exhibits 1.1 and 1.2 you were able to see the dramatic asset growth and flows into the products. There are some defining characteristics that lead investors to use these products, either for new portions of their portfolios or to convert over their entire investment strategies. The main ones are:

1. Transparency
2. Exchange listing
3. Tax efficiency
4. Lower fees
5. Diversity

In the following sections I'll go through these main characteristics and explain them in detail.

Transparency

If I had to choose one characteristic that adds value to all users of ETFs, it would be transparency of the portfolio. Transparency of the portfolio provides protection against risks for all investors.

When transparency is mentioned as a defining characteristic, it may take a minute of personal product inventory for an investor to realize that there is no other fund product available that provides a daily accounting of exactly what the fund holds. Before ETFs, portfolio holdings were typically only released on a quarterly or semiannual basis. ETFs make their portfolio publicly available daily. This has a host of positive ramifications from eliminating style drift to creating the basis for an “arbitrage” that keeps the trading price right around fund value. Actually, one would have thought transparency should have been the gold standard in investment products from their very beginning.

When talking about the transparency of ETFs, it is important to understand that the majority of assets are in index-tracking products. Daily transparency works well for index tracking. A majority of mutual fund assets, however, are in what is called actively managed funds. These are funds that have a portfolio manager whose intention is to manage the holdings of the fund to perform better than some specified benchmark. One of the most prevalent arguments for not disclosing a daily portfolio is a fear that investors would purchase the portfolio themselves instead of putting assets into the fund. That may be true if it were more economical for investors to do that and gain efficiency. Another argument is that the disclosure would drive costs to the fund higher because of the “front-running.” In reality it would probably drive the management fees for those funds lower in order for them to compete, as it would become apparent how similar many of the active strategies are as they struggle to achieve outsized returns. We are already starting to see that happen, slowly squeezing the industry.

In addition, portfolio managers of actively managed funds may be concerned about investors backing into their “magical” proprietary strategies. These concerns do not outweigh the benefits to clients of knowing what is in a fund portfolio on a daily basis. Currently, there are active ETFs available that are providing baskets daily without announcing changes before they occur. That is working very well as a model, and the assets in those funds are growing rapidly. I agree with the BlackRock goal of “daily disclosure of holdings and exposures.”⁶ as defined in their recent recommendations on the ETF product set.

Exchange Listing

Exchange listing is not all about liquidity; that is just one of several benefits. There are three major benefits of exchanging listing:

1. Standardization
2. Intraday trading
3. Liquidity

Standardization is proving to be a tremendous benefit to holding multi-asset portfolios all within the same account structure. This was impossible just a few years ago. Now you are able to keep your bond position wrapped in an ETF structure within your investment account, instead of having two separate pieces of your portfolio with attendant complications. And you can include your commodities piece and your alternative selections as well. Trading in the products also becomes standardized. If you understand how ETFs trade, you'll be able to trade easily in all parts of your portfolio from within the same account, probably using the exact same tools.

Intraday trading of exchange-traded funds has been the characteristic that presents itself as both a blessing and a curse. The mutual fund industry has the benefit of never having to explain to a client the concept of how to achieve best execution. They rarely even need to explain away poor trading practices within the performance of a portfolio. While beneficial, both liquidity and intraday trading of ETFs remain misunderstood by many. I've been trading in ETFs for almost 15 years, and I am still answering basic questions about liquidity and trading. Every new client has a learning curve about how to achieve a good execution in the products.

The execution portion of the equation is a very important part of the investment process. The ETF industry has given investors the ability to manage their own executions. But with this responsibility the learning curve is proving to be steeper than the industry expected. It is critical to become an advocate for yourself and your clients when trading ETFs. Advances in execution due-diligence and strategies when managing a portfolio of ETFs can save millions of dollars annually.

For many investors, the intraday trading aspect of ETFs is not that important, nor should it be. This is why I have broken it out from liquidity as a separate factor. If you are using an investment process that instructs you to buy a fund today, hold it for some extended period based upon various parameters, and then sell it, then trading intraday, except on those execution days, is like a good insurance policy. It is there if you ever need it, but most of the time you won't. There are some ancillary benefits, however, to adding intraday trading to different types of investments. For instance, if you're trading in ETFs with foreign underlying, the intraday trading of a fund in the United States adds an additional time zone for trading the foreign assets. Many ETFs now trade 24 hours per day in the various markets around the world, and in different tax structures. This has added tremendous flexibility and price discovery to the management of portfolios.

As the trading industry evolves from an engine based upon making profits on spreads and trading to a process-driven business based upon customer service and liquidity, the customer experience in ETFs will continue to improve. Several of the large customer execution-providers are offering

commission-free ETF trading on many of the products. Essentially we are seeing a full-scale change in the way equities orders are executed because they now include ETFs. ETFs trade differently than stocks, although they share similar characteristics, so the major execution platforms servicing advisors are retooling. You will read more about this, including the growth of liquidity aggregators to agency executions of baskets with a transfer to ETF shares.

The listing of a product on an exchange and exposing it in a standardized format to a wider variety of market participants can increase liquidity and decrease spreads beyond what was previously available. You can often see examples in the market where the ETF price is actually trading between the “bid” and “ask” spread of the underlying basket. This is because the exchange provides a central meeting and pricing place for all investors in that strategy. The benefit of being able to access liquidity within the bid and ask of the underlying assets is an advantage not available to mutual fund portfolio managers or their investors.

This does not happen in every product, but the trading that takes place in some of the highest volume ETFs has had the effect of causing the ETF itself to trade at a tighter spread than its underlying basket, and in much greater size than would be expected. In Exhibit 1.8 you can see a market price and the indicative value (IV) of the SPDR S&P 500 ETF Trust (SPY).

If you look at the spread column, you can see that the basket is showing an implied ETF spread of four cents wide. However, the fund is showing a trading spread of only one cent wide. The fund is trading at a tighter spread than would be available if you traded the basket. This anomaly becomes much more pronounced in some products that trade high volumes and international baskets. This is partly caused by the gathering of a wide variety of market participants with different perspectives into the same products. The advantages of this are also evident as products are developed that provide access to formerly hard-to-access asset classes. In many cases the ETF is becoming a vehicle to aid liquidity growth in the underlying. Bringing together multiple different investor types into one standardized vehicle definitely centralizes some product liquidity. As you can see in Exhibit 1.4, the

EXHIBIT 1.8 SPY Price and Basket Values

	Bid	Ask	Spread	Last
SPY Price	\$119.25	\$119.26	\$0.01	\$119.25
SPY IV Basket Value	\$119.22	\$119.27	\$0.04	\$119.24

Source: Bloomberg

wide array of ETF users come together in the products on an equal playing field. There are no multiple share classes or alternative structures for institutions versus smaller investors.

The tighter spreads are also possible because of the arbitrage available when you have two products, the basket and the ETF, that can be converted easily into each other. This is known as being fungible. There is a lot of competition in the trading industry to capture any spread between the ETF price and the basket price. This is beneficial for investors because as those trading firms compete, they drive spreads ever tighter. There are also alternative trading vehicles like futures and options that trade in conjunction with some ETFs. For investors the centralizing of users into ETFs is also beneficial because the products will sometimes present tighter spreads and more liquidity than had previously existed.

Tax Efficiency

I will outline the basics of why ETFs are different than other investment products in terms of their tax consequences. Since each individual situation is different, you should consult your own tax attorney or accountant regarding your personal tax situation. I am also discussing the funds in a normal taxable environment. The situation can change when the funds are held in tax-deferred accounts and other structures.

Tax efficiency of the ETF structure is another major characteristic of the product that is helping to drive growth. To simplify this discussion, I have determined three subcategories:

1. Tax efficiencies within the portfolio management process
2. Tax efficiencies within the distribution process
3. Structural differences that affect tax efficiency

The major tax advantage of the ETF structure within the portfolio management process derives from the concept of in-kind “creation” and “redemption.” I will cover the details of how creation and redemption work in Chapter 2, but will now explain the differences between ETFs and their mutual/closed-end fund cousins.

When investors add assets to mutual funds, the portfolio managers take in cash from the investors and then purchase the underlying basket of assets. The reverse happens when an investor wants to redeem shares of the mutual fund. At that point, the mutual fund manager has to raise cash to deliver back to the investor. In general they need to sell assets that the fund holds. This selling of assets typically generates a taxable event for the mutual fund. Funds do hold certain cash reserves to accommodate some redemption, but

this can lead to performance lag, so is done only sparingly. There may be some other minor management techniques, but at its essence, when investors come into and out of mutual funds, the portfolio managers are buying and selling the underlying assets. This is creating taxable events within the funds that will have to be distributed among the remaining shareholders. Then, at some point in the future, depending on the distribution schedule, the mutual fund will make distributions of short- and long-term capital gains that will be taxable events for shareholders.

The way a typical equity ETF takes in and disburses assets is quite different. It surprises me how many users of ETFs have still not firmly grasped how the ETFs take in assets, unwind assets, and even make money on those assets. The first stage is taking in assets. An ETF transacts on two levels in the markets, the primary and the secondary market.

When an ETF is trading, the process of taking in new assets actually begins away from the ETF portfolio itself, in the secondary market. When there is an influx of investors who want to buy the ETF, the liquidity-providing community will sell the shares of the ETF to those buyers. They then typically buy the shares in the underlying basket to hedge their trading books. As this continues throughout the trading day, the liquidity providers are getting larger short positions in the ETF; and at the same time they are continually growing their long exposure to the underlying basket. At the end of the trading day, the liquidity-providing community will assess their own trading portfolios and take actions to clean up their balance sheets. This is where the magic happens in the ETF structure. If the liquidity provider has done everything correctly, they have two positions on their trading book: short the ETF and long a basket of stocks that represents perfect creation units of the ETF portfolio. They can then effect a creation. In this process the liquidity provider will deliver the basket of underlying assets to the ETF issuer's portfolio management agent, and there will be new shares of the ETF issued. This is a primary market transaction that is not considered a trade or taxable event by the ETF portfolio. It is separate and distinct from the secondary trading activity that was taking place throughout the day. Sometimes, but more rarely, a liquidity provider will create shares first with the intention of selling them into the market.

To understand why, think about the liquidity provider who is in the ETF market daily. There may be days when they are selling ETFs and buying baskets all day; but since they know they will be doing similar things the following day, they don't process a creation order.

The ETF shares do not increase. The activity in the secondary market can have varying effects on the primary markets, which I'll discuss further throughout this book. At this point the ETF has grown the assets it is managing, and that growth has been represented to the public via an increase

in the shares outstanding number. Now let's look at what is going to happen in the reverse situation. In our hypothetical example, there are sellers in the market. Investors want to do nothing but sell the ETF shares. All day long they are selling the ETF to liquidity providers who are in turn selling shares across the underlying basket of the ETF. This is the key transference between liquidity in the ETF and activity in the underlying baskets. In this reverse example, at the end of the day the liquidity provider may have a large position of long the ETF and short the underlying basket in perfect unit sizes. Remember, if done correctly this is a perfectly hedged position, so there is no market exposure; but there are financing fees on the various long and short positions. To manage their balance sheet costs and exposures the liquidity provider decides to effect redemption of the ETF shares. In this case the liquidity provider will be delivering the shares of the ETF back to the ETF issuer, and the issuer will be delivering perfect units of the underlying basket back to the liquidity provider. The ETF shares outstanding will decrease because those ETF shares are no longer in existence and tradable in the marketplace. The assets in the fund have also decreased because the underlying shares that represented those assets have been delivered out. This is all very tax efficient for the ETF.

This primary market transaction is not considered to be a trade and is, therefore, not creating a taxable event for the ETF. The in-kind creation and redemption process enables the delivery and receipt of shares into and out of the portfolio, but they are not considered to be trades for tax purposes. This is a critical concept that I refer to as a piece of the structural alpha of the products.

Lower Fees

A look at the two main competitors to ETFs, mutual funds and closed-end funds, reveals stark differences in the fees they charge to investors and how they generate those fees. Like ETFs, both competing products charge management fees as a percentage of the assets under management of the fund.

A CEF launches via an IPO. The sales team for the fund gets paid in the form of a sales commission based on how many shares of the offering it sells. This diminishes the risk that the CEF will launch and not have enough shares outstanding to generate breakeven fees. Once sold, those shares are not redeemable except under certain circumstances (activism and other types of open endings). Management fees are generated on the full amount of fund assets from the first day of trading. Before the fund has generated anything in terms of performance or even traded a single share, there are enough assets locked in indefinitely to pay the fees.

CEFs have an interesting place in the investing world. After they issue their fixed amount of shares via the IPO, the markets take over the pricing

relationship between the fund and its NAV. There are only two things that can happen next:

1. The fund can be well received, causing many people to want to buy more shares and causing it to move to a premium: meaning the price of the fund will be higher than the actual value of the assets in the fund. At that point, the CEF issuer either can institute a rights issue to get more shares out to the marketplace to satisfy demand or can launch a similar fund and have the sales team sell it to clients for another IPO.
2. Alternatively, the CEF can move to a discount to NAV: meaning that the price of the fund is lower than the assets in the fund. If you bought shares in the IPO and the fund has moved to a discount, you will now be facing a loss on your position. If you are a new buyer of the fund, you are essentially buying the assets on sale, because as a group they are trading cheaper via the fund than if you bought them each in the open market. Many investors who buy CEFs at the IPO typically pay a premium for the shares to account for the selling commission; then a majority of CEFs move to a discount, causing a loss for those investors.

The process by which investors utilize mutual funds is interesting as well. Investors essentially deliver cash to the fund company. The fund company then issues new shares of the fund to account for the position of the investor. In many, if not all, cases mutual fund companies know a lot about their investors, because they are direct holders of the shares. The companies can use this identifying information to tailor specific marketing to those investors, and you can track what other positions they may have in their portfolio. You can pay your sales force based on clearly delineated asset flows, enabling them to get compensated directly on assets raised from investors. In some cases, customers in mutual funds are paying a front-end load just to get into a mutual fund. This is basically a fee to make the investment. It is hard to comprehend why investors would pay for the right to make a specific investment before seeing any of the returns of the fund. This explains why net new assets in funds with loads have been negative for the five years leading up to 2015, according to ICI. Many of the assets invested in mutual funds are in what are known as actively managed funds, with a specific fund manager managing the assets. Investors believed that these managers would be able to beat the market over time and therefore were worthy of higher fees. Many actively managed mutual funds have fees that can be upwards of 1 percent of the assets in the fund. You can find lower fees in the index portion of the mutual fund marketplace but that makes up only about 10 percent of the asset base in the products.

The introduction of ETFs to the marketplace has brought with it a significant reduction in the fees that investors need to pay to attain a wide variety of easy-to-manage exposures as building blocks for a portfolio. The asset-weighted expense ratio for ETFs as of July 2015 was 30 basis points, or .30 percent. Many ETF assets are in index tracking funds, but the number and breadth of those indexes are increasing almost daily. More recently there has been incredible compression in the index funds that brings exposure to the largest and most followed indexes, with firms like Vanguard and Schwab and BlackRock continually bringing pricing lower on the core building blocks of an investor's portfolio. You can purchase an S&P 500 Index fund for approximately .03 percent in early 2016. This is significantly lower than what was available before the introduction of ETFs to the marketplace. In addition, you get significantly more transparency into the portfolio of holdings of the fund; and via the ETF structure, you as an investor in the fund are unaffected by the activities of other investors in the same fund.

This is of critical importance to investors and enables them to maintain their positions without fear of gains being distributed to other investors who are entering and exiting the ETF, as is experienced when investing in mutual funds.

Diversity of Product

A plethora of exposures are currently offered across the several thousand exchange-traded funds. Wide arrays of ETF products allow investors to get very specific desired exposure. This might range from major indexes to fixed income in foreign markets, to leveraged commodity bets and every nuance in between. ETFs are also changing the way investors view traditional benchmarks. No longer are ETFs beholden to existing index strategies. The industry has evolved to question how every index is constructed and its benefit for the investor. ETF managers are not only working with traditional index providers but are creating new indexes based around modern financial thinking with access to greater data than ever available before. The very concept of beta exposure created many years ago, the idea of confining a core part of the portfolio to the most well-known indexes, has come into question as a portfolio management technique. In the early days of indexing it was difficult to create indexes and monitor them and provide returns, and even to do the necessary research involved in testing their efficacy. Now that process has become much easier and is enabling the generation of thousands of new indexes providing scores of new investment themes that can be put into an ETF wrapper. Advances in technology are driving the evolution of investment products. ETFs are leading to massive changes in the portfolios of investors.

CONCLUSION

It is human nature to invent, evolve, and explore with more efficiency. ETFs were born from an investment segment that looked to pool investments and gain hard-to-reach exposures. ETFs continue to further democratize investment and do it cheaper and more efficiently. ETFs give investors more power over index investing than ever before. It is our duty, as investors, to understand the new products and learn how to use them properly in striving for investment returns. Welcome to the future!

NOTES

1. Investment Company Institute Factbook 2015.
2. Securities and Exchange Commission, “Fast Answers: Investment Companies,” July 9, 2013.
3. Sec.gov.
4. *Derivatives Strategy* magazine archive, June 1996.
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Steps for Developing an ETF

Launching an exchange-traded fund (ETF) involves numerous decisions for a fund company. One of the first things to be decided is what type of market exposure will be offered by this new ETF. Once the underlying exposure is determined, decisions can be made that involve choosing the best methods to provide that exposure to clients. This is when fund companies determine which of the various structures will be used to bring the product to market. (This book focuses on the ETF structure as separate and distinct from other exchange-traded products in the marketplace, but Chapter 13 discusses the unique characteristics of these structures.)

Once the decision has been made as to what the underlying product set will be and in what structure the fund will be brought to market, there are the details of building the actual ETF. The formation of the creation unit, the basket of shares that comprises the fund's underlying constituents, is one of the most critical decisions in ETF development. Ensuring that the basket underlying the ETF is transparent, liquid, and reasonably easy to trade has proven to be a consistent measure of product success in the marketplace. ETFs are listed products that trade during the day on an exchange. One of the main concepts that will be emphasized throughout this book is the mechanism that keeps the ETF trading near its underlying net asset value (NAV). The process of being able to create and redeem shares in an ETF on a daily basis, and thus the “fungibility” between the ETF and its underlying basket, is a critical and distinguishing feature of the product's design.

Throughout this chapter we tour the basic steps involved in bringing an ETF to the marketplace. We look at decisions regarding whether a product will be providing access or performance, whether it will become a passively or actively managed fund, and what will be the universe of its underlying constituents. Then we get into the actual development of the ETF itself. I discuss the development of the basket for the creation unit, the creation and redemption process, and the authorized participant.

The creation and redemption process is discussed at the end of this second chapter. It is presented early in the book because almost nothing is as critical to understanding ETFs as what is going on in the creation basket and the relationship that basket has to the ETF price and its liquidity. The creation and redemption mechanism of the ETF product line is the differentiating factor that has been most responsible for its success.

MARKET ACCESS OR OUTPERFORMANCE?

The entire universe of ETFs can be boiled down to two essentially different product goals: those that provide market access and those that offer some form of added performance metric. Although there are some black-and-white distinctions, there are also products that fit at intermediate points along the product spectrum. In the product spectrum presented in Exhibit 2.1, you can gain an understanding that there are pure products providing access and those that are being actively managed and also the products in the middle that utilize enhanced indexing and other methods for achieving exposures.

An access product is a tool that provides passive exposure to the ETF user. The investor can attain exposure to a particular index, region, country, commodity, currency, or sector by using an access product that typically tracks and tries to replicate a benchmark of some kind. The ETF market has made available a broad range of investment products that enable investors to access types of exposures only dreamed of previously. Never before was it practical to have an equity-based position in actual gold bullion in your investment account. Countries such as Vietnam, groups of global stocks representing specific sectors, and currencies from countries around the world are all available now within the ETF wrapper.

An ETF providing access to any form of defined exposure, such as tracking an index, is considered to be a beta-type product. A fund that is trying to outperform a specific benchmark would be considered an alpha-type product.

If an ETF is trying to provide something beyond pure tracking of a traditional benchmark index, it is considered to be a performance product. This type of product has become more prevalent over the last few years. In the earlier days of ETF growth, the products were all designed as access vehicles competing against various other structures as tools for providing exposure. More recently ETFs have been moving across the spectrum and attempting to outperform the traditional benchmarks, thereby providing new strategies for

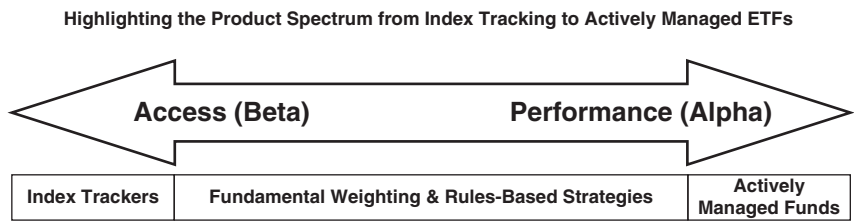


EXHIBIT 2.1 Product Spectrum: Index Tracking to Actively Managed ETFs

money managers to use in their portfolios. This is one of the fastest growing product segments.

Performance-type products are attempting to provide more than a basic index-tracking tool. They are bringing to the market investment products that can be utilized to complete core or satellite portfolios and other strategies. Performance products that track new indexes are providing a form of passive alpha. They are not traded like actively managed funds but according to rules-based mechanisms. The funds track the newly created index rules, but within those rules are goals of outperformance (alpha). The new actively managed portfolios are attempting to generate alpha versus a traditional index benchmark, not tracking an index at all, while attempting to generate returns that outperform those benchmarks.

INDEX TRACKING OR ACTIVELY MANAGED?

When initiating the process of creating a new ETF, one of the primary considerations is to fully conceptualize what value you are trying to provide to the investing public. There are many different types of indexes, and they pursue many different methods of producing their desired results. Some take the entire available community of a specified group in order to produce a tracking mechanism. Others take a sampling of that same group and, by using weighting optimizations and other screens, they create a reasonable tracking mechanism.

When creating an index on which to base an ETF, it is important to define the actual goal of the index. Is it being designed to provide a unique measurement of certain securities that have not historically been monitored in this way? Is the index being designed to track a benchmark or outperform it? The index could be created with the goal of improving on indexes that already exist. An example of this would be the creation of an index using fundamental screens in an attempt to outperform indexes based on market capitalization over time.

Typically the firm creating an index is separate from the firm that issues ETFs. There are a few firms that have both an index development and an ETF issuance group within the same infrastructure. This is interesting because a typical index provider has different concerns from an ETF issuer. Part of the determination in the construction of the index will inevitably be the ability to invest in the underlying products; this is not always the first concern of an index provider. The product development teams in the ETF world have been extremely creative in utilizing product structures to attain various exotic exposures. And in the places where they have determined that the exposure cannot be achieved via the typical route of index tracking, they have moved further toward actively managed vehicles.

Actively managed ETFs have been growing in the United States, in a fully transparent manner. According to the AdvisorShares Active ETF Report, as of January 31, 2016, there were 134 actively managed ETFs with approximately \$23 billion in assets in the United States. There are quite a few people both inside and outside the ETF industry that actively monitor the growth of active ETFs and expect them to grow rapidly in the future. Actively managed ETFs free the products from their traditional tethers of replicating underlying indexes. In their simplest form, they enable ETF providers to produce products that aspire to outperform traditional benchmarks without the need for strict adherence to an index and its rules. Among the first products utilizing the active management exemption were currency ETFs designed to achieve their exposures via actively managed portfolios of nondeliverable forwards and other instruments. In 2016 a significant percentage, greater than 50 percent, of the actively managed assets are in Short Term and Global Bond Funds.¹ These products are still in their infancy, and the directions that the active management exemption will take the ETF world are still unknown.

UNDERLYING ASSETS

For an ETF to be effective and representative, it should consist of a group of securities that are, in all reasonable circumstances, adhering to the overall goal of the index or strategy. There are usually going to be several constituent cuts when developing the ETF basket. If you are considering an ETF composed of large-capitalization stocks, for instance, the following steps might occur:

1. Cut the stocks with a defined minimal capitalization from the universe of all stocks to create the index.
2. Then cut the stocks with a minimal float or liquidity or any of a variety of variables. You might use any number of variables to screen and cut constituents.
3. Now you might have your index universe, and you proceed to create an index and then an ETF.
4. The ETF might be a perfect replication of the index or just an optimized cut, depending on underlying trading volumes and other potential constraints on creation basket constituents.

The decision to optimize your ETF basket, further reducing its constituents, or to provide perfect replication is not something taken lightly. There are various benefits and detractions to each methodology. Some of

the largest ETF issuers, like Vanguard and BlackRock, compete in a variety of categories with similar funds that can be differentiated only on a basis of basket optimization versus perfect replication. These decisions can lead to significant performance differences over time.

Notional value of the assets underlying both an index and its tracking ETF is a very important consideration. If the universe is too small, it might not draw a broad enough investor audience or have enough underlying liquidity to ensure product success. There have been several examples throughout the short history of ETFs where products have been listed and failed to attract enough assets to continue growth. One reason for some of those failures might have been an extremely narrow goal that led to a highly specialized and small investment universe. This can lead to two distinct problems: A limited number of investors will have the desire or need to utilize the fund, and liquidity is unattainable because trading the underlying constituents of the funds can be very difficult.

Throughout this book I discuss the activity of accessing liquidity of ETFs via their underlying baskets. The notional assets of the underlying universe becomes an important factor that is closely related to actual ETF trading volumes.

REBALANCING AND INDEX CHANGES

Another important consideration that comes into play during the development stages of both the indexes and the ETFs is the frequency of corporate activity and other turnover in the universe of constituents. Frequent changes to the baskets result in high trading costs and sometimes an inaccurate representation of the goal of the index. Various analyses will be done on the chosen constituents to determine the frequency of corporate actions, price volatility, weighting movements, and dividend yields to create guidelines for the management of the index. Tracking an index with a limited number of constituents whose names change on a weekly basis can become challenging and cost prohibitive. Constituent weighting needs to have a reasonable distribution to be representative of the universe as well. If the basket is too concentrated in a few top stocks, then you will lose representation of the rest of the universe. This can lead to tracking issues and to a small number of names having an overly strong influence on the product.

A perfectly replicated basket will have the least tracking error as compared to the underlying index. Any existing error would result primarily from friction costs of executing the basket in a rebalance and management fees. Additionally, similar to the index, there will inevitably be some form

of rebalance mechanism to account for underlying changes in the components for a variety of reasons. There are mergers and acquisitions, substantial changes to market capitalization, dividend size, and frequency, as well as other changes to underlying equities that could create the need for some form of rebalancing of both the index and the ETF basket.

The main considerations for creating the rules for rebalancing and tracking don't always coincide with each other. Although you may consider the underlying notional of an index for breadth, the fact that an index is not initially intended as a trading vehicle limits the concerns regarding the trading of its components. In creating the ETF basket, however, trading is an extremely important consideration. This is because, in many ways, the growth of the ETF itself is dependent on the ability of that basket to be traded and delivered to the issuer. Additionally, although you may desire perfect index replication to limit tracking (the spread between index and basket returns), at some point there must be a trade-off between the complexity and limited marginal added value of having too many names in the basket versus how much you are willing to diverge from tracking perfection.

ETF BASKET

The exchange-traded fund basket is the central character in the entire production. It is called the creation unit, and it is used to facilitate the advanced features of the product wrapper. The creation unit is the basket that is published by the ETF issuer that is utilized for the in-kind, or cash, exchange of constituent shares and ETF shares. The ETF basket aims to satisfy the important characteristics of transparency, liquidity, accessibility, and tracking. These must all be considered within the constraints of basket and fund development.

Whereas an index may utilize the entire available universe within its constraints, in order for an ETF to have a viable basket, it is important to examine further elements of the underlying components. Specifically, analysis should focus on the liquidity of those products and whether an investor would be better off utilizing a smaller sampling of that universe in order to satisfy the trade-off between correlation and accessibility. In addition to liquidity, analysis should also focus on the individual weights of the index constituents. The ETF structure does not benefit from weightings that are too large. And ETFs do not benefit from weightings that are too small because that can increase the trading costs without relative performance value. A balance of liquidity and weightings is sought by the ETF issuer to minimize tracking and implementation costs.

Creation Unit Determination

Let us look at some more particular points involved in the determination of the creation unit. Price point of the ETF is very important for product positioning. Typically, it starts with a notional amount determination. At this point an analysis of the basket will be done at differing price points to assess the efficiency of trading the basket's constituents.

The average trading volumes of the underlying constituents of an ETF basket will be determinants in the potential future volumes of the ETF. At each step of determining the underlying universe and whittling it down to the ETF creation basket will be some form of analysis of its underlying constituents. If the ETF structure is not being used, there is potentially greater leeway in the liquidity of the underlying baskets. Closed-end funds (CEFs) gained some of their popularity from their ability to invest in less liquid assets because they do not have a daily issuance component. The ETF wrapper allows for the daily issuance and redemption of shares; liquidity in the underlying basket is important to facilitate these transactions.

One of the main factors in determining the underlying basket will be the volume analysis of the components. This is also done during rebalances and at other times during the life of an ETF, not only during its initial development. I discuss the liquidity underlying an ETF via its basket in depth in later chapters, but let us look at some assessments of basket liquidity at this stage. Exhibit 2.2 shows several things that are important to pay attention to in an ETF creation unit basket.

The first thing to highlight would be ticker BBB, the second name in the basket, sorted alphabetically by ticker. This is an exceptional stock in the basket because its daily average trading volume is very small compared to the other constituents. The creation unit shares required for the other constituents are all less than 1 percent of their average daily trading volume (ADV), but in order to trade the required shares for BBB, you would have to trade fully 20 percent of its average daily volume. This is an outlier that could cause terrible potential liquidity issues for the ETF. If you look over to the right of the grid, you can see that the Implied Daily Tradable Shares at 25 percent of ADV is only 62,500 shares. That number means that if you want to trade 25 percent of the BBB ADV, you can buy 62,500 shares of the ETF. In the case of ticker BBB, because the required amount of shares is so high compared to its ADV, it becomes a serious constraint on the amount of ETF shares that potentially can be created and traded during a day.

In comparison, if you look at ticker III, you can see that the shares required for a creation unit are very small compared to the stock's ADV. The implied ETF column shows that if it were the only stock in the basket and just 13 shares of it had to be traded to complete a creation unit, and if you restricted yourself to only 25 percent of the average daily volume of the

EXHIBIT 2.2 Potential Liquidity Constraints of the Underlying Basket

Fictional ETF Demonstrating Potential Liquidity Constraints of the Underlying Basket								
#	Ticker	Last Price	Average Daily Volume	Creation Unit Shares as Percent of ADV	Shares per Creation Unit	Percent Weight in Basket	Implied Daily Tradable Shares at 25% ADV	Implied Potential ETF Units at 25% ADV
1	AAA	10	100,000	0.02%	21	0.07%	59,523,810	1,190
2	BBB	11	5,000	20.00%	1,000	3.75%	62,500	1
3	CCC	12	300,000	0.13%	386	1.58%	9,715,026	194
4	DDD	13	400,000	0.02%	80	0.35%	62,500,000	1,250
5	EEE	14	500,000	0.01%	49	0.23%	127,551,020	2,551
6	FFF	15	100,000	0.13%	131	0.67%	9,541,985	191
7	GGG	16	200,000	0.62%	1,242	6.78%	2,012,882	40
8	HHH	17	300,000	0.05%	139	0.81%	26,978,417	540
9	III	18	400,000	0.00%	13	0.08%	384,615,385	7,692
10	JJJ	19	500,000	0.17%	857	5.55%	7,292,882	146
11	KKK	20	100,000	0.11%	113	0.77%	11,061,947	221
12	LLL	21	200,000	0.59%	1,177	8.43%	2,124,044	42
13	MMM	22	300,000	0.29%	880	6.60%	4,261,364	85
14	NNN	23	400,000	0.22%	894	7.01%	5,592,841	112
15	OOO	24	500,000	0.01%	56	0.46%	111,607,143	2,232
16	PPP	25	100,000	2.80%	2,800	23.87%	446,429	9
17	QQQ	26	200,000	0.66%	1,311	11.62%	1,906,941	38
18	RRR	27	300,000	0.11%	331	3.05%	11,329,305	227
19	SSS	28	400,000	0.14%	571	5.45%	8,756,567	175
20	TTT	29	500,000	0.26%	1,300	12.86%	4,807,692	96
				Assets per CU	\$ 293,239.00			
				Shares per CU	50,000			
				NAV	\$ 5.86			

stock, you could still trade enough in a day to create 384 million shares of the ETF. It is important to notice that the number really is 7,692 creation units at 50,000 ETF shares per unit. Or, to say it in another way, you could trade enough versions of the underlying basket to generate 15,385 creation units yielding 384 million ETF shares. At a current NAV value of \$5.86, this implies that the ETF could potentially trade roughly \$2.25 billion of ETF shares in a day (384 million \times 5.86). Because there are other stocks in the basket, however, ticker symbol BBB would restrict the daily trading notional in the ETF to approximately \$293,000. This is a significant restriction to the trading of the underlying basket in this ETF; it shows how you typically calculate the potential liquidity of the ETF by its least liquid component. It would be better for the ETF if BBB had been screened out of the underlying basket for liquidity constraint reasons.

Something else that stands out in this ETF basket is the weight of ticker PPP in the overall portfolio. Ticker PPP is showing a weight of 23.87 percent of the basket. This one stock comprises almost 24 percent of the basket, leaving it significantly overweighted compared to the other names in the basket. Typically an ETF has some form of regular rebalance that counteracts the effects of large weights due to price moves, which can potentially cause significant weighting imbalances in a fund. Some products on the market, however, do not rebalance their portfolios and end up with highly concentrated weights in a select number of names, which can become a constraint on the performance of the basket as a whole.

Beyond having an effect on the performance of the underlying ETF, weighting and liquidity determine the viability of the creation unit. This is the lifeline of an ETF that enables it to grow its assets under management (AUM). This makes the product viable and valuable for investors and profitable for the issuers. Those are the two mutually dependent goals of any good investment product. This is interesting because previously in the investment company space, performance and tracking were two of the only common goals of the investor and the issuer. With ETFs, performance, tracking, and tradability (which determines implementation costs) are three factors that issuers and investors need to find alignment on in order for the ETF to be successful.

Creation and Redemption Process

The creation/redemption process can sometimes be misunderstood by investors using ETFs. It is important to understand that the creation and redemption process is a function of the primary market and that this process facilitates the accessing of underlying liquidity in an ETF. While the creation/redemption process is being utilized in the background as

products grow and shrink, many investors do not need to utilize that process firsthand to utilize the products.

When ETFs are traded on an exchange, they are considered to be trading in the secondary market. The primary market is one of issuance. In an initial public offering (IPO), shares are issued initially in the primary market, and they begin trading in the secondary market. That is the case with an ETF as well, except that an ETF via the daily creation and redemption process has what is called “continuous issuance.” When an authorized participant (AP) does a creation, the requisite shares matching the creation unit are delivered to the issuer, along with the required cash component, and the issuer delivers the AP shares of the ETF. The issuer does not maintain an inventory of shares that it delivers to the AP, but as part of the creation process, the issuer “issues” new ETF shares. These new shares are reflected in the shares outstanding number of the ETF that is published daily. In an opposite situation, when the AP processes a redemption order, shares of the ETF are delivered to the issuer, and the issuer delivers the underlying basket to the AP. Again, these deliveries would also include the stipulated cash component amount. In this case, however, the issuer does not hold onto those shares or put them in some inventory; rather, those shares are theoretically “destroyed.” This means that they are no longer outstanding in the marketplace, and the assets under management (AUM) of the ETF would decrease.

TRADING TIP

The in-kind transfer of stocks that is utilized in the creation and redemption process is the delivery of the stocks in the creation basket one way and the delivery of ETF shares in the opposite direction. This is usually accompanied by a small cash component making up for some rounding or other small items in the portfolio. Cash investments are not delivered to the ETF issuer except under certain circumstances, an important differentiating feature from the mutual fund. The in-kind process enables the fund to take in the stocks it needs for new investments without having to go into the market and purchase those shares. And the redemption process enables the fund to disburse the basket of stocks it no longer needs because there are fewer assets in the fund. This process is not considered to be a trade, or a taxable event, and has very important repercussions for management of the fund portfolio. One important feature is that it enables the portfolio manager to manage the cost basis of assets in the portfolio. Throughout the book we discuss various other benefits of this unique facility.

Exhibit 2.3 shows a very basic diagram of the creation process. In its simplest form, the AP is delivering a basket of shares to the issuer and the issuer is delivering shares of the ETF. These transactions are not considered official trades, and they do not report to the consolidated tape. They are in-kind transactions, an exchange of one for the other. The ETF issuer in this basic example is not trading any shares in the markets but is receiving them from the AP.

I have deliberately simplified this diagram because I want market participants to understand the basic nature of the transaction first and its ramifications later. This seemingly simple process enables the trading of millions of shares of ETFs at price levels right around NAV, and it is changing the underlying nature of the financial markets. It also enables ETF portfolio managers to manage their portfolios in a tax-efficient manner with which many other product wrappers cannot compete.

Exhibit 2.4 shows the process in reverse. In this case the ETF issuer is delivering the stocks in the underlying basket to the AP. This in-kind delivery of stocks from the ETF portfolio is the key to allowing ETF portfolio managers to manage gains and losses. It enables them to reduce any potential capital gains in the portfolio that might have occurred from rebalance trading or other corporate actions. Unlike reportable portfolio transactions, these exchanges are not considered taxable events for the ETF.

Delivering and receiving in-kind shares is a process whereby the AP acts as the execution-and-trading agent of the underlying shares. It is the responsibility of the AP to either purchase the shares in the market or borrow those shares to deliver to the issuer. The in-kind shares exchange is the issuer either receiving or delivering shares in exchange for doing the reverse in the ETF shares. This is acceptable because the shares are fungible vehicles, interchangeable for each other. This process removes the expense of trading from the ETF itself when there is a growth or decrease in assets. It also enables

The Simplified Creation Process

**The Authorized Participant delivers a basket of stocks to the Issuer.
The Issuer delivers the shares of the ETF to the AP.
These are in-kind transactions.**

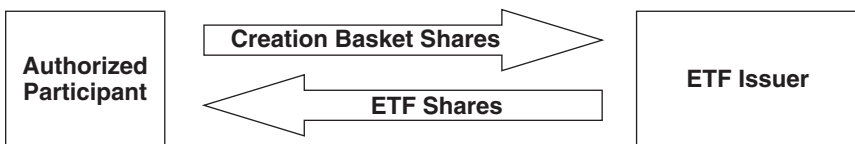


EXHIBIT 2.3 Simplified Creation Process

The Simplified Redemption Process

The Authorized Participant receives a basket of stocks from the Issuer. The Issuer receives the shares of the ETF from the AP. These are in-kind transactions.

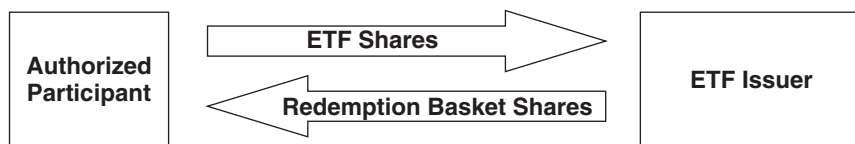


EXHIBIT 2.4 Simplified Redemption Process

the ETF to attain a high level of tax efficiency because it is able to divest its portfolio of shares without trading them in the marketplace and generating a taxable event. Because of this ability, capital gains distributions in many ETFs are typically very low or nonexistent. By contrast, a mutual fund that is facing the redemption of a large seller of assets will be required to go out and sell assets from the fund so that it can deliver cash to the redeemer. This can generate trading expenses to the fund and also generate taxable events in the form of gains from stocks that have been bought and must now be sold in the marketplace. In the ETF structure, most trading expenses due to asset growth and shrinkage are the responsibility of each individual investor and are not borne by all shareholders.

I have presented the pictures of the simple creations and redemptions because I will expand on the important specific features of the processes throughout this chapter and the rest of the book. Many of the other graphical versions of this process bring in surrounding aspects that hide the effect of what is actually happening. At various points throughout the book, we will see additions to these basic charts to account for surrounding events, such as client involvement on one side and market trading on the other.

Almost every facet of the success of the ETF wrapper can be traced back to the process of the creation and redemption of shares. The two main competing products, closed-end funds and mutual funds, have very different methods of issuing and redeeming shares. The CEF issues shares via an IPO, and, once it is listed, is perpetually trading with a constant share amount. Unless there is some activist or other event that causes the CEF to liquidate, its shares will remain listed on the exchange. A mutual fund never lists its shares on the exchange. It takes in cash directly from customers and issues shares directly to those customers. In the case of a redemption order, a mutual fund cancels shares outstanding and delivers cash to the customer. In both the case of a CEF listing via an IPO and a mutual fund issuing new

shares, the funds' portfolio managers put the cash that they have received to work in the markets via trading. Most ETF portfolio managers do not trade into their baskets of securities; they are delivered to them via their registered counterparts, the authorized participants.

Shares of the ETF are created and redeemed at the official NAV of the fund. The total cost of the creation and redemption including all costs and fees is paid by the APs, who then charge it either back to the initiating investor or in the spread of the ETF they are quoting in the market. Since the NAV of the fund is calculated from the basket of stocks called the creation unit and a specified cash adjustment amount, both the basket and the ETF at that price are of equal value. If there were no charges for balance sheet usage and the positioning of stocks, one would be indifferent as to whether to hold the ETF shares or the creation unit of the ETF and its requisite cash piece. The only difference will be the management fee. This essentially describes the arbitrage relationship between the separate and distinct pieces. The ETF trades as a security listed on the exchange at prices determined by the supply and demand of the marketplace. The basket of securities making up the creation unit also trades as listed securities independent of each other and independent of the ETF. However, an arbitrage relationship has been created by the creation and redemption mechanism that enables traders to tie the relationships of the various different prices together to an NAV value. This is addressed in further detail in the trading strategies discussion in Chapter 12.

Client-Driven Creation and Redemption Even if the creation or redemption is based on a client order, the AP is actually deciding to use the creation and redemption process. When I speak with clients who are seeking to move shares in large size into or out of an ETF, they are always asking if they can just do a creation or redemption. It would be beneficial if clients departed from thinking that they themselves are doing the actual creation or redemption. Rather, they should take the view that someone will be facilitating their access or exit into or out of an ETF via the creation and redemption mechanism. There are several reasons for this:

1. Clients should not feel constrained by the creation unit size.
2. The creation and redemption process delineates basket pricing on the closing price while an AP can access intraday liquidity for tailored executions. There are a multitude of execution methods around basket execution that do not require only on-the-close execution.
3. The creation and redemption process is really a back-office end-of-day function utilized to transfer and flatten positions. It gives the AP, however, the ability to provide either liquidity or the underlying exchange of securities for ETFs to the customer throughout the day.

4. The creation and redemption of shares is done on an accounting level at the official NAV of the fund. The AP or ETF market maker bears all the costs of transacting those underlying shares. Those costs will be reflected in the price to the investor. The ETF fund and its holders are not affected and do not share the transaction costs of every creation and redemption, like the shareholders of a mutual fund.

Let us talk about these points in further detail. The client base should not feel constrained by the creation unit size. Creation unit size is typically a minimum amount of shares that can be submitted by an AP for either a creation or a redemption order. The size minimum was created as a function of the regulation process that allowed ETF issuers to interact with an institutional client base. The process allows for the APs to aggregate smaller trades into a larger lot size and then process a creation to flatten their position. The ETF clients, and the advisor businesses that are handling their order flow, need to realize that if they contact either an AP desk or a portfolio trading desk (typically these two are the same or related), the trading desk can transact in the underlying ETF basket and give them an implied ETF price execution. If the creation unit size is 100,000 shares, the trading desk still can go out into the underlying market and trade a smaller basket on the behalf of the client. This is actually what is being done when the liquidity providers are making risk markets in the ETF. They are taking on the risk of providing an ETF price and will go out and hedge with the basket after the ETF trade has been completed. This process can also be utilized in a risk-free fashion, however, via an agency type of order from the investor. This order effectively instructs the trading desk to transact in the underlying basket first, then calculate the implied ETF price from the basket executions and give the client an ETF report. If the size being facilitated is smaller than the creation unit size, it will lead to residual shares on the trading desk books. This will lead to a slightly higher facilitation fee to cover financing until the ETF desk can piece together an entire creation unit and collapse the position.

The next crucial point is pricing. Because an ETF releases a creation basket every day, then any time you trade that exact basket of stocks, you are trading the ETF at its relative NAV price, minus costs. If you are benchmarked to the official NAV price for some reason and you want to be able to compare your price to the published NAV of the ETF, trading at the close is optimal. The official ETF NAV is based off the closing prices in the underlying stocks, and by trading at those closing prices your price should match the ETF NAV. However, if you trade the exact basket of the ETF one hour before the close, you are also trading at the implied NAV of the fund. In this circumstance, it is referred to as the ETF's intraday indicative value (IIV). The creation and redemption process lets the liquidity providers pursue any

arbitrage slippage between the basket and the ETF price. Pursuing strategies utilizing the underlying basket as your trading vehicle can give you executions in your desired ETF without actually trading the ETF on the exchange, at prices that are at or very close to the intraday NAV. An example would be to instruct an AP to buy the underlying basket of a very illiquid U.S.-listed ETF with domestic underlying constituents at the volume weighted average price (VWAP) during the day. The AP would then work orders in all the underlying stocks in the basket and come to an overall VWAP price on the basket, which can then be interpolated into an ETF price. This is transacting in the ETF while not actually trading it, and is another way to pursue liquidity.

TRADING TIP

The volume weighted average price (VWAP) is a measure of the notional amount of a stock traded divided by the amount of shares traded over a specified time period. If you are trading at the VWAP price, you are trading where the majority of stock has traded during that same time period. The VWAP algorithm is used by money managers to ensure that they are buying and selling stocks at prices in line with the rest of the market.

At that point, the AP would have a position in which the client has been sold the ETF shares and the basket replicating that ETF has been bought. A creation order would then be submitted to flatten the trading book positions. Let us take a closer look at whom this critical player is in facilitating the in-kind delivery of shares leading to the creation and redemption of the ETF.

Authorized Participant

The creation and redemption mechanism that enables the ETF to accept and disburse assets also functions as a necessary position management system for the facilitators of ETF secondary market trading: the authorized participants. The mechanism is essentially designed to enable share delivery back and forth between the issuer and the market makers, without the issuer actually having to execute baskets.

Becoming an AP requires an agreement with the ETF issuer and puts the AP in a position to consolidate baskets of stocks and deliver them in

exchange for shares of the ETF. It also enables the AP to receive those baskets from the ETF and disburse them into the market when a redemption order occurs. It is one of the most crucial aspects of the entire process because, without the APs consolidating basket trades into large blocks and then delivering them, assets would not grow and fees would not be earned. The ultimate goal relies on the partnership between the AP and the issuer and their delivery of baskets of stocks to that issuer. It is this process that enables an ETF to grow and increase in assets.

There is no initial fee to become an AP, and in fact it has become a very good business for participants. Almost every major investment bank and clearing firm has become an AP to facilitate the ETF creation and redemption process. There is a fee charged for creating and redeeming ETFs, but it is typically rated as a processing fee. This fee is typically a single flat fee irrespective of how many units are required in the transaction. This creates a great economy-of-scale benefit to a large client market-making business. Because it is unknown how many shares of an ETF an AP will trade in the future, the creation and redemption fees are built into the standard spreads in an ETF market. This creates the situation where APs can build the fee spread into every trade they do; upon consolidating order flow, they can, over time, reap that differential between one unit and multiple units. If the trade is an agency-type creation or redemption, the client will pay the fee. If a market is being made, the ETF spread will include the fee on a per-share basis. A by-product of making markets in ETFs is the enabling of an AP to collect creation and redemption fees in market spreads, particularly in lower-volume ETFs. If the volume coming in the future is unknown, market makers include in their spread the cost of flattening their books via the creation and redemption process. If the ETF has a very high volume, there is a greater chance of unwinding any facilitation position in the market, and spreads can include a probability adjustment to the creation fee, enabling slightly tighter markets. This partially explains why ETF spreads narrow as volume increases as products develop.

APs are a big differentiating factor between ETFs and mutual funds. APs stand between the investor and the ETF issuer. The ETF portfolio manager never interacts directly with an ETF investor. The benefit here is that APs are indifferent to whether the ETF issuer is gaining or losing assets, which means they are indifferent to the investors' buying or selling. This leads to a critical piece of the structure and the solution to one of the most important questions asked by investors: Will the liquidity be the same on the way out as on the way into the position? The answer is yes because the liquidity providers are basing their markets on where they can trade, not whether they are buying or selling.

Trading Example of an AP Facilitating Order Flow An AP who is facilitating multiple clients could produce results in this manner: If a client enters an order to buy 100,000 shares of ETF-A, the AP acting as a liquidity provider could sell the client the ETF and buy the creation unit basket of shares to hedge the short ETF exposure. The creation unit size in ETF-A is 100,000 shares, and the fee is \$2,000 to do a creation or redemption, regardless of the number of units. When the client order comes to the trading desk, the AP has no clear idea of what the future will bring in terms of additional orders, so embedded in the price that the AP offers the shares for ETF-A to the client would be the cost per share to process the creation, or two cents per share ($2,000/100,000 = .02$). Then, later that day, another client may come in to buy an additional 100,000 shares of ETF-A. At this point the AP still does not know if future client orders will go in the opposite direction and cancel out the position, so the AP again embeds the creation costs in the asking price, or another two cents per share.

For this example, we are speaking about an ETF with low intraday volume. The AP is hedging with the basket instead of unwinding the ETF position in the secondary market. At this point the AP has now collected \$4,000 in creation fees embedded in the spread, but because it pays a flat fee to create units, it will have to pay only \$2,000. Let us add a seller to this concept. A new client comes in with 200,000 shares of ETF-A to sell. At this point the AP would calculate the price it is willing to pay, including a redemption fee of one cent per share ($200,000/\$2,000 = \$.01$). The client trades and sells the ETF-A shares, and the AP sells basket shares underlying 200,000 shares of the ETF. The AP has now completely flattened its positions in both the ETF and the basket component shares, leaving it with no balance sheet usage. Additionally, the AP has collected three sets of fees for creation and redemption orders that are not processed versus the issuer. This is a rare and simplified example in an ETF with low secondary market trading volumes. If the ETF had high on-screen volumes, then the future of flow in that ETF would be easier to predict and the AP would not charge the full creation or redemption fee in every trade. Spreads on that ETF would narrow slightly. This highlights the importance to issuers of working diligently to keep creation/redemption costs down to the lowest minimum charge they can negotiate with processing agents. These costs, which can be considered an implicit cost of trading ETFs, can have a direct impact on the costs of trading. Although the cost is present in every ETF, it is more relevant in ETFs with low intraday trading volume because typically there are not as many offsetting trades to enable market participants to narrow the spread. This point is discussed in further detail in Chapter 11 regarding execution.

CONCLUSION

In this chapter, we started with the initial development procedures of the ETF because that is where the decisions are made regarding the ETF's underlying exposures. A solid foundation in the mechanics of ETF development is beneficial for the proper utilization of the products. The growth of the ETF and its facilitation by the authorized participants using the creation and redemption mechanism was presented because it is such a primary advantage of the ETF wrapper.

The exchange-traded fund is a “pure” product that bestows a variety of benefits to the user. The last chapter takes a closer look at the various structures of exchange-traded products. The listed funds industry has expanded to include products that look similar to ETFs but have some important differentiating characteristics. It is important to understand those features when determining which product is right for each investment opportunity.

NOTE

1. AdvisorShares Active ETF Report, 1/31/2016, page 5.

Giving an ETF Life in the Markets

The road from conception to initiation is no simple feat with investment vehicles as complex as exchange-traded funds (ETFs). Many factors must be coordinated to bring an ETF to market. Listing on an exchange has facilitated the growth and popularity of ETFs. The listing enables investors to utilize the unique benefit of the intraday trading ability of an open-ended wrapper. It provides investors with the flexibility to take advantage of intraday volatility, compared to other products that might offer only end-of-day liquidity. For certain types of ETFs, however, being listed on the exchange has led to confusion.

One of the most confusing issues concerns ETF trading volumes. As ETFs move further along their evolutionary path from index replication tools and hedging products toward unique investment vehicles, different parts of their structure become more valuable. Trading volume is a component that often breeds confusion. Because some ETFs have high intraday trading volumes, it is sometimes assumed that the higher the volume, the more useful the ETF. That assumption does not take into account the variety of offerings of the ETF marketplace. Many of the newer products that have been issued are investment products. They compete with mutual fund– or hedge fund–style investments. While the intraday trading feature is important for a high-frequency trading vehicle, daily trading volume is less important for an investment vehicle. What is important is the ability to utilize the underlying basket to reduce execution impact to get in and out of a fund, which is made possible by the creation and redemption mechanism.

The ideal situation for ETFs is when liquidity providers stand as intermediaries between customers and the underlying baskets via the ETF. If the ETF structure is working, a customer can get into or out of an ETF with minimal impact on the ETF on the exchange, assuming the size is digestible by the underlying basket. The largest U.S. ETF exchange by number of listings, the New York Stock Exchange (NYSE) Arca, tries to help facilitate this activity by having a lead market maker (LMM) in almost every product. BATS, the third largest U.S. exchange, is offering a variety of incentives to market makers in ETFs. Liquidity programs are being created to help incubate newer ETFs or those with low trading volumes. They have a goal of

incentivizing market makers to quote more ETFs and reduce spreads for investors. The LMM is an important player in bringing new ETFs to the market. In this chapter we look closely at the LMM and at the seeding of new products and other processes related to the introduction of ETFs.

This chapter discusses the seeding of ETFs because it is a critical part of the process in bringing an ETF from concept to listed product. I also discuss incubation as it relates to helping ETFs grow and understanding the deluge of new products coming to market. The chapter touches on the importance of marketing as it can make or break emerging products. The chapter ends with the procedure of closing an exchange-traded fund and explains what then happens to the shares of investors.

PARTNERING WITH AN EXCHANGE

Exchange-traded funds, as implied in the name, are listed and traded on an exchange. This structural distinction adds a utility that mutual funds do not provide. ETFs may trade on a single exchange, multiple exchanges, and electronic communication networks (ECNs). Exchanges typically charge a small listing fee and provide a list of services to ETF issuers that choose to list on them. Listings until this point have taken a follow-the-herd mentality whereby the NYSE Arca controls a significant majority of the ETF listings in the United States. Yet, the rapid expansion of ETF products and the need for listing diversification is opening the doors for competition. The NASDAQ OMX Group and BATS Global markets are making aggressive pushes to list ETFs on their exchanges. Since listing its first ETF in the beginning of 2012, BATS now claims to be the trading venue with the most ETF trading volumes.¹ The precision and efficiency of computers no longer necessitates a brick-and-mortar exchange with traders on the floor. Exchanges have become simply an electronic meeting place for buyers and sellers.

Incoming competitors fighting for market share in the ETF exchange listing business will drive efficiency. Increased competition reduces listing fees and can drive better market quality for ETFs. In turn, this keeps costs low and helps deliver additional liquidity to investors. Electronic trading has in many ways diluted the personal value offered by a specific exchange for the majority of investors. For example, when I trade in my electronic account, in many cases I may not even know which exchange my order went to for processing. When I worked as a trader at Bear Stearns, we used to see order flow that specifically dictated the exchange where it should be traded. Smart order routers and best execution regulations, however, have diminished the value of any specific exchange in favor of clients getting fair pricing wherever their order flow is routed.

The exchanges act as the intermediary between the ETF issuer and the investing world, as the mechanism for the ETF's secondary distribution. They are the place that buyers and sellers come together. Unique to ETFs, all sizes of buyers and sellers, from smallest to largest investors, are trading in the same share classes of the same funds, on the same exchanges, and at the same prices. This is driving increases in liquidity for all investors. Many newly listed ETFs have an inauguration period during which investors gauge their comfort level before investing in the new product. This is the time when these new ETFs recruit initial investments, market participants, assets, and interest. There are always exceptions, such as the three-times-leveraged ETFs that launched into a market sweet spot in late 2008. In several of these funds, both volumes and assets grew very quickly without an introductory phase. However, the first ETF to be listed—the SPY in 1993—did not pick up a large amount of assets and volumes until three or four years after its initial launch. Exchanges make opportunities by helping issuers and investors during the inception of new products. Incentives can be provided to those that create further investor interest and assist to attract assets. Real value to new issuers and the investing community stems from the ability to acquire liquidity. There is little interest for investments that lack the ability to be sold or those that don't have a solid marketing and distribution plan behind their launch.

SPECIALISTS AND LEAD MARKET MAKERS

There are no more specialists in the ETF world; with the move of primary listings to the NYSE Arca platform and other electronic exchanges, lead market makers (LMMs) succeeded them. One of the most profound differences between an LMM and a specialist is that there is no longer a time-and-place advantage. Essentially a LMM commits to provide electronic liquidity in an ETF with no more information than the rest of the market. LMMs match buyers and sellers. They are in the market posting bids and offers to buy and sell when matching interests don't coincide simultaneously. It's important to understand that LMM is an official designation for providing liquidity in an ETF. All other market makers quoting an ETF in the marketplace perform almost the same function and serve the same purpose to the end investor. All liquidity providers source liquidity for an ETF in the multitude of avenues available, like baskets, futures, and other proxy hedges, and translate those into the ETF for current buyers and sellers. The LMM and all subsequent market makers or liquidity providers may have slightly different official designations but are all in the market as buyers and sellers of last resort in the case where customer interests to buy and sell don't match each other at specific times.

LMMs typically have the opportunity to make money in several ways when facilitating flow in the ETF marketplace. They can make money by traditional market making, that is, by buying on the bid and selling on the ask side, by arbitrage between the ETF and its underlying basket, and by receiving stock loan fees on inventory and rebates for trading as the LMM. The ability to provide liquidity and hedge via an arbitrage mechanism has enabled ETFs to have liquidity for a large amount of shares to be provided by the liquidity provider with minimal risk. A liquidity provider seeks to be fully hedged and/or left without a position at the end of the day. With transparent baskets and the ability to exchange their perfect hedge and ETF positions with the fund, there exists a great environment for market makers to participate in ETFs. ETF arbitrage in this scenario is the spread between where an LMM can provide liquidity in the ETF and the price at which it can position its hedge. It is important to understand this concept, which is emphasized throughout this book: ETFs are different from and trade differently from stocks. The differences create more sources of liquidity for an ETF than is available in a traditional single-stock equity.

A common example is IBM. When a market maker/specialist/LMM provides liquidity in IBM, either by publicly quoting or by taking the other side of large order flow, there are not many direct ways to hedge or offset the position. If the LMM has just sold 100,000 shares of IBM to a customer, it can buy another company that it thinks correlates well to IBM and hope its price will move in tandem with IBM's until the LMM can unwind the positions. Or it can potentially purchase an offsetting derivative position. But both of these options leave the liquidity provider with a position that has to be monitored and takes up balance sheet. With an ETF, however, particularly one in which the basket is trading while the ETF is trading, you have an arbitrage trading functionality. You can sell as much of the ETF as liquidity may be available by buying the exact underlying basket. The two separate pieces will move in tandem; thus, you have neutralized your market exposure. This is a significantly different scenario than single stock market making. There are more options for liquidity and a cleaner balance sheet.

One of the underlying themes in all of the methods that an LMM can undertake to make money in an ETF is that they are all tied to the number of shares that trade in an ETF, and the fact that those two separate and distinct pieces are completely fungible. One can be exchanged for the other. This type of system has been very good for the growth of the exchanges because it aligns the goals of the exchange with the goals of its contractual market makers. What would also be helpful in the LMM model, however, is a special system designed to provide enhanced liquidity in the newer ETF

products that do not have high trading volumes. This is where a system of new product incubation becomes critical.

Let us take a look at the requirements of the LMM system. The LMM is a contracted liquidity provider of the exchange. The most basic requirements of being an LMM are laid out by the NYSE in this way:

1. LMMs must maintain continuous, two-sided quotes for each security in which the firm is registered.
2. LMMs must meet minimum performance requirements, which include the percent of time at the National Best Bid and Offer, average displayed size, and average quoted spread.
3. Performance requirements will be determined by NYSE Arca.²

In order to satisfy the demands of having an LMM in each of several thousand listed products, the requirements are reasonably generic. The ETF product line, however, is unique to the exchange system, and its growth has surprised even some of the most astute market watchers. Let us examine some of the needs and procedures within a potential ETF incubation system.

ETF INCUBATION

ETF incubation consists of seeding (initial investment) and providing initial liquidity and marketing to create an investor comfort level with a new and sometimes complicated investment strategy. An ETF incubation system would enable investors to develop an understanding and a sense of security in a new structure that could lead to even more widespread adoption of the product wrapper. Seeding is the first creation unit needed by an ETF to list on an exchange. There should be a standardized system of seeding new ETFs. Then investors will not be misled by the difference between large seed numbers versus small ones. The amount of seed capital an ETF begins with is in essence a financing trade held by the seeder, generally a market maker. It is not necessarily an accurate representation of actual interest in the ETF, nor should the size of the seed matter to any investor once the fund is listed.

During the incubation phase, liquidity providers need to be set up to attract initial real investments. Investors want enough liquidity so that they can trade the ETFs with minimal impact and at prices closely related to the value of the underlying securities. Independent trading firms and liquidity providers as a group will be willing to provide liquidity through the underlying basket or other respective hedges if they can collect small spreads. An entire sub-industry of trading firms participates without being paid directly because of the arbitrage opportunity inherent in the ETF structure. If an

ETF is new and unique, however, it will not necessarily attract a widespread user base quickly. Even though liquidity can be organically created, there are still relatively few liquidity providers compared to the number of available ETFs. There is no coordinated effort to cover every new ETF or low-volume product that needs additional liquidity assistance. This fact demonstrates the overwhelming need for an LMM during the incubation phase and perhaps a standardized method of greater participation to help newer ETFs get established. It has been statistically proven that the percent of trading volume of an LMM in an ETF moves in an inversely correlated manner to the trading volume of an ETF. In fact, there has been discussion in the marketplace about removing the LMM completely in some of the most liquid ETFs. This fact demonstrates the need to find a way to structure the LMM functionality to be utilized primarily to provide liquidity where it is most needed in the new and lower-volume ETFs.

Let's use a very basic ETF as an example of what can potentially be done to provide liquidity for the investor base. If you are providing liquidity in a plain-vanilla domestic ETF where the basket is reasonably easy to borrow, such as a Standard & Poor's 500 basket, then there could be tight requirements for a minimum size, depth, and electronic trading ability for the LMM. This can be a function of the cost to hedge the ETF trade, based on the trading of the underlying creation basket. In high-volume ETFs, where competition drives prices to levels in which the spreads sometimes are actually tighter than the spread of the actual basket, LMM requirements can be relaxed and observed only during periods of extraordinary duress. If the ETF and its basket are trading together in real time, then facilitating liquidity in one from the other is merely a function of applying advanced computing and can be provided in all ETFs equally. There is a cost for borrowing the underlying stock, and there is a calculation of the execution costs of the basket in relation to the size traded or the depth of the market being provided. The market width and depth would shift progressively wider and smaller, respectively, as the difficulty to hedge increases.

There also should be a marketing effort that introduces the new ETF not only to the investing public but also to the liquidity providers. The Capital Markets desks at issuers are typically charged with driving initial ETF liquidity and working with liquidity providers on market quality and seeding. These initial procedures are critical for the ETF launch mechanism to function. The creation and redemption processes and risks need to be clearly detailed and explained. The institutions that are maintaining positions and hedges in these products need to be able to quantify all the risks, so they can properly price the ETF and hedge themselves. The more comprehensive the hedge, the less costly the position is for the liquidity provider and, thus, the smaller the spread for investors. Investors need to understand all the facets

of this new ETF to be able to judge the appropriateness of the products as well as predict their potential portfolio performance. After achieving an investor comfort level, the issuer will be in a position to attract the maximum potential assets as defined by demand.

ETF incubation is a learning curve for market makers and investors alike. Both need to perform due diligence on the new construction, performance metrics, risks, and appropriateness before the ETF can attract new assets. This process relies on one of the most important components of the ETF structure, transparency of the basket. This helps the products to function and is critical for the provision of liquidity and the protection of investors. As the drive to perpetuate the non-transparent actively managed fund industry continues, I recommend investors tread very carefully with new products that may not make their holdings known to investors and liquidity providers on a daily basis.

Seeding ETFs

The initial seed of an ETF is commonly misunderstood except by those involved in the process from the very beginning. In order for an ETF to launch on an exchange, it normally needs to have 100,000 shares outstanding, referred to as the seed of the fund. In the beginning, specialists wanted to be in ETFs because they would make revenues from wide spreads and the rebate; they were interested in attaining as many ETF listings as they could. When there were not many ETFs, and the vast majority of those listed were beginning to trade at reasonable volumes, the specialists were open faucets for the flow of seed capital. This was a great situation for the ETF issuers: They had a ready market of people willing to put seed capital into their funds to help them launch. The growth of the ETF product lineup is partly attributable to the fact that seed capital was once very plentiful for the issuance of new products. The use of balance sheets to seed ETFs was extremely inexpensive before the downturn of late 2008.

Let's look at the positions behind an initial creation unit, which is what I call the seed of an ETF. In the example, ETF-X is a plain-vanilla U.S. domestic-based ETF. It is new to the market and needs a "seeder" to do an initial creation. In a typical ETF creation order, the authorized participant (AP) has to buy the basket of stocks underlying the ETF and deliver those to the issuer. The ETF issuer will then utilize the continuous issuance function to deliver new ETF shares to the AP, creating an increase in shares outstanding. In the initial creation unit, the process is exactly the same: An AP would deliver the shares to the issuer, and the issuer would issue new shares of the ETF. Once the ETF has shares outstanding or assets under management (AUM), it can be listed on the exchange.

An ordinary creation order typically is dictated by some position that was entered into by the AP. Perhaps the AP has sold shares of an ETF and bought the underlying basket, or has entered into some other trade involving the ETF. The seeder of an ETF does not, however, have to take a directional view of the ETF to provide the initial creation unit. Seeders and liquidity providers leave the business of determining market direction to the money managers, hedge funds, and various other clients. Seeders are financiers. They are looking to utilize their balance sheet for some form of remuneration. The LMM seeding model was predicated on the use of balance sheets in exchange for LMM designation that theoretically resulted in profits. To this end, instead of buying the basket to deliver to the issuer, seeders borrow it. Then they deliver to the issuer the basket of stocks that then become short positions on the seeders' books. These shorts are covered with the borrowed stocks, and then the issuer delivers to seeders their ETF shares. This has created a position of being long the ETF and short the corresponding basket of underlying stocks. In certain circumstances, a long position in an ETF and a short position in the underlying basket can be very profitable from a financing perspective. I discuss this type of trade when I discuss stock loan trading strategies later. This can become an expensive position for seeders for a variety of reasons, primarily because the costs of the long position are supposed to be offset by the fees earned for lending the shares. But in a new ETF there is little demand from shorts to borrow shares. It is, however, perfectly hedged with no market exposure and has a cost structure that can be calculated in real time with no risk of slippage. Here is what the position looks like economically:

Economics of a Seed Position

- **Long ETF**
 - Paying financing charges on the money used to buy the ETF
 - Paying the management fees
 - Receiving the dividends paid on the stocks in the basket of the ETF
- **Short Basket of Stocks**
 - Receiving financing rates on the money received for selling the underlying stock in the creation unit
 - Paying fees to borrow the basket of stocks
 - Paying dividends on the basket of short stocks

These two positions create an arbitrage because of the fungibility between the ETF and its underlying basket. In a typical 1940 Act ETF, there is a basket of stocks underlying the ETF. Via the creation and redemption process, those two separate and distinct units can be exchanged for each

other in kind. In seeding, however, seeders need to sit with the position until other assets are accumulated by the ETF or sell out the position in the secondary market.

Once the ETF is listed on the exchange, people inevitably (in successful issues) buy the ETF. Only two market participants can possibly be selling the ETF shares at this early stage in its listed lifetime: either the entity that performed the initial creation or another market maker. If another market maker sells the new ETF, they will either have to borrow it from the seeder or create new shares from the issuer to facilitate settlement. In the case of the LMM being the seed entity, this is a very clean process because there is already a position on its books that is long ETF and short basket. This means it can be out on the exchange as an LMM and offer shares for sale to the public without having to borrow them from someone else. Then every time it makes a sale of the ETF shares, it unwinds a corresponding piece of its short basket position by buying the shares back and returning its borrowed stock. The LMM eventually sells its entire ETF position and buys back its underlying hedge of the short basket, thereby flattening its exposures and freeing up the balance sheet consumed by the position. If there is good volume, the LMM will sell more than its initial creation position and need to do further creations. This is how an ETF will grow its assets and shares outstanding.

The initial ETF shares are then disbursed throughout the marketplace. Typically, the ETF is sold to investors or traders who want the ETF shares for various reasons and are willing to take the directional risks associated with a long or short position in the ETF.

Seeding Away from the LMM A slightly more complicated format beginning to unfold in the market environment is seeding undertaken by a party other than the LMM. This concept is important to understand: Either the LMM seeds the ETF and it has shares to sell, or someone else seeds the ETF and then lends those shares to the LMM for it to start trading. This is significant; the LMM must have shares to sell in the early days of trading, because typical initial interest in an ETF is from the buy side. If the LMM decided not to seed and did not borrow the shares, but then decided to start trading the ETF, it could be out on the exchange but hesitant to sell any shares and would be bidding without offering at a valuable level for investors. Or it could be forced to create shares upon encountering buy-side demand for the fund. If a fund was seeded by a party that is not the LMM but refused to lend out the created ETF shares, it would be effectively forcing the LMM into an early creation. The LMM, the seeder, and the issuer should all understand this process before launch.

In practice, by assuming the LMM position in an ETF, you are either going to seed or at least secure a stock borrow on the shares for the first

settlement following the first trading day so you have some shares to sell. This will enable market making, which will help to get the wheels moving. Lately, the seeding process is moving away from the LMMs, not necessarily by choice, but because balance sheet space for any fund that comes along has been greatly reduced. This situation is understandable and purely economic. The number of ETFs has exploded, and many of them need a longer incubation period, which can become an expensive drain on the balance sheet. In an environment with 2,000-plus ETFs, many of which trade less than 50,000 shares a day, the expectations for length of holding of a seed position should be adjusted accordingly.

The fact is that seeding is really just balance sheet rental; it was originally paid for by trading revenues received by the LMMs. Now they can pay to borrow those shares from an unrelated seeder and still make enough profit to justify being in the LMM business. This has led to the sudden creation of a new revenue stream for non-LMM seeders. If you seed a fund and are not the LMM, you have an immediate client in need of borrowing shares from you to cover potential shorts. This will not be a long-term revenue stream, however, because the LMM will not want to pay borrowing fees for an extended amount of time on a small short position, and eventually will be forced to create the ETF shares. New entrants coming into the ETF market are willing to seed funds in an attempt to extract a piece of that revenue stream or to drive other business initiatives.

The methods for seeding ETFs are evolving rapidly. Typically, LMMs seeded funds because they wanted listings. This also facilitated having shares to sell when the fund initially launched. More recently, LMMs have become much more selective about seeding, resulting in a dearth of seed capital and a long pipeline of funds in queue for listing. The difficulty of acquiring seed capital has a potentially positive effect on listing quality. As the costs to seed products increase, the process of deciding which products to list will become more thoughtful. Better and more effective products will be listed, with the ones failing the vetting process destined for an eternity in registration.

From an issuance standpoint, this is a bad situation. Issuers never want the expenses for trading or launching their fund to increase. To combat this, the process of cutting creation unit sizes down has begun. Cutting the creation unit size will decrease the amount of residual positions sitting on books around the Street. These positions are not large enough to process a creation and simply generate finance charges for the involved parties. Smaller creation units reduce financing costs and make it less expensive to seed a fund.

When an LMM sells an amount of the ETF that is less than a whole creation unit, it must decide when to create shares to cover its short position. If the creation unit is 100,000 shares and the LMM has sold 25,000 in the market, it may not be inclined to process a creation, and therefore have a

long position of 75,000 shares that remains unsold. It may be willing to sit short the 25,000 shares and pay stock borrow fees to the seeder. The decision is whether to pay borrowing fees on the short or finance fees on the long. This is the cost to carry the position and is built into ETF pricing spreads. Remember that all of these positions are hedged with baskets and are therefore not exposed to market movement risks.

Typically, because of the creation/redemption feature of ETFs, the act of growing your positions big enough will allow you to unwind them versus the issuer; thus, you will have no, or very low, carrying costs. In a new ETF, however, there is not always enough volume, and you will incur the costs while holding the position. This fact explains why issuers are moving toward reducing the size of the creation units in an attempt to lessen the costs that flow through to investors when bringing products to market. We discuss this topic again later when speaking more about executing hedging baskets.

Risks to Seeding Executed properly, the risk associated with maintaining an initial creation unit is minimal. The main risks to seeding occur if the underlying basket is not borrowable and a proxy hedge is used. This can potentially lead to a tracking error between the ETF position and the hedge on a seeder's trading books. Many observers over the past decade erroneously assumed that the LMMs were seeding funds by taking an outright long position in the fund. They believed that the LMM was buying the underlying basket of the ETF, delivering that to the issuer, and receiving shares via the in-kind creation feature. This would be leaving the LMM with an outright long position in the ETF at the risk of the markets. This belief highlights a misunderstanding of what LMMs do and how ETFs work. LMMs, or any liquidity providers, are not in the business of taking large directional bets. Most of the time they pursue arbitrage opportunities, profiting from spreads either between the bid price and ask price or between one product and another. In the case of ETFs, the arbitrage occurs between the ETF and its underlying basket.

The risks of doing an initial seed creation can be summarized in this way:

1. Borrow costs increasing dramatically.
2. The short basket gets called back.
3. ETF AUM do not grow, leaving the seeder in the position for a longer than expected time period.
4. The ETF exhibits tracking error versus the underlying basket or available hedge.
5. Missing a corporate action in the underlying basket causes tracking losses.

EXHIBIT 3.1 Demonstration of an Initial Seed Valuation Position

Description	Value
NAV of Long ETF Position (1 Creation Unit)	\$1,533,246.08
Calculated NAV of ETF $((A + C) / B)$	\$30.66
Estimated Residual Cash (C)	\$4,734.32
Shares in a Creation Unit (B)	50,000
Total Market Value of the Underlying Basket (A)	\$1,528,511.76

Note: The short market value of the basket equals the value of a creation unit less the cash amount.

In Exhibit 3.1 you can see an example of what a hedged position in an ETF would look like in market value terms. When you do an initial seed creation, you are delivering the exact basket of shares at the closing prices and receiving the ETF shares at the net asset value (NAV).

The total market value of the underlying basket (A) is the sum of each stock in the basket multiplied by its closing price. This is the short market value of the basket position at a specific time. You can see from the table that the market value of your short basket positions and your long ETF position less any cash will be equivalent. You will have no market exposure because as the basket moves, the value of your ETF will move as well. The price of the ETF in the market will potentially be trading at prices slightly away from NAV. But if you enter and exit the ETF position via the creation and redemption mechanism, you can remove any secondary market risk from the position, only paying resulting fees.

Seed Pipeline Seeding new funds is important because new fund launches are the lifeline of the ETF issuer. When valuable new funds are brought to market, investors will benefit from various increases in potential exposures. It is important here to consider how ETF issuers are paid. Many people do not understand the general flow of assets into ETFs and how management fees are extracted from those assets. It is also critical to understand that ETFs are bringing professional-quality investing tools and all of their benefits to a broad range of investors.

We have discussed how, during the creation process, an authorized participant delivers the basket of shares to issuers in return for shares of the ETF. Issuers have an inherent position (in a 1940 Act fund) in which they are essentially long the basket of stocks underlying the ETF and theoretically “short” the obligation of the ETF shares. In this case, however, the

issuers' ETF position is considered to be shares outstanding and not an actual short position. The NAV of the ETF is the sum of the value of the stocks in the basket and any residual cash in the fund. In a typical equity ETF, the basket of stocks replicating the ETF held by the issuer functions like any other portfolio of stocks. It pays dividends and experiences corporate actions. The issuer maintains the basket to account for all the changes that occur. That is why there is always a small residual cash position. Sometimes stocks exit the basket, and the money has to be reallocated. At other times, a dividend is paid on a stock in the basket and will have to be paid out to ETF shareholders at the specified dividend payment period for the ETF. The issuer typically accrues the fees daily and receives those fees from the cash portion of the fund on a specified basis.

The issuer is the last in line to receive payment throughout the process of issuing an ETF. It hires staff, builds a business, licenses or creates an index, and then pays legal fees, creates setup procedures, and writes prospectuses. Finally, after all of that expensive work, it may issue an ETF. The ETF must attract assets before it can begin to generate any fees. The fee for the fund is based on a percentage of the assets under management. In the case of ETFs, the fees typically are less than many fund competitors of different types, specifically closed-end funds (CEFs), mutual funds, and hedge funds. ETF issuers do not have upfront sales charges to incentivize brokers to sell the funds. There is not typically an initial public offering (IPO) process whereby brokers generate fees from steering clients into the funds. Even the salespeople at a typical ETF issuer do not get paid transactional-based commissions for selling ETFs. The ETF wholesaler is selling the concept of the ETFs in its product suite and developing client utilization plans. This is much more of an educational role than a transactional commission-based sales role. In the early years of ETFs, wholesalers would spend much time and energy with clients educating them about the ETFs they represented. Then, when clients were ready to buy, wholesalers would tell clients to call their trading desks. ETF issuers typically were detached from the execution process of their clients. Issuers do not actually process trades for clients directly.

Issuers start to generate revenues from ETFs when customer trades start to funnel through the system and result in the creation of new ETF shares. First, the customer has to have a trading system and brokerage account. Then the customer has to send the order to the exchange, and when they trade, they generate a trading commission. The exchange generates fees for executing the trades. Clearing firms charge fees for processing the tickets. Finally, after enough shares of the ETF are bought, an AP does a creation, driving assets into the ETF. Then issuers can start generating fees to cover all those upstream expenses they have already paid to put the fund into the hands of their clients.

TRADING TIP

Now issuers have adopted much more of an educational stance on trading. Because of the introduction of products that are more sophisticated and trade less intraday volume, issuers have become more involved in guiding the trading process. The largest issuers now have experienced trading professionals extremely knowledgeable about the trading process, helping investors to understand it and, at times, helping to bring the various parties to a trade together. Many traders at the authorized participants can also explain the various trading options and help customers execute efficiently. Additionally, *The ETF Handbook* is a great tool for wholesalers to help explain the processes and for the client base to gain a greater understanding of the entire ETF mechanism.

DISTRIBUTION

Once the mechanics of the fund have been put in place, the issuer is ready to launch the ETF. Currently in the United States, listing takes place on either the NYSE Arca, Nasdaq OMX, or BATS. NYSE Arca has been a dominant player in ETF listings. In February 2016 they had over 1,550 ETP listings, representing more than 93 percent of ETP AUM in the United States.² Other major listing venues, Nasdaq and BATS, are attempting to break this stronghold and garner listings and trading volumes. They are being very innovative with new programs designed to compensate issuers or lead market makers for listing on their exchanges. They are also designing programs to enhance the economics of providing liquidity in ETFs, thereby aiming to improve the experience for investors and the market-making community.

The last thing done in the process of listing the ETF is the selection of an LMM and the initial seeder. Finally it becomes simply a matter of picking a day when everything will be in order for the exchange to alert members and turn on trading. At this point the ETF begins a life of its own. Unlike a stock or a closed-end fund with a limited amount of shares outstanding, this is a vehicle with assets and shares outstanding that will grow and shrink with demand and interest. ETFs can grow extremely quickly or more slowly, depending on investor interest.

ETFs are sometimes thought to be discovered and bought by investors, not necessarily sold by salespeople. This makes the marketing process critical

to the entire launch of a new product. Because there are so many products, investors seem to approach the product suites in two main ways. Some go for a particular fund family, similar to what they might do in any other fund investment scenario. And others consider use of the ETF product line segmentation enough. They pursue the variety of products available to them regardless of the issuing company.

In recent years, funds launched and closed even with compelling strategies from an investing standpoint because they were not able to achieve the critical mass necessary for survival. Some of these closures can be attributed to inefficient marketing and distribution tactics. The marketing of products for investment is a delicate balance of branding, product positioning, and distribution, and is generally done by an issuer sales force.

CLOSING OF ETFs

As in many investment ideas, failure is a possibility for ETFs. In this highly competitive industry not all ETFs will attract enough assets to break even with their costs over a specific time period. There are a wide variety of variables that could lead to closure; the most prevalent is probably the cost structure of the issuer. If the issuer is generally providing an ETF platform with many funds in different categories, the tendency is to make decisions about individual funds only with regard to their broader business strategy. Whereas if it is a small issuer with only a few funds, the costs of each particular fund in the market and the costs of running the business overall can weigh heavily on the lives of their ETFs.

It is a fact that ETFs close. Not all investment products are winning ideas. Although certainly a negative for investors, this should not be viewed as a stain on the ETF industry as a whole. An ETF's inability to attract and maintain sufficient assets should lead to a reevaluation of the product. Culling the herd is important for the cash flow of the products and the health and development of the ETF industry. This is common in most fund structures. As Lisa Smith wrote on Investopedia, "Several hundred [mutual] funds closed nearly every year during the late 1990s and the early 2000s. Niche funds are particularly vulnerable, as they are often invested in fads, or focused on such a small aspect of an industry that there is a risk the concept will never catch on with investors."³ According to Investment Company Institute data, more than 500 mutual funds either merged or liquidated in 2008. This is a natural process for any type of fund business.

It is important to note that one of the main characteristics of ETFs also turns out to be a benefit when ETFs close. Because of the creation and redemption mechanism of ETFs and the in-kind transfer of assets (both processes are detailed in later chapters), closing an ETF and unwinding the assets

generally does not create a taxable event for the ETF. Because funds that close are typically very small, sometimes the closing entails a return of the underlying shares to the initial seeder, with that party returning the ETF shares. This would be an in-kind transaction between the ETF provider and the AP and would not generate any potential trading gains or losses. This is very different from the procedure for a mutual fund, which would either have to merge or sell the basket of securities underlying the assets of the fund.

There are many reasons why a fund might close, mostly economic. The fund-issuing company assumes all the expenses related to development and production of an ETF before it is launched. Additionally, it pays the expenses required for listing and support and to keep the funds running. Most of this is done before the fund has even started to collect assets that will generate revenue. Issuers of ETFs are in business to make money. They are offering products that are valuable for investors, but their underlying goal is a profit at the end of the day. Why keep funds listed in perpetuity if they have not generated a stable asset base? Until recently it was cheaper to launch ETFs because seed capital was readily available, which made listing and maintaining some funds less expensive. The issuers listed as much as possible in the race to reach critical mass.

The process has changed; seed capital and initial capital infusions into funds are not as easy to secure, or are coming from new and unique sources. This fact is leading the issuers to proceed more carefully in fund listings and will lead to fewer closures down the road along with a much higher success rate on listed products. Also it will lead to a rise in the average assets gained in the initial and early years of listing. The market has already moved from launches of 20 funds at a time to more typical launches of one or two funds at a time.

The Downside of Closures

Even if the delisting and closure goes smoothly, it can still be inconvenient for investors and issuers.

If an issuer desires to close an ETF for business reasons yet the ETF has a wide set of holders, the issuer will likely try to sell the fund to another issuer. If that is unsuccessful and the fund needs to close, there is the process of selling the assets and returning cash to investors. For the investor this would appear like the sale of the ETF at NAV and could generate tax consequences in their portfolio. It is critical to understand that there is no principal risk of loss to the investor but more the inconvenience of having to redeploy investment capital into a different strategy.

If messaged properly by issuers with enough lead-time for investors, much of the repositioning takes place before the closure. Many investors

will sell the shares in the secondary market leading to the APs' consolidating those shares into baskets and redeeming. So in the final days of an ETF, the issuer typically has very few assets that it has to liquidate.

Reputation Risk From the perspective of advisors, avoiding funds at high risk of closure can help avoid egg-on-your-face phone calls to clients after recommending a fund that is now closing: "Remember that great ETF I told you about?" is never a call that an advisor is happy to make. So issuers need to work hard to reduce incidences of closure or changes in investment strategy while still trying to keep their lineup fresh and appropriate for investors.

Reinvestment Risk When an ETF delists or liquidates, it creates reinvestment risk for its investors—not to mention the extra and unnecessary burden associated with reinvesting. Once you receive your cash-equivalent NAV, you need to find somewhere else to put it, which could mean repeating the entire process that landed you in the ETF to begin with.

Tax Burden Since investors must either sell their shares or receive cash equivalents of NAV, they are forced to realize any capital gains. Realizing capital gains earlier than planned can create a tax burden that investors (and clients) might not have anticipated. This is something that should be discussed with a tax advisor once you have learned about the potential position closure.

Closure Risk Factors It is not always easy to spot potential closure candidates. And although investor capital is not at risk because of closures when holding an ETF, a little homework can provide some good insurance.

- Low Assets Under Management (AUM)

Low AUM is one of the best indicators of closure risk. After all, funds with hundreds of millions of dollars in assets under management are most likely profitable and not candidates to close.

The downside of using AUM as an indicator of fund-closure risk is that you may rule out far too many ETFs. There are hundreds of ETFs with low AUM that do not close each year—and some of them are great products.

As a general rule of thumb, once a fund surpasses the \$50 million mark in AUM, it is far less likely to close. But this does not help to assess the hundreds of funds that have not yet reached that benchmark.

- Issuer Strength

Surprisingly, even more important than AUM in predicting fund closure is the strength of its issuer and its business model. After all, when the issuing company is unprofitable, all of its businesses are at risk. Indeed, most ETF

closures historically are the result of entire companies getting out of the ETF business, not big issuers simply closing ETFs that are slow out of the gate.

Consequently, when evaluating whether a low-AUM fund is at risk of closure, consider the strength of its issuer as well as the issuer's history and general culture surrounding closures.

- **Fund Rank in Segment**

If a particular ETF is the least popular (by AUM) among 10 ETFs that offer similar exposure, it is more likely to close than a similarly unpopular ETF that is the only ETF offering exposure to a particular sector/country/strategy. Essentially, unpopular funds in oversaturated markets are at greater closure risk than unpopular funds offering unique exposure.

Closings in Sum

Ultimately, do not let media headlines about ETF closures invoke fear, because, most importantly, ETF investors do not stand to lose their investment dollars when an ETF closes. Secondly, ETF assets can change dynamically in a very swift time frame. There are many examples of ETFs with very low assets and trading volumes suddenly taking on large investments by some portfolio manager. The ETF assets may increase dramatically, but this may have no impact on trading volumes. Highlighting low average daily volume is not a viable indicator for assessing ETF health. In addition, an ETF with a large amount of assets can suddenly lose a significant amount of those assets, even though the ETF value has not declined. This may simply be the result of an asset allocation shift, unrelated to performance. So a large ETF can quickly become a small ETF, but this does not necessarily put it on the list of potential closures. Most reliable indicators of change in a particular ETF will be issuer strength and the management of their businesses.

CONCLUSION

Launching an ETF is an extremely complicated and involved process. There are major expenses involved in resolving potential legal issues and developing a full investment mechanism around a product. Because of the size of the market, a firm launching one or two niche products will have a difficult fight for survival against the behemoths with their marketing machines.

The changes in the financial markets over the last several years and the growth of the product set has made it more difficult both to secure an LMM and to get seed capital for launching new funds. Once those obstacles are

overcome, it is still a difficult battle to get people to focus attention on new products amid a rising cacophony of new product announcements. There are more than 500 ETFs in registration; even if a small percentage of those are brought to market, there will be a significant population of products, in addition to the more than 2,000 already listed in the United States. The number will grow even further as more products migrate from competing structures. And there is incessant demand from the investing community throughout the world for new funds and products that offer ever more arcane exposures.

It is imperative for the growth of the ETF wrapper to advance the incubation process. It would be fruitless to discuss the merits of selecting liquid baskets that provide valuable investments if it were impossible to bring new products to market. Key to the various structural qualities that will be discussed is that they are all exchange-listed products. It is this exchange listing that brings benefits to the investor, and it is the listing process that must continue to advance with the growth in assets.

NOTES

1. You can see the full requirements at: <http://www.reuters.com/article/2015/03/20/batsglobalmarkets-etf-idUSL2N0WM1TM20150320> https://www.nyse.com/publicdocs/nyse/products/etp-funds/LMM_Requirements.pdf.
2. NYSE, "Strengthening U.S. Equity Market Structure to Better Address Extreme Volatility," February 2016.
3. "Liquidation Blues: When Mutual Funds Close," Lisa Smith, <http://www.investopedia.com/articles/mutualfund/09/mutual-fund-liquidation.asp>.

ETF Trading and Execution

One of the crucial benefits of the exchange-traded fund (ETF) structure is the fact that the funds are listed on exchanges and can be traded throughout the day. This is a huge benefit for investors of all types. Short-term investors and traders can incorporate the funds into strategies that trade at a variety of frequencies. And longer term investors gain the benefit of fair valuation of their positions in real-time during every trading day. The additional benefit of being able to enter and exit the position midday, without waiting for a closing NAV, adds an amount of liquidity and potential risk reduction to every portfolio. The ability to trade ETFs intraday is proving to be a game-changing technology. Part Two discusses the details of execution and of how to trade and when participants can take advantage of the underlying liquidity of ETFs.

The trading of ETFs lies at the very heart of utilizing the products in an intelligent manner. You need to know how to interpret the price of a fund when you are getting ready to trade. You should be able to assess whether it is trading in line with its valuation. Understanding the underlying value of the fund you are planning on positioning means you are able to make important decisions about execution times and strategies. Once that valuation is determined, you need to understand the people with whom you will be interacting when trading ETFs and some strategies for executing ETF order flow. In addition, if you do not understand how liquidity is provided in ETFs, you may be using only those with the most highly traded volume, mistaking their

volumes for liquidity, while more sophisticated users will be investing in the broader product set regardless of actual trading volume.

Part Two explains:

- What ETF volumes mean
- What the money flows look like in an ETF trade
- The ETF trading model
- What is ETF Implied Liquidity™
- Practices for best execution in ETFs
- Examples of large and small ETF trades being executed in the marketplace, including discussion on the interaction of the different players and how the liquidity was achieved
- Who are the most frequent traders of ETFs and what businesses they are engaged in
- Who provides liquidity and who typically takes it

It is quite simple to take a small order in one of the most popular ETFs and get it executed. It is much more valuable to attain a good execution in an ETF in which not many people are participating. Then you will be able to utilize that ETF to build a better portfolio, outperforming your competitor and the market. A tremendous amount of research is being put into the development of new ETFs. Although the end goal from an issuance side is always to acquire assets and fees, issuers are also trying to bring valuable tools to the marketplace to enable investors to efficiently achieve their own goals.

With the knowledge you attain here regarding the players and their business models, you will be able to utilize the full battery of resources available for executing your order flow in the best manner possible. This will be a benefit for your portfolio, your client base, and your entire business.

Trading Volumes and ETF Liquidity

The exchange-traded fund (ETF) market has changed stock trading and market analysis. By watching ETF quotes representing baskets, you can clearly see groups of stocks trade and how they are moving in relation to similar groups of their peers. This is also changing the way stocks are valued in the marketplace. It once took advanced systems to see the performance of various different sectors in the markets. Now, for example, you can easily watch an ETF covering a U.S. sector and see how it is trading versus one covering a similar but international sector. You can use this trading comparison to judge how news is being interpreted on a global basis, as well as a sector basis.

Both ETFs and stocks are subject to many of the same trading rules regarding equities trading. One of the main distinguishing characteristics of ETFs was their exemption from the up-tick rule for shorting stocks. Their success with this structural nuance paved the way for all U.S. stocks to enjoy the same benefits in recent years.

In actual product structure, however, ETFs have some internal mechanics that make them very different from a typical equity product. The most glaring is the fact that ETFs have what is called continuous issuance of shares via the creation and redemption mechanism. This feature enables rapid expansion or contraction of shares outstanding in an ETF and is the main facilitating feature that has enabled ETF volumes and assets to grow. It is the creation and redemption functionality that unlocks all of the underlying liquidity in an ETF, making it accessible to every investor.

In this chapter we discuss:

- The main similarities and differences when trading stocks and ETFs
- How the liquidity of an ETF is based on both trading volume and underlying basket volume
- The landscape of current ETF volumes

In this chapter and throughout Part Two we detail who the participants are in the marketplace and how participants can take advantage of available liquidity in ETFs via the secondary market on exchanges or in the primary markets using the underlying baskets. Volume and liquidity are the keys to the ETF world. Understanding that you can utilize an ETF that trades

infrequently in the market by accessing its underlying basket enables you to expand your usable product universe. This will give you tools to expand portfolio access and manage risk that were previously unavailable.

ETFs TRADE DRAMATICALLY DIFFERENT THAN STOCKS

One of the main differences I like to highlight between how ETFs and stocks trade is the typical counterparty. I consider the typical stock trade as two opposing viewpoints meeting in the marketplace. An investor with a bullish viewpoint and an investor with a bearish viewpoint come together at a similar price point, enabling a trade to occur.

An ETF trade is different. A large proportion of ETF trades take place between a bullish or bearish investor and a liquidity provider facilitating the transference of liquidity in between. An investor wants to buy or sell. Instead of buying from another investor with an opposing viewpoint, the investor typically is trading versus a liquidity provider. An ETF acts like a derivative whereby its value is derived from an underlying basket of securities. A position in the ETF can then be hedged by utilizing the underlying, thereby reducing the potential risk to a liquidity provider. The lower the average daily volume in the ETF, the more the liquidity provider will be needed to facilitate unopposed flow.

TRADING TIP

What Is an ETF Liquidity Provider?

An ETF liquidity provider is a market participant who is trading ETFs either to satisfy customer flow directly for their own set of clients, or indirectly by providing pricing electronically into the secondary market. If the provider is satisfying direct investor requests, they are typically taking the other side of a customer trade and then hedging their position. If they are providing quotes into the market, they are generally providing two-sided quotes as part of a strategy designed to buy and sell ETFs versus hedges individually or on the portfolio level.

Lower-volume ETFs, those that trade less than a million shares per day, are the products for which ETF liquidity providers provide the most important function for investors. In the very-high-volume ETFs, there are many arbitrage participants and other traders continually competing with ever-tightening spreads to squeeze out any potential margins, rendering

liquidity providers less critical to the daily order flow. An interesting statistic exists about specific liquidity providers known as lead market makers (LMMs) regarding their participation in ETFs as the funds grow. You can see an inverse correlation between LMM participation rates and ETF volume. Typically, an ETF will start its early life with the LMM focusing on the fund and offsetting trading demand by providing liquidity. As the fund becomes more popular, other ETF liquidity providers are attracted to the fund; they tend to crowd out the LMMs, which lowers their participation rate. The ETF liquidity community has become deep and vast with multiple providers in almost every ETF. Primarily in lower-volume ETFs, there is an opportunity for a liquidity provider to take the other side of an ETF trade, achieving two simultaneous goals:

1. Satisfying investor demand to buy or sell the ETF
2. Taking advantage of a spread between the price at which the ETF trade takes place and the price at which the basket or hedge can be executed

This has been beneficial for the growth of the ETF business because issuers are able to launch products, and liquidity providers and LMMs stand ready to support new ETFs with initial liquidity. Liquidity can be created because of the creation and redemption mechanism embedded in the ETF structure, which has proven to be a most important element compared to traditional equity and competing structures.

The creation/redemption mechanism allows liquidity providers to exchange underlying assets for ETF shares and vice versa. This guaranteed offset of positions allows for constant liquidity to be provided as well as scouting for arbitrage opportunities. The beauty of the arbitrage mechanism in the ETF is that it has created an entirely new ecosystem for trading in the markets. While in the past there were only a handful equity indexes on which you could pursue arbitrage opportunities between baskets and the futures, now there are thousands of arbitrage opportunities between baskets and ETFs. The ability to trade baskets of stocks as separate individual equities or as a unit has created arbitrage revenue streams previously available only to the index arbitrage trading desks. As more and more indexes are created and ETFs are issued on those indexes as replication vehicles, the opportunities to take advantage of arbitrage spreads has grown tremendously.

A BRIEF LOOK AT EQUITY TRADING VOLUMES

Exhibit 4.1 presents a grid showing stock listings by volume trading buckets. The universe is composed of products trading on NYSE Arca but not including ETFs and closed-end funds (CEFs). There is a reasonably normal distribution of volumes in relation to listed equities. A full 78 percent of

EXHIBIT 4.1 NYSE Listed Stocks 3-Month Average Trading Volume Breakdown, a/o 2/3/2016

	50k <=	100k <=	500k <=	1M <=		
	<50k	x 100k	x <= 500k	x <= 1M	x <= 10M	>10M Total
Number of Stocks per Volume Bucket	189	231	714	335	660	51 2,180
Percentage of Stocks per Volume Bucket	9%	11%	33%	15%	30%	2%

Source: Bloomberg

listed products traded between 100,000 and 10,000,000 shares per day on average over the last three months. The listing of stocks on exchanges is an established business and is considered to be mature. The ETF market has grown dramatically but is still young compared to competitive products. There have been many products issued recently that are attempting to bring the advantages of this new structure to investors. You will see the difference in Exhibit 4.2, which provides the same view of ETF volumes from both 2010 and 2015.

EXHIBIT 4.2 Top Four ETFs by Average Daily Trading Volume (as of 1/14/10)

Top Four Most Traded ETFs - 1/4/2015 - 3M ADV		
	3M ADV	AUM
SPY	116,123,568	\$182,039,453,100
EEM	62,819,852	\$21,529,898,440
GDX	58,609,660	\$4,316,717,773
XLF	40,400,888	\$19,464,052,730
Top Four Most Traded ETFs - 1/14/2010 - 3M ADV		
	3M ADV	AUM
SPY	162,159,584	\$80,391,480,000
XLF	86,049,144	\$7,173,530,000
QQQQ	85,658,336	\$18,537,440,000
EEM	71,461,760	\$40,697,840,000

Source: Bloomberg

A DETAILED LOOK AT ETF TRADING VOLUMES

There is always much heated debate about the importance of the average daily trading volumes of ETFs. I have heard arguments that the extremely high volumes generated by people pursuing arbitrage opportunities in ETFs are bad for the investing community. And I have also heard arguments that the low trading volumes in ETFs are an indication of faulty product development. I do not agree with either of those arguments. Higher trading volumes are beneficial for everyone because of the increased liquidity that all participants can utilize for their own purposes. It has also been proven that low-volume ETFs provide no additional risk to investors. Since low-volume ETFs are still in a structure that can handle rapid swings in volume and rapid changes in fund size, their low daily trading volumes do not indicate either a lack of fund success or product development problems. As I noted earlier, there is a long history of some ETFs existing in the market for an extended period before attaining significant assets. With the growing expenses of listing funds compared to several years ago, some fund companies may no longer have the luxury of extended wait times for smaller products. The main product issuers are, however, in the business of launching and incubating new products conceived around novel and beneficial themes and are therefore inclined to put a wide variety of products in the market and supporting them.

In part, the volume debate arises from the fact that many of the initial ETFs were tracking indexes with long histories and massive amounts of money already using them as a benchmark. This led to a belief that all ETFs need to have huge trading volumes as a testament to their success. This is actually an incorrect way to view the product structure. The newer ETFs utilize their more advanced structure to compete in a different arena. Many of the fundamentally weighted ETFs, for example, are investment vehicles meant to compete with the actively managed mutual fund families. They are not designed as trading vehicles, and while they can be used for shorting and trading, they usually would not work well as a hedging vehicle. They are attempting to go beyond pure beta exposure. They are challenging the efficiency of the traditional capitalization-weighted beta and attempting, via a compendium of methods, to outperform those indexes and everything else that may be using them as a benchmark. Whether you refer to the products as smarter beta, better alpha, or factor weighted, they are all designed to overcome the deficiencies of older market capitalization-weighted indexes and improving the index-based experience for investors.

These newer products are really a modern structure of listed mutual funds; they offer the benefits of the new structure while embodying all the benefits of the old. In this context, judging them according to trading volume

is inconclusive because the idea is for them to be used by the longer-term investment community. Think of ETF volumes as a bonus, above and beyond volumes available to a mutual fund investor. A mutual fund can only access the volume of its underlying portfolio. An ETF has that access *plus* whatever congregates on exchanges. Judging an ETF by its average daily volume is akin to thinking that a mutual fund has unlimited liquidity because, if you send in a check, you get a share quantity at an NAV basis. Both assessments would be mistaken. The beauty of the ETF structure is that, with its many different types and uses, it can be attractive to all sorts of investors, from fast-money accounts thriving on high volumes to the buy-and-hold accounts that do not trade frequently. The target audience should be taken into account when discussing viability, along with other analyses into the liquidity of underlying and assets under management (AUM).

Let's take a look at the average daily trading volumes of ETFs listed in the United States shown in Exhibit 4.2. I have presented the data from 2010 and 2015 for comparison. It is interesting how volumes traded have generally declined in the funds, but assets under management have increased in three of the four funds and declined in one. I use the three-month average daily trading volume (ADTV) in a series of buckets to delineate where the products are currently trading and where, in volume terms, are the funds with the most assets.

Exhibit 4.3 presents a scatter-graph view of ETF assets and volumes. While the picture presented is dramatic on its own, it is even more dramatic if all U.S.-listed ETFs are included. The top four volume leaders in the ETF space trade so much more volume than the rest of the ETF universe that they would make this chart virtually useless if they were included. Those funds were presented in Exhibit 4.2. All except the top four ETFs trade less than 25 percent on average of the most frequently traded ETF, SPY. And the assets in the Standard & Poor's (S&P) 500 Depository Receipts (SPY) are more than twice the amount of the next highest asset leaders, as of January 2016.

You can see in Exhibit 4.3 that many ETFs are still below \$5 billion in assets and trade less than 10 million shares per day. You can also see the growth of funds in asset terms over the five-year span between the two charts. It would seem unproductive to exclude most of a universe of products in your portfolio because they do not stack up well versus the extremes in the product category. Remember, average daily volume of an ETF is a bonus and not a definition of available liquidity.

Let's take a more detailed look at where the ETFs are trading on a volume bucket basis. I use volume buckets because they give you a range that makes sense in terms of actual trading liquidity by product, not including underlying liquidity from baskets. There is little difference in exchange-based liquidity between a product in the less-than-50,000-shares bucket and one in the 50,000-to-100,000-shares-per-day bucket. Any of these ETFs would

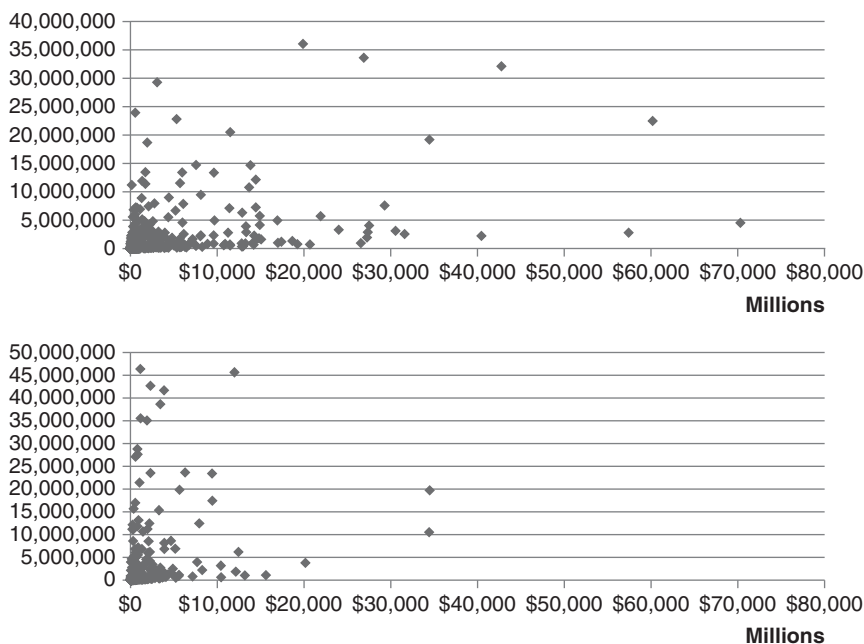


EXHIBIT 4.3 ETF Volume and Asset Scatter Graph (Excluding Top Four Volume Products)

Source: Bloomberg, 1/4/16

require care when trading by most participants; I have broken them out to highlight the large group of ETFs that reside in the lowest-volume buckets.

In Exhibit 4.4, showing both 2010 and 2015 data, you can see that more than 50 percent of the ETFs listed in the United States currently trade less than 50,000 shares per day. You can also see in the box directly underneath that those ETFs control a mere 3 percent of the assets in the market. On the opposite end of the spectrum, the top 11 percent of the ETFs listed in the United States control approximately 63 percent of the assets, and those ETFs trade more than one million shares per day each. This product line is clearly undergoing a rapid growth spurt and will likely experience a more normalized curve of the assets and volume curves over time.

I view the bucket containing ETFs with an average daily volume in the 500,000-to-1-million range as the transition zone. This may explain why there are fewer funds in this range. As an ETF's investment strategy becomes more popular, its secondary trading volume, ADV, grows and matures. At an inflection point of about 500,000 shares per day additional trading firms and investors come in, taking the product to over one million shares daily in a short time span. It is important to remember here that I do not consider daily trading volume to be a valid consideration for positioning unless you

EXHIBIT 4.4 Totals of Funds and Assets in U.S.-Listed ETFs (as of 1/14/10 and 1/4/16)

Number of Funds per Volume Bucket, 2010 and 2015, 3M ADV									
		50k <= 100k		100k <= 500k		500k <= 1M		1M <= >10M	
		<50k	x 100k	x <= 500k	x <= 1M	x <= 1M	x <= 10M	>10M	Total
2015	Number of Funds per Volume Bucket	688	131	259	74	111	25		1,288
	Percent of Funds per Volume Bucket	53%	10%	20%	6%	9%	2%		
2010	Number of Funds per Volume bucket	425	78	143	34	74	30		784
	Percent of Funds per Volume Bucket	54%	10%	18%	4%	9%	4%		
	5-Year Change	62%	68%	81%	118%	50%	-17%		64%

AuM per Volume Bucket, 2010 and 2015, 3M ADV						
	<50k	50k <= x 100k	100k <= x <= 500k	500k <= x <= 1M	1M <= x <= 10M	>10M
2015	\$71,101	\$49,517	\$331,072	\$323,269	\$809,976	\$509,845
AuM per Volume Bucket (Millions)						
Percent of AuM per Volume Bucket	3%	2%	16%	15%	39%	24%
2010	\$24,724	\$21,574	\$118,744	\$95,424	\$208,044	\$327,730
AuM per Volume Bucket (Millions)						
Percent of AuM per Volume Bucket	3%	3%	15%	12%	26%	41%
5-Year Change	188%	130%	179%	239%	289%	56%
						163%

Source: Bloomberg. 3-Months Average Daily Volume.

are pursuing a high-frequency or day-trading strategy. The further out your investment horizons extend, the less value trading volume should have in your investment decisions. With a longer-term horizon, you are better off executing via some form of NAV-type execution, which we discuss in detail later. This will make trading volumes largely irrelevant because you will be having an AP utilize the creation and redemption procedure for your execution, providing you have access to the underlying liquidity.

TRADING TIP

Trading Volume Is Only One Piece of ETF Liquidity

If your investment horizon is longer than one day, trading volume should not be relevant to you as criteria for portfolio suitability. No matter what size you wish to execute, the liquidity of the underlying assets in the fund will determine the minimum liquidity available in your desired ETF, and not its average daily trading volume.

Exhibit 4.5 offers expanded views of the same data, showing the number of funds separated out by issuer in each volume bucket. The percentages of each issuer's product suite in each volume bucket are provided in Exhibit 4.6.

This data on trading volumes does not take into account potential liquidity available from the baskets, and it does not show growth trends. It is a static moment depicting the previous three months of trading volumes and a point-in-time asset number. Some important conclusions can be gleaned from the data:

- When we look at the percentages of each issuer's suite by volume buckets, we see that low-volume ETFs are present in every suite of products in varying degrees.
- There are many products in the market that do not have high trading volumes. The majority of ETF in existence trade less than 50,000 ADV.
- There is room on the trading side to grow the facilitation business in low-volume funds to aid in utilization of a large group of available products. These products have been brought into the marketplace and in most cases have a sufficient amount of underlying liquidity that is still sometimes difficult to access by the investor base. I see movement toward finding new and innovative ways to provide liquidity in low-volume ETFs to investors electronically.
- Although there is a large increase in new users of the ETF structure, they are not yet pushing large amounts of assets into the more esoteric

EXHIBIT 4.5 Number of Funds by Issuer (as of 1/4/16)

ISSUER		<50 k	50 k <= x < 100 k	100 k <= x < 500 k	500 k <= x < 1 M	1 M <= x < 10 M	=> 10 M	Totals
1	AdvisorShares	17	1	1				19
2	ALPS	9	1	1			1	12
3	Arrow Investment Advisors			1				1
4	BlackRock [iShares]	105	28	64	28	41	7	273
5	Calamos	1						1
6	Cambria	3						3
7	Columbia	5						5
8	Deutsche Bank [X-trackers]	8	1	3	2	3		17
9	Direxion	19	2	11	6	11	1	50
10	Emerging Global Shares	6	1	1				8
11	ETF Securities	5	1	1				6
12	Exchange Traded Concepts	6	1	1				8
13	Fidelity	2	2	7				11
14	First Trust	50	12	20	2	2		86
15	Franklin Templeton	1						1
16	Global X	21	7	6				34
17	Guggenheim	39	7	16	2			64
18	Highland Capital Management			1				1
19	Huntington Strategy Shares	2						2
20	IndexIQ	10	1	1				12
21	Invesco PowerShares	76	17	27	5	5	1	131
22	JPMorgan	1						1
23	KraneShares	2		1				3

(continued)

EXHIBIT 4.5 (Continued)

ISSUER	<50 k	50 k <= x < 100 k	100 k <= x < 500 k	500 k <= x < 1 M	1 M <= x < 10 M	=> 10 M	Totals
24 LocalShares	1						1
25 Merk	1						1
26 Northern Trust	6	5	3	1			15
27 OppenheimerFunds	7						7
28 PIMCO	10		4				14
29 Precidian	1						1
30 ProShares	78	9	13	7	17	2	126
31 PureFunds	1						1
32 QuantShares	3		1				4
33 Recon Capital	1						1
34 Renaissance Capital	1						1
35 Schwab		4	12	4	1		21
36 SSGA (SPDR)	78	8	21	6	15	9	137
37 Teucrium	5						5
38 U.S. Commodity Funds	5	2	2		1	1	11
39 Van Eck	29	5	9	1	3	2	49
40 Vanguard	17	7	23	10	9	1	67
41 Velocity Shares	3						3
42 Victory CEMP	3						3
43 WisdomTree	49	9	8		3		69
44 Yorkville	1		1				2

Source: Bloomberg. 3-Months Average Daily Volume.

EXHIBIT 4.6 Percent of Funds by Issuer Assets per Volume Bucket (as of 1/4/16)

ISSUER		<50 k	50 k <= x < 100 k	100 k <= x < 500 k	500 k <= x < 1 M	1 M <= x < 10M	=> 10 M
1	AdvisorShares	69%	19%	12%			
2	ALPS	7%	5%	10%			78%
3	Arrow Investment Advisors			100%			
4	BlackRock [iShares]	3%	1%	14%	19%	45%	18%
5	Calamos	100%					
6	Cambria	100%					
7	Columbia	100%					
8	Deutsche Bank [X-trackers]	1%	0%	2%	9%	87%	
9	Direxion	6%	1%	13%	11%	66%	2%
10	Emerging Global Shares	20%	16%	64%			
11	ETF Securities	86%	14%				
12	Exchange Traded Concepts	29%	32%	39%			
13	Fidelity	22%	6%	72%			
14	First Trust	8%	13%	53%	14%	12%	
15	Franklin Templeton	100%					
16	Global X	20%	25%	55%			
17	Guggenheim	18%	7%	40%	35%		
18	Highland Capital Management			100%			
19	Huntington Strategy Shares	100%					
20	IndexIQ	14%	8%	78%			
21	Invesco PowerShares	6%	6%	22%	5%	17%	44%
22	JPMorgan	100%					
23	KraneShares	5%		95%			

(continued)

EXHIBIT 4.6 (Continued)

ISSUER	<50 k	50 k <= x < 100 k	100 k <= x < 500 k	500 k <= x < 1 M	1 M <= x < 10 M	= > 10 M
24 LocalShares	100%					
25 Merk	100%					
26 Northern Trust	17%	27%	36%	21%		
27 OppenheimerFunds	100%					
28 PIMCO	11%		89%			
29 Precidian	100%					
30 ProShares	10%	5%	14%	8%	55%	8%
31 PureFunds	100%					
32 QuantShares	61%		39%			
33 Recon Capital	100%					
34 Renaissance Capital	100%					
35 Schwab		5%	45%	39%	12%	
36 SSGA (SPDR)	2%	1%	4%	7%	22%	64%
37 Teutrium	100%					
38 US Commodity Funds	1%	3%	14%		12%	70%
39 Van Eck	8%	4%	35%	6%	14%	33%
40 Vanguard	1%	1%	19%	20%	51%	7%
41 Velocity Shares	100%					
42 Victory CEMP	100%					
43 WisdomTree	12%	13%	10%		65%	
44 Yorkville	26%		74%			

Source: Bloomberg. 3-Months Average Daily Volume.

structures, as shown by the asset concentration in a very small group of funds. This is changing, as you can see from the scatter charts over the five-year span. This will continue to change with increased trading abilities and increased education about using ETFs.

ETF MONEY FLOWS—DON'T JUDGE AN ETF BY ITS SIZE

The assets under management (AUM) of an ETF is the representation of how much money the fund manages. This number can change. The two factors affecting change in AUM are daily valuation changes of the fund as well as net shares created and redeemed. The AUM and the shares outstanding of each ETF are publicly disclosed daily and are available to all investors through numerous sources including issuer websites. The market movement of the underlying basket and the creation and redemption activity change the AUM of the fund on a daily basis.

The actual trading volume of an ETF does not have a direct effect on the AUM. An ETF can trade a tremendous amount of shares in a given day, but if that trading does not lead to net creations or redemptions, then the AUM can remain constant. Take the example of an ETF arbitrage firm's selling a particular ETF all day and buying baskets against it to hedge. In this example, the buyer of the ETF shares was another ETF arbitrage firm that was buying the ETF and selling the basket. At the end of the day, the firm that had been selling the ETF puts in a creation order of 10 units to flatten its position. The firm that had been buying the ETF submits a redemption order of the same size to flatten its own position. In this scenario, the ETF exhibited a very high trading volume on the day, but its net assets (AUM) do not change.

Now let's look at a scenario where a sovereign wealth fund is buying large blocks of a particular ETF from a liquidity provider that is selling the ETF to the client and buying the underlying basket to hedge its position. At the end of the day, the liquidity provider submits a creation order in the ETF. This will show up as an increase in AUM and an increase in shares outstanding of the ETF.

Another client is interested in making a large investment in a new ETF that currently only has \$50 million in assets. The client wants to make a \$50 million investment and is concerned about owning the entire fund and all of its assets. It agrees to go ahead with the trade and has an authorized participant (AP) process an NAV-based transaction for the desired investment size. The AP buys the underlying basket of stocks at the closing price and submits a creation order for \$50 million of the fund (in creation unit form). When the transaction is finalized, the client does not own 100 percent of the fund, since the creation causes the assets of the fund to double; the client will own only 50 percent of the AUM and 50 percent of the shares outstanding.

These examples highlight some important points:

- When you buy shares in the secondary market, you are not necessarily having an effect on the number of outstanding shares in a fund or its AUM. If you are buying from someone who is selling a long position that they had or is going to turn around and buy the shares back in the market, then the activity may not lead to a creation. Without a creation or redemption, the fund AUM and shares outstanding do not change. This highlights the difference between activity in the secondary market (on the exchange) and in the primary market (via the creation and redemption process).
- When creations or redemptions are done, they directly affect the shares outstanding and the AUM of an ETF, but they do not have any effect on trading volume. If you have an AP process and an agency creation that does not run through its principal trading books, and you receive the shares of the ETF at the price as delineated by the transfer agent, then the ETF trade will not be printed to the consolidated tape and will not have an effect on trading volume. If, however, a creation is done on behalf of a client order, whereby it flows through the AP's account, and the price to the client is different from that of the NAV, then the order will be printed to the tape.
- Trading volume is not always an indicator of an ETF's gaining assets. Many of the ETFs that are considered trading vehicles can be traded back and forth in the secondary market without any change in the primary issuance.
- The AUM and shares outstanding can change dramatically on a daily basis. This is most apparent in newer ETFs, where they are usually seeded with one creation unit. If the launch is successful, within a few days there can be another creation doubling the AUM and shares outstanding of the fund. This can also happen at any point in the life of the fund and is merely a function of the underlying liquidity of the ETF. A fund with \$1 billion in AUM can take in a \$1 billion creation order if the underlying basket has that liquidity available. And the same can happen in the reverse direction via the redemption process.
- ETFs have no lockup on assets. They enable daily liquidity on your entire position. The structure is essentially a bet that transparency and flexibility will lead to higher assets over time without the need for a fixed amount of shares outstanding or the need to have gates on asset redemptions. Exiting an ETF position via a redemption order of the underlying shares is just as easy as entering into a position via a creation. There has never been a situation where investors have been unable to redeem shares in an ETF for any extended amount of time, as in what was experienced by hedge fund investors in 2008–2009. When a particular market has been closed due to extenuating circumstances,

like the revolution in Egypt, the ETF tracking those assets had to halt both creations and redemptions while the markets in that country were closed. However, the ETF was still trading on exchange, and investors were able to adjust their positions in the ETF as needed. Investors may not be properly assessing their asset risk when they invest in hedge funds and other vehicles that are able to lock up their assets for extended periods of time. If you can only redeem a portion of your assets on a quarterly basis in a product, there is a hidden cost to that lack of control and liquidity that is not being properly evaluated by investors.

In Exhibit 4.7, you can see some examples of client order flow facilitation and how assets get into funds via the creation process. All the client business in the example is done on the secondary market, and then the AP utilizes the creation process to manage the positions on its books.

The AUM and the shares' outstanding number need to be examined together to determine whether an ETF that is growing in assets is doing so because of market moves or share purchases. Looking at just the AUM provides a valid snapshot of assets at any one moment in time, but it does not tell a complete story. Sometimes the AUM can lead people to believe that an ETF is too small for the size of an intended investment. Because of the open-ended issuance available in the ETF wrapper, however, the liquidity of the underlying basket is a much better way to determine how much can be invested in any fund. If there is a lot of liquidity in the underlying basket, an ETF can grow its assets very quickly as baskets are bought and creation orders are submitted. The AUM should be combined with the shares outstanding and sometimes even the volume numbers to present a complete picture of the money flows in the ETF.

WHERE MONEY FLOWS CAN STEER YOU WRONG

Shares outstanding alone does not present clear indicators of money flows, investor demand, or rising prices in an ETF. In Exhibit 4.8, you can see the shares outstanding (dark line) charted against the closing price (light line) of XLF (a financial sector ETF) during the financial meltdown of 2008–2009. Domestic and International sector ETFs typically are used as access and hedging vehicles. In this case, many people were using the XLF as a hedging tool or as a vehicle to achieve short exposure, and that short activity was driving shares outstanding. You can see in the oval on the left that shares outstanding leapt upward as the market started to downdraft toward the October 2008 lows. Then, in the oval on the right, you can see the spike near the March 2009 lows when people started to fear that there would be a further downdraft in the markets.

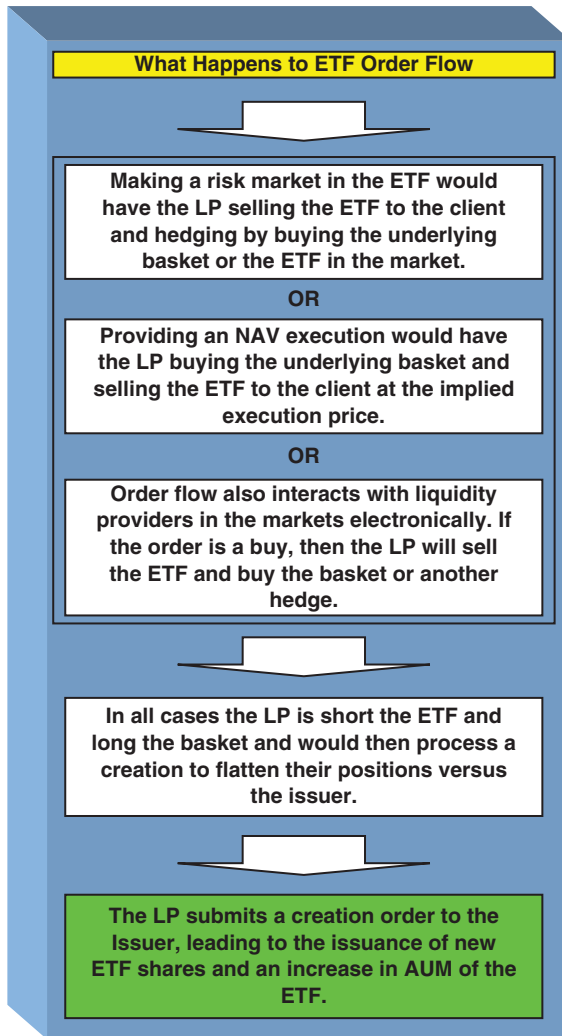


EXHIBIT 4.7 Flowchart of Client Order Flow

I mention that shares outstanding are not a valid indicator of investor demand on their own. Let's take a look at that in relation to Exhibit 4.8 and the shares outstanding spike in XLF as its value dropped. In order to short an ETF as a hedge against your position, you first need to borrow the shares. In a stock, when you borrow shares, they are typically lent through a clearing broker utilizing long positions on the books. This is the same in many ETFs; however, if there are not a lot of outright long holders of an

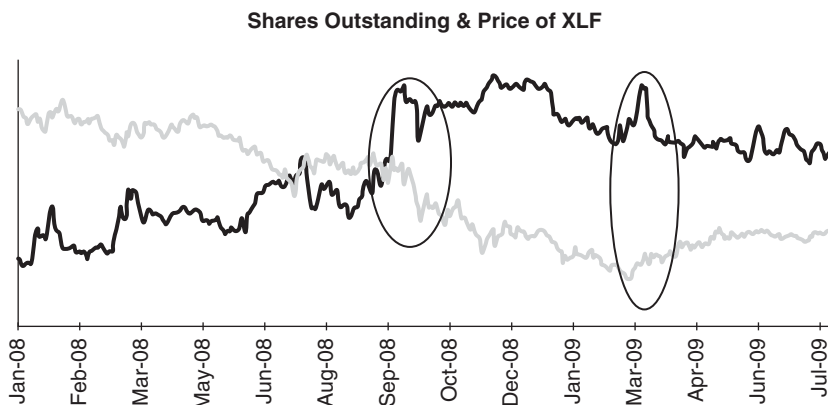


EXHIBIT 4.8 Shares Outstanding and Price of XLF

Source: Bloomberg

ETF with shares to lend, then the large trading desks will create the shares to lend them out. This would entail being short the underlying basket and long the ETF—a market-neutral position—and various financing costs on your books that can result in either a profit or loss. In the case of XLF, it was possible to be long the ETF and short the basket and lend the ETF shares out while generating a net positive return on the financing costs.

If you had been tracking AUM in the fund or shares outstanding, and were not aware of the financial meltdown, you might buy into XLF. You might have thought from the increase in shares outstanding that that is where the money was flowing. This would have been a fateful mistake. It is also one that, surprisingly, is still made quite often in analysis of ETFs. It is important to note that assets rising in ETFs could be from buyers or sellers and should not be the only criteria in determining trading trends. Let's further examine money flows into and out of the ETFs and why this is important.

MONEY FLOWS OF THE BUYERS

As discussed in Part One, an ETF is born when a basket of stocks is delivered to the issuer's custodian and in turn that issuer delivers shares of the ETF to the initial creator. This is referred to as the initial creation unit. One way that an ETF grows is when the authorized participants who have contracted with the issuer to provide their services begin the process of consolidating chunks of baskets and ETFs and exchanging them with the issuers.

Exhibit 4.9 shows a very basic picture of the beginning steps of interactions between the customer and the AP. In this example, the customer is

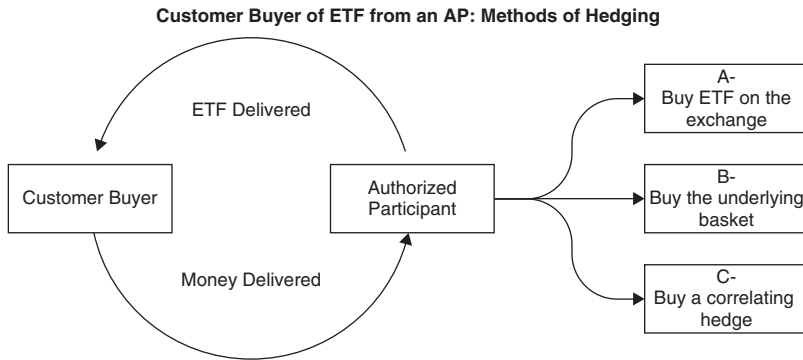


EXHIBIT 4.9 Methods of Hedging when Providing Liquidity

a buyer. The customer has transacted with the AP either electronically or manually, buying the ETF from the AP. Only three scenarios can then take place. In scenario A, the AP, acting as an agent, went out and bought the ETF on the exchange for the client. In scenarios B and C, the AP was providing liquidity and acted in a principal capacity. The AP sold the ETF shares to the client. APs have two choices with regard to hedging the position. They can either buy the exact basket of the ETF, if it is trading at the same time as the ETF trade, or they can buy some other correlating asset that they use to hedge their short position in the ETF.

In case A, the AP ends up buying the ETF on the exchange, on the client's behalf. In this case, an AP is not required to do anything further because it is merely a middleman between the market and the customer. What is happening, however, is that the AP probably is buying the ETF shares from another liquidity provider (LP) somewhere along the order flow chain. At some point, that order flow gets into a scenario like that of case B.

In case B, the AP sells the ETF to the customer and is able to buy the underlying basket that replicates the ETF. The position on the books of the AP will be short the ETF and long the basket. Then the AP would process a creation with the issuer. This would require the AP to deliver the shares that it is long of the underlying basket to the issuer; and it would in turn receive the shares of the ETF. The AP's position would be flat, and the issuer would have increased the shares outstanding in the fund, simultaneously increasing the AUM. This is always the ideal scenario for the issuer.

In case C, the AP buys some correlating hedge that tracks the ETF well. Since doing so implies that there will be financing charges in maintaining the long hedge and short ETF position, this is ideally a short-term solution. At some point in the future, the AP either intends to unwind the short ETF

position and the hedge or will want to exchange the hedge for the basket of underlying stocks and then proceed to do a creation.

In summary, if there are many buyers of the ETF, then LPs who are selling the ETF could be buying the underlying basket to hedge their exposure. They would then process a creation, delivering the basket to the issuer and receiving in return ETF shares. This would flatten out the position on the LP's books, leaving the LP with no exposure and no balance sheet position. It would leave the customer with the long position in the ETF. And it would leave the ETF issuer with a basket of stocks and a theoretical "short" position in the ETF, which is referred to as the shares outstanding. The shares that the issuer has delivered in exchange for those baskets of stocks are the new shares outstanding of the fund.

Because the shares outstanding number can fluctuate wildly depending on supply and demand of ETF shares, it becomes a very important indicator of interest in a specific product, but it is not indicative of market direction. If potential clients are looking at a fund with only 100,000 shares outstanding, and they had the intention of buying 100,000 shares, they should not be concerned about owning 100 percent of the fund. Because of the structure, they will buy the shares from an LP who will in turn receive the shares from the issuer. So whereas the client might have been wary of buying 100 percent of the shares outstanding, soon after the transaction is completed, the client's holding of 100,000 shares will represent only 50 percent of the shares outstanding. Also at this point, assuming no drastic market price moves, the AUM of the fund will have doubled as well.

TRADING TIP

Sometimes ETF Flows Depend on Fund Size and Trading Volume

It is important to realize that when you make an actual investment in an ETF, at some point down the order flow chain it will lead to a creation—unless it happens to be offset by someone unwinding an investment at the same time. The LP is acting as the middleman between the customer and the issuer. When you are putting a large amount of assets into a small fund, the fund's AUM will increase by your investment. You are typically not buying a piece of the assets already in the fund, but receiving liquidity from someone who will pursue a creation to increase the fund shares outstanding and the AUM.

This activity also serves to highlight why the ETF almost always will be trading at a price near the value of its underlying basket. If the basket starts trading away from the ETF price, the LP always can sell the ETF and buy the basket of shares to create more available units of the ETF. It works like a pressure release valve on the pricing of the ETF. Arbitrage traders will be in the marketplace looking for any pricing differences. They are, by default, keeping the ETF price in line with the value of its underlying assets.

MONEY FLOWS OF THE SELLERS

Short activity in ETFs is often misunderstood. As a representative of an ETF provider, many times I have explained to clients how I would really love to have them put on a huge short position in our products. Clients responded with confusion. They did not understand why I, as an asset manager, would want them to short my products. I would explain that an ETF issuer is actually providing a tool that can be used for tailoring portfolio exposures. There are many situations where using that tool to achieve short exposures is applicable. Clients would ask: If everyone wanted to use that tool for short exposure, what would that do to assets? At this point I would describe what I have just presented with regard to share spikes when markets drop. Shorting the ETF can drive assets into the fund because someone needs to facilitate that short by providing a loan of the ETF shares. If those shares are not available for borrow, they can be created and then loaned out to short sellers.

A very profitable trade on the brokerage side of the ETF industry is creating ETFs to facilitate stock loan. Because the market in stock loans is so fractured and is still mostly an over-the-counter marketplace, there are profits to be reaped by banks' providing ETF borrows to short selling investors. In the case of someone shorting an ETF, typically an AP will go out and do a short creation of the ETF to facilitate the stock loan. This means the AP will borrow the underlying basket and deliver it to the issuer who will in turn deliver out the ETF shares (increasing the shares outstanding), which can then be lent to the end client.

LOOKING AT CEF VS. ETF MONEY FLOWS

The process of creation and redemption is very different from what happens in a closed-end fund. A CEF has a fixed amount of shares outstanding. If you are buying shares in the secondary market, there is no way for your counterparty to access the primary market for the issuer to create more shares,

so you actually will create pressure on the fund price. If you want to buy 100,000 shares of a CEF with 100,000 shares outstanding, you could have a significant effect on the price of the fund as you vacuum up all of the available shares in the marketplace, and you will end up being the sole owner of the outstanding shares of the fund. This also explains why CEFs typically trade at persistent discounts because the shares outstanding cannot adjust to account for changes in demand.

A similarity between ETFs and mutual funds is their open-ended issuance function. In the case of a mutual fund, investors are delivering cash and a portfolio management team is going out and buying the basket of shares for the portfolio and then issuing you shares of the fund. In contrast, with the ETF, the LP is buying the basket of shares for the portfolio and delivering them to the ETF issuer in the proper format. This is what leads to the tax advantages of the ETF structure: A fund manager buying and selling stock will create taxable events within the fund. Since an ETF is receiving and delivering its stock holdings as part of an in-kind transaction, the portfolio can be managed in a more efficient manner.

LOOKING AT MF VS. ETF MONEY FLOWS

One question that people often ask regarding ETFs is, Can I be hurt by the actions of other investors in the funds? To answer this question it helps to understand what is happening in both types of products when assets come in and out of the funds.

When a large investor makes an investment into a mutual fund, they deliver money to the portfolio manager at the mutual fund. The portfolio manager then goes into the markets to purchase the portfolio of assets that make up the fund to account for the increase of assets in the fund. Now what happens when the same investor decides to redeem their position in the mutual fund? They submit a redemption request and the portfolio managers go into the market and sell a slice of the assets across the fund holdings to raise cash for delivery against the redemption. If the asset prices had increased in the period between when they purchased the fund and when they sell the fund, there will be gains in the fund that will have to be distributed across all investors in the fund. In this scenario, even if you are a fund investor who had no change to your position, you can be impacted by the activity that takes place within the portfolio to satisfy the actions of the other investor.

This process is very different in an ETF. The actions of an investor in an ETF have no impact on other investors of the fund. When you make a large investment into an ETF, you typically go into the secondary market and

purchase new shares. If your ETF investment is large, a liquidity provider will be needed to offset your order flow. They will then process a creation order in the ETF against their sales to you. To effect the creation, the liquidity provider (typically an AP) will purchase the underlying assets in the ETF and deliver them to the fund company, who will then issue new shares of the ETF. This increases the shares outstanding in the fund and shows up as an increase in AUM. At no point will the portfolio manager of the ETF need to go into the market to purchase assets; they are delivered to his portfolio. After a time, the investor may be ready to remove the ETF position from their portfolio. They go into the secondary market and sell the shares on the exchange. Assuming their position is large enough, it will be offset by an ETF liquidity provider who will want to redeem their shares in the fund. In this case they submit a redemption order, via an AP, who delivers ETF shares back to the ETF issuer, thus reducing the number of shares outstanding in the ETF. In turn the issuer delivers out a representative slice of the underlying assets of the fund. This activity is not considered to be a trade. The portfolio manager of the ETF is not trading the assets in the market, but simply delivering them out of the portfolio. Since the shares of the ETF were delivered back to the issuer, the number of shares outstanding decreases, thus showing a decrease in the AUM in the fund. In this case, no trading took place within the portfolio of the ETF, so all the other ETF holders were not impacted at all by the activities of this large holder.

In many ways the ETF acts like a separately managed account on behalf of each individual shareholder. This is why looking at the assets in an ETF as criteria for use makes no sense. If you are the only holder of all the assets in an ETF, then the fund acts like a convenient wrapper on those assets to provide one-position monitoring of those assets in your portfolio. There is no additional risk afforded you as the only holder. If you want to redeem your shares, you simply utilize an AP to redeem the shares on your behalf. When ETFs are new to the market, they typically launch with a very small number of shares outstanding, and occasionally institutional-size investors will say that they are waiting until the fund scales up before they feel comfortable using the fund. This displays a lack of understanding of the fund structure and that size has no impact on your position. You have no more, or less, portfolio protection having 20 percent of the assets in an ETF, versus having 80 percent of the assets in an ETF.

CONCLUSION

Trading volumes of the ETFs tell a very interesting story, but not the whole story. The current market for ETFs is expanding quickly in terms of various products offered, but the assets flowing into those new products can

move slowly at times. Part of the problem is that techniques in facilitating ETF trading flows have not advanced as quickly as demand. Hopefully, after reading this chapter you have gained an understanding of how assets grow and the effects the various types of trading and money flows have on ETFs. Once the problems of ETF incubation are solved, as delineated earlier in this book, then the broadening investor base with their desire to use the many different types of products available will force an evolution in trading sizes available both on- and off-screen. I expect the trading side of ETFs will expand rapidly over the next few years.

An ETF that is trading with a very small daily average volume can still be accessed via its underlying basket. Making this underlying liquidity available to the broader client base in a cost-effective manner has proven to be a bottleneck in the ETF growth curve. I will discuss later how to access underlying liquidity efficiently. However, it is incumbent on investors to understand the liquidity capacity of an ETF and not judge the product based upon average daily volume. You do an incredible disservice to your business and your clients if you put average requirements on ETFs for investment candidacy. As in the ADV buckets, you would lose the potential to use the majority of ETFs available. It's critical to learn from this chapter that ETF volumes add to the liquidity picture of an ETF, but they are by no means the whole picture. The base liquidity for an ETF comes from the underlying basket of assets.

Volume \neq Liquidity— Understanding ETF Implied Liquidity

The core liquidity of an exchange-traded fund (ETF) is based upon the underlying basket. Assessing that liquidity and being able to provide ETF trading liquidity based upon it are crucially important for the continuing growth of the product structure.

This chapter discusses the trading model that is at the heart of the ETF liquidity system. The primary function is to take the universe of ETFs and calculate a fair value for each product and assess the liquidity available via the basket and other derivatives. There are high barriers to entry for providing liquidity in ETFs. The abilities to trade globally in multiple asset classes and manage position risks in thousands of securities simultaneously are needed at a minimum. After reviewing the basic trading model I will explain ETF implied liquidity in detail. Then I discuss liquidity assessments of the basket and what constraints can affect the liquidity of the ETF. This enables me to explain the proper way for you to assess which ETF you can use, and how much of that ETF can be positioned efficiently. I also explain my rating scale for ETF liquidity, the ETF Basket Implied Liquidity Scale (EBILS), which larger ETF platforms are now using to determine platform suitability for ETFs.

At the end of this chapter I present the minimum requirements for building an ETF customer facilitation business. It is essentially an ETF liquidity-providing business for offsetting ETF order flow. This should give users of ETFs an idea of the backbone they are leveraging when they place a simple ETF order. It should also help you to understand the root causes of the market structure issues during the 2010 and 2015 flash crashes, which will be discussed in detail later.

The knowledge of valuation and trading brings us to a very important part of the process for the broad investor base. In Chapter 6, I discuss the various methods and techniques available for executing order flow. Utilizing the variety of ways available for executing order flow and understanding

how it will evolve in the future are invaluable for the continued expansion of the ETF product lines.

First, let's see what the liquidity providers are looking at when they see investor orders come into the system. Then we can decide how to place those orders.

TRADING MODEL

The structure of the ETF enables the trading of either the underlying basket or the ETF itself to attain the same exposures. Since there are two separate and distinct vehicles trading in the marketplace, there are opportunities for arbitrage, or an interchange of liquidity, between the two. In order to do this, you would have to be watching, either physically or via machine, the spread between the basket and the ETF. Understanding the potential liquidity of the underlying basket is also important and defines trading capacity for market makers as well as investors.

Liquidity providers (LPs) will have different needs depending on their position within the ETF ecosystem. If you are satisfying institutional demand and facilitating large-block order flow, you will need to know more about market depth to estimate potential available supply against your larger markets. If you are providing liquidity versus retail order flow, your position in an ETF might be very small and change dramatically throughout the day as buyers and sellers interact with your trading book. Additionally, if you are facilitating flow for a customer base and do not make markets in all ETFs directly, you will need to know where to go to source liquidity when necessary.

Let's take a look at a trading model for an ETF and what the pieces contribute in terms of information for providing and determining liquidity.

The trading model displayed in Exhibit 5.1 is a version of what traders are looking at when determining what trading opportunities exist in the marketplace. Although the automated systems are not physically looking at a screen like this, it includes all of the embedded calculations necessary to make an immediate trading decision for an electronic arbitrage system. This is the core of any ETF trading mechanism.

The ETF quote line shows a real-time market view of what is seen when looking at a level-one quote. The level-one quote shows just the top of the order book, the inside market bid and ask quotes. It does not show any depth of book statistics. The size in shares is also included, shown on each side of the order book. The way to read that quote line would be, "There is a 27.64 bid for 500 shares, and there are 1,000 shares offered at 27.77."

EXHIBIT 5.1 ETF Basic Trading Model

	ETF Basic Trading Model View						
	Bid Size	Bid Size	Bid	Last	Ask	Ask Size	Ask Size
	Notional	Shares				Shares	Notional
ETF Quote	\$13,820	500	\$27.64	\$27.77	\$27.77	1,000	\$27,770
Calculated IIV	\$4,658,060	168,161	\$27.70	\$27.71	\$27.72	171,137	\$4,743,918
Discount/ Premium			-0.22%	0.22%	0.18%		

TRADING TIP

Terminology note: Shares are always “bid for” and “offered at.” When customers are buyers and are curious at what price they might be able to buy an ETF, they might ask, “What is the offer?” The reply would be, “The shares are offered at x price.” If customers are sellers, they might hear, “There is a \$10 bid for x amount of shares.” A standard quote in a stock or ETF would be phrased “\$10 bid for 10,000 shares and 10,000 shares offered at 5.25.” This would represent a market that is 5.00×5.25 , $10,000 \times 10,000$. Use of these terms is diminishing as floor trading and quoting ends but they still can be important in the ETF market, because, when asking an LP for a market, proper terminology ensures that the proper transaction takes place.

In Exhibit 5.1, the ETF last traded at 27.77. The screen does not show the amount of shares that last traded at that price. Just below that line is a conversion to show the notional amount available on each side of the market. You can see that there is approximately \$28,000 worth of the ETF available at the offer, 27.77, or 1,000 shares.

The most important line is the calculated intraday indicative value (IIV) line. This shows what the calculated value of the underlying basket of the ETF is worth. It also shows the implied size of the ETF available by sending an order in the basket for each stock. This line is read in a similar manner to the quote line: “There is a 27.70 bid for 168,000 shares, and there are 171,000 shares offered at 27.72.” This line is quoted in ETF terms even though it is being calculated from the basket underlying the ETF. You can

buy the actual ETF in the market, or you can buy the exact basket underlying the ETF and convert it into ETF shares via the creation redemption mechanism. This is probably one of the most important concepts in the understanding of how an ETF works, and it underpins the trading differences from CEFs and stocks.

Liquidity is assessed, therefore, not by looking at ETF volume or basket volume alone but by consolidating those numbers to determine what potentially could be traded. Because the market for the actual ETF in this example is so small—only 1,000 shares offered—it does not have much impact on the overall liquidity profile of the ETF. The 171,000 shares offered in basket terms is really the true top of book liquidity underlying the ETF. This should be added to the displayed size to get a more clear view of available liquidity.

Calculating Market Depth for Trading

It is also important to note here that both quotes just discussed are based strictly on what is being shown on the inside market. The ETF quote line is a picture of the inside market in the ETF. The calculated IIV line shows what is being implied by the inside markets in each stock in the basket. Although calculating the IIV implied prices of the ETF is straightforward, calculating the implied size is more complicated because each stock is required in a different amount to satisfy the ETF basket. The ETF basket requirements are published daily. In order to calculate the implied IIV line, the calculation has to take into account how many shares of each stock are required to formulate the proper basket. It can then calculate the implied price and the amount of ETF shares available. The amount of shares of the ETF available as implied by the basket is restricted by the lowest factor of shares required per creation unit multiplied by the shares available on the market.

Exhibit 5.2 utilizes several columns in calculating IIV and the ETF implied liquidity. The exhibit shows just part of an ETF basket comprised of several hundred stocks. The creation unit (CU) shares column shows how many shares of each stock are needed to compose one unit of the ETF. In this case, one unit of the ETF equals 50,000 shares of the ETF. As displayed, 248 shares of NKE are required to make each unit of the ETF. The bid-and-ask CU factor (outlined) is the amount of shares shown on the market divided by the amount of shares required for each CU. In this case there are 37 shares of NHP required for each creation unit, and there are only 200 shares of NHP offered at 25.42. This implies that, at most, you can take the offer in NHP and translate that into 5.41 units of the ETF. Since the creation/redemption mechanism works only in full-unit sizes, the authorized participant would be able to create only five units of the ETF, or 250,000 shares.

EXHIBIT 5.2 Sample of Basket as Used for Calculating IIV and Implied Liquidity

Ticker	Creation Unit Shares	Bid CU Factor	Bid Size Shares	Bid	Last	Ask	Ask Size Shares	Ask CU Factor
NKE	248	22.58	5,600	\$49.99	\$50.00	\$50.03	4,340	17.5
NFLX	16	37.5	600	\$32.74	\$32.75	\$32.75	200	12.5
NHP	37	8.11	300	\$25.39	\$25.42	\$25.42	200	5.41
NOV	214	14.49	3,100	\$27.02	\$27.02	\$27.04	3,450	16.12

Five units would then be the offered value of the underlying basket for this ETF. As mentioned before, you have to take the most limiting security in the basket to determine how many ETF shares can be created or redeemed using posted quotes in its basket.

The models displayed show only level-one price and volume calculations. A more sophisticated system would look deeper into the book and calculate how much liquidity is available at different price points. If you are an electronic LP and you are posting small bids and offers, the depth of book is important as a forecasting tool. You might use it to estimate important price points. If you are on an institutional trading desk and are attempting to facilitate large-block flow in ETFs, a true depth-finder calculation is extremely important. If you are bidding for or offering one million shares in an ETF and there are only 200,000 shares offered on the screen and only another 200,000 shares offered in implied basket terms, it is important to understand what is available further into the markets. It is possible that there are only 200,000 shares offered in implied basket terms, but one cent away (higher on the offer side) there are another 800,000 implied shares offered in basket terms. Assuming you had a fast and dependable basket trading system, you might be very comfortable offering one million shares based on that implied price and depth.

Unfortunately, because of fragmentation that has led to the decrease in displayed share size in the markets, it has become very difficult to truly determine where liquidity resides in the markets. It has thus become very technologically intensive to develop a system for determining ETF underlying liquidity via the baskets of constituents. But the ETF and the basket in funds with domestic constituents can be traded on an interchangeable basis. A lot of ETF trading desks have emerged that are heavily investing in trading systems and analytics to properly provide the maximum amount of liquidity their risk systems will allow. There are also analytics available to the investing public, either directly from broker dealers or through your trading platform. Such analytics of the underlying basket liquidity can be

done by a transaction cost analysis system. Investors are now able to use transaction cost analysis (TCA) tools, available from their brokers, to make assessments of what cost might be associated with large trades in ETFs and their potential impact on the market.

The current trading infrastructure also involves agency-only-style brokers entering the business of creating and redeeming ETF shares using the underlying baskets for customers. This is not strictly limited to ETFs that trade during the same hours that the basket is traded because, in many cases, shares of the ETF are not traded in the market at all (i.e., U.S.-listed ETFs with international constituents). The broker will go into the marketplace and strictly use the underlying basket to give the client an execution in ETF shares at the implied price of the basket trade. This is big business for basket-trading businesses globally. It is enabling trading of ETF shares on a 24-hour basis for investors. For example, they are trading U.S.-listed Japanese ETFs overnight (in U.S.-hour terms), while the underlying basket is open and trading in Japan.

ETF IMPLIED LIQUIDITY

The most misunderstood function in the ETF industry is trading volume. The discussion around trading volume and potential liquidity has hamstrung many clients. The lack of understanding of how trading volume and underlying liquidity relate has been one of the biggest roadblocks to widely distributed ETF asset growth across the product set. It has worked to keep ETF assets concentrated in a smaller number of funds, and it is the first excuse that the press defers to when they are looking for controversy about ETFs. Product use is now expanding rapidly as the investing public becomes more educated about how to access products with lower perceived liquidity.

Key Point

ETF trading volume does not equal ETF liquidity. This is a critical concept to understand when looking at ETFs, perhaps one of the most critical considerations when assessing what size portfolio you can build and what ETFs can be included within the portfolio. ETF volume is a historical number showing what has traded in the past. ETF implied liquidity is a forward-looking number showing how much of an ETF can be traded in the future.

GRAB

EquityHP

CLOSE/PRICE

WISDOMTREE DVD EX-FIN FU (DTN US) PRICE 50.86 T \$

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Range 12/ 6/10 to 12/ 2/11 USD Period 1 Daily Market Trade

HI 52.83 ON 5/10/11

AVE 49.4922 VL 119754

LOW 44.37 UN 8/ 8/11

DATE	PRICE	VOLUME	DATE	PRICE	VOLUME	DATE	PRICE	VOLUME
F 12/ 2	50.86	156349	F 11/11	51.12	180222	F 10/21	50.31	98727
T 12/ 1	51.02	112060	T 11/10	50.29	71847	T 10/20	49.44	131740
W 11/30	51.14	1547557	T 11/ 9	49.83	243752	W 10/19	49.30	185319
T 11/29	49.36	110708	T 11/ 8	51.29	115932	T 10/18	49.59	95345
M 11/28	48.96	135258	M 11/ 7	50.87	109397	M 10/17	48.94	145914
F 11/25	47.87	70248	F 11/ 4	50.55	278795	F 10/14	49.49	518960
T 11/24			T 11/ 3	50.77	161971	T 10/13	48.96	103722
W 11/23	47.84	156226	W 11/ 2	49.92	253739	W 10/12	48.92	224081
T 11/22	48.72	180080	T 11/ 1	49.36	280965	T 10/11	48.66	180111
M 11/21	48.988	605300	M 10/31	50.45	215652	M 10/10	48.86	394305
F 11/18	49.69	95979	F 10/28	51.25	533443	F 10/ 7	47.65	105138
T 11/17	49.709	136251	T 10/27	51.41	201960	T 10/ 6	47.58	156150
W 11/16	50.17	74793	W 10/26	50.18	151285	W 10/ 5	46.98	242792
T 11/15	50.83	84849	T 10/25	49.75	166721	T 10/ 4	46.34	318823
M 11/14	50.60	93104	M 10/24	50.54	342767	M 10/ 3	45.77	398959

Australia 61 2 9727 8600 Brazil 5511 3048 4500 Europe 44 20 7330 2500 Germany 49 69 9204 1210 Hong Kong 852 2877 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2011 Bloomberg Finance L.P. SN 187250 H521-517-0 03-Dec-11 12:46:57 EST GHT-5:00

EXHIBIT 5.3 ETF Volume—Domestic (HP)

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ETF trading volume does not equal ETF liquidity. The trading volume of an ETF is a number that shows how many shares have traded of that particular ETF over some time period in the past. ETF liquidity is a measure of how many shares of an ETF are available to trade. The impact on the market of achieving that liquidity will be discussed later in this chapter. In Exhibit 5.3 you can see the HP screen of an ETF. The green circle highlights that the average daily volume (ADV) is 119,754. In the red circle you can see that the ETF traded 1,547,557 on 11/30/11, more than ten times its average daily volume. If you had been using the ADV number to assess how many shares of the ETF you could possibly trade, then you might never have imagined you could trade that many shares in a day.

STEP BY STEP

Calculating Average Daily Volume (ADV)

1. Sum up the daily volume for a particular number of days in an ETF.

2. Divide that by the number of days.

The liquidity of an ETF is a function of a much greater group of variables than just the historical trading volume. Taking the average daily volume of an ETF itself as a benchmark for how many ETF shares can be traded without impact is a big error made by investors. This error limits them to only a small percentage of the available fund universe. Technology has not yet progressed to the level where the end investor can access the liquidity of the underlying basket without an intervening liquidity provider. There is an industry of liquidity providers, however, posting quotes and providing liquidity for them in ETFs.

Most descriptions of the ETF product set explain that ETF liquidity is a function of the underlying basket. The underlying basket is really only one piece of overall ETF liquidity. For example, if the underlying basket is closed in the Hong Kong ETF, then the basket is not providing any of the liquidity for intraday trading in the United States. Yet, as you can see in Exhibit 5.4, the fund trades approximately 3.7 million shares per day (upper circle).

You can also see that the fund traded more than twenty million shares on 2/4/16, during the U.S. trading day, while the basket of stocks listed in Hong Kong was closed. So clearly liquidity was created through means other than the basket.

EWH US Equity			96 Export to Excel			Page 1/6 Historical Price Table		
iShares MSCI Hong Kong ETF								
Range	02/11/2015	02/11/2016	Period	Daily	High	24.32	on	02/11/15
Market	Last Price	Volume	Currency	USD	Low	16.86	on	02/11/15
View	Price Table				Average	21.1313		3,750,783
					Net Chg	-4.90		-22.52
Date	Last Price	Volume	Date	Last Price	Volume	Date	Last Price	Volume
Fr 02/12/16			Fr 01/22/16	17.58	7,498,477	Fr 01/01/16		
Th 02/11/16	16.86	2,710,629	Th 01/21/16	17.23	10,016,647	Th 12/31/15	19.82	2,274,495
We 02/10/16	16.98	4,103,211	We 01/20/16	17.25	8,589,620	We 12/30/15	19.91	4,208,267
Tu 02/09/16	16.87	5,768,442	Tu 01/19/16	17.84	5,755,257	Tu 12/29/15	19.97	1,583,336
Mo 02/08/16	17.02	5,828,316	Mo 01/18/16			Mo 12/28/15	19.83	5,611,213
02/05/16	17.29	4,688,371	Fr 01/15/16	17.75	7,837,217	Fr 12/25/15		
Th 02/04/16	17.35	20,873,244	Th 01/14/16	18.35	7,137,760	Th 12/24/15	20.03	843,994
We 02/03/16	17.48	7,643,345	We 01/13/16	18.23	5,716,718	We 12/23/15	20.03	3,136,217
Tu 02/02/16	17.57	5,069,994	Tu 01/12/16	18.34	8,382,096	Tu 12/22/15	19.82	4,818,744
Mo 02/01/16	17.82	3,388,101	Mo 01/11/16	18.33	5,452,498	Mo 12/21/15	19.67	2,697,787
Fr 01/29/16	17.97	12,217,863	Fr 01/08/16	18.43	6,006,069	Fr 12/18/15	19.85	4,855,002
Th 01/28/16	17.52	4,391,345	Th 01/07/16	18.74	7,357,541	Th 12/17/15	19.80	4,053,107
We 01/27/16	17.39	16,086,319	We 01/06/16	19.11	3,579,368	We 12/16/15	19.92	4,045,815
Tu 01/26/16	17.57	2,911,049	Tu 01/05/16	19.46	3,730,659	Tu 12/15/15	19.68	2,600,097
Mo 01/25/16	17.35	4,578,391	Mo 01/04/16	19.39	3,733,741	Mo 12/14/15	19.59	5,995,228

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2016 Bloomberg Finance L.P. SN 539471 6917-2425-1 11-Feb-16 10:35:38 EST GMT-5:00

EXHIBIT 5.4 ETF Volume—International (HP)

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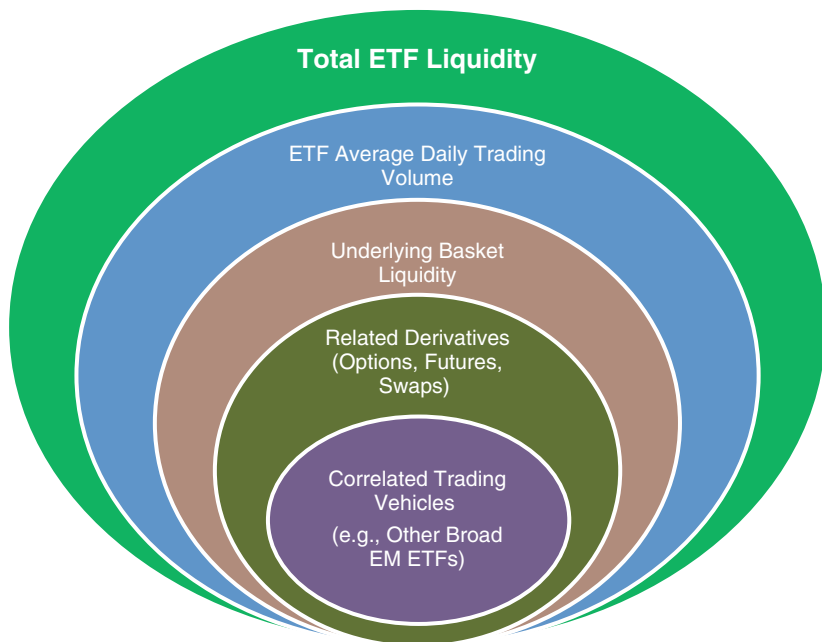


EXHIBIT 5.5 The Components of ETF Liquidity

In Exhibit 5.5, I present a diagram of the liquidity function of an ETF. In it you can see that the liquidity of an ETF is made up of the average daily trading volume, plus the IDTS (implied daily tradable shares) from the basket plus additional liquidity that may be achieved by accessing the derivatives markets plus any other highly correlated products or baskets that can be used to offset positions in the ETF itself.

I have explained that the spread of an S&P 500 ETF, at .01, is tighter than the actual basket spread that is .04 wide. This is made possible by the additional sources of good hedges such as S&P futures, enabling liquidity providers to be able to trade the ETF and efficiently hedge their portfolio. If an ETF has multiple liquid alternative hedges in addition to its basket, then the bid/ask spread will tend to be tighter on screen, which could enable it to better thrive in the ETF landscape. This acknowledges that even today many investors still make the mistake of looking at the bid/ask spread to determine feasibility. The bid/ask spread should only be considered relevant to small investors who are going to trade electronically off the posted screen markets. If you are an investor trading in block size with access to liquidity providers, they will make your markets based upon the implied liquidity, other hedge

sources, and the reflection of the costs to access that liquidity. Their market will not necessarily be made in relation to the posted bid and ask, and many times will be tighter than that posted on screen.

The basket will, however, be one of the main sources of liquidity. Everything at some point will funnel down to trading the actual basket because that is what drives creations and redemptions in the funds. This makes it imperative that, as a starting point, you understand the liquidity of a fund as implied by its underlying shares. To do this, you need to understand the components of ETF liquidity and in particular the IDTS.

Components of ETF Liquidity

Since the introduction of the product it has been said that the liquidity of an ETF is based upon its underlying basket. While this is not the only component of ETF liquidity, it is one of the most important. Four components of ETF liquidity work in conjunction to equal total ETF liquidity. The four components are:

1. The liquidity of the underlying basket (as determined by ETF implied liquidity)
2. The average daily volume (ADV) of the ETF
3. Derivatives based upon the ETF
4. Correlated, but different, trading vehicles

In order to understand the importance of both the underlying basket liquidity as well as the total liquidity picture, let us first look at the various components.

Average Daily Trading Volume of an ETF

The average daily trading volume of an ETF takes the amount of shares that an ETF has traded over some time period in the past and calculates an average of the volume for each of those days. In an ETF with rapidly growing assets, this average will be lower than its more recent trading volumes, since it is a representation of what has happened in the past. If the average is very low, and there are some very-high-volume days, then a new investor is given an idea of what could potentially happen in the fund. Because this is based only upon actual ETF trading volume and not the underlying basket, however, it does not provide a representation of the liquidity of the underlying basket itself. A high trading volume in an ETF, resulting in a high ADV, can be incorporated into the liquidity picture of the ETF, but is not its only component.

Related Derivatives for Providing ETF Liquidity

The most common derivatives that help market makers provide liquidity in ETFs are options and futures. On a product where there is a very liquid futures market, many participants can trade the ETF versus the corresponding future. This will in essence supplement the underlying basket as a source of liquidity. Since the listed futures market is reasonably thin in terms of diversity of product, only the main indexes are involved. The S&P 500 Index against the ETF, SPY, the Nasdaq 100 Index against QQQ, or the Russell 2000 Index against the IWM are frequently traded examples.

In addition, a liquid options market in the contracts of an ETF can lead to greater ETF liquidity as people trade the options against the ETF shares for various strategies.

Correlated Trading Vehicles for Providing ETF Liquidity

When there are products that correlate very well to each other, participants can trade them against each other, thus driving trading volumes in each. The broad-based emerging markets funds are an example of this type of trading. Even though the underlying baskets are closed during the U.S. trading day, traders have developed trading relationships between EEM and VWO and DEM and trade those three products against each other. In addition, they have found ways to formulate baskets of other ETFs that also correlate well for strategies. This in turn drives volumes in the ETFs as traders pursue various strategies against each other, even though the underlying basket is not presenting any liquidity at the moment of trading.

Another example of a correlated trading vehicle is the future on the Nikkei index that is listed in Chicago. This future is key to hedging and pricing the U.S.-listed ETFs based on Japanese equities. While many of these ETFs are not directly based on the Nikkei index, they correlate well over short time periods. The futures give traders an indication of market sentiment on Japan during U.S. trading hours and a place to hedge risk. Since the growth of ETFs has proliferated, volume in the Nikkei futures has increased. In comparing a simple volume statistic on the futures from December 2000 expiry to December 2015 expiry, the contract volume has increased from 1,500 to 12,500 contracts daily, respectively. Looking at a similar metric, the main unhedged Japan-focused ETF traded on average 438,000 shares daily from September to December 2000, and 42,000,000 shares on average daily from September to December 2015. On top of that we have also seen tremendous growth in hedged Japan-focused ETFs. While the multiples of growth are much higher for the ETFs, you can definitely see that the correlation in the increased appetite for U.S.-listed ETFs on Japan has had a direct positive impact on usage of the Nikkei futures contracts as well.

ETF IMPLIED LIQUIDITY: IMPLIED DAILY TRADABLE SHARES

Quantifying the liquidity of an ETF has proven to be a challenging endeavor for market participants. There is now a field available via Bloomberg called ETF implied liquidity designed to explain the most important piece of the ETF liquidity function. This field is based upon the calculation of the implied daily tradable shares (IDTS) of an ETF. This is a unique way of assessing the liquidity of an ETF based upon its underlying basket. It is the main data point available outside average daily volume that provides a base to quantify the potential liquidity available in an ETF. This calculation has never before been available on a broad scale, but is now available via the Bloomberg system and specific issuer websites.

In Exhibit 5.6 you can see the field displaying the ETF implied liquidity for the ETF and, above it, the actual 30-day average volume. As you will come to understand, the two fields are quite different. Bloomberg was the first group to license the ETF implied liquidity calculation and concept to make it available for users of their system.



EXHIBIT 5.6 Finding ETF Implied Liquidity on Bloomberg
Chart reprinted with permission from Bloomberg. Copyright 2011 Bloomberg L.P. All rights reserved.

Until recently, there has not been available for investors a number that represents the volume that can potentially be traded in an ETF based upon the underlying basket. The IDTS looks at the average daily trading volume of each of the underlying components of the ETF and calculates how many ETF shares can be traded based upon those volumes over a one-day period with no market impact. This should be the greatest source of liquidity for an ETF because all trading in the ETF eventually distills down to the actual basket of underlying holdings.

What the ETF Implied Liquidity Field Is Showing

If we look again at the example in Exhibit 5.6, we can see that the ADV of the fund is 240,800 shares but the implied liquidity of the ETF is 11,800,000 shares. This indicates that the ETF holdings are composed of a very liquid basket of stocks. If you were trading only a small percentage¹ of them in the proper sizes to make up the basket, then you could potentially trade a huge number of implied ETF shares. If you were a portfolio manager who wanted to invest roughly \$28 million in the ETF (1 million shares * \$28 share price), you might have been hesitant at first because the fund only trades approximately \$6.7 million notional per day (240,800 shares * \$28 share price); but when looking at the underlying basket, you can see that it could possibly trade almost \$330 million notional daily (11.8 million shares * \$28 share price).

Investors can now see the potential liquidity of the baskets for a wide range of products. Those products might have seemed impractical for use because of a low average daily volume, but investors can now see the liquidity of the underlying basket. That, coupled with the understanding of how to access that liquidity by having the underlying basket traded on their behalf and interpolated into ETF shares, broadly expands the universe of investable products.

Exhibit 5.7 shows a table of the top 50 funds sorted by highest ETF implied liquidity and their 30-day ADV. You can see that the funds can trade high or low volumes on a daily basis, but their baskets display extremely high potential liquidity available in the ETF. There is also a very wide range of product type included.

The Calculation

It is simple to calculate ETF implied liquidity, but it can be resource intensive because it requires knowing all of the components of each ETF and the average daily volume for each as well.

EXHIBIT 5.7 Top 50 Funds Sorted by Highest ETF Implied Volatility

Ticker	Fund Name	Inception Date	AUM	ETF Implied Liquidity (Dollars)	ETF Implied Liquidity (Shares)	30-Day ADV (Shares)	Price
1	PHDG POWERSHARES S&P DOWNSIDE HDG	12/6/12	\$359,405,273	\$10,469,697,934	425,597,477	132,790	\$24.60
2	PBP POWERSHARES S&P 500 BUYWRITE	12/20/07	\$371,006,256	\$8,525,752,702	417,929,054	204,026	\$20.40
3	FAS DIREXION DAILY FIN BULL 3X	11/6/08	\$1,370,720,703	\$7,289,058,165	265,926,967	4,776,267	\$27.41
4	HSPX HORIZONS S&P 500 COVERED CAL	6/24/13	\$69,788,872	\$8,727,153,262	201,737,246	660	\$43.26
5	UPRO PROSHARES ULTRAPRO S&P 500	6/25/09	\$1,031,380,493	\$10,796,784,967	180,186,665	3,050,459	\$59.92
6	SSO PROSHARES ULTRA S&P500	6/21/06	\$1,957,235,229	\$10,195,714,666	166,623,871	3,632,086	\$61.19
7	QYLD RECON CAPITAL NASDAQ-100 COV	12/12/13	\$32,518,482	\$3,663,102,212	158,438,677	26,171	\$23.12
8	IWL ISHARES RUSSELL TOP 200 ETF	9/28/09	\$98,173,866	\$7,120,200,824	154,719,705	6,281	\$46.02
9	SPUU DIREXION DAILY S&P 500 2X	5/28/14	\$9,374,831	\$4,265,702,664	133,349,047	4,365	\$31.99
10	VSPY DIREXION S&P 500 VOL RESPON	1/1/12	\$13,658,649	\$7,036,050,764	130,248,996	2,254	\$54.02
11	FNDX SCHWAB FUNDAMENTAL LARGE CAP	8/15/13	\$904,530,640	\$3,442,349,460	121,723,814	270,857	\$28.28
12	DGRO ISHARES CORE DIVIDEND GROWTH	6/12/14	\$347,868,683	\$2,980,818,508	117,772,363	203,632	\$25.31

(continued)

EXHIBIT 5.7 (Continued)

Ticker	Fund Name	Inception Date	AUM	ETF Implied Liquidity (Dollars)	ETF Implied Liquidity (Shares)	30-Day ADV (Shares)	Price
13	MGC VANGUARD MEGA CAP ETF	12/24/07	\$957,593,262	\$7,485,580,261	108,897,007	39,242	\$68.74
14	TOK ISHARES MSCI KOKUSAI ETF	12/12/07	\$289,830,383	\$5,115,703,185	101,080,877	20,204	\$50.61
15	FNDB SCHWAB FUNDAMENTAL BROAD MKT	8/15/13	\$186,441,864	\$2,807,588,851	99,914,194	44,585	\$28.10
16	IWY ISHARES RUSSELL TOP 200 GROW	9/28/09	\$570,086,853	\$5,180,529,788	98,613,082	39,593	\$52.53
17	VV VANGUARD LARGE-CAP ETF	1/30/04	\$6,469,147,949	\$8,943,200,811	97,050,470	270,347	\$92.15
18	RWL OPPENHEIMER LARGE CAP REVENUE	2/22/08	\$333,386,139	\$3,737,394,966	95,968,441	26,028	\$38.94
19	EWJ ISHARES MSCI JAPAN ETF	3/18/96	\$19,899,554,690	\$1,102,063,575	92,377,500	32,368,624	\$11.93
20	IWX ISHARES RUSSELL TOP 200 VALU	9/28/09	\$157,992,020	\$3,629,058,127	88,686,660	10,173	\$40.92
21	VIXH FIRST TRUST CBOE S&P 500 VIX	8/30/12	\$3,610,059	\$1,941,897,524	80,111,284	226	\$24.24
22	IEV ISHARES EUROPE ETF	7/28/00	\$2,757,052,979	\$2,901,210,094	73,429,767	964,342	\$39.51
23	SPXL DIREXION DAILY S&P 500 BULL	11/5/08	\$630,676,331	\$5,811,937,438	73,336,750	1,742,914	\$79.25
24	SCHD SCHWAB US DVD EQUITY ETF	10/20/11	\$3,169,369,873	\$2,768,627,734	72,629,269	817,230	\$38.12
25	FMK FT MEGA CAP ALPHADEX FUND	5/12/11	\$17,103,373	\$1,851,349,597	71,674,394	6,370	\$25.83

Ticker	Fund Name	Inception Date	AUM	ETF Implied Liquidity (Dollars)	ETF Implied Liquidity (Shares)	30-Day ADV (Shares)	Price
26 XLK	TECHNOLOGY SELECT SECT SPDR	12/22/98	\$13,685,145,510	\$2,994,208,427	70,835,307	11,124,209	\$42.27
27 MGV	VANGUARD MEGA CAP VALUE ETF	12/21/07	\$1,044,798,584	\$4,035,248,454	69,238,992	67,345	\$58.28
28 EWU	ISHARES MSCI UNITED KINGDOM	3/18/96	\$2,371,936,035	\$1,074,486,868	67,662,901	3,487,335	\$15.88
29 CHNA	POWERSHARES CHINA A-SHARE	10/10/13	\$5,574,378	\$1,679,023,945	65,080,970	1,867	\$25.80
30 UVXY	PROSHARES ULTRA VIX ST FUTUR	10/4/11	\$560,363,220	\$2,053,094,412	64,235,480	27,675,134	\$31.96
31 EUSA	ISHARES MSCI USA EQUAL WEIGH	5/7/10	\$42,164,200	\$2,585,630,314	62,499,222	3,483	\$41.37
32 MMTM	SPDR S&P1500 MOMENTUM TILT	10/25/12	\$13,226,119	\$5,315,253,757	61,661,805	988	\$86.20
33 OEF	ISHARES S&P 100 ETF	10/27/00	\$4,650,965,332	\$5,528,618,552	61,607,071	1,308,634	\$89.74
34 VONV	VANGUARD RUSSELL 1000 VALUE	9/22/10	\$441,045,990	\$5,200,123,765	61,525,364	55,456	\$84.52
35 XLF	FINANCIAL SELECT SECTOR SPDR	12/22/98	\$19,464,052,730	\$1,432,149,543	61,281,538	41,479,728	\$23.37
36 QLD	PROSHARES ULTRA QQQ	6/21/06	\$1,037,828,979	\$4,579,876,965	60,991,836	1,324,114	\$75.09
37 FHLG	FIDELITY HEALTH CARE ETF	10/24/13	\$748,626,831	\$2,050,359,348	60,625,646	111,654	\$33.82
38 SPYG	SPDR S&P 500 GROWTH ETF	9/29/00	\$600,885,437	\$5,945,250,348	60,558,298	31,773	\$98.17

(continued)

EXHIBIT 5.7 (Continued)

Ticker	Fund Name	Inception Date	AUM	ETF Implied Liquidity (Dollars)	ETF Implied Liquidity (Shares)	30-Day ADV (Shares)	Price
39 FEZ	SPDR EURO STOXX 50 ETF	10/21/02	\$3,982,291,260	\$2,025,895,450	60,115,592	2,376,825	\$33.70
40 FTEC	FIDELITY INFO TECH ETF	10/24/13	\$454,411,560	\$1,928,965,500	59,850,000	159,526	\$32.23
41 FENY	FIDELITY MSCI ENERGY ETF	10/24/13	\$283,866,089	\$1,014,887,332	59,419,633	219,438	\$17.08
42 VTV	VANGUARD VALUE ETF	1/30/04	\$18,655,968,750	\$4,740,858,840	58,870,717	1,595,107	\$80.53
43 VOOG	VANGUARD S&P 500 GROWTH ETF	9/9/10	\$700,515,015	\$5,953,491,185	58,430,574	45,700	\$101.89
44 SCHX	SCHWAB US LARGE-CAP ETF	11/3/09	\$5,124,535,645	\$2,793,443,093	58,379,166	625,264	\$47.85
45 MGK	VANGUARD MEGA CAP GROWTH ETF	12/21/07	\$2,131,909,424	\$4,677,401,597	57,321,098	162,311	\$81.60
46 SCHB	SCHWAB US BROAD MARKET ETF	11/3/09	\$5,549,409,180	\$2,766,108,038	57,257,463	721,051	\$48.31
47 VYM	VANGUARD HIGH DVD YIELD ETF	11/16/06	\$11,484,500,000	\$3,763,684,063	57,068,750	824,164	\$65.95
48 VUG	VANGUARD GROWTH ETF	1/30/04	\$20,690,320,310	\$5,737,361,985	54,866,233	809,301	\$104.57
49 CSM	PROSHARES LARGE CAP CORE PLU	7/13/09	\$392,037,903	\$2,643,880,887	54,389,650	32,782	\$48.61
50 FEU	SPDR STOXX EUROPE 50 ETF	10/21/02	\$233,116,119	\$1,697,094,222	54,237,591	40,468	\$31.29

Source: Bloomberg 1/4/16

The formula:

$$\text{IDTS} = ((30\text{-Day ADV of each Constituent} * \text{VP}) / \text{Constituent Shares per CU}) * \text{Creation Unit Size}$$

where:

$$\begin{aligned} 30\text{-Day ADV} &= \text{Average Daily Volume over 30 days} \\ \text{VP} &= \text{Variable Percentage (defaulted to } 25\%)^2 \\ \text{Constituent Shares per CU} &= \text{Number of shares of each stock required in the basket} \\ \text{Creation Unit} &= \text{Number of ETF shares for each basket of stocks} \end{aligned}$$

The smallest IDTS becomes the constraint on how many shares can potentially be traded and is therefore the ETF implied liquidity.

An Example

In Exhibit 5.8, you can see the 10 lowest IDTS numbers calculated for the basket of an ETF. The implied basket liquidity of this ETF is 1.089 million shares per day, 25 million dollars notional, which is represented by the lowest IDTS of 1,089,204 for stock RTRY SP. The formula used to get to that IDTS would look as follows:

$$\begin{aligned} \text{IDTS for the RTRY shares in the ETF} &= ((95,850 * .25) / 1,100) \\ &* 50,000 = 1,089,204 \end{aligned}$$

where:

$$\begin{aligned} \text{Creation Unit Size} &= 50,000 \text{ shares} \\ \text{Shares per Unit} &= 1,100 \end{aligned}$$

The process entails calculating the IDTS for each stock in the ETF basket and then sorting to find the smallest constraints. It is important to note that the constraint is not simply the stock in the basket with the lowest average daily volume. It is a function of the weight of each of the stocks in the basket and their corresponding average volumes. One thing you will notice is that the weight of RTRY in the basket is very small, only .02 percent of

DDMM US Equity		9 Export to Excel		ETF Implied Liquidity			
WTS00MTRFEE BY OUR HDG INTL		Min Portfolio Weight		Variable Percentage			
		0		25			
Implied Liquidity							
Implied Liquidity (shares)	1.089M	Creation Unit Size	50000	Open For Creations	No		
Implied Liquidity (USD)	25.651M	Creation Fee (USD)	\$500	Settlement Cycle	T-3		
Liquidity Limiting Holding	RTRY SP	Creation Cutoff Time	10:00 AM EST	Create/Redeem Process	In-kind		
Holdings (2/22/2016)							
11)	Rotary Engineering Ltd	RTRY SP	1,089,204	.02	.2220	27,300	95,950
12)	Keiyo Co Ltd	8168 JP	1,815,325	.19	4.4440	70,200	72,613
13)	Singamas Container Holdings	716 HK	2,227,952	.05	.0890	2,030,000	1,069,417
14)	Kace offshore services hold	KOON SP	3,303,000	.02	.2240	77,200	342,439
15)	OUE Ltd	OUE SP	4,062,267	.07	1.1720	151,400	227,487
16)	Port of Tauranga Ltd	POT NZ	4,127,500	.06	11.9480	51,434	19,812
17)	IFG Group PLC	IFP ID	4,340,670	.06	2.1470	141,139	120,497
18)	k1 Ventures Ltd	KONE SP	5,088,517	.03	.5290	117,300	284,957
19)	Metlifecare Ltd	MET NZ	5,979,266	.04	2.8860	141,718	79,883
20)	TrustPower Ltd	TPW NZ	6,014,569	.06	4.9670	50,361	72,656
21)	Chip Eng Seng Corp Ltd	CHIP SP	6,101,486	.04	.4820	1,008,400	439,307
22)	Pacific Radiance Ltd	PACRA SP	6,122,920	.02	.2140	173,900	538,817
23)	SIA Engineering Co Ltd	SIE SP	7,391,656	.08	2.4720	418,800	236,533
24)	EVN AG	EVN AV	7,787,331	.07	10.7970	21,320	46,101
25)	OLAM International Ltd	OLAM SP	10,450,718	.04	1.1430	95,600	334,423
26)	New Hope Corp Ltd	NHC AU	11,151,856	.01	.9880	102,934	90,107
27)	comdirect bank AG	COM GR	12,243,509	.05	10.7080	13,175	50,933
Edit Basket							
Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000							
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2016 Bloomberg Finance L.P.							
SN 532778 6729-2418-1 22-Feb-16 13:48:26 EST GMT-5:00							

EXHIBIT 5.8 Implied Liquidity Detail Page of an ETF
Source: Bloomberg

the portfolio. Many times the potential liquidity of a basket is constrained by stocks with very small weights in the basket. The ETF implied liquidity starts out as a conservative assessment of the potential liquidity in an ETF. Often, however, when hedging themselves when providing ETF liquidity, traders won't use the entire basket as a hedge; they will use an optimized version of the basket or some other proxy. So many times there can be a long tail of very small stock positions that seem to act as a constraint on liquidity, but the trading community can provide more liquidity in the ETF. They will be managing around these small positions during the creation and redemption process.

In Exhibit 5.9, I show the same ETF implied liquidity detail page for the same ETF, except in this view I have adjusted the minimum portfolio weight (top-middle of exhibit) to include only stocks that are at least a .25 percent weight in the basket. Excluding some of the stocks that are very small weights has a dramatic impact on the ETF implied liquidity assessment of the fund. It has jumped to 74 million shares, approximately 1.7 billion dollars.

DDM US Equity

Export to Excel

ETF Implied Liquidity

WISDOMTREE BY CUR HDG INTL

Min Portfolio Weight

0.25

Variable Percentage

25

Implied Liquidity

Creation Information

Implied Liquidity (shares)

74.067M

Creation Unit Size

50000

Open For Creations

No

Implied Liquidity (USD)

1.744B

Creation Fee (USD)

5500

Settlement Cycle

T+3

Liquidity Limiting Holding

6 HK

Creation Cutoff Time

10:00 AM EST

Create/Redeem Process

In-kind

	Holdings (2/22/2016)	Ticker	IDTS (shares)	Weight (%)	Last (USD)	Volume	30 Day Avg Vol
11	Power Assets Holdings Ltd	6 HK	74,067,225	.40	9.5280	1,677,034	2,962,689
12	CLP Holdings Ltd	2 HK	78,210,900	.37	8.7230	2,633,705	3,128,436
13	Teva Pharmaceutical Industr	TEVA IT	97,121,767	.28	57.5370	295,824	450,645
15	Hang Seng Bank Ltd	11 HK	149,614,437	.29	17.3050	5,081,834	2,393,831
16	Westpac Banking Corp	WBC AU	186,549,895	.88	21.7790	4,511,264	7,133,668
17	Shin-Etsu Chemical Co Ltd	4063 JP	199,043,750	.42	50.1390	1,185,100	1,592,350
18	CNOOC Ltd	883 HK	207,743,708	.53	1.0420	32,159,396	99,716,980
19	Electricite de France SA	EDF FP	217,828,791	.30	11.6820	2,951,595	5,227,891
20	Woodside Petroleum Ltd	WPL AU	218,471,629	.35	20.0570	3,972,358	3,565,457
21	Singapore Telecommunicatio	ST SP	226,041,000	.34	2.6580	16,672,200	27,124,920
22	Commonwealth Bank of Austr	CBA AU	229,768,154	.95	53.7170	2,228,877	3,860,105
23	NTT DOCOMO Inc	9437 JP	265,206,875	.79	23.3420	4,506,000	8,486,620
24	Telstra Corp Ltd	TLS AU	272,547,254	.48	3.8200	42,767,523	32,356,810
25	National Australia Bank Ltd	NAB AU	272,812,396	.57	18.5660	6,232,846	7,900,647
26	Wesfarmers Ltd	WES AU	273,448,373	.39	31.7200	2,071,201	3,193,877
27	GlaxoSmithKline PLC	GSK LN	274,056,490	1.56	19.6850	7,401,873	20,521,350

Edit Basket

Australia 61 2 9777 8600

Brazil 5511 2395 9000

Europe 44 20 7330 7500

Germany 49 69 9204 1210

Hong Kong 852 2977 6000

Japan 81 3 3201 8900

Singapore 65 6212 1000

U.S. 1 212 318 2000

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EXHIBIT 5.9 Implied Liquidity Detail Page with .25% Minimum Weight

This demonstrates that if an ETF liquidity provider is using sophisticated hedging techniques, instead of just hedging with an exact basket replica, there can potentially be much more ETF liquidity than would have initially been expected. At some point all of the actual stocks in the basket will have to be traded because the creation and redemption process requires delivery of the entire basket for equity products, but this serves to highlight a primary reason why ETFs can often trade greater volume than their ETF implied liquidity would predict.

Some Considerations When Utilizing IDTS

There are several factors to consider when using the ETF Implied Liquidity number. It identifies a large group of potentially very liquid ETFs that investors can use. If there were a smooth and efficient way for investors to access that liquidity electronically, ETF use would spread to more products. If an ETF shows an implied liquidity of millions of shares, yet it is only trading a few thousand shares per day, it may be because it was judged by average daily volume and unfortunately excluded by many potential users. If you think about it, this incorrect way of culling the ETF universe presents opportunities for the trained user. If you understand implied liquidity and want to access that larger base volume, you must know who can provide the liquidity. Market structure has created an environment where that liquidity is not posted electronically on-screen. Most large-block ETF trading still

takes place on an upstairs basis where a customer calls a trader and asks for a market. The market makers are utilizing the underlying liquidity pool and translating that into ETF liquidity. Indeed, there is still some evolution to come in ETF trading, but remember that the product is relatively young. The landscape continues to change and becomes more efficient every day.

Something else to understand when using the IDTS is that its best current application is with ETFs that hold an actual underlying basket of equity securities. While this is where the majority of assets are in the industry, there are newer products that hold securities that are not as easily quantifiable, in liquidity terms, as the listed equities. This makes it harder to determine the potential liquidity of the product. The recent growth in the fixed-income ETF space has put even more impetus toward determining ways to understand potential liquidity available in the bond-based ETFs. Without consistent printing of bond trades, it is significantly more difficult to determine the potential liquidity in the ETFs holding those bonds.

Exhibit 5.10 is an example of where the ETF implied liquidity field fits into the overall liquidity function of an ETF. You can see the DES page for the SPDR S&P 500 ETF Trust, the ETF with the highest average daily trading volume. You can see the ADV of 178.6 million shares, and you can see the ETF implied liquidity of only 55.5 million shares daily. The ETF implied liquidity, based on the basket, is only about 31 percent of the total overall volume. In this ETF, it is a lower percentage of the overall ETF liquidity function than in other ETFs. Since there is such a liquid futures and options market surrounding this product, there are myriad ways for market participants to be trading the ETF. This drives daily trading volumes even higher than would be implied by the underlying basket.

There are a variety of reasons why an ETF can trade many more shares than would be shown by the ETF implied liquidity field. When that is the case, the field is displaying potential liquidity based on trading the exact basket, and does not account for optimizing the trading basket or a variety of other trading strategies.

Key Point

ETF Implied Liquidity as a Replacement for ADV

The ETF implied liquidity function is replacing the average daily volume measurement as the metric for determining ETF suitability on platforms. It more closely reflects the risk features for clients holding an ETF and the base underlying liquidity. The average daily volume number is only representing what has happened in the ETF over some time period in the past, and is not a valid measure for the potential liquidity of ETFs.



EXHIBIT 5.10 ETF Implied Liquidity and the Overall Liquidity Function
Chart reprinted with permission from Bloomberg. Copyright 2011 Bloomberg L.P. All rights reserved.

The function is extremely helpful when looking at an ETF that is not trading a high average daily volume to assess its suitability for investment. As was seen in Exhibit 5.7, the low-volume ETF with a very high implied liquidity presents an opportunity for investment that might have been ignored when ADV was used as the measurement metric. This proves the concept that average daily volume is not a valuable measure of how many shares can be traded in an ETF on a particular day. The actual proof of this happens every day when large prints, multiples of the ADV, happen in lower volume ETFs without moving the markets. If you want to see the proof yourself, contact the capital markets group at any ETF issuer, and they will share recent examples of large prints in their ETFs. Alternatively, you can contact your broker to discuss liquidity they have provided for large executions.

THE ETF BASKET IMPLIED LIQUIDITY SCALE (EBILS)

The implied daily tradable shares (IDTS) available on Bloomberg provide a clear and quantifiable number of shares that can potentially be traded in an ETF. Investors need to go further to assess where those numbers fit within the

product universe. Many portfolio managers look at positions in dollar terms, potentially asking themselves, Can I invest \$25 million in a particular ETF in a day? So some would prefer to look at the implied daily tradable dollars (IDT\$), which is a representation of potential liquidity in dollar terms of the basket. This will be important when you are comparing multiple ETFs at different prices and attempting to determine what liquidity may be available in each.

In Exhibit 5.11 you can see the three names that constrain basket liquidity for each of the three main S&P 500 Index ETFs. If you compare them based upon implied daily tradable shares, it would seem as if the first is twice as liquid as the others. The difference is actually due to the price point of the ETF rather than the actual basket. When you look at the three funds in dollar terms, you can see that they all present similar implied daily tradable dollars (IDT\$), representing a similar amount of liquidity.

The next step would be to try to gain an understanding of where these implied liquidity numbers fit relative to each other. I have developed a scale of ETFs in order to make it easy to identify whether the ETF you are interested in fits within your liquidity parameters. The ETF basket implied liquidity scale (EBILS) gives the underlying basket of each ETF a rating as follows:

EBILS—ETF Basket Implied Liquidity Scale

- A—Extremely Liquid Basket
- B—Very High Basket Liquidity
- C—Good Basket Liquidity
- D—Low Basket Liquidity
- E—Very Low Basket Liquidity

Each of these levels corresponds to a dollar-based Implied Daily Tradable Dollar level and is then cross-referenced to an Implied Daily Tradable Shares level on a grid.

The dollar trading amounts of each liquidity rating correspond as follows:

EBILS—Implied Daily Tradable Dollars (IDT\$)

- A—> \$1,000,000,000
- B—\$1,000,000,000 < x < \$100,000,000
- C—\$100,000,000 < x < \$10,000,000
- D—\$10,000,000 < x < \$1,000,000
- E—< \$1,000,000

EXHIBIT 5.11 The Liquidity of ETFs at Different Prices

ETF	Ticker	Name	Shares per Creation Unit	30D Average Daily Volume	Implied Daily Tradable Shares (IDTS)	Implied Daily Tradable Dollars (IDT\$)
VOO	BF/B	Brown-Forman Corp. COM B USD 0.15	25	211,516	105,758,234	\$6,538,619,110
VOO	BRK/B	Berkshire Hathaway Inc COM B USD 0.0033	447	4,610,223	128,921,211	\$7,970,695,596
VOO	PM	Philip Morris International Inc COM USD NPV	434	5,444,806	156,820,449	\$9,695,596,686
ETF	Ticker	Name	Shares per Creation Unit	30D Average Daily Volume	Implied Daily Tradable Shares (IDTS)	Implied Daily Tradable Dollars (IDT\$)
IVV	BF/B	Brown-Forman Corp. COM B USD 0.15	55	211,516	48,071,925	\$6,523,389,378
IVV	BRK/B	Berkshire Hathaway Inc COM B USD 0.0033	979	4,610,223	58,863,924	\$7,987,870,187
IVV	PM	Philip Morris International Inc COM USD NPV	949	5,444,806	71,717,677	\$9,732,132,255
ETF	Ticker	Name	Shares per Creation Unit	30D Average Daily Volume	Implied Daily Tradable Shares (IDTS)	Implied Daily Tradable Dollars (IDT\$)
SPY	BF/B	Brown-Forman Corp. COM B USD 0.15	55	211,516	48,071,925	\$6,497,314,965
SPY	BRK/B	Berkshire Hathaway Inc COM B USD 0.0033	973	4,610,223	59,226,908	\$8,005,002,429
SPY	PM	Philip Morris International Inc COM USD NPV	943	5,444,806	72,173,993	\$9,754,907,149

Source: Bloomberg, 6/18/12

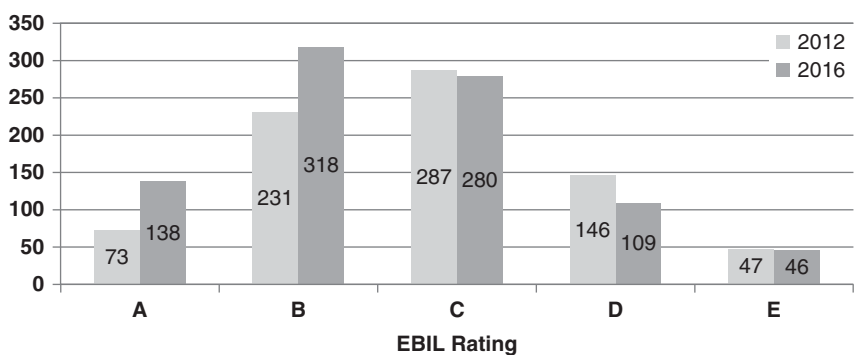


EXHIBIT 5.12 EBILS—ETF Basket Implied Liquidity Scale—Dollars

These numbers represent the dollar notional amount of the ETF that could possibly be traded, while constrained to a maximum of 25 percent of the average daily volume of each of the stocks, in the proper weights within the basket. The IDT\$ is presented in dollars of ETFs. As an example, an ETF with an A rating has a basket in which you could easily trade more than a billion dollars’ worth of the ETF in a day, while being no more than 25 percent of the volume of any stock in the basket. This is a very liquid basket. On the other side of the spectrum, a fund with an E rating means that you will be able to trade less than one million dollars’ worth of ETF notional via the basket on a given day. This is also while being no more than 25 percent of the volume of any of the underlying stocks. This is a fund with very low dollar liquidity as implied by the basket.

In Exhibit 5.12, you can see the breakdown of funds by number and percent of the five EBILS ratings. There are more than 500 ETFs with ratings of C or higher. These ETFs represent funds with baskets that can be traded and implied into more than ten million dollars per day in each of the funds. On the extreme high end, 9 percent of the funds have baskets that could be traded to imply a billion dollars of liquidity in the ETF on any given day. These ratings correspond to the IDT\$.

It is also important to understand these numbers in share amounts as well. While most ETFs with very high dollar notional liquidity will have very liquid baskets in share terms, there are differing levels within each dollar liquidity rating. So within each EBILS letter rating there is a number level that corresponds to each particular ETF. This number is the implied daily tradable shares numbers broken down to five levels as follows:

EBILS—Implied Daily Tradable Shares (IDTS)

- 1—> 100,000,000
- 2—100,000,000 < x < 10,000,000

3— $10,000,000 < x < 1,000,000$

4— $1,000,000 < x < 250,000$

5— $< 250,000$

Using these numbers, an ETF in level one can potentially trade more than 100 million shares daily based upon the basket. A fund considered to be level five implies that fewer than 250,000 shares of the fund could be interpolated from the basket in a day. This would be considered a basket that is difficult to trade. In Exhibit 5.13 you can see the breakdown of how funds fit into the EBILS parameters based upon implied daily tradable shares.

It is easier to think of the rating scale as a grid where each ETF fits in a particular box corresponding to both a dollar and a share amount of ETF implied liquidity. In Exhibit 5.14 you can see the EBILS grid for the currently available universe of equity ETFs with an implied liquidity number, as per Bloomberg. The empty spaces represent areas where it is unlikely that an ETF will fall. For example, in the space on the grid corresponding to rating A level 4 (A4), the ETF would have a basket that presents liquidity of more than a billion dollars notional, but in share terms less than a million shares per day. This is a highly unlikely scenario. You can also see that a significant amount of funds are rated either B or C, presenting good to very liquid baskets, and have a level-3 IDTS, amounting to more than a million shares of implied liquidity available daily.

Exhibit 5.15 shows the same EBIL scale in list form. As you can see, for each EBIL rating, A thru E, there are five sub-levels representing different potential implied daily tradable share quantities.

How to Think about EBILS ratings

If you were a portfolio manager running a multibillion-dollar portfolio where every position you took in an ETF averaged \$30 million dollars in notional, you might consider using only funds that have a rating of C or higher. Whereas if you are managing a smaller portfolio and your typical position sizes were about \$1 million each, you might expand your usable range of ETFs to include funds with a D rating, or higher. This gives you a universe of 845 out of 891 rated ETFs. That is, almost 95 percent of the rated ETFs with sufficient liquidity available via the underlying basket. These ratings do not include ETNs. If you were using average daily volumes and you restricted yourself to funds that trade more than 100,000 shares per day, you would be limited to 327 out of 891, or only 36 percent of the available product universe. Understanding an ETF liquidity scale, like the EBILS, enables you to broaden the universe of products to position within your portfolio. This is a critical factor in building ETF portfolios.

EXHIBIT 5.13 EBILS—ETF Basket Implied Liquidity Scale—Shares*

Rating	Implied Daily Tradable Dollars (IDT\$)	# of ETFs & Percent in 2012	# of ETFs & Percent in 2016	Liquidity Level	Interpretation
A	More than 100,000,000	15 2%	14 2%	Extremely Liquid Basket	The underlying basket trades very easily
B	100,000,000 > x > 10,000,000	136 17%	204 23%	Very Liquid Basket	You can trade up to \$1 billion dollars notional of this fund on a given day
C	10,000,000 > x > 1,000,000	302 39%	399 45%	Good Basket Liquidity	This fund will trade with average liquidity
D	1,000,000 > x > 250,000	185 24%	149 17%	Low Basket Liquidity	The basket implies less than a \$10 million notional liquidity daily
E	Less than 250,000	146 19%	125 14%	Very Low Basket Liquidity	The fund basket could be difficult to trade

*Data as of 7/2/12 and 1/4/16.

EXHIBIT 5.14 EBILS Grid of ETFs*

		A Extremely Liquid	B Very Liquid	C Good Liquidity	D Low Liquidity	E Very Low Liquidity
		Implied Daily Tradable Dollars (IDT\$) Rating				
		<div><div>> \$1,000,000,000</div><div>\$1,000,000,000 > x > \$100,000,000</div><div>x > \$100,000,000 > \$10,000,000</div><div>x > \$10,000,000 > \$1,000,000</div></div>				
Implied Daily Tradable Shares (IDT\$) Level	1	> 100,000,000				
	2	100,000,000 > x > 10,000,000	A1 = 14/2% A2 = 121/14%	B2 = 83/9%		
	3	10,000,000 > x > 1,000,000	A3 = 3/0%	B3 = 232/26% B4 = 3/0%	C3 = 162/18% C4 = 109/12%	D3 = 2/0% D4 = 37/4%
	4	1,000,000 > x > 250,000				
	5	< 250,000				
Totals		138 15%	318 36%	280 31%	109 12%	E5 = 46/5% 46 5%

* Data as of 1/4/16.

EXHIBIT 5.15 EBILS Breakdown of ETFs*

EBIL Rating	Level	# of ETFs	% of ETFs	Implied Daily Tradable Shares (IDTS)	Implied Daily Tradable Dollars (IDTs)	Basket Liquidity Levels
A	1	14	2%	>100,000,000	> \$1,000,000,000	Extremely Liquid Baskets
	2	121	14%	100,000,000 > x > 10,000,000	> \$1,000,000,000	Extremely Liquid Baskets
	3	3	0%	10,000,000 > x > 1,000,000	> \$1,000,000,000	Extremely Liquid Baskets
	4			1,000,000 > x > 250,000	> \$1,000,000,000	Extremely Liquid Baskets
	5			<250,000	> \$1,000,000,000	Extremely Liquid Baskets
B	1			>100,000,000	\$1,000,000,000 > x > \$100,000,000	Very High Basket Liquidity
	2	83	9%	100,000,000 > x > 10,000,000	\$1,000,000,000 > x > \$100,000,000	Very High Basket Liquidity
	3	232	26%	10,000,000 > x > 1,000,000	\$1,000,000,000 > x > \$100,000,000	Very High Basket Liquidity
	4	3	0%	1,000,000 > x > 250,000	\$1,000,000,000 > x > \$100,000,000	Very High Basket Liquidity
	5			<250,000	\$1,000,000,000 > x > \$100,000,000	Very High Basket Liquidity
C	1			>100,000,000	\$100,000,000 > x > \$10,000,000	Good Basket Liquidity
	2			100,000,000 > x > 10,000,000	\$100,000,000 > x > \$10,000,000	Good Basket Liquidity
	3	162	18%	10,000,000 > x > 1,000,000	\$100,000,000 > x > \$10,000,000	Good Basket Liquidity
	4	109	12%	1,000,000 > x > 250,000	\$100,000,000 > x > \$10,000,000	Good Basket Liquidity
	5	9	1%	<250,000	\$100,000,000 > x > \$10,000,000	Good Basket Liquidity
D	1			>100,000,000	\$10,000,000 > x > \$1,000,000	Low Basket Liquidity
	2			100,000,000 > x > 10,000,000	\$10,000,000 > x > \$1,000,000	Low Basket Liquidity
	3	2	0%	10,000,000 > x > 1,000,000	\$10,000,000 > x > \$1,000,000	Low Basket Liquidity
	4	37	4%	1,000,000 > x > 250,000	\$10,000,000 > x > \$1,000,000	Low Basket Liquidity
	5	70	8%	<250,000	\$10,000,000 > x > \$1,000,000	Low Basket Liquidity
E	1			>100,000,000	< \$1,000,000	Very Low Basket Liquidity
	2			100,000,000 > x > 10,000,000	< \$1,000,000	Very Low Basket Liquidity
	3			10,000,000 > x > 1,000,000	< \$1,000,000	Very Low Basket Liquidity
	4			1,000,000 > x > 250,000	< \$1,000,000	Very Low Basket Liquidity
	5	46	5%	<250,000	< \$1,000,000	Very Low Basket Liquidity

* Data as of 1/4/16.

TYPICAL TOOLS OF ETF MARKET MAKING

In order to provide the investor base easier access to this underlying basket liquidity, the brokerage community has to continue developing the businesses that provide ETF liquidity. Over the last several years, many trading firms have developed desks that provide liquidity in ETFs utilizing the arbitrage mechanism.

There is still space in the industry for further participants who are considering developing broad businesses to satisfy a growing client base in ETF order flow. I present the following ETF business strategic requirements plan as a basis for some of the development that will be necessary to build that business.

Many of the ETF businesses on the Street already have many, if not all, of the parts of this business plan.

Database Requirements

- A broad data warehouse comprised of ETFs and linkages to underlying baskets of stocks and futures with real-time pricing where applicable
- ETF data file storage and parsing abilities for both domestic and international ETFs
- Monitoring and processing of corporate actions and dividends for the universe
- Monitoring of funding rates and stock availability with a stock loan
- Tracking of ETF cash balances and variables affecting NAV that are not in the creation/redemption basket
- Exporting baskets for creations and redemptions

Theoretical NAV Model

- It should be able to take underlying baskets of equities and calculate an IIV spread for each ETF. Secondary iterations would be able to calculate the theoretical depth of baskets.
- It should be able to display the lists of ETFs in multiple filtered arrangements.
- It must have fast quoting abilities in active markets in a universe of several thousand ETFs and underlying securities.
- It should be able to display and flag halted stocks and those not open for trading within each basket by ETF, in addition to understanding the rules around limit up/limit down (LULD) halts.
- This will be developed with click-to-trade abilities versus customer flow running through the book.
- It will get all its information from the data warehouse described earlier.

- For ETFs with underlying assets that are closed or not trading, pricing models need to be developed using correlating instruments to create estimated fair values.

ETF Trading System

- The system should provide the ability to trade the futures, the ETF in all venues, or the basket of underlying stocks.
- The key to this system is the ability to trade multiple ETFs or corresponding hedges in concert, with a good order management system for tracking and monitoring executions, and make adjustments based on market dynamics.
- A basket-monitoring function must be able to show completion percentages and single-stock delta that exists from incomplete orders.
- The ability to send a combination of baskets and futures and spray the Electronic Communications Networks (ECNs) would be optimal based on a target quantity of the underlying ETF (i.e., market spray functionality).

Risk Management and Profit and Loss (PnL) Monitoring System

- This system handles all positions, showing a delta in single-stock terms based on deconstructing the ETFs and futures down to stock level. It also must be able to recognize and process all asset classes of exposure including fixed income, currencies, and commodities.
- It also shows calculations on daily funding, stock loan, dividends, and fair value.
- It should be able to separate positions into multiple risk books, such as index funds, sector funds, and the like.
- It should be able to show a PnL breakdown between the ETFs and baskets/futures for analysis.
- The system must be able to handle the manual input of trades done outside the system, either versus customers or with brokers.
- It should show a real-time delta and PnL for all positions.

Client Order OMS

- This system receives orders from the sales force in ETFs and sends back fills.
- It maintains the required electronic time stamp on customer order flow.
- It enables both agency execution of order flow or principal facilitation via the crossing facilities that must comply with Reg NMS and other relevant regulations.
- It should be able to electronically feed principal positions to the risk management system for delta management.
- It also performs the functions of commission tracking and electronic transfer of trades to the middle office for processing.

CONCLUSION

The models for providing liquidity in ETFs can be complicated to build and maintain. The requirements to build a full-service liquidity business in the products also are capital intensive. We are at the early stages, however, of what can potentially be a very long cycle of product use and development that will make all of those investments worthwhile.

The markets in the United States are exhibiting severe fragmentation. Intelligent systems that scour markets for mispriced securities are leading to the deterioration of displayed depth in the markets. Dark pools and aggregators and ways to trade around the exchanges have made any published size vulnerable to aggressive trading strategies. It is unfortunate for the financial infrastructure that the very machines designed to aid in securities trading efficiency have combined with outdated regulations to diminish some of that efficiency. For the past several years I have inaccurately predicted the demise of high-touch order brokerage because of its inefficiency compared to the machines, only to see that business continues to flourish because market fragmentation actually creates a greater need for human intervention.

In this volume, I look at execution as an exercise in capital preservation and efficiency. I examine the optimum methods for accessing the true hidden liquidity of ETFs. I do not dispute that there are spreads, but I disagree that they are more egregious than the opportunity costs of not utilizing these products. There are hurdles to overcome to achieve this liquidity, but the markets are continually evolving. It is becoming ever easier for the average investor, money manager, or trader to take advantage of the gains that await.

There are three parts to achieving many ETF investment goals, as presented in this ETF handbook: understanding the products and investment suitability (Part One); understanding who your likely counterparts are in the marketplace, their intentions, and how to execute your order flow (Part Two); and learning how ETF prices are derived (Part Three). In the next chapter we examine the strategies available for efficient execution of ETF order flow.

NOTES

1. The default is 25 percent of the average daily volume in each of the components. This is based upon the assumption that at only one quarter of the volume, trading will not have an impact upon market price.
2. The Variable Percentage is defaulted to 25 percent of the average daily volume of each of the underlying so you can get a perspective of how many ETF shares can be traded without having an impact on the price of each underlying stock. You would want to adjust upward to be more aggressive, which would reflect higher liquidity, or lower to be more constrained.

Execution

This book was conceived around my work educating people on the exchange-traded fund (ETF) mechanism and the best ways to execute ETF order flow. I still encounter investors confused about the process of proper order flow execution in ETFs. This is causing many of them to use only a small group of ETFs with very high average daily volume. There are many products in the ETF product set that can be used to custom tailor portfolios, but a certain amount of knowledge about liquidity is required for their efficient use. This is because they are designed as investment vehicles that typically have lower volumes than those designed more as trading vehicles.

An interesting aspect of the ETF structure is that it removes most trading and execution from the asset management side of the business. This is a divergence from the mutual fund business that controls the buying and selling of assets and uses that order flow to pay commissions to the Street. At the core of the ETF business, the investor controls the buying and selling of assets; this is causing a shift in the balance of power. There is a dramatic rise in self-directed and advisor-guided assets in ETFs that is leading to changes in the way brokerage firms do business. In addition, the fact that making markets in ETFs typically requires the use of firm capital will necessitate a rethinking of order flow at the large firms that steer discretionary order flow away from the proprietary businesses where the ETF desk resides. It makes no sense for the wealth management business at a large brokerage firm to steer client ETF business away from the in-house ETF liquidity desk. Over time, as it becomes clear that ETFs are becoming a huge part of the wealth management business and that a tremendous amount of commissions are being paid away to the Street for executions that can be facilitated more efficiently in-house, this order flow process will change.

Another important point is that the ETF issuer has no ability to control the width and depth of markets in their products. The liquidity-providing function of ETFs is completely separate and distinct from the business of managing those assets. The backstop liquidity providers are the lead market makers (LMMs) that are under basic requirements by the exchange. Beyond them, liquidity providers (LPs) in ETFs are in business to make money. They are not there as a service provided by ETF issuers, and they are not always completely aligned with the best interests of the client base.

As I considered the issues that arise throughout my investor meetings, I began to realize that the execution of ETFs is a stumbling block for many clients and products. The early adopters of any product are willing to get their hands dirty and figure it out, working through the kinks. They typically come to a product as seekers looking to understand its mysteries. The second group consists of more general users; they have determined that the product will satisfy a need. They want to use the product but may have expectations for how the product should work as opposed to how it actually does work. Many of the newer adopters of the ETF product line think the product must work just like a stock since it is listed like other equity products. Looking at an ETF simply like a stock is not utilizing many of its features, which are unavailable in an ordinary stock investment. It is the equivalent of buying a smartphone merely to make phone calls, without acknowledging any of its other features.

Taking this one step further, many of the newer users of the ETF product line are migrating over from portfolios of mutual funds. They are used to net asset value (NAV) executions once a day. They are not accustomed to looking at markets during an execution process. With a mutual fund, the execution is ignored as a back-office procedure of delivering cash and seeing a journal entry in your portfolio the next day. In the world of an ETF, execution is incredibly important. In this chapter, we discuss many of the important ways of handling order flow in ETFs. The information in this chapter alone should make owning this book mandatory for every trader and execution flow staff member who handles orders in exchange-listed funds.

TIME FRAMES AND ORDER TYPES

The New York Stock Exchange (NYSE) Arca makes roughly 30 different order types available for people to utilize when sending orders down to the exchange.¹ The program trading desks and the electronic trading firms use most of the various order types. By contrast, most customer flow utilizes only a few different types of orders, overwhelmingly market or limit orders.

When trading in an ETF, there are several different methods and specific times for placing and executing orders.

Execution Time Frames

There are two time frames in which you can execute an ETF order in a U.S.-listed ETF:

1. During the U.S. trading day, while the U.S.-listed ETF is trading
2. During the hours when the underlying basket is trading

If it is during the U.S. trading hours and the ETF has a basket of domestic constituents, you can execute an order for the ETF either in the actual shares of that ETF or by trading the underlying basket of stocks and converting those executions into an ETF price. If the constituents of the basket are not U.S.-listed stocks, you can either execute order flow in the ETF shares on the exchange, or you can utilize the basket of constituents during their local trading hours and have the traded price implied back into an ETF price and execution. This is what I refer to as an NAV-based execution.

TRADING TIP

Let's take an example of an ETF with Japanese underlying stocks that trades in the United States. You can trade the ETF during the U.S. trading day while the markets are open, and even on either side of market open and close because of after-hours and premarket trading. Additionally, you could theoretically trade the ETF during the hours that the Japanese markets are open because someone can execute the entire basket making up the creation unit (CU) of the ETF and generate an implied price for the ETF. If the ETF is trading at a time when the underlying basket of stocks is closed, the ETF is acting like a price discovery vehicle for where that basket will be when it next starts trading. This will be discussed in later chapters when I cover the calculation of intra-day indicative value (IIV) and the need for an estimated NAV (eNAV) calculation.

Types

During the two time frames, you can use these types of executions to achieve your desired exposure:

1. Market orders
2. Limit orders
3. Stop-Loss orders
4. Algorithms
5. Risk markets
6. NAV/IIV-based executions

Throughout this chapter we go through these types of executions in detail. We end with several different examples of executions in the various types.

MARKET ORDERS

The main order type used by noninstitutional investors is the market order. A market order sends an order to the marketplace and gives the systems and other market participants the opportunity to trade against it with no specific limitations regarding at what price the order will get filled. It sweeps the order book and does not stop until it is complete. In our current world of multiple exchanges, dark pools, and electronically hidden liquidity, market orders are not a cost-effective way to trade ETFs. The speed and abilities of systems to determine that orders are open to market pricing, and the ability to game those types of orders, has established the market order as impractical in any ETF beyond those with the highest average daily volume. When trading an ETF that has a relatively low intraday trading volume, sending market orders can be devastating.

Let's take a look at what can happen in a worst-case scenario with a market order in a low-volume ETF. In this example, an ETF trades fewer than 25,000 shares daily. The typical market for this ETF is about 10 cents wide, and the typical depth provided by an LMM is about 300 shares on two levels. In Exhibit 6.1 you can see the 25.01 bid for 300 shares and the 24.98 bid for 300 shares. And you can see 300 shares offered at 25.11 and another 300 offered at 25.13, as the second level of liquidity offered by the LMM.

Now let's say a buy order comes in to buy 2,000 shares of the ETF at the market. If the order book was as displayed in Exhibit 6.1 and had no hidden size, the order would make the purchases shown in Exhibit 6.2.

This would give an execution of an order to buy 2,000 shares at the market at an average price of 25.6125. (Again, this is based on the assumption of no hidden liquidity in the system and no one simultaneously coming in to sell the same ETF.)

EXHIBIT 6.1 Simulated Order Book—Market Order

	Bid Size	Bid	Ask	Ask Size
1	300	\$25.01	\$25.11	300
2	200	\$24.99	\$25.12	100
3	300	\$24.98	\$25.13	300
4	100	\$24.95	\$25.15	100
5	100	\$24.89	\$25.21	100
6	500	\$24.01	\$25.75	400
7	500	\$23.89	\$26.01	500
8	100	\$23.57	\$26.50	500
9	100	\$23.50	\$26.80	500
10	100	\$23.48	\$26.85	300

EXHIBIT 6.2 A Market Order Sweep

	Ask Price	Ask Size
1	\$25.11	300
2	\$25.12	100
3	\$25.13	300
4	\$25.15	100
5	\$25.21	100
6	\$25.75	400
7	\$26.01	500
8	\$26.50	200

This order has actually missed on two fronts. The first is that the market order probably took out the two levels of liquidity provided by the LMM and did not give the systems a chance to refresh before the order continued taking all other liquidity it could find. Additionally, it did not give an LP a chance to execute against the underlying basket to satisfy the order. If this was an ETF with domestic underlying stocks, an LP might have been willing to sell all 2,000 shares of the ETF at a slight profit to the basket to accommodate the trade. Let's say that the basket was priced at 25.03 to 25.08, with an implied liquidity of several hundred thousand shares on each side. If the LP could sell the ETF balance of 2,000 shares at 25.10, cover its trading expenses, and make a profit, the order could potentially have been filled much more efficiently. In an extremely liquid ETF, part of that liquidity is coming from electronic systems monitoring and competing in the markets for arbitrage opportunities. This protects the outcome from being terribly expensive in a product in which a lot of people are trading. But in a lower volume ETF, those systems are not necessarily set up, as there are fewer participants or opportunities. There is little chance a market order can be efficient in any ETF that is not in that highest-volume bucket (above 10 million average daily shares traded based on investment order flow). If you are an electronic trading business, then market orders may work within the parameters of your strategy.

LIMIT ORDERS

The limit order is at the opposite end of the spectrum from the market order. While a market order leaves you dependent on the environment of the marketplace to determine an execution price for your order, a limit order is established with a fixed price limit in mind. A problem with this order type is

that you have a much lower probability of getting a fill unless you are close to the market. The information in this book will help you place limit orders within a reasonable tolerance level of ETF valuation. This will enable you to drive up your execution probabilities while saving yourself money with good executions.

You would use a limit order primarily in two circumstances:

1. You have a set price that you are looking to trade at based on a model or other expectation.
2. You are looking to transact at close to current market levels and will place your limit accordingly.

A limit order removes any spread from a trade. If you place an order at a specified price and get filled, regardless of whether you chose to place your order in the middle of a bid and ask or in the middle of any other two hypothetical prices, you are not cutting a spread. You are trading at a price that was predetermined. If you place a limit order and the market moves toward and through your order and you receive an execution, you also should not suffer buyer's remorse. Limit orders set below or at the bid side typically get filled when the market moves toward and across your limits. You have to expect some price movement through your limit for execution. In ETFs, limit orders getting filled are the result of either the underlying value of the ETF moving through your limit range or sellers coming into the marketplace and moving the prices into your limit range. In a low-volume ETF, you will frequently be dealing with either an LP or a market maker watching the underlying value for an arbitrage opportunity. In order for either to want to interact with your order, they will have to be able to position its hedge at an advantageous price.

It is important to understand the nature of your trading counterpart when trading in low-volume ETFs because then you can place your limit order properly to entice the arbitrageurs or wait for them, depending on your own desires.

Let's use the same market picture for an example of two markets in which execution probability rises with the improved limit placement. In Exhibit 6.3, you can see that the market in the ETF is 25.01 to 25.11, 300 shares up (bid and offered). Let's continue with the understanding that the IIV for this ETF with domestic underlying constituents is showing as 25.03 to 25.08.

If you place a limit order at 25.01 for 1,000 shares, what might happen? Probably nothing will happen until another customer seller of the ETF enters the marketplace. An LP is not going to sell you the ETF at 25.01 because it would have to pay 25.08 to buy the basket equivalent or 25.11 to buy

EXHIBIT 6.3 Simulated Order Book—Limit Order

	Bid Size	Bid	Ask	Ask Size
1	300	\$25.01	\$25.11	300
2	200	\$24.99	\$25.12	100
3	300	\$24.98	\$25.13	300
4	100	\$24.95	\$25.15	100
5	100	\$24.89	\$25.21	100

the ETF. So in a low-volume ETF, nothing might happen for a long while, perhaps the entire trading day. In actuality, if you place your order at a similar discount to IIV in a very liquid ETF, there is a high probability you will not get filled either because it is very rare that a liquid ETF with domestic constituents will be trading at a discount to IIV.

If you place a limit order at 25.08 for 1,000 shares, what might happen? The odds of your getting filled have risen dramatically. If an LP sold the shares to you, it might be able to buy the basket at some point in the middle of the implied spread, 25.03 to 25.08, and lock in a profit versus its ETF sale.

Both of these orders were based on the premise that the market was not moving around. A limit order placed at 25.01 might get filled if the market moves down, placing it in the range of either the offer side of the market or the range of the underlying basket equivalent.

Limit orders typically require market moves and interaction to get filled, but they also need to be within trading range in terms of price. There are many occasions where a client has been bidding five cents below a market for an ETF, or even bid side, and not getting filled. In trading ETFs in the marketplace, it seems as if your bid price will be “wrong” in order to be executed. But this is a distinction of time frame and nothing more. The arbitrageur is attempting to take advantage of pricing spreads between the ETF and its underlying basket or proxy hedge. This is typically a business of pennies and extremely short time periods. Your order should be placed in the context of a longer-term investment horizon. So the “wrong” price actually may be the perfect price for you because, while you may be looking for a 10 percent gain, others may be looking to lock in a gain of 0.1 percent on this trade before moving on to the next.

In a domestic ETF trading during the U.S. day, the proper trading level is a function of where the basket is priced. If the basket is two cents wide and you are on the bid side of a market that is two cents below the basket bid, you will have an extremely low probability of getting filled. Why would an LP sell an ETF below the bid side of the basket? Typically, it would hit a bid that is above the offer side of the basket so it can concurrently buy

the underlying basket to lock in its profit spread. But, again, this requires an understanding of the volatility of ETF prices. When you have a basket of stocks that is moving in a market and that is directly affecting the price movements of the ETF, there will be higher volatility in the ETF price. Every tick in one of the underlying stocks causes a tick in the ETF price. This causes the prices to move around within the basket band and even causes the basket band to shift, causing even more tick volatility. It is possible to see through general observations that ETF tick volatility and quote frequency are much higher than in single stocks. This is market noise and should be ignored by the average ETF investor. Decide on a price based on your valuation of the underlying basket of the ETF and your desired outcome and place your limit order. Let patience and the markets do the rest.

STOP-LOSS AND STOP-LIMIT ORDERS

There are two types of stop orders that are important to understand and distinguish between to protect your portfolio. A stop-loss order is designed to trigger at a certain price and send an execution order to the exchange. Typically when you enter a stop order, that order remains on the books of the brokerage firm that handles your order flow; and when the trigger price is hit, the resulting order is sent to the exchange for execution. In a stop-loss order, when the trigger is hit, a market order is sent to the exchange, aiming for immediate execution at any price. With a stop-limit order, when the trigger price is hit, a limit order is sent to the exchange. There are a variety of ramifications of these types of orders. In the case of stop-loss, the resultant order is a market order. Those orders are time based and do not take into account potential liquidity in the order book or anything else. If you had placed a stop-loss order and it was triggered during the flash crash of 2010, you could have received execution very far away from the fair value of the ETF. If you are using stop-loss orders to protect your portfolio from pricing risk, you may actually be adding execution risk because of its transformation into a market order. I advise investors not to use market orders outside the set of ETFs with the highest average trading volumes, and this includes the stop-loss order type.

If you insist that you want to try to protect your portfolio using stop orders, you should consider only using stop-limits. In this order type you enter a trigger price and you enter a limit price. When the trigger price gets hit, a limit order gets sent to the exchanges for execution. The biggest concerns that I hear investors having with this order type is that, if their trigger is hit, they really want to get executed, and using a stop-limit leaves you open to the risk of missing the trade. The way to counteract that is to place your limit

appropriately so that, in a market that is moving fast, you have a significantly higher probability of getting filled in your order, and yet you protect your portfolio from exposure to flash-crash-type events when extreme volatility is occurring in the markets. The proper guidelines for using stop-limit orders are to limit yourself at a level of expected volatility appropriate for the ETF you are trading. If you are willing to sell a \$50 ETF 25 basis points (1/4%) lower than your trigger price, you can place a stop-limit order using a 50 stop and a 49.87 limit. This means that, when the ETF price hits \$50, your broker will send an order to the exchange to sell the ETF at 49.87. At this point the system will sell the ETF at each level of liquidity down to your price. If there is a remainder that is not filled, your order will sit there on the offer at 49.87. This is actually a good thing because it also gives the market time to refresh. If the value of the ETF versus the value of the basket makes sense to a liquidity provider, they will most likely act against your order.

ALGORITHMS

The financial markets are composed of many layers of people answering to many other layers of people. There is the portfolio manager who answers to investors, the trader who answers to the PM, and the floor broker who answers to the trader client. None of these people wants to be the one to pay the wrong price for a security. So a PM, instead of giving a limit order to the trader, would say, “Buy me X” at the market, letting the trader with his or her expertise in the marketplace determine the correct price. The trader, not wanting to have an impact on the market, would give the broker instructions to be in the crowd going along with what other people are doing. If someone asks why a certain price was paid for a security, someone in the chain can always fall back on the explanation that other people were also paying that price at that time. It is this psychology of market participants not wanting to pay the wrong price that helped lead to volume-weighted average price (VWAP) and other algorithms.

A useful method to determine if your trading and execution are stacking up as compared to the rest of the Street is to trade based on how the rest of the Street is trading. In a VWAP order, you are basically willing to buy/sell in volume and prices proportional to those at which the security is trading in the marketplace. You make no decisions as to how much to buy at each price level but leave it up to the wisdom of the crowd. If others are trading, then your order should be trading in the market as well. It is tough to be held accountable if you are only a small percentage of the volume trading at your levels. The VWAP has become a major metric in the pricing of order flow.

An entire sub-industry has been based around building models for trading to achieve this price.

Other algorithms utilize different metrics to place orders systematically into the marketplace. All of these systems attempt to get an execution based on specific parameters with the intention of having a minimum effect on the market price of the security. And all of these order types can be used when trading ETFs. The beauty of algorithms with exchange-traded funds is that you can use them either on the actual ETF or on the underlying basket of securities. In an ETF in which there is high average daily trading volume (ADV), it might make sense to use an algorithm on the ETF shares to participate at levels where the market is trading or to use other methods. In an ETF in which there is low ADV, an algorithm on the underlying basket enables you to participate with the actual volumes of the constituent shares. This is a great way to achieve the hidden liquidity because you are trading the components, and the execution desk can give you the interpolated shares and price for the ETF. This is a critical use of the underlying basket to eliminate large spreads due to low trading volumes and the other costs associated with risk markets or using brokerage balance sheets to create volume in an ETF at suboptimal times.

As with market or limit orders, algorithms can always be used going both ways in either the ETF or the basket. Many times people do not seem as worried about getting into an ETF position as they are about getting out. If a market event prohibits trading in equities, then everything will be affected universally. But if the equity markets are trading, you can exit your ETF position via a market or limit order or via use of an algorithm; all these methods can be used for either the ETF or its underlying basket.

The fact that ETFs trade on an exchange like an equity security is an added bonus to their liquidity structure. Every day APs can create or redeem shares in the ETF, achieving NAV pricing and liquidity. If you do not want to wait for that closing print, you can trade in the market. If it is an emergency and you want to sell ETF shares regardless of the price, then some LP will be willing to buy the shares at some level in relation to the underlying basket. In extreme situations, all markets get irrational and many market correlations move toward one. It would be irrational to think that spreads would stay the same in those situations. A base expectation for ETFs is that there will still be LPs in the products pursuing arbitrage and keeping discounts reasonable. That expectation was satisfied during the market dislocation of late 2008–2009.

What is most important for the proper functioning of the ETF marketplace is clarity of pricing of the underlying assets and transparency of that basket. Market pricing disruptions—halts to stocks, for example—translate into difficulties for liquidity providers in making prices in ETFs.

RISK MARKETS (UTILIZING BROKER-DEALER CAPITAL)

Some of the largest facilitators of the ETF order flow over the last decade have been the broker-dealer desks. They have been facilitating order flow for the institutional client base since the beginning of ETF issuance in the mid-1990s. I built the ETF trading business at Bear Stearns in 2000 as an offshoot of the index arbitrage trading desk within the equity derivatives department. The main feature of our business at the time was utilizing firm capital to provide risk markets to our clients in the ETFs. Our sales pitch was extremely simple. If you asked us for a market in an ETF, regardless of what the screens were showing, we would provide prices at which you can trade in real time. Once the client had traded, it was our problem to hedge our risk and exposures. This was a clear outgrowth of the typical business of equity block facilitation that the large institutional clients were used to and that broker-dealers were accustomed to providing. The difference in this case was that the trading desk actually was able to hedge itself using a fully fungible product. In a typical block facilitation, a broker-dealer might sell a large amount of shares to a client and then work itself out of the short position over a number of weeks with a rough hedge. The desks would call all their other clients to find a seller and therefore offset their risk and make some money in the process.

In ETFs, the market-making process is different. As a trader making risk markets to clients, the minimum goal should be to close out the risk with a flat profit/loss and keep the commissions paid by the client. Since an ETF has a fungible underlying basket, if you made a sale to a client, in many cases you are able to buy the underlying basket at either flat or slightly cheaper, closing out your risk. It took a long time for clients, who were used to trading against natural order flow on the other side, to realize the new realities of the ETF marketplace. They were no longer as important in providing offsetting liquidity. They could call in almost any name at any time and the desk would be willing to make a market regardless of whether it had been trading the ETF with other clients.

ETFs actually leveled the playing field for clients in many ways because the broker-dealer desks had no information advantage by trading versus the order flow. Everyone started trading to flat risk positions, and volumes grew steadily. This also drove spreads lower because the business became commoditized very quickly. If I were a client who typically traded with Bear Stearns because I knew it handled a lot of flow in the stock I was interested in, now, with the ETF, that did not matter. Lehman would have the same basket trading system as Bear, and I could take my trades there if Lehman would make a tighter market. In today's markets large institutions frequently shop their order flow among the large brokers and liquidity providers.

The mechanics of a risk market are reasonably simple. It now boils down to speaking to the desks with the most capabilities. Here is an example: You are a buyer of 100,000 shares of the financials ETF. You call the ETF trading desk and ask for a market or an offer in 100,000 shares. You can ask for a market, which does not let the desk know whether you will be buying or selling. Or you can ask for an offer, which lets the desk know that you will be buying. By asking for a market, the desk stands ready to buy or sell at its prices, whereas by making an offer, it is only willing to sell. Say the desk offers 100,000 shares at \$20, and you agree to buy those shares. It will then print the ETF trade on the consolidated ticker tape. Then it needs to hedge its position. Since you have bought, the trading desk has sold you the shares. It could have been selling you a piece of a long position in the ETF and therefore have nothing to do, but most likely it is selling you the ETF short and will go and hedge its position. In order to hedge the exposure, it will make a decision as to whether the most profit is via the basket or from actually buying the ETF in the marketplace or some other hedge. It has taken the risk that the market could move in the interim between the time you agreed to the trade and when it is able to secure a hedge for its new position. You have transferred the risk of market impact to the trading desk for which you will pay commissions and usually a slight premium to the ETF value. One thing to notice here is that block order flow rarely crosses between two investors. It is typically an investor versus a liquidity provider. The liquidity provider will facilitate buying and selling from investors all day and then balance out their net position using the creation and redemption process.

Costs of Risk Markets

Typically, desks charge clients for offering risk in two ways: either via the spread embedded into the price or via the commission. If the charge is built into the spread, it means that they are making your market at a price at which they can hedge the position while locking in some amount of profit versus the price at which they sold the ETF shares. If they are charging a commission, the basic assumption is that the spread they are making versus the hedge should be smaller because they will be compensated for some of their risk. The commission for a trade where a firm commits risk capital will be higher than for an agency transaction.

The price of a risk market will always include the implied costs of doing the trade. It will thus include a piece of the risk of slippage in the market during the interim until the hedge is secured, and it will include the other basic costs of facilitating the ETF trade: the financing costs of partial CUs and creation or redemption (C/R) fees.

A simple look at where the spread would come from in an ETF market is presented next. All pricing is based on the basket price.

$$\begin{aligned} \text{Bid Side of an ETF Market} &= \text{Bid Side of Basket} - (\text{C/R Fee/CU}) \\ &\quad - \text{Slippage Margin} - \text{Expected Financing} \end{aligned}$$

$$\begin{aligned} \text{Offer side of an ETF Market} &= \text{Offer Side of Basket} + (\text{C/R Fee/CU}) \\ &\quad + \text{Slippage Margin} + \text{Expected Financing} \end{aligned}$$

If the basket is closed, and therefore not relevant to pricing at the time of the ETF trade, the value of the correlating hedge will be substituted in place of the basket price in the equation. The expected financing is a function of how long the position potentially could be on the books of the firm making the market. This is dependent on the ADV of the ETF and the size of the CU. Once that estimate of time is made, financing would be determined by the costs of maintaining the position, inclusive of management fees, borrowing fees, and trading fees of the hedge.

Typically, the main broker-dealer ETF desks dealt with the institutional client base of the firm. The main equity or equity derivatives sales force handled order flow from their client base. In order to have access to those risk markets that were predicated upon using the firm's balance sheet to apply capital, you had to be a covered account. But again, the world is a different place from just a few years ago, and the change has been drastic. Partially as a result of the rapid growth in the number of ETFs, it became impractical for many trading desks to be able to cover and make markets in all the products. They did not want to turn client business away, however, and it is impractical, in the heat of the trading day, to expect clients to know which ETFs they could call the desk for and which they could not.

The ETF trading desks also started interacting with the LPs and the ETF flow aggregators to be able to offer access to all the various products. The barrier to entry in that market was the fact that they had to be participants, sometimes providing markets as well as taking liquidity out. Now it is possible to access the risk markets of the main broker-dealers via the aggregators or other intermediary trading desks. The old specialist firms are now also running upstairs proprietary market-making desks that not only trade and make markets electronically but also are willing to provide large-block markets to clients that they can access either directly or via the aggregators. Just a few years ago, it might have been impossible for clients in the wealth management division of a broker-dealer to access large-block-size liquidity. Now, utilizing their platform execution desk, they can get large-block markets in all of their ETF order flow.

CREATIONS AND REDEMPTIONS

The creation and redemption process is at the heart of the ETF product wrapper. Open-ended issuance, as the process of daily creations is called, enables ETFs to grow to accommodate demand. Then, when demand reverses and the underlying are no longer in demand, authorized participants (APs) are able to redeem positions. This is one of the reasons that ETFs tend to trade within a tight band around their NAV. The forces of supply and demand are manageable with this just-in-time inventory process.

There is a massive amount of confusion among the ETF client base about the creation and redemption process. For many years, the C/R process has been advertised as the way to access the hidden underlying liquidity in the ETFs. While it is true that the liquidity is from the underlying basket, it is a mistake for clients to think they are actually doing creations and redemptions. The C/R process is basically just the back-office functionality that enables APs to manage their positions on the trading books. It allows trading desks to be more aggressive in making markets and providing liquidity. The APs have registered with the issuers to deal on the primary market on a daily basis. They are providing the liquidity, either via executing a basket for the client or trading in the ETF, and cleaning up their positions with either a creation or redemption. Clients are able to achieve an NAV execution plus or minus small fees. But clients are not doing the creation/redemption; they are having it done on their behalf. What makes this distinction so important? The semantics are important because many clients think the creation process restricts them to certain sizes that they must do in order to gain access to a specific ETF. Although that may have been true several years ago, in the current world, there are plenty of providers who are willing to aggregate the order flow, so clients can get NAV executions in almost any size they desire, and in any ETF.

You can see from Exhibit 6.4 that the client and the issuer will always have the AP between their transactions. Because of this, it is not actually the client who is restricted by the amount of shares in the CU. The restriction to CU size was imposed on clients over the years from APs. APs did not want residual pieces of ETFs and baskets sitting on their books, accruing financing costs. If a client wants to get into 80,000 shares of an ETF at NAV and the ETF creation unit size is 100,000 shares, then somewhere the 20,000 extra shares will have to be accounted for, positioned, and financed. APs can buy the underlying basket equivalent for 80,000 shares of the ETF and sell the ETF to the client. In order to flatten the position on the trading books, they would then process a creation order, delivering the basket to the issuer and receiving ETF shares. But this has to be in 100,000-ETF-share equivalents, so in order to remain hedged, they would have to buy more baskets first or sell out the extra ETF shares in the marketplace.

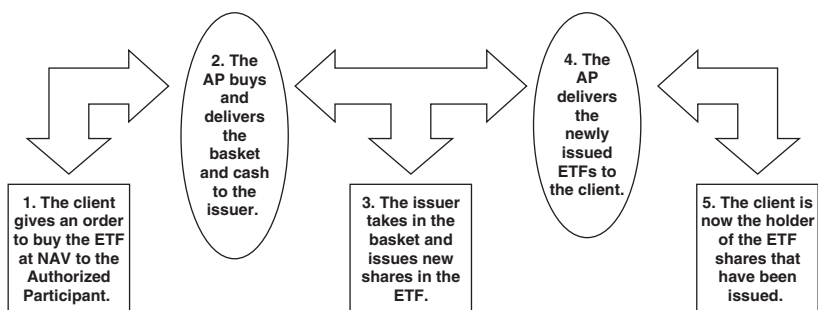


EXHIBIT 6.4 Steps of an Agency-Based Creation Order

We must remember that the goal of LPs or APs is to facilitate the transfer of assets between the issuer and the client without using up balance sheet or taking directional market risk. Everything they do in this regard must be perfectly hedged. The financing cost is what many people miss in the positioning, and it is important to understand when attempting to judge the costs of the transaction. Where the AP is short the ETF to the client and long the basket to facilitate an 80,000 share order, it is financing both sides of a potentially large notional amount. In the other scenario where the AP does the creation, it is financing a much smaller position of the residuals, 20,000 ETF shares, and the corresponding baskets.

The cost of financing is embedded in every ETF trade. In very liquid ETFs, where the LP would be able to unwind the residual positions in the marketplace, the financing costs would be very small. In lower-volume ETFs, the financing costs of residual positions, either from processing partial creations and redemptions or providing liquidity into the marketplace, can be quite high because the positions consume precious amounts of balance sheet.

In addition to the costs of financing residual pieces of C/R trades, there is also a fee for doing a creation or redemption. Issuers charge management fees already. This additional fee is a processing fee levied by operations management companies for moving stocks and ETFs around and moving money on the other side. Essentially it is a ticket charge. The size of this fee is typically a function of the number of stocks in the underlying basket and the complications involved in trading/positioning those stocks. A stock basket comprised of Indian local securities typically will have a higher C/R fee than a U.S. domestic fund, along with higher local brokerage commissions. This fee is also translated into the spread of every ETF trade. The potential financing costs for maintaining residual positions of ETFs and baskets will also be factored into spreads.

It is important to understand these fees because they will drive the pricing of your NAV-based transaction (my preferred name for a client-driven

creation or redemption). You can expect to receive the ETF at NAV plus small additional fees that will drive the cost slightly higher. Last, there will be commissions on the transaction by the AP. There is no standardized fee setup for an NAV-based transaction. Some are calculated around basis points of notional, others are a per-share charge, and still others consider it to be a mechanical operational procedure and levy a flat fee.

Three main costs are embedded in the pricing of an NAV transaction and are built into spreads:

1. Financing/stamp taxes on positions
2. Local brokerage commissions
3. Creation/redemption fees

Since there is no systematic NAV crossing network for ETFs, the end investor pays all the fees all the time. There has been some early-stage discussion about creating an exchange-based NAV cross for ETFs. Then the end user would not pay the financing costs of residuals because they could potentially be eliminated. This would also be done outside the processing firms, thus eliminating the payment of the C/R fees. It would be useful for cleaning up share sizes that are smaller than actual creation units.

NAV Crossing Mechanism

A big step toward solving the dilemma of potentially low trading volumes in new ETFs and in those products that are not intended as trading vehicles would be the establishment of an ETF NAV crossing facility. The brokerage community is attempting to devise ways to execute baskets of underlying constituents on an agency basis for clients while facilitating the use of the ETF regardless of its intraday trading volume. NAV crossing is even more valuable in facilitating volume in low-volume ETFs in general. If you have an ETF with an extremely difficult basket of underlying constituents, an NAV cross can potentially reduce the need for an LP to act as an intermediary. Although there might be no initial guarantee of an execution in a basic cross structure, there is always the potential that the mechanism will develop in ways that will enable LPs to facilitate on the opposite side of imbalances to provide a higher hit rate of executions.

This NAV cross is already happening in the mutual fund world because the process is based around buying and selling fund shares for cash at NAV. It is a certainty that a mutual fund manager faced with the delivery of \$100 and the payment of \$100 from two opposing clients is doing nothing in the portfolio. In the ETF structure, those two orders are most likely being facilitated at different points in the exchange mechanism. An article on the

website IndexUniverse recently announced that “db x-trackers is offering clients the ability to trade at the official net asset value (NAV) for all 59 of its exchange traded funds listed on the London Stock Exchange.”² The article goes on to explain:

Its most important impact, however, may be as a way to level the playing field between smaller, less-established ETFs and large, more liquid alternatives. Often, investors hesitate to buy ETFs with relatively low assets and trading volumes for fear of illiquidity. They are concerned that they will pay too high a spread, or that a large order will impact the price of the ETF, or that they will be unable to exit an ETF during a down market. With NAV-based trading, they will at least be assured a certain level of price accuracy.

This can and should be done in the U.S. markets. When a process like this is rolled out for the entire universe of ETFs, the business will certainly change drastically for everyone involved.

Estimated NAV Trading

The market is evolving to a synthetic NAV trading model. In this model, portfolio desks will use ETF baskets and apply their algorithms with the creation/redemption process in the background to flatten positions. In this model, international-based ETFs are utilized to provide liquidity to the client base without the additional costs of risk-based liquidity spreads and premiums and discounts related to sentiment as opposed to actual market behavior. The ETF IIV is valuable when attempting to determine a price to place an order in a domestic U.S. ETF that is not time sensitive. If you are using a 15-second lag on pricing for a position anticipated to be in a portfolio for an extended time period (use one-day minimum as a base), it becomes irrelevant if you get filled at an IIV level from 15 seconds ago. If you are not trading news, intraday market activity should not affect your trading. Additionally, beyond the realm of domestic U.S. ETFs, into the international underlying baskets, the IIV is almost a useless number for trading. It should be disregarded by investors as stale no matter how frequently it updates during the day. I expect that the major data providers will be calculating and selling “estimated NAV” numbers that will incorporate a correlation indicator to estimate the moves expected of the underlying basket and produce a number that indicates where the ETF should be trading (eNAV).

Many of the major trading firms are already calculating an eNAV in order to provide liquidity in the various ETFs. It should also be made available to clients to aid in their execution. Estimating IIV is necessary for a fund

in which the underlying basket is not trading during the same hours as the ETF. Typically, this is done with a correlation proxy used to adjust the IIV to account for recent market movements.

The basic calculation for the estimated net asset value is:

$$\begin{aligned} \text{eNAV} = & \left(\sum (\text{Shares per each component stock} \right. \\ & \times \text{Last Local Price}) / \text{Foreign Exchange Rate} \Big) \\ & \times (1 + x) / \text{Creation Unit Shares} \\ & + (\text{Estimated Cash} / \text{Creation Unit Shares}) \end{aligned}$$

where:

x = the expected percentage change in the underlying constituents

A great way to ease liquidity concerns is to shift the execution of many ETFs to the underlying baskets in the appropriate time frames and interpolate that trading back to the ETFs for a client portfolio. I expect the program trading desks to continue to expand on that in coming years to handle the growth of ETF business. Although many of the ETF products were access based and originally valuable only with tremendous intraday volume, many products are now investment based. Those products provide performance versus a specific benchmark and were not intended to be used as intraday trading tools. The ability to trade the underlying basket or a close proxy hedge and interpolate that into the ETF is critical for their continued development.

Spreads

The cost to trade ETFs has been a hotly debated topic in the industry since their inception. It would be remiss of this handbook to completely ignore spreads, but I will not dwell on them. Matt Hougan discusses several of the costs of trading ETFs and some of their potential causes in the *Guide to Exchange Traded Funds*.³ He highlights several studies demonstrating a high inverse correlation between size of fund in AUM and the spread and depth of market. He ends by saying: “Spreads should be incorporated into every ETF trading decision, much the way that brokerage commissions are. Their impact will be felt most by the short-term traders, but even long-term investors should consider their planned holding period and incorporate spreads into their trading decisions.”

I agree with Hougan that spreads are a cost of trading ETFs. We are, however, discussing methods of trading that dramatically reduce the spread issue. If you are trading a high-frequency or other type of statistical arbitrage strategy, spreads are incredibly important. But if you are moving outside that realm and using ETFs as an investor, you can eliminate many of the negatives associated with wide spreads by proper order-type use and utilizing the open-ending issuance function to achieve NAV-style executions. Proper execution of ETFs can bring the costs of spreads down to the root problem now affecting all stock trading. Stock spreads in general have widened and depth of book has decreased in the current market regulatory regime. The problem with spreads is not actually in the ETF but in the underlying basket from which their price is derived.

To take that argument one step further, I would point out that the structural component of in-kind stock transactions of the ETF does even more to diminish the negative impact of spreads. In an ETF, if you have given an order to buy the basket with the purpose of achieving an implied NAV execution, you will bear the costs of the spreads of the underlying stocks. The AP will then deliver the underlying stocks to the issuer at the closing price. The ETF will not pay any spread. This is an example of how the ETF structure pushes execution costs down to the individual investor for the investment. In a mutual fund, when there is a large creation or redemption and a basket is traded, that pricing goes into the fund and is funneled to the entire population of fund holders.

In one of his concluding lines, Hougan states: “Especially for newer ETFs with low assets under management, investors would do well to pay attention to spreads when they trade to avoid paying too much above fair value.” This is absolutely true for the plain-vanilla domestic equity ETFs. If you go beyond those products, fair value may be based on price estimations of where the underlying instruments might be accessible. In many cases, what is considered to be a spread is actually an estimate of actual value including the costs of execution. You might look at the ETF as a pass-through vehicle to the underlying assets; you should be looking at the costs of trading those underlying assets instead of the ETF. The important piece often missed is how the liquidity in the underlying baskets is accessed. When an LP is making a risk market in an ETF that has a basket that is not trading at the same time, the customer is paying for potential risk associated with tracking error of the hedge. The customer is buying the ETF at a price based on the LP’s estimated value of the ETF. If the customer considers the ETF to be trading at a low price compared to his or her own estimated value of the ETF, then the spread can be working in the customer’s favor, no matter how wide it is.

EXAMPLES OF EXECUTIONS IN THE MARKET

In this section, we review several examples of executing ETF order flow. There are millions of examples of what not to do and also many great examples of perfect executions. I have tried to utilize examples that demonstrate what can happen in a particular situation and how it might have gone better or worse.

Example 1: A Market Order Sent Electronically in a Low-Volume ETF

A market order sent in a high-volume security in small size will most likely be executed at the national best bid or offer. In an extremely liquid security, a market order can do well to satisfy execution needs.

In a low-volume ETF, however, the results can be extremely costly in relation to where a trade may have occurred if liquidity had been sourced correctly. Exhibit 6.5 shows the results for a market order that is sent in a low-volume ETF. The ETF typically trades approximately 4,000 shares per day, and the market order was to buy 43,000 shares. It is a unique situation that a market order was sent at 10 times the daily average volume. It is typical, and a testament to the structure, that on any given day an order for 10 times the daily average volume can take place in a low-volume ETF.

In this case, the market order took approximately 18 seconds to get filled and moved the price almost 15 percent from its initial on-screen market

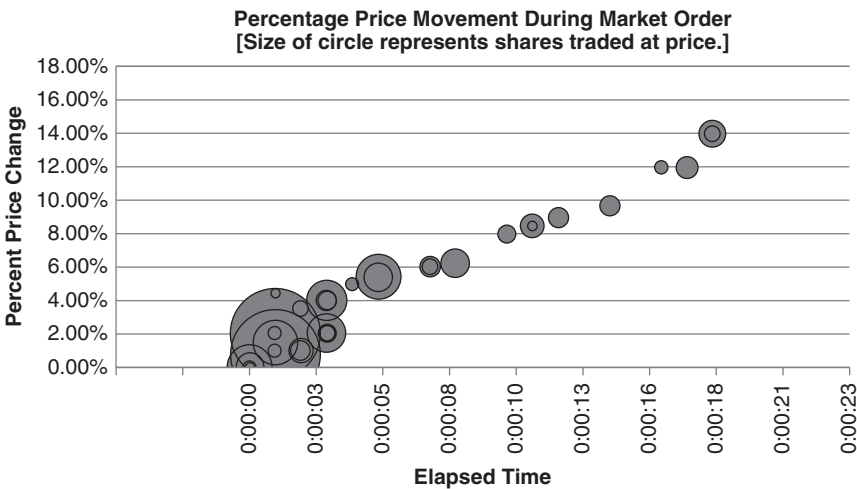


EXHIBIT 6.5 Percentage Price Movement During Market Order

prices. The bubble graph in Exhibit 6.5 shows the amount of shares bought at each level represented by the size of the bubble. The order was almost 50 percent filled up to approximately 5 percent from the initial market price. Then it continually took offers all the way up the market until it was finally completed. A representation of the execution as it appeared on the tape is shown in Exhibit 6.6.

As mentioned, the time for the whole execution was about 18 seconds. The market order kept plowing ahead and buying whatever shares of the ETF it could at whatever level became available. At no point does it stop to wait and see if any more shares will come in to fill in the order book. Market orders are based on speed of execution regardless of price. They have a valuable place in the order-type spectrum but can be very dangerous if not utilized properly by investors.

Example 2: A Large Risk Market and Agency Creation

In Exhibit 6.7, you can see a two-minute picture of the tape on a day in August 2008. The highlighted line displays a trade of 642,342 shares at a price of 25.59 that occurred near the end of the trading day in an emerging market currency ETF. The price of the trade is merely eight basis points above the most recent offer price of 25.57. Although it cannot be seen from the illustration, the size of the offer at that time was 100 shares, and the ETF had a daily average volume of less than 50,000 shares at the time. In this scenario, a customer called up an LP and asked for a risk offer in the ETF. Upon agreeing on the price, the trade was printed to the consolidated tape. This trade was 12 times more than the daily average volume of the ETF. To facilitate this trade, the market maker achieved exposure via the currency market to hedge the portfolio and then processed a creation to flatten out its short position in the ETF and its hedge.

At the time of this trade, the customer also gave an AP an order to buy an additional \$30 million notional of this same ETF benchmarked to NAV. In order to satisfy this order, the AP would do a creation. This is an agency creation on behalf of the client order underlying it. It is important to understand the distinction between the agency creation and the risk market because it highlights an interesting technique by the client. The customer positioned one-third of his or her desired size immediately by using a risk market. The client paid a slight premium versus the market for the use of that firm capital. Then he or she achieved the rest of the exposure via the creation process, which should equate to a price close to NAV of the fund.

In this scenario, the ETF had AUM of \$50 million when the customer placed the orders. The day after the creations had been processed, the fund would have AUM of \$100 million because the customer effectively doubled

EXHIBIT 6.6 Tape Display of Large Market Order

Time	Trade Price	Size Executed	Percent from Initial Price	Bid Price	Ask Price
13:05:01	\$35.92	2,500	0.00%	\$35.91	\$35.92
13:05:01	\$35.92	1,000	0.00%	\$35.91	\$35.92
13:05:01	\$35.92	100	0.00%	\$35.91	\$35.92
13:05:01	\$35.92	200	0.00%	\$35.91	\$35.92
13:05:02	\$36.28	200	1.00%	\$35.54	\$36.28
13:05:02	\$36.28	200	1.00%	\$35.54	\$36.28
13:05:02	\$36.64	200	2.00%	\$35.54	\$36.64
13:05:02	\$36.64	200	2.00%	\$35.54	\$36.64
13:05:02	\$36.44	2,500	1.45%	\$35.54	\$36.44
13:05:02	\$37.50	100	4.40%	\$35.51	\$37.50
13:05:02	\$36.66	10,000	2.06%	\$35.50	\$36.55
13:05:02	\$36.19	10,000	0.75%	\$35.50	\$36.19
13:05:03	\$36.28	500	1.00%	\$35.55	\$36.28
13:05:03	\$37.18	300	3.51%	\$35.55	\$37.18
13:05:03	\$36.28	700	1.00%	\$35.54	\$36.28
13:05:04	\$36.64	1,800	2.00%	\$35.57	\$36.64
13:05:04	\$36.64	300	2.00%	\$35.56	\$36.64
13:05:04	\$36.64	400	2.00%	\$35.74	\$36.64
13:05:04	\$37.36	2,000	4.01%	\$35.55	\$37.36
13:05:04	\$37.36	400	4.01%	\$35.55	\$37.36
13:05:04	\$37.36	500	4.01%	\$35.55	\$37.36
13:05:05	\$37.72	200	5.01%	\$35.65	\$37.72
13:05:06	\$37.86	2,500	5.40%	\$35.69	\$37.86
13:05:06	\$37.86	1,000	5.40%	\$35.69	\$37.86
13:05:08	\$38.08	500	6.01%	\$35.55	\$38.08
13:05:08	\$38.08	300	6.01%	\$35.55	\$38.08
13:05:09	\$38.16	1,000	6.24%	\$35.55	\$38.16
13:05:11	\$38.79	400	7.99%	\$35.55	\$38.79
13:05:12	\$38.97	700	8.49%	\$35.56	\$38.97
13:05:12	\$38.97	100	8.49%	\$35.56	\$38.97
13:05:13	\$39.15	500	8.99%	\$35.57	\$39.15
13:05:15	\$39.40	500	9.69%	\$35.58	\$39.40
13:05:17	\$40.23	200	12.00%	\$35.72	\$40.23
13:05:18	\$40.23	600	12.00%	\$35.72	\$40.23
13:05:19	\$40.95	310	14.00%	\$36.11	\$40.95
13:05:19	\$40.95	900	14.00%	\$36.11	\$40.95
13:05:27	\$36.26	200	0.95%	\$36.26	\$40.92

EXHIBIT 6.7 Display of Large Risk Market

Time	Trade Price	Size Executed	Bid Price	Ask Price
15:58:12			\$25.51	\$25.56
15:58:12	\$25.52	500		
15:58:14			\$25.51	\$25.56
15:58:16			\$25.51	\$25.57
15:58:16			\$25.51	\$25.58
15:58:16	\$25.56	100		
15:58:16			\$25.51	\$25.56
15:58:17			\$25.51	\$25.57
15:58:28			\$25.51	\$25.57
15:58:59			\$25.51	\$25.57
15:58:59	\$25.59	642,342		
15:59:00			\$25.51	\$25.57
15:59:00			\$25.51	\$25.58
16:00:24	\$25.59	900		
16:00:24	\$25.57	100		
16:00:24			\$25.51	\$25.59

the size of the ETF. At the same time, the customer, who was concerned about potentially owning 100 percent of the fund's outstanding shares, was comfortable with owning only 50 percent of those shares once the creations were completed. This is an excellent method for achieving exposure. If you are not sensitive to intraday price movements of the ETF, waiting for an overnight execution via the underlying constituents can give you the exposures you want without an impact on the market. If the customer went to the LP with a request for a market in the whole size, he or she would have had a greater impact because the price offered would have been further away from the market as quoted. In this case, the customer was able to secure one-third of the position immediately, therefore participating to some extent in any price move between the time of trading and close of business in the underlying constituent market.

Example 3: A Basket Trade Executed Overnight

In this example, the customer wanted to gain exposure to the Japanese markets via an ETF that trades in the United States. Since an international ETF trading during the U.S. trading day is a price discovery vehicle for attempting to determine where prices would be trading when the market next opens, the customer decided to use the underlying basket for achieving the exposure and to receive a report in the ETF the next day. It is important to note that,

EXHIBIT 6.8 Display of an Average Price Block Trade on the Tape

Time	Trade Price	Size Executed	Conditions
9:27:55	38.6163	250,000	Average Price, Form T, Nasdaq Trade Reporting

even though the customer is not paying the premium or discount from price discovery, he or she is assuming the risk of market move by waiting for the overnight execution.

The customer places an order with an ETF trading desk, which is also an AP, to buy the basket underlying the ETF at the volume-weighted average price in Japan overnight. At the end of trading, the AP will calculate the implied price of the ETF from the basket executions; add in the appropriate charges for creation fees, brokerage costs, and commissions; give the customer an ETF price and share amount; and then print the trade to the tape.

In Exhibit 6.8, a few things should be highlighted. The trade prints to the tape at 9:27:55 a.m., before the market opens for trading. The trade price goes out four digits, indicating an average price. This can also be seen in the conditions printed with the trade. Since this is the first trade on the tape for that trading day, there have not been 250,000 other shares that could have been traded at various prices to make up the average price, further confirming that this was probably a trade done based on the underlying basket traded in the local market.

This trade did not put the trading desk at risk because the customer did not ask for a market. Therefore, there is no risk premium attached to the trade to make it more expensive. By trading the underlying basket of the ETF, the customer was trading the ETF in NAV terms, with just costs attached, removing the variability of the price discovery mechanism of premiums and discounts that can occur during the U.S. trading day.

THE 10 KEYS TO TRADING ETFs

There is an easy way for investors to avoid all of the potential pitfalls associated with learning how to become the head trader for your ETF portfolio. The following 10 Keys to Trading ETFs will enable any investor to master their execution process. With these 10 simple guidelines, you'll be able to understand what you need to know to handle implementation of any size ETF portfolio from the smallest retirement account to the largest institutional portfolio.

1. Understand the fair value of the ETF you intend to trade.
2. Try not to trade during the first 15 and last 15 minutes of trading.
3. Focus trading of ETFs with various underlying assets at times when those assets are trading and overlapping with the U.S. trading hours. For example, trade Europe-focused ETFs in the U.S. morning while those markets are still open.
4. Utilize the full gamut of order types when available:
 - a. **Place a limit order.** Limit orders are most effective when they are placed in relation to the IIV of the ETF with domestic underlyings or in relation to an eNAV when trading an ETF, where the underlyings are not trading at the same time as the basket. When doing so, you should be cognizant of where the ETF should be trading.
 - b. **Do not use market orders.** This order type is only good for specific trading strategies in a select number of very-high-volume ETFs.
 - c. **If you must use stop orders, only use stop-limit.** It is important to place your limits appropriately to increase your probability of execution. I would recommend avoiding stop orders in ETFs as they provide a false sense of security for managing a portfolio. In many ways they introduce a measure of risk in the trading function while they are being utilized to reduce risk in the portfolio management function. This makes no sense from an overall portfolio management perspective.
 - d. **Utilize algorithms only when appropriate.** You can use any algorithm on either the actual ETF shares or the basket of constituents. If you are looking to trade a large amount of shares in a low-volume ETF, you will essentially be the VWAP; so using that type of algorithm is not advisable.
 - e. **Have an authorized participant process an NAV-based transaction.** If you are satisfied being based on the closing prices, this will produce a price at NAV. If you have the AP utilize an algorithm of some sort to trade the basket throughout the day, this will provide an execution at an implied NAV price. This does not have to be in creation unit size but will involve trading the underlying basket and interpolating those executions into ETF shares.
5. Place limits within reasonable range of fair value, where they can realistically expect to be executed.
6. Utilize liquidity providers for blocks of more than 5,000 shares or 25 percent of ADV.
 - a. If you are an institutional investor or an advisor, you have access to the ETF liquidity providers for risk markets.
 - b. If you are a client of a large broker-dealer, all broker-dealers have ETF trading desks that are in the business of committing capital for block trades or facilitating NAV-based executions.

- c. If you are in a wealth management business, you probably would have to direct your intermediary trading desk to get you a risk market either from its LP relationships or from a liquidity aggregator.
- 7. Get a sense of how much of an impact in the market your trade might create as compared to other trades of similar or larger size in the past.
 - a. You can work with the capital markets desk at ETF issuers or your brokerage firm to get a transaction cost analysis (TCA) study done on your anticipated trade to determine best methods for executing and expected impact on the markets.
- 8. Understand when you need to utilize risk capital from traders versus when you can have them trade the basket on your behalf.
 - a. Having trading desks and liquidity providers utilize the creation and redemption feature (and other functionality) of the ETFs is very important in the efficient execution of ETF order flow. Customers can take advantage of this unique ability to grow and reduce shares outstanding. They benefit from it once they understand how it works. Although ETF providers have made tremendous efforts to get this information to their client base, the rapid adoption by new users means that the education process must be advanced. Many issuers have been building up their sales forces on the educational side to teach clients best practices on execution for their ETF order flow. This saves clients money and enables them to move further along the curve of available products. Utilizing ETFs that may be showing less average daily trading volumes but offering different exposures is changing the way that investors manage their portfolios.
- 9. Develop a relationship with your execution platform or liquidity provider. An open trusting relationship helps them to understand your goals and helps you to achieve them by navigating a complicated ETF trading landscape.
- 10. Do not undervalue the true cost of not paying attention to the execution of your ETF positions. Executing efficiently in the ETF markets is critical for the performance of your portfolios and can be easily achieved with a small amount of work.

NOTES

1. Here is the list of all available order types as listed on the NYSE Euronext website for NYSE Arca equities:
 - Market order
 - Limit order
 - Inside limit order
 - Reserve order

- Adding liquidity only (ALO) order
 - Good-till-cancel order
 - Primary-only (PO) order
 - PO+ order
 - Primary sweep order (PSO)
 - Immediate-or-cancel (IOC)
 - Fill or kill (FOK)
 - Post no preference (PNP) order
 - Post no preference blind (PNP B) order
 - Tracking limit order
 - Passive liquidity (PL) order
 - Midpoint passive liquidity (MPL) order
 - Discretionary order
 - Discretion limit order
 - Passive discretionary order
 - Cross order
 - Midpoint cross order
 - IOC cross order
 - Post no preference (PNP) cross and post order
 - Pegged order
 - NOW order
 - Market-on-close (MOC)
 - Limit-on-close (LOC)
 - Auto-Q order
 - Intermarket sweep order (ISO) for IOC
 - Intermarket sweep order (ISO) for PNP
 - Intermarket sweep order (ISO) for IOC cross orders
 - Intermarket sweep order (ISO) for post cross orders
2. IndexUniverse.com, “db x-trackers Offers Facility to Trade at NAV,” May 29, 2009.
 3. Matt Hougan, *A Guide to Exchange Traded Funds* (Autumn 2008).

Market Participants and Their Trading Strategies

In the early days, the specialists were the primary liquidity providers (LPs) in exchange-traded fund (ETF) products. They facilitated order flow that was customer driven, flowing from the broker-dealers heading toward the exchange floors. At some point in the late 1990s, investment banks realized there was money to be made intervening in and facilitating this flow. Many of the active participants in ETF trading have come from the realm of index arbitrage, portfolio trading, or equities traders who have migrated into the space over the years. This business of providing liquidity away from the exchange (e.g., at a broker-dealers), is called the “upstairs market.” It has been a learning experience for many firms; this upstairs business has developed from almost nothing in the mid- to late 1990s to become a very profitable source of revenue. The businesses of providing block and electronic liquidity and stock loan portfolios have grown the most rapidly. This chapter describes the participants and interprets some of their primary behaviors. Knowing the motivations of your counterparts in the markets will help you to get your ETF orders executed efficiently.

The explosion of ETF block trading and order facilitation occurred when equity block trading revenues were beginning to show signs of decline at major investment banks and ETF usage started to rise dramatically. The banks developed desks covering the ETF product line and began to find ways to trade the products. In many ways, providing liquidity in ETFs is a combination of two trading methods that the banks already did very well: large block facilitation and basket trading. Take block traders and give them a way to truly hedge their positions by trading a basket of underlying stocks, and you create a powerful revenue stream. The institutions became early adopters of the process. Due to natural evolution, banks were able to generate revenue streams from all the corollary businesses around the product as well. Also, this was a very profitable product line for specialists on the exchange floors. Many of those early ETF traders have since migrated to upstairs businesses, continuing to provide liquidity.

When the institutional customer base got involved, it was because customers saw the opportunity to trade a futures-type product that was actually a listed equity. It would enable them to hedge a large portion of their portfolio with relative efficiency. ETFs also provided institutional investors with a way of getting risk markets in the index space. Up until that point, only a handful of futures existed. Even fewer allowed block prints, and it was rare to get capital commitment risk on index swaps. Hedge funds could now employ their trading strategies in the index space, and ETFs quickly amassed a user base with large amounts of capital. Customers were used to executing large blocks of stocks via institutional desks at investment banks, so they naturally started sending ETF flow through those desks. The desks realized that, if they traded the underlying basket, they could hedge themselves efficiently and provide markets to their client base, and the business of being a liquidity provider (LP) grew.

Liquidity provider and market maker are interchangeable terms. One (market maker) denotes an official capacity and obligation set by the exchanges, but they both use their balance sheet and various sources of liquidity to facilitate all forms of client order flow. It is also here where a lot of clients get confused about available liquidity. Taking only the ETF volume and not the underlying basket-interpolated volume does not give you a valuable picture of the true liquidity of the product, as was discussed earlier in this book. LPs are accessing this additional volume so that they can facilitate order flow. This has created massive liquidity opportunities in some of the products.

There are five unique forms of LPs, each interacting with ETF order flow in a distinct manner in the market. There is some overlap, but I distinguish between them because they play different roles. The five types are:

1. Broker-dealer facilitation desks
2. Proprietary market-making firms
3. Lead market makers (LMMs)
4. High-frequency trading firms
5. Liquidity aggregators

Reviewing the typical goals and roles of each of the participants will help you understand the ETF order flow food chain. We are going in no particular order because many of the players act in different roles depending on market circumstances. Knowing the players enables investors to price orders more efficiently and understand what might be happening when questions arise.

BROKER-DEALER FACILITATION DESKS

The biggest investment banks, which also have clearing departments and wealth management arms, typically have two areas that handle the facilitation of ETF order flow: the institutional ETF trading desk and the intermediary trading desk. Some of the order flow can be handled by both desks, although not all can. Typically, discretionary-based order flow from the wealth management businesses cannot be facilitated with firm capital and needs to be segregated out from the proprietary trading desks. This is discussed in further detail later in the section on intermediary trading desks.

Institutional ETF Trading Desk

The institutional ETF trading desk is typically a feature of the equities or equity derivatives departments. It works in conjunction with the equity derivatives group, portfolio trading, and institutional sales. This desk typically handles all of the institutional customer businesses revolving around ETFs. The main functions are:

1. Committing firm capital to facilitate block trades in the secondary market
2. Dealing in the primary market doing creations and redemptions as authorized participants (APs)
3. Using firms' trading infrastructure to access the underlying ETF liquidity for customers
4. Maintaining stock loan inventory

The primary clientele of these desks traditionally has been the hedge fund and long-only institutional community. This recently has been changing, however, as larger advisors use the products and change the nature of order flow for the desk.

The desks have been growing over the last few years as the requirements of being a full-service ETF desk have also evolved. In the late 1990s, when building the desk at Bear Stearns, we were able to cover most trades with an international and a domestic trader. Now traders with knowledge of the different asset classes of commodities and fixed income are also needed because of all the different types of ETFs in the marketplace. The continuing growth and asset class expansion of the ETF product has actually broken down barriers in these firms. Now the products that are classified as equities and sit on the equity trading desks need trading information and capabilities

from international equities, fixed income, currency and commodity trading groups. To create the best ETF customer service, these firms are leveraging all the talent across their whole firm. ETF-specific sales positions are being created for the first time. Not only is the ETF user base now large enough to support such a role, but the services for them are robust enough to need dedicated staff.

Earlier I presented suggested requirements for building a full-service ETF trading business. The systems required are extensive. Beyond the typical client order management systems, there needs to be advanced real-time pricing systems and a group tasked with building and maintaining the models for ETF pricing. There are currently more than 1,800 U.S.-listed ETFs. Sophisticated systems are needed to bring in all the underlying securities and weights for each ETF and price them in real time so that markets can be priced effectively. Staff members are needed to monitor corporate actions, index changes, and dividends. Then smart order routers and basket trading systems for all asset classes are needed to handle the hedging. Since the hedging is no longer just equities and future based, but can be bonds or commodities of wide variety, there also needs to be advanced risk management and position monitoring systems that can recognize and value all asset classes in multiple currencies and break down each ETF into its constituent parts. One of the most attractive features of being a trader on the institutional ETF trading desk is the diversity of potential experience. ETFs are a melting pot of asset classes and require traders to bring together many parts of the firm that did not previously need to interact or coordinate. The desk can be trading baskets of global securities, commodities, and bonds and interacting with a wide variety of players throughout the firm. The downside is the same: Many of the main trading desks have been unable to break down the barriers between other asset class divisions in the firm and thus efficiently hedge certain underlying types. This has left open the doors for product specialists to enter the ETF market-making business.

Since the ETF marketplace has exploded from next to nothing over the past 15 years, so has the client base of the desk. Over the same time period, the institutional community has expanded rapidly as hedge funds have proliferated. Some of the biggest businesses focus on servicing the needs of these firms and facilitating large blocks of ETFs. Other big customers—passive accounts using ETFs for transitions, cash equitization, and money management—have also become significant clients of ETF desks. In the future, we will continue to see the client base grow and evolve to include more sovereign wealth funds, 401(k) and Individual Retirement Account platforms, financial advisors, and retail investors.

Another feature of large broker-dealer ETF trading desks is facilitating stock loan inventory. The current inefficiencies of the stock loan business

are astounding. The stock loan desk is typically part of the clearing business. Stock loan desks are not traditionally the firm's risk-taking desks, and they do not typically maintain risk positions. The stock loan department would take the inventory of the firm positions and lend them to the Street, attempting to optimize the balance sheet. In the ETF business, you can create inventory in order to lend it to the Street. These creations typically are done on the ETF trading desk, and the positions are maintained on that desk. This situation enables ETF traders to better monitor the risk embedded in maintaining an ETF position versus its underlying basket, such as rebalances, corporate actions, and tracking error. The stock loan desk takes those positions and lends them to the Street at a better rate than the costs to maintain the positions, and the profits are split between the stock loan and trading desks.

The desks at the broker/dealers typically facilitate client flow on a proprietary basis. They make markets (provide liquidity) with firm capital for clients and handle agency flow, creations, and redemptions. As the client base grows to understand the benefits of using ETFs in the form of net asset value (NAV)-type transactions, either via algorithms on the basket or benchmarking to the close, the desk is doing more business with large firms on an agency basis. This is also bringing the user base along the curve of available ETFs into the domain of those that show lower average daily trading volume but have plenty of underlying liquidity available via the underlying basket.

Another major feature of broker-dealer institutional ETF trading desks is their capacity as APs. ETF providers have entered into agreements with all the main ETF desks to enable them to transact in the primary issuance market utilizing the creation and redemption mechanism. Because the creation and redemption of ETFs is one of their most important features, I consider this functionality of the desks primary to their importance in maintaining positions balanced both on the Street and on the broker-dealer balance sheets. The main business of making large block markets in the ETFs would be riskier and costlier if they were unable to adjust their positions with the issuer at the end of each trading day. They can clean up their balance sheet usage and move large assets onto the books of the ETF issuers, or vice versa. This keeps the ETF trading around NAV and enables the LPs to start each day with a clean sheet. Additionally, they are able to utilize this feature for the wide variety of financing trades surrounding the ETF business.

While the institutional ETF trading desk is handling a considerable amount of the flow, providing clients with large-size risk markets on demand, another alternative is an intermediary: an agency-only internal trading desk.

Intermediary Trading Desk (Advisor Platform Trading Desk)

The clientele of the intermediary trading desk has evolved with the adoption of the ETF product line. As recently as a few years ago, if you were situated in a wealth management or private client services department of a large broker-dealer, order flow would not reach your own institutional ETF trading desk. Even now, some large ETF trading desks cannot deal with intermediary trading desks that handle order flow from the brokerage and advisory businesses. But the adoption of ETFs, and the generation of large-block ETF order flow, is changing the nature of the order flow from wealth management businesses. Access to the desk typically is determined by whether the customer business is discretionary or nondiscretionary. All order flow from the advisory businesses is kept segregated within the prime brokerage business and runs through the intermediary trading desk. All advisor clients, large or small, have access to an equity trading desk dedicated to them. This desk is agency-only, in most cases, meaning they are facilitators of your orders. They either use in-house algorithms, or source liquidity from the multitude of market makers available. They do not charge a fee and are not a revenue center. They sometimes have limited access to their own institutional ETF trading desk because of regulations but they are, in general, large clients of all the other market makers on the street. The regulations have unwittingly created a situation where a middle player needs to intervene between an ETF trading desk and the firm's own wealth business, which inevitably adds fees that are borne by the end investor. I consider the regulations regarding discretionary order flow not receiving firm capital to be outdated because of the advances in risk management now available via technology.

The intermediary desk has had to learn how to access liquidity in the ETF product line. Historically, intermediary desks handled agency-based order flow, which they would take directly to the floors or, more recently, to dark pools and internal crossing engines. Now the advisory businesses have embraced the ETF product and are pushing farther down the product curve. They do not want to be restricted to using the top 20 percent of available ETFs because they are not only using ETFs for basic beta exposure. They want to be able to access the product that can fit into the alternative alpha categories as well. The volumes in these products are lower, but the underlying baskets still provide liquidity if they can be accessed, and the client base is pushing to use more of those products. The intermediary trading desks have become the new experts at accessing ETF liquidity.

The accessing of the liquidity takes place primarily through the use of external LPs and market makers or liquidity aggregators. These platform

desks have made deep relationships with the largest trading desks on the Street and have access to the same first-class technology, infrastructure, and balance sheets that the largest institutional clients receive.

Advisor-Based Order Flow—How It Works A few years ago, advisors with large ETF orders in low-volume ETFs might have been told by their platform trading desk that their order is too large for the product. Since then, ETF issuers and trading desks have been relentlessly educating all those touching ETF orders on how to best execute these products. ETFs do not trade like stocks, and therefore should not be judged by their ADV. ETF issuers continue to reaffirm this message to all types of desks that receive ETF orders as well as all types of ETF users. ETF market makers have also been educating these platform trading desks on the types of services they can provide for all their ETF execution. These services range from trading strategy consultation, electronic algorithm access, underlying ETF liquidity access, NAV executions, and everything in between. These platform desks that aggregate flow from all sorts of advisors have become large clients of the Street. Their flow has gotten so big that all types of ETF market makers would like the opportunity to compete for this flow. What this means for the end-advisor and client is that their quality of markets and liquidity has increased over the recent years. These platform desks, though, have also evolved and have become experts on who is the best liquidity provider for certain types of trades as well as specific underlying exposures.

ETFs present all manners of asset classes across the world. It is not common to find one liquidity provider that has expertise in everything. The platform desks should know what each liquidity provider is most proficient in to help get the advisor the best possible execution. I have compiled two order flow diagrams to display how the flow is working for the advisor community. Exhibit 7.1 focuses on nondiscretionary or transaction-based order flow. Because of the nondiscretionary nature of this order flow, some is allowed to go directly to the institutional ETF trading desks at the large firms. This is highlighted by the dotted line shown from the order box to the fourth box down detailing sourcing liquidity from the ETF desk or outside liquidity sources. There are generally different firm-specific internal rules about order flow that advisors must understand in order to process their orders.

In Exhibit 7.2, we can see the flowchart for order flow based on discretionary account business. This type of order flow usually cannot interact with the in-house institutional ETF desk because of compliance reasons. Therefore, larger flow is taken outside the firm to the liquidity providers and aggregator community.

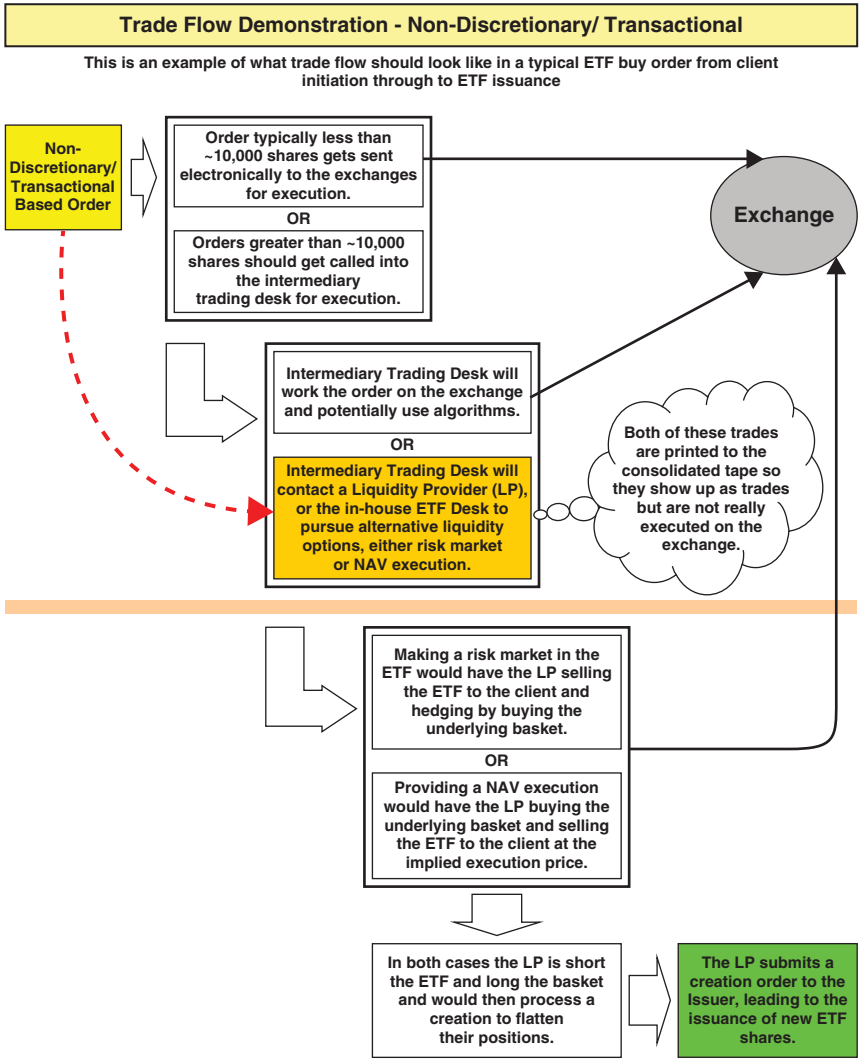


EXHIBIT 7.1 Trade Flow Demonstration—Nondiscretionary/Transactional

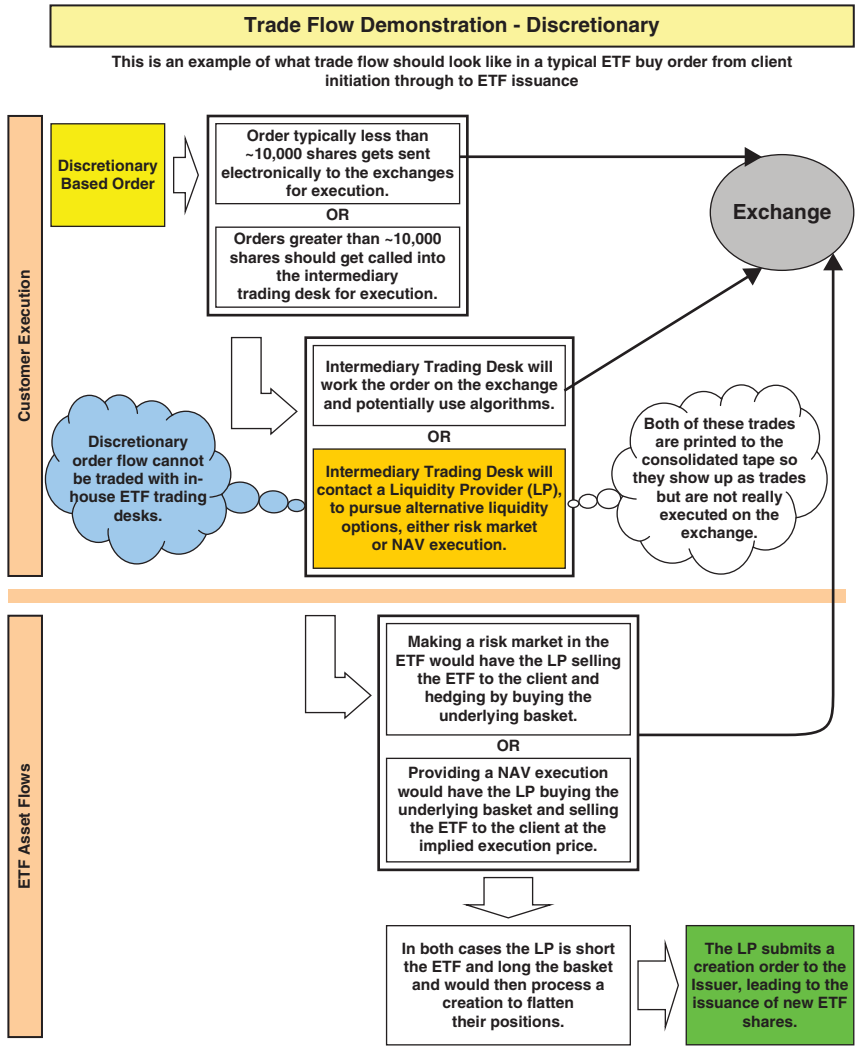


EXHIBIT 7.2 Trade Flow Demonstration—Discretionary

ELECTRONIC MARKET MAKING

A variety of different players provide liquidity in ETFs. They can be proprietary arbitrage desks, market makers and LMMs, statistical arbitrage, and high-frequency trading firms. According to some accounts, electronic trading firms provide more than 60 percent of the average daily volume in U.S. equities. Because of the unique structure of ETFs in particular, these firms provide a tremendous amount of liquidity in the products, with some trading exclusively in the ETFs. The ETF markets have grown so that they make up more than 25 percent of the U.S. Average Daily Dollar Value traded.¹

Proprietary Arbitrage Desks

Businesses that focus on capturing pricing differences between the ETF and the respective underlying baskets are performing a trading strategy called “proprietary arbitrage.” These businesses can be either stand-alone trading firms that manage their own or investors’ money or desks within large investment banks. Dodd-Frank has had a significant impact on proprietary trading at banks, causing many ETF trading businesses to move outside the banking structure. The businesses are focused on pricing out the underlying basket of the ETF and trading it versus the actual ETF shares. They are not facilitating customer order flow; they are getting involved only in trades that will reward them with a profit between the ETF and their respective hedge. I consider this to be an expansion of the index arbitrage businesses that used to focus only on the difference between futures and baskets of stock. Over the last several years, there has been much growth in the number of indexes available and the ETFs issued that track those indexes, creating tremendous opportunities to arbitrage the spread between the two fungible parts. It is difficult to determine what has caused the tremendous growth in the business of statistical arbitrage trading: the availability of these new arbitrage pricing spreads or the increased availability of technology fast enough to trade baskets of stocks at incredible speeds. Most likely, it is a combination of the two. Volume has exploded in recent years in many ETFs as the result of the growth of the ETF arbitrage and statistical arbitrage trading businesses.

A proprietary trading group is an LP without an underlying sales and commission structure. While the group is servicing investors by providing liquidity, it is not dealing directly with those clients. LMMs sometimes interact with order flow at a less advantageous price to satisfy the minimum requirements of the position; however, this occurs only because of the advantageous pricing scheme for LMMs. There are no fees being paid to

a proprietary trading group by the market center beyond standard trading volume rebates. The group makes its money in trading profits. An LP in the form of a proprietary trading group will be making markets electronically, hoping to interact with order flow as it comes into the system. It typically is pricing at different levels of profit depending on how much it wants to interact and how much it wants to profit per trade. I consider proprietary trading groups to be LPs because they are typically not hitting bids and taking offers but are being taken and hit by order flow coming into the marketplace. Because of order types with hidden size and the ability to do high-speed order refresh and flashing, there is almost no way for liquidity-seeking order flow to determine how much liquidity is available at the different pricing levels without testing each level with an actionable order.

Current market structure has made minimal movement toward consolidating order flow onto one exchange to aid in available depth. This situation has led to the proliferation of dark pools that further fragment the market. An LP is waiting for orders that typically have already screened against all other natural customer order flow and are now flowing into the markets because of a favorable price limit or are market orders. Since the goal is profitable interaction, waiting for the overflow from dark pools and trading desks has become less attractive. So many of these businesses are now opening up client-facing arms to try to capture flow further up the food chain. This can have a benefit for investors by removing certain middlemen and leading to tighter spreads without the additional fees they might have paid in the past.

Hedging is of primary importance to profitability for market makers. Although trading at the right price will be important for initiating the position, being able to hedge yourself effectively and lock in your expected profit is what sets the different participants apart. Much of this comes down to advanced systems and good analysis on correlation trading. In the domestic ETFs, profits are a function of getting great execution in the basket or futures in real time. When moving into the international realm, profits are a function of having a good hedge that correlates with your position and being able to unwind that long and short position before financing eats away at your spread. There are typically two ways of managing the risk, either position-by-position hedging or global risk bucket. In a position-by-position hedge, when you trade an ETF you typically try to hedge that trade using the basket or other correlating vehicle. When you are using a global risk bucket, all your trades go into a pool and your systems assess the risk of the entire portfolio and try to hedge those risks dynamically. The transition of large ETF liquidity providers toward using global risks books has led to an increase of liquidity at tighter spreads in a wider variety of ETFs because they are able to apply a wider variety of hedges against those positions.

Today's proprietary ETF market-making firms are some of the largest participants in terms of number of traders and abilities. Broker-dealer trading desks have fewer traders covering a very broad number of ETFs. At the proprietary arbitrage shops, you will see more specialized traders covering increasingly smaller segments of the ETF market. These proprietary shops are responding to order flow and therefore are focusing where the order flow is. These shops do better in names where there are fewer participants, wider spreads, and more opportunities for arbitrage. There is a delicate balance between a name having enough volume and wide enough spreads versus some of the names with incredible volume that are trading at spreads less than a tenth of a cent, and, last, some names with wide spreads that do not trade enough volume to be worthwhile. The arbitrage shops will be monitoring most, if not all, of the ETF market to respond to order flow in the markets and requests for bids and offers.

Lead Market Makers

I consider LMMs (formerly known as specialists) to be a subset of proprietary trading firms. In many respects, they are pursuing the same businesses: arbitrage between the ETF and its respective basket. However, LMMs are registered with the stock exchange in a partnership through which they agree to meet minimum liquidity requirements for which they enjoy a modified fee structure received from the exchange. LMMs are there to provide basic levels of liquidity. This is a very different job from that of specialists before ETF trading went electronic. As exchanges have evolved, there are no longer definitive closes where all orders must get filled. The opening and closing prints were a big part of specialist fulfillment roles in the past.

As previously discussed, in ETFs, specialists on the floor of the American Stock Exchange were the early profiteers in spreads between the ETF and its underlying, or the hedge. Much of the trading in the first several years of the ETFs was done on the floor of the exchange and facilitated by the specialists. This was before Unlisted Trading Privileges made the actual listing venue somewhat irrelevant. Specialists had a time-and-place advantage that enabled them to see all order flow and participate when appropriate. As that business changed and moved to electronic venues, the lead market-maker roles moved upstairs and became entwined with the proprietary arbitrage and customer facilitation desks. It is both less expensive and more flexible to have traders on a trading desk than on a floor. In many cases there are advantages to placing liquidity on multiple markets at once, eliminating the need to be on one exchange.

The most basic requirements of being an LMM are discussed earlier in the book. LMMs typically are providing liquidity to the retail order flow

that makes its way down to the exchanges via a variety of different order entry systems. One of the main tasks of LMMs is to be the LP of last resort for order flow. LMMs are not obligated to completely fill all orders that come into the systems, but they do have minimum requirements in terms of facilitation and market width and depth that must be met.

The key to this role is that by satisfying the minimum requirements of being an LMM, you inject some form of minimal liquidity for interaction with the order flow coming through the pipes in exchange for a slightly modified fee structure for trading. Recently, it has been debated in the marketplace whether the remuneration makes it worth being an LMM with even the most minimal of requirements. The requirements, however, aren't stringent enough to help the neediest of ETFs, which is the new issue. There is current debate and innovation from exchanges on how to support new and less traded ETFs while helping lead market makers make it economically worthwhile. Remember that there are more than 1,700 ETFs listed in the United States that have LMMs with minimum requirements that need to be met. That is a liability for them, especially on days like August 24, 2015, when they are still expected to meet their requirements.

The evolution of ETF trading will be the ability to access that underlying liquidity electronically in ETF terms. That evolution can either come out of exchange advancements or an entrepreneurial trading house seeking to expand their ETF trading participation. Currently, ETF quote requirements for LMMs are not based around size and depth of the underlying market, which has to do with current market structure, numerous exchanges, and fragmentation of order flow. A system that makes it valuable for LMMs to be providing deeper and tighter markets in those ETFs that have available underlying constituents would help to incubate an expansion of the ETF market. This would make it cheaper for investors to trade the newer ETFs and would aid in ETF growth and development. It would also increase the value of these ETFs to LMMs. The role of LMM transformed from the old specialist system, but more can be done to rethink the role as a potential incubator of new products. Those products that grow quickly and attract a large following will not need to be attended to by an LMM, but sometimes can be their most profitable products. Product issuers and the exchanges have made several proposals to address some of these concerns. The system will continue to evolve until we have reached a point of equilibrium so that being an LMM is truly a worthwhile endeavor for a trading firm, and the presence of that LMM is valuable to the ETF issuer and the investor.

High-Frequency Trading

In an ideal world, the price and liquidity of an ETF and its underlying constituents would be economically equivalent all the time. In practice, because

of all the different types of participants, the two separate assets can dislocate from each other for small periods of time. The high-frequency trading systems are trying to take advantage of that opportunity for profits.

They are using models looking at volatility and expectations for future moves in order to make small amounts in incredibly small time periods, even down to microseconds. However, because of the fungibility of the underlying basket and options and other derivatives on many ETFs, the products present a wide variety of different opportunities for trading strategies. High-frequency players have become another liquidity source by creating even more volume in many ETFs. Their existence and growth highlights the diversity of product uses resulting in the greater development of the ETF business.

The convergence of many different trading styles into the same products enables higher volumes and satisfies many different needs simultaneously. The presence of high-frequency players enables other players to utilize the volumes they create to facilitate their own strategies, creating even more volumes. The strategy works well in ETFs because some players trade the ETF versus the underlying baskets or other available derivatives; others are trading available volumes utilizing tick anticipation strategies; and still other players, such as the investment community, are somewhat price insensitive. And still others are trading to position for either hedging or performance. As with any instrument, volume begets volume. The consolidation of all these players in the ETF enables them to feed off of each other's differing strategies to create the perfect ecosystem for massive volume growth.

LIQUIDITY AGGREGATORS

Because of the wide variety of ETFs in the marketplace, it has become very difficult for trading desks to be proficient in every represented underlying asset class. They have a customer base, however, that is ever hungrier for the newer ETFs with the more esoteric exposures as sources of alpha for their portfolios. Many of the smaller orders flow to the exchange floors and can be satisfied by the electronic market makers, but there are still larger investors who need to be able to trade in sizes greater than 10,000 shares. A different type of liquidity provider has developed to satisfy this need for markets in the more arcane instruments. This newer type of liquidity provider is called a "liquidity aggregator." They evolved from interdealer brokers (IDBs), who used to stand between brokers who want to swap positions for myriad reasons. Now, they stand between a host of market makers, proprietary and customer-facing desks, and the end ETF user. They use their long-standing relationships with the market makers to put an order into competition and

get the best price. If a client does not have the market-making relationships or trading landscape acumen, liquidity aggregators can offer much value in execution. The extensive relationships that liquidity aggregators have with the trading community can be very beneficial for the ETF investor base. They work similar to a lending tree organization. By calling several LPs simultaneously for markets, aggregators cause them to compete for access to the customer flow, thereby leading to tighter market spreads with deeper size for ETFs. LPs are happy to trade for slightly less spread in bigger size rather than not participate at all. From a customer perspective, you can get access to several LPs at once and/or get specifically to the LPs that might specialize in the product type you are interested in trading. The matching up of client demand with available potential liquidity is a win-win situation. This liquidity aggregation can be done via phone or through newer electronic systems that enable real-time aggregation without speaking to anyone directly. Many of the larger platform execution teams have evolved their own form of liquidity aggregation where they call several desks simultaneously for competitive pricing. The entrance of a variety of electronic liquidity aggregation tools is changing the landscape for this service very rapidly.

We have seen this form of evolution in ETF pricing and liquidity from early days. It leads inevitably to tighter available pricing in more size for the client base. The ETF issuance stream and the customer base have recently eclipsed the growth of LPs, which has led to a smaller than desirable number of trading firms providing liquidity in ETFs. More room for growth exists, especially as the product investor base continues to expand in its desire to move farther along the product curve to use less frequently traded and newer products. If the product pipeline continues unabated, there will be further demand for larger LPs or those that focus on industry niches.

TRADING STRATEGIES

The growth of assets in ETFs would not have been possible or nearly as successful without the creation and redemption (C/R) mechanism. In the introduction to this book, I discussed features that distinguish ETFs from their predecessor products, the mutual and closed-end funds (CEFs). The C/R mechanism is the feature most responsible for ETF success. It is important to remember that ETFs did not have first-mover advantage in the grand scheme of investment funds. Nor did they have first-mover advantage in the listed funds world. CEFs offered certain similar exposures listed on U.S. exchanges long before ETFs. When a product comes into the marketplace offering similar exposures in a different and more efficient structure, it is the structure that truly makes a difference. It is the unique structure of ETFs

that has enabled the product line to compete well against the existing product leaders.

I have seen this firsthand in my evolution from a CEF specialist into the head of a major ETF trading desk and then even more closely from my perch inside a leading ETF issuer. A prime example of a niche where the ETF structure was the late and last entrant to the marketplace but has become dominant is U.S.-listed Indian exposure. In the particular example of India investment products, you can see several Investment Company Act of 1940 ETF products enter the market and successfully compete with long-established CEFs and exchange-traded note products. The Indian ETFs that came after those in CEF and mutual fund form have grown larger and faster. A newer, more efficient structure overtook older, less efficient vehicles. A similar phenomenon can be seen in the fixed-income products where the opaque and slow fixed-income market is being modernized by investors' desire to be able to trade bond ETFs on exchange with ample liquidity and full transparency in their portfolios.

The C/R mechanism has broadened the arbitrage trading opportunity between indexes and funds that previously existed in the marketplace. For many years, index arbitrage desks monitored the spreads between the main index derivative products, futures, and their underlying indexes. Limiting that business was the relatively small number of indexes that were tracked by futures, which reduced the number of potential arbitrage opportunities. The ETF, a product that acts like a listed future in a structure similar to an equity product, has brought an entirely new universe of tradable indexes to the marketplace. Now there is the potential to track every ETF versus its underlying index and monitor those two separate yet fungible trading products for arbitrage opportunities. Add to this the growth in the corollary derivatives markets for options and single-stock futures, and you see that the opportunities for arbitrage trading have increased exponentially.

A long list of variables determines arbitrage success in ETFs. Differences in financing rates, trading speeds, hedging techniques, and even pricing estimation enable many different practitioners to coexist. In the example of a straightforward U.S. domestic ETF, the competition to arbitrage between the basket and the ETF is dominated by speed. The basket is trading in real time with the ETF, so you are able to price and trade both products simultaneously. Since they are completely fungible via the creation and redemption feature, it is a pure arbitrage trade. There is typically minimum financing embedded in the trade because you can trade during the day and unwind after the bell on the same settlement cycle. You have the ability to trade the perfect creation unit, so you have no market exposure if you get complete execution on your order flow. The main differentiating factor between two different pursuers of this strategy is speed of processing and execution.

It must be understood that, although a number of trading firms monitor these arbitrage trades, the barriers to entry of capital-intensive infrastructure keep the number of participants limited to those firms willing and capable of investing in the required technology and operations.

Typically, the arbitrage opportunity appears when you can take advantage of a dislocation between the basket and the ETF because another market participant executing some strategy either in the ETF or in one or all of the underlying stocks is not concerned about the relationship of these two products. In many cases, the market participant could even be dependent on the efficiency of the arbitrage market to keep pricing in line. An example would be if there was a large outright buyer of a U.S. domestic ETF with typically high intraday trading volume and a known presence of arbitrage traders. This buyer could leverage the presence of the arbitrage players by buying what liquidity becomes available in the ETF, assuming it is coming to market at prices relative to the underlying basket. I emphasize the word *relative* because the buyer is probably paying a small premium in the marketplace for the ETF, which includes loss to trade and a margin to profit.

I have coached execution firms in the past on developing trading strategies in ETFs. They were sending ETF order flow to the exchanges in large enough size to push prices far away from the underlying value. This process was feeding the participating arbitrage community. There are smarter ways to execute ETF order flow because while ETFs trade on exchanges, they are more dynamic than stocks and should be handled differently. I have spent much of the past six years educating execution desks on how ETFs work, which market makers are out there supporting liquidity in the ETFs, and how to best access the liquidity. The consultation ranged from creating an in-house ETF trading desk to harness the arbitrage themselves and pass the benefit back to their customers, to as simple as making introductions to market makers and electronic systems to access these market makers. In the end, it is the ETF user that benefits from more efficient ETF executions.

International ETF Arbitrage

When you attempt to do arbitrage between an ETF and its underlying basket of international stocks, there are many more factors to consider. First and foremost, an ETF trading during the U.S. market hours with a basket that is closed during this time frame is acting as a price discovery vehicle for the future trading levels of the underlying basket. It is no longer pure arbitrage if you are trading the ETF versus the value of a closed basket; the technique is to find a correlating asset or basket that has some relationship to the ETF. Ideally you would be able to run a 24-hour trading book in which you could trade the ETF versus the correlating hedge during U.S. hours and the

correlating hedge versus the underlying basket during local market hours. This way you will be left with ETF versus the basket that you can flatten through the C/R mechanism. The difficult-to-find link is the correlating hedge that trades during both time frames. Trading strategies in international ETFs involve several other dynamics. First, there will be some financing costs because of the time differences due to the fact that positions will have to be held at least for one day. Next there are specific trading nuances in every different international market that involve taxes and fees related to transactions. There can be currency exposure and currency trading necessary to fully hedge a position. Finally, there can be slippage on any of the legs of exposure and their hedges. The crux of the trading in this type of strategy is the trader's own estimation of fair value, or eNAV. The interesting part about trading on eNAV is that it is a personal opinion or estimation. This means that every trader can have a slightly different view leading to varying bids and offers and can even introduce trading across different strategies using different assumptions. The ability to speculate on a closed basket makes these ETFs so powerful. Prior to their existence, such exposures were nearly impossible to achieve during U.S. trading hours. Those that were available had greater risks owing to less efficient structures.

It is important to understand the difference between trading price and basket value in an ETF with international underlying components. And it is equally important to understand the real meaning of the premium or discount. If an ETF with Japanese underlying stocks is trading at a discount to IIV during the U.S. trading day, it is not necessarily showing an arbitrage opportunity. It is showing that traders of the ETF expect the Japanese market to open at a point lower than it closed the previous night. The magnitude of the expected market move is where an arbitrage opportunity can arise in this situation.

A simplified example will demonstrate this concept. In the example, you have developed a model, from back-testing and correlation studies, that shows a certain group of U.S.-listed stocks that predict almost exact movements in the Japanese basket of stocks that is replicated by ETF INTL. By watching the movement of that group of stocks, you can estimate where the market will be trading upon opening in the morning in Japan. Now, during the U.S. trading day, that group of stocks is trading 4 percent lower, showing that the constituents of the ETF will open approximately 4 percent lower in Japan in the morning. In actuality, ETF INTL is trading 6 percent lower in the U.S. market at the same time. This probably would be showing up as a 6 percent discount to IIV since it is based on the close of trading in Japan.

This is a potential trading opportunity where you can buy the ETF down 6 percent with the potential to sell the underlying basket in Japan down the expected 4 percent on the open. There is a problem, however, in that

if you just buy the ETF down 6 percent during the U.S. trading day, the pricing variables may change between your purchase time and the time of the Japanese market open. During this span the perceived discount can be completely erased, leaving your portfolio at risk. You can attempt to lock in your arbitrage spread by selling the group of stocks short to lock in the price differential, but this will leave you with an up-and-down position. You are now long ETF INTL and short the group of stocks. In theory, in this example, you are hedged and have locked in a spread. The only way to actually capture that spread would be to unwind both sides simultaneously after the price differential has narrowed. This is not pure arbitrage. It is quite different from the arbitrage available in a domestic ETF trading at the same time as its basket. In this scenario, the ideal situation would be that the discount narrows between your estimation of where the fund should be trading and where it actually is in the market. Then you would be able to sell ETF INTL in the market and buy back the group of stocks, closing out your positions and capturing the spread differential. But since you are speculating on an overnight movement, you probably are holding the position for at least one day. Also, in this simplified example, we are assuming that the correlating hedge has an equal amount of offsetting foreign exchange exposure so as to isolate the bet on the equity piece. If the hedge is, for example, a group of American companies and not American depositary receipts, representing Japanese companies, you would have to put on a yen currency trade to hedge out exposure inherent in the U.S.-listed ETF with yen underlying constituents (ETF INTL). This is the type of trading and hedging that happens in ETFs all the time. These international ETFs trade at a price that represents an estimation of a basket of stocks. They are trading independently from each other. The trading community has models that it uses to estimate fair value (eNAV) at all times during the trading day. Members are trading those ETFs versus their correlated hedges based on their eNAV estimations.

You can interpolate the trading in the other ETF asset classes of commodities, currencies, and fixed income along the same lines. Sometimes the basket and the underlying asset will be trading at the same time, and you can enter into a more pure arbitrage-style trade. At other times they will be trading separately, and you can trade spreads between the ETF and an estimation of the value of its underlying assets utilizing a proxy hedge. In all cases the C/R mechanism can be used for establishing positions on either side or for unwinding those same positions. But it cannot be used to collapse your proxy hedge positions and free up your balance sheet because the vehicles being traded are not perfect replications of both the ETF and the underlying basket. They are, therefore, not acceptable to the ETF issuer via the in-kind C/R process. More recently, institutional investors have begun utilizing the ETF as a mechanism to position a basket of stocks or bonds. That process would

simply be buying the ETF and then having an AP redeem the fund and deliver the underlying assets to the investment account. To date, the ETF is a completely look-through vehicle, and in most cases can be exchanged directly for the exact slice of the fund that it represents. Investors and traders can decide which is most valuable for them to hold at any given time.

Stock Loan Facilitation

Another type of trading strategy that utilizes the C/R process but is not looking at discounts and premiums versus the underlying baskets is the financing trades. The purpose of the position is the facilitation of stock borrows. The stock loan market has been a good source of profits for the clearing firms providing stock borrows in ETFs. It is surprising that there is not a central clearinghouse with published rates and available quantities of stock that investors can access and utilize as needed. This is an OTC market and the lack of a centralized system has created an opaque market where two investors can pay vastly different prices to borrow the same stock. Each investor remains subject to the terms and stock loan accessibility of their own individual broker. This has led to a proliferation of financing positions in ETFs for the purpose of providing ETF inventory for loan. In a trade where financing is the most important function, high-speed trading capabilities are rendered irrelevant, and rates at which the firms finance themselves reign supreme.

The most basic trade is to facilitate the borrow demand of an ETF by creating shares to lend them out to the market. The procedure for this type of facilitation would be to do what is known as a “short creation.” In a typical creation, the AP buys the basket of underlying stocks and delivers those to the issuer. In a short creation, instead of buying the underlying constituents, the AP would borrow the underlying basket shares and deliver those borrowed shares to the issuer. The AP would receive them and in turn deliver newly issued shares of the ETF. The process of delivering the borrowed shares of the underlying basket to the issuer creates a short position on the books of the AP, which is hedged by a long position created from the ETF issuance. The AP now has a market-neutral position. If the ETF rallies, creating a profit, the underlying basket short will rally equally, creating an offsetting loss.

To value the position you have to take into account the various elements of financing costs and remember to recognize the interest rate risk. The financing rates are usually determined by one-month Libor rates and change daily. Exhibit 7.3 presents the various costs of maintaining a position that is long an ETF and short the underlying basket.

The long cash rate is determined by the interest charged on money used to buy the long asset, plus management fee depreciation, minus any benefit

EXHIBIT 7.3 Cash Flows of a Long ETF and Short Basket Position

This is a summary of the cash flows when maintaining a long ETF position hedged by a short position in the basket.

Long	Short
ETF	Underlying Basket
Pay Financing on Purchase	Receive Financing on Cash Received
Pay Management Fees	
Receive Dividends	Pay Dividends
Receive Loan Rebate	Pay Borrow Fee

from the ability to loan out long positions. The short cash rate is calculated by the interest rate received on cash raised from the asset sale minus the cost of borrowing shares from the lender. The dividends are typically offsetting because the ETF is a pass-through vehicle; any dividends owed on the short side are also paid through to the ETF holder on the long side (except in various international markets where there are tax withholding securities). Your intent is to receive more in loan fees than you are paying in the financing fees and management and borrow fees.

Since this is not a trade done in the market, and you are perfectly hedged, the prices at which the ETF trades in the marketplace are irrelevant. If the ETF happens to move to a premium in the market, you may be able to unwind your position at a price favorable to its initiation parity; however, that is separate from successful operation of the stock loan facilitation. The typical method of entry to this type of trade would be through the C/R process. It can also be entered, however, via the electronic trading of the ETF and the basket; the costs of that type of entry can vary depending on the fund. If you plan to sell baskets and buy ETFs in large quantities and there is no demand for lending the ETF, then it will be more expensive to position the trade because the loan value of the long ETF shares will be lower. Every day there is a cost to maintaining the position because of the expenses as accounted earlier. And there is the additional expense of opportunity cost by tying up the balance sheet, which has become quite expensive as market participants seek optimization of profits resulting from decreased availability of leveraged capital.

There are two ways to find opportunities in the stock loan market. You can seek out the demand from the stock loan markets and then do short creations to facilitate this demand. A difficulty with this method is that there are many market participants pursuing this same low-risk strategy. The second approach is more proactive, creating newer ETFs to spark demand.

This involves taking calculated risks that there is short interest waiting for shares to become available for borrowing. Your reward for those calculated risks will be a higher spread in a less crowded trade, enabling the loan of a higher percentage of your shares. Since much of the borrow market is based on overnight availability, this type of trading requires frequent monitoring and positioning of trades. But as market participants are using ETFs for longer-term long investments, they are adding some stability to the loan markets because they are able to provide borrows for long time frames at stable rates.

There is a swap market with other broker-dealers looking to lock in financing rates on their ETF positions for a set period of time. They meet through specific interdealer brokers to match up opposing positions and either borrow or lend from each other for a specified time period. This is also helping to stabilize this type of trading strategy. The trading desk, however, has to work in conjunction with the stock loan desk to make sure there is demand to loan out the long ETF shares in inventory. Facilitating ETF borrows has been a great profit engine for clearing businesses. If you are able to successfully track any changes in the basket, you will have negligible market risk. When the position becomes crowded and no longer profitable, you can easily unwind by using the redemption process. Because the ETF market publishes daily baskets, tracking is a very manageable risk, and daily C/R eliminates potential long-term exposures. At the point of unwind, you can deliver your ETF shares to the issuer; it will deliver you shares of the basket, which you can then use to close out your borrowed positions. ETFs are a great tool for shorting to hedge risk or offset other long exposures. The resultant demand to borrow ETFs is satisfied via the C/R mechanism and a firm willing to house that position on its balance sheet.

Statistical Arbitrage and High-Frequency Trading

Statistical arbitrage trading refers to a highly technical short-term mean reversion strategy involving large numbers of securities, a very short holding period, and IT infrastructure, according to Wikipedia. High-frequency trading can be viewed at a high level as trading strategies involving the most sophisticated technology to execute at incredibly high speeds broken down to fractions of a second. Statistical arbitrage may be a type of trading strategy implemented in a high-frequency manner, although it does not have to be the case. The ETF structure offers these types of traders opportunities to trade. These opportunities, or profit margins, are so small they are barely recognizable, and most likely executed before you can blink. However, the net effect to ETFs is liquidity and trading efficiency brought between the underlying baskets and the ETF itself.

ETF quotes seem to change at a far more rapid pace than do quotes for equities. This is understandable when you look at the calculation of the IIV and the movement of stocks in the underlying basket. When there is any change in the valuation of any of the underlying components, the implied value of an ETF changes. The change can be almost imperceptible but could potentially create an opportunity for trading and would require a change in your market. Exhibit 7.4 shows a very basic demonstration of how a change in the basket can change the valuation of the ETF.

EXHIBIT 7.4 Basket Price Changes Causing Movement in IIV

Scenario 1 - Beginning ETF IIV				
Stock	Shares	Bid	Last	Ask
1	10,000	\$25.00	\$26.00	\$27.00
2	10,000	\$30.00	\$31.00	\$32.00
3	10,000	\$35.00	\$36.00	\$37.00
4	10,000	\$40.00	\$41.00	\$42.00
		\$1,300,000.00	\$1,340,000.00	\$1,380,000.00
ETF	100,000	\$13.00	\$13.40	\$13.80
Scenario 2 - Bid Change Stock 1, Bid Change ETF IIV				
Stock	Shares	Bid	Last	Ask
1	10,000	\$26.00	\$26.00	\$27.00
2	10,000	\$30.00	\$31.00	\$32.00
3	10,000	\$35.00	\$36.00	\$37.00
4	10,000	\$40.00	\$41.00	\$42.00
		\$1,310,000.00	\$1,340,000.00	\$1,380,000.00
ETF	100,000	\$13.10	\$13.40	\$13.80
Scenario 3 - Last Trade Change Stock 2, Last Change ETF IIV				
Stock	Shares	Bid	Last	Ask
1	10,000	\$26.00	\$26.00	\$27.00
2	10,000	\$30.00	\$32.00	\$32.00
3	10,000	\$35.00	\$36.00	\$37.00
4	10,000	\$40.00	\$41.00	\$42.00
		\$1,310,000.00	\$1,350,000.00	\$1,380,000.00
ETF	100,000	\$13.10	\$13.50	\$13.80

Exhibit 7.4 depicts a very simple ETF with four component stocks. It takes 10,000 shares of each stock to create one unit of the ETF that equals 100,000 shares. You can see the current bid, ask, and last prices for each stock in the basket. Then, below those, is the implied ETF IIV from the basket. Scenario 1 depicts the ETF and its components in the first moment of monitoring the basket. In scenario 2, the bid price of stock 1 has changed, and this has caused an increase in the bid-side valuation of the ETF IIV (both are shaded in gray). Because of this bid-side move in the component, the ETF buyer should, in theory, be willing to pay a higher price for the ETF. An arbitrage firm watching that valuation would believe that it can sell the basket for a slightly higher price than a moment ago (scenario 1) and would be willing to pay a slightly higher price as well. While I do not show the market prices of the ETF, they would presumably move, in this case, because the valuation they are based on has changed. In scenario 3, the last price of stock 2 has changed. I am using “last price” to indicate trade price, so a change in the last price indicates that stock 2 has just traded at a higher price than it had a moment ago. The last price of the ETF IIV number is showing you the last trading price of the basket of securities underlying the ETF. While the bid and ask will show you the value that you can potentially trade at any given time, the last-price IIV is always a slightly backward-looking number in that it indicates the most recently known activity. All of these numbers will be used in the formation of algorithms for electronic trading.

TRADING TIP

A change in the last-price valuation of the ETF will cause a revaluation of expectations for where the ETF will trade next. To be clear, the ETF did not actually trade at that price; the basket underlying the ETF did. Since the two vehicles are completely fungible, and the ETF is a derivative of the basket, you can interpret that as an ETF trade.

If it was a basket-trading algorithm and it bought 10,000 shares of all four stocks in the basket at the last price in scenario 3 (\$13.50) and then sold 100,000 shares of the ETF simultaneously at 13.60, it would have locked in a \$0.10 gross gain on the trade. The size of this trade is not restricted to creation unit (CU) size. If the algorithm was able to buy only 1,000 shares of each stock, then it would sell only 10,000 shares of the ETF. In this case, it would have to continue trading to either unwind the positions or build up enough size for a full CU so that it can submit a redemption order to flatten

the books. It would make sense to assume that an algorithm will continue trading until the opportunity for profit has disappeared.

To do a basic calculation on the number of arbitrage opportunities potentially occurring every moment, let's look at the number of ETFs available. Let's say there are 750 U.S.-listed ETFs with an average of 100 components in each. If you are monitoring the bid, ask, and last prices of every component for all the ETFs, you are monitoring almost 225,000 quotes per moment. This does not even include monitoring price changes in the actual ETF market. The true numbers are most assuredly much larger! I use the term *moment* in this discussion because the concept of the length of time in that moment is decreasing almost constantly. The trading and calculation times for the statistical arbitrage trading business are down to milliseconds, or thousandths of a second. Timing and financing differences based on calculations similar to those previously described are what is driving the increases in volume in certain ETFs. And there is the set of decision calculations that is determining the probabilities of getting executions before other competing machines.

Some argue against growth in high-frequency trading businesses as a detriment to ordinary investors. I have not seen a compelling or statistically documented argument persuading me that that is the case. For an ordinary investor, whose typical size is very small, the high-frequency systems have narrowed spreads on many trading vehicles. They have also pursued efficiency among multiple products while driving away costly inefficiencies.

In the diverse world of ETF trading, I consider the electronic trading businesses to be acting in a beneficial manner. They are responsible for narrowing the spreads between ETFs and their underlying baskets, and they are providing liquidity to the investment community. When you move beyond the most liquid ETFs, as I described earlier in the book, a typical transaction takes place between a customer and a liquidity provider. As we have learned from several sections in this book, LPs are typically providing liquidity based on some arbitrage strategy, between the ETF and the basket, in some underlying derivative, or in some other correlating hedge vehicle. If these LPs were not pursuing these strategies, then ETF pricing would depend on matching natural customer buyers and sellers and would be less related to the price of the underlying basket. This would lead to less volume and wider spread in the products, and the ETF would act more like a closed-end fund.

CONCLUSION

The trading community stands between the asset owner (the ETF investor) and the asset manager (the ETF issuer). The community is critical to transfer

assets to the ETF issuers and support the ETF product. Any participant in the ETF industry must, at the very least, understand how the liquidity provider fits into the overall picture, and how to best access its resources. The trading community both benefits from and drives the growth of the ETF industry. There is high demand for traders and salespeople experienced in analyzing and trading exchange-listed products of all types. Even during the recent consolidation and repositioning of the major trading firms, there has been consistent positioning of market participants in the ETF space. Much of this is driven by the continued growth of the customer base adopting the ETF structure. The increase in volumes of ETFs has been good for both investors and industry professionals. Disconnecting the execution mechanism from the portfolio and asset management aspect of an investment vehicle will lead to increased efficiencies for investors in the future.

New avenues for investing, whether they are previously unavailable exposures or new strategies for outperforming a benchmark, are expanding the dialogue on how best to invest. Many in the industry are focusing on the looming battle between ETFs and mutual funds for trillions of dollars of actively managed assets. They realize the potential growth impact this can have on the ETF trading and investing communities. Both systems and people will have to continue to advance and evolve to satisfy the coming explosion in liquidity demands as trading shifts from portfolio managers and traders at mutual funds firms to trading desks of ETF liquidity providers.

The true consequences of the growth in the ETF marketplace will not be fully understood for many years. We know now, however, that the mechanisms embedded in open-ended issuance and creation and redemption are truly having an impact on the nature of investing.

NOTE

1. "Credit Suisse Trading Strategy—Market Structure," October 6, 2015.

Market Structure and ETFs—Protecting Your Portfolio from Flash Crashes

There have been two prominent events over the last decade that many investors have deemed so significant that they have been given names. If you look at the history of markets on a chart, notable events are typically given short names that aid in recollection of those events. The events are typically unique or independent, but in this case we have two market events that look similar from the outside so they have been given similar names in a series: Flash Crash and Flash Crash II, May 6, 2010, and August 24, 2015, respectively. Both events involved the markets moving dramatically lower and then recovering those losses in a similarly swift fashion. If you examine the actual events, you will see that while they do have some similarities, they also have some dramatic differences. In this chapter we'll dig deeper into these events to provide an understanding of what was taking place and what has changed, or will change, in market structure as a result. It is important to note here that the structure of the U.S. markets has become incredibly complicated with the addition of multiple exchanges, the growth in electronic order flow, and the spectacular advances in the speed of that order flow over the last decade. There is a constant battle taking place in the markets between those who want to execute efficiently on behalf of their portfolios and those who want to utilize market structure to take advantage of less sophisticated order flow.

I will go in reverse chronological order through the event descriptions in this chapter. I'll be discussing the more recent event, August 24, 2015, prior to reviewing what happened earlier. This may seem strange because, as you read, you'll see that some of what happened in Flash Crash II (FCII) is a direct result of policy implementations from the Flash Crash (FC). But I think it is important to examine what happened more recently, and get the historical perspective later. Immediately after the FC, ETFs were falsely accused as being causative, while after FCII the focus was more on the protection of the markets so that nothing impedes the fluidity of ETF trading.



EXHIBIT 8.1 The Flash Crashes across Time

The question might be, why even discuss these events in a book focused on the mechanics and trading of the products? The answer is that this is a book focused on teaching the critical elements of efficiently managing portfolios of ETFs, and that simply can't be done without understanding market structure and how our markets work. Yet in the grand scheme of history, these events will be considered minor. They even have difficulty standing out amid the more dramatic volatility of recent years. You can see them highlighted by the arrows in Exhibit 8.1.

FLASH CRASH II: AUGUST 24, 2015

What people consider to be the second flash crash occurred on August 24, 2015. August is usually a quiet month in the markets. This day and the days surrounding it were anything but. The day has become one of the most discussed days in the recent history of the markets and in the ETF industry, among regulators and exchange officials. What happened that day?

The overnight markets in Asia and Europe were extremely weak. Those markets were down between 3 percent and 5 percent as traders in the United States came into work on Monday morning. The Shanghai Composite index had dropped 8.5 percent overnight. The S&P futures mini-contract was limit down 5 percent, an unusual event in 2015. In pre-market activity, traders

and investors were inputting a tremendous amount of sell orders, looking to unwind positions or protect themselves from further risk. These orders were predominantly market orders that sought to sell at any level regardless of price. According to the NYSE, the number of market orders on August 24 was approximately four times the average. All of this fear and potential volatility in the markets would not necessarily lead to a flash crash. The trading and exchange systems are designed to be able to handle increases in volume and volatility.

Rule 48

The most dramatic change during the runup to the open of the markets on August 24 was the imposition of Rule 48¹ by the NYSE. Rule 48 suspends the requirements to make indications regarding a stock's opening price and the need for floor official approval before opening a stock for trading. This effectively removed visibility into the potential opening prices of hundreds of individual securities on the exchange. This was a crucial mistake.² In a world where many trading systems cue their pricing automatically from feeds, the NYSE attempted to add a human element back into the maelstrom. Instead of instilling calm it led to chaos. ETFs in particular are priced off the indications of the underlying stocks so delaying the openings and reducing visibility into the auction pricing led to ETF liquidity providers being forced to widen their markets until they could gain an understanding of the value of the underlying stocks.

One thing that we learned from the dramatic differences between 2010 and 2015 was the reaction to the event by the press and investors. In 2010, immediately after the Flash Crash, attention turned to ETFs as possibly being the cause of market turmoil. There were hundreds of articles written about how the products were still new and were potentially destabilizing to the markets. In 2015, the amount of ETF assets had more than doubled since the prior event and investors of all sizes were much more comfortable having ETF positions in their portfolios. Immediately after Flash Crash II there were almost no accusations against ETFs, but there were hundreds of research reports written focusing on the need to fix market structure in order to enable ETFs and their liquidity ecosystem to continue functioning and remain transparent. It had become painfully obvious to many market participants that removing transparency from the marketplace would inevitably negatively impact ETFs and their investors.

The Limit-Up/Limit-Down Halts and Bands

After the NYSE had invoked Rule 48, the transparency of the marketplace deteriorated. It became unclear to people removed from the immediate circle

of the exchange floor what levels stocks and ETFs might potentially open at and what the imbalances looked like. Then something new and unexpected happened. Immediately after the 9:30 a.m. open, there was a mass trigger of limit-up/limit-down (LULD) halts at a magnitude never before experienced or expected. This was actually an unintended consequence of a market protective measure put in place shortly after the original Flash Crash known as Rule 80c.³ After the original Flash Crash LULD halts were put in place to protect investors from dramatic price swings in individual securities and ETFs. Limit-up/limit-down halts enable a stock or ETF to be immediately paused upon triggering at a certain level away from its last price. The purpose was to give markets pause to replenish liquidity with the aim of reopening a calmer market with more thoughtful trading. On many occasions, in individual circumstances, they were proven valuable. There had never been a situation, however, where this many halts were triggered at the same time. According to J.P. Morgan, the volatility pause breakdown was as shown in Exhibit 8.2.

As a former ETF liquidity provider, I have some personal insight into what was happening around the liquidity providing businesses on that morning. As soon as it became apparent that there would be less visibility into auction prices of stocks, the process of being able to provide tight markets in ETFs was slowed. The interesting part of this Flash Crash is that the most affected ETFs in terms of pricing were those with U.S. underlying assets. This was because there was no visibility into the potential opening prices of stocks and no indications of the sizes of auction imbalances. Market makers were thus forced to widen their prices in those affected ETFs until there was some clarity of the value of the underlying assets. You can see the delays in the opening of stocks on the NYSE in Exhibit 8.3, which shows the time of opening for the 500 stocks in the S&P 500. You can see on the chart that I have highlighted 9:35 a.m. (five minutes after the typical market opens), and more than 50 percent of the stocks in the main index were still not open.

It is very important to understand that it was not only a function of the stocks not being opened that made the ETFs much more difficult to price, but that indications of interest in those stocks and order imbalances were

EXHIBIT 8.2 Limit-Up/Limit-Down Halts

	# of Halts	% of Halts	# of Symbols	% of Symbols
ETPs	1, 048	82%	330	70%
Stocks/Non-ETPs	230	18%	141	30%
Total	1, 278		471	

Source: JP Morgan

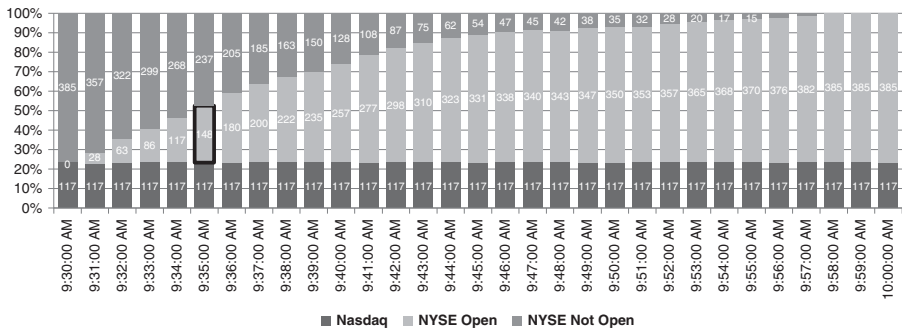


EXHIBIT 8.3 S&P500 Components Opening Trades by Minute, August 24, 2015
Source: BATS, 2015

obscured so that it was impossible to gain any understanding of pricing of the underlying equities. New investors are sometimes surprised by the fact that ETFs with international underlying assets can trade and act like price discovery vehicles while those markets are closed. They may then ask why ETFs during the Flash Crash could not be priced in a similar manner. Because a market is closed does not mean that there is insufficient information to assess the valuation of the underlying stocks. You can make very educated guesses about where a stock or a market will open next based upon all the available information in the marketplace. That is the key. Information about what is happening in other markets and other important pieces of news is in the marketplace. If there is information that can impact pricing that is not in the marketplace, then valuation moves toward impossible. In the case of removing imbalance information (transparency) from the marketplace, you remove the ability to assess the value of those underlying assets. The risk of making a tight market without waiting until this information about the underlying assets becomes clear is too great, so spreads widen out.

There is also an increased risk of order cancellation as prices swing in a volatile fashion. This is important to ETF liquidity providers. They are typically putting on an ETF position at a perceived discount to their hedge and simultaneously positioning a hedge to lock in their profit and eliminate market risk. If the probability increases that your ETF trade might get canceled from the tape because of erroneous print rules, then there is greater risk that you can be left with only one leg of an anticipated pair trade. This can expose your portfolio to tremendous risk and would lead traders to widen their spreads or reduce their trading until certainty about pricing has returned to the markets. After the 2010 flash crash, many trades were deemed erroneous and canceled. This left market makers with one-sided positions and cost them a lot of money. That fear and risk pervaded into the second flash crash and caused market makers to step away entirely when price swings got extremely volatile.

What Didn't Happen?

Flash Crash II was even more dramatic than the original Flash Crash. The DJIA dropped by 6.6 percent in the first 5 1/2 minutes of trading.⁴ It was actually worse than the original Flash Crash and was the worst point drop since October 2008. There was a mass trigger of LULD halts unlike anything ever seen before. What did not happen, however, was a slew of executions at stub quote levels of one cent per share. If you remember back to the original flash crash, at the height of volatility, many electronic market-making systems needed to widen their markets back to their stub quotes. This was a different event. First, the original FC was a systems-based event. There

were different quotes on different exchanges for stocks, and executions were not flowing back to firms in a timely fashion. You can read about those details later in the chapter. In this case, stocks were not being opened on the exchange, but it appeared that, beyond the lack of transparency around opening auctions, other things were working well. In addition, the introduction of LULD halts (since the original FC) blocked many ETFs and stocks from sweeping the books down to levels that would have overwhelmed the systems down to stub quotes. During FCII in 2015, there were no trades that occurred at one cent per share.

Another problem that did not occur on August 24 was a large quantity of clearly erroneous executions. According to research produced by J.P. Morgan, there were only two trades that were considered clearly erroneous during the maelstrom. This is significantly better than during the original flash crash. This is partly due to some improvement in erroneous trade rules since the first flash crash, and also partly due to market maker advances in understanding extreme volatility events and enabling their systems to behave more efficiently. This is not to say that there were executions in ETFs that took place at prices that were far away from their previous price, but those were much more limited than during the original FC. Again, this was helped by LULD levels. The takeaway here is that while there has been much media attention around the chaos caused by the LULD halts, they actually did serve to improve the consequences of an extremely volatile trading event.

Why Was My ETF Trading Away from Its Indicative Value (IV)?

There were still some concerns about the ETF arbitrage system's malfunctioning, with some ETFs trading dramatically away from their indicative value (IV). I think this is due to some investors not understanding exactly what was happening with IV during the event, and also what IV represents during the U.S. trading day. During FCII many stocks in the S&P 500 Index did not open in a timely manner. In the graph in Exhibit 8.3 you can see that by 9:35 a.m. more than 50 percent of the stocks in the index were still not open. It is important to understand that the indicative value of an ETF is a representation of the last price of each of the underlying assets in a fund, plus any excess cash, interpolated into an ETF price. So even though the market officially opened at 9:30, in an ETF with U.S. underlying stocks—many of which were not opened—the IV would be representing a combination of the last price traded in the stocks that were open and the previous closing price for stocks that had not yet opened. So the IV is not showing a value at that point, which would be representative of an appropriate price for a particular ETF.

Many ETFs traded at prices away from their indicative value because the IV was stale and not tradable. This is so important to understand that I want to walk you through an example. In the example we have an ETF with three stocks in the basket: IBM, AAPL, and GE. Assume it is 9:35 a.m. and AAPL and GE are open, but IBM has not opened yet. The ETF IV is showing a value of \$25.50, which is a combination of the last price in each of the three stocks in the basket (including a previous closing price for IBM because it has not opened yet) multiplied by their weight in the basket and then divided by the number of ETF shares they represent to translate the number into ETF terms. Assume also that while IBM is not yet open for trading, it correlates on almost a one-for-one basis with MSFT that has already opened for trading and is trading down almost 11 percent. You should then understand that if MSFT is down almost 11 percent, then IBM would be expected to be down almost 11 percent. If you apply that potential price change to IBM, bringing its last price down by approximately 11 percent, you can then calculate what would be a more realistic IV for the ETF. This number is roughly 1 percent lower than that IV being posted by the exchange at that moment. So because IBM is only about a 10 percent weight in the basket, an 11 percent move in the stock only really affects the entire fund's IV by about 1 percent. The reason why market makers could not use correlated instruments to estimate the value of closed stocks is that most of them, including the most popular benchmark, S&P and its future, were not trading. In FCII there was no clarity of value.

This calculation of fair value is being performed by ETF market makers and liquidity providers on a continuous basis throughout trading days. Not only are they using the actual basket of the ETF to calculate what they think its value should be at any given moment, they are also monitoring baskets and individual stocks with similarly correlating activity to try to interpret what may happen to an ETF in the future. It is incorrect to think that ETFs were trading away from their IV, and therefore the arbitrage mechanism had broken down. Instead, they were trading away from their IV at a time when that calculation was no longer representative of live trading events. Exhibit 8.4 shows an example of the calculation of indicative value while stocks are open and closed. This actually happens every day in the U.S. markets with ETFs that have holdings that trade in a different time zone, like Japan. An ETF with holdings of Japanese equities will trade away from its IV throughout the trading day because those underlying equities are closed at that time. During FCII, because so many stocks did not open, the ETF IV was rendered inaccurate until traders could find a value footing.

EXHIBIT 8.4 Estimated Indicative Value Example

	Last Price	Price % Change	Open/Not Open	Shares in CU	Weight	Notional
IBM	\$100.00	0.00%	Not Open	2,500	9.80%	\$250,000
AAPL	\$250.00	−9.80%	Open	5,000	49.02%	\$1,250,000
GE	\$75.00	−3.60%	Open	14,000	41.18%	\$1,050,000
						\$2,550,000
						IIV
US ETF Published Indicative Value				100,000		\$25.50
MSFT		−10.50%	Open			
	Last Price	Price % Change	Open/Not Open	Shares in CU	Weight	Notional
IBM	\$89.50	−10.50%	Not Open	2,500	8.77%	\$223,750.00
AAPL	\$250.00	−4.80%	Open	5,000	49.02%	\$1,250,000.00
GE	\$75.00	−3.60%	Open	14,000	41.18%	\$1,050,000.00
						\$2,523,750.00
						IIV
US ETF Estimated Indicative Value				100,000		\$25.24
					Change	−1.03%

What Do We Expect to Happen as a Result of FCII?

Certain changes are already occurring as a result of Flash Crash II. One of the immediate consequences is that liquidity providers started working on adapting their systems for a situation where hundreds or even thousands of halts happen simultaneously. It is no longer practical to think that a human trader can go through the circumstances for each name that is halted and assess the new levels for future halts and auction processes. All of that information will be built into the trading systems so that they can function well during extreme events. Remember, eventually there will be some changes in regulation to address the market events, but that could be years away and the markets will be open during that period. Going forward, the evaluation and reengagement of liquidity after LULD halts rolloff will be automated by the trading firms committing capital. It is also a function of capitalism that

market participants in today's environment will continue to evolve their systems to behave rationally at a time when investors around them are not behaving rationally, so that they can take advantage of the opportunities created by those events.

On September 8, 2015, the NYSE put into effect new and wider bands for the opening auctions of securities on that exchange. They expect that this will help to prevent mass halt triggers during periods of extreme volatility. I am also confident that the regulatory bodies will be assessing the efficacy of LULD halts and trying to further refine the process of determining the proper bandwidth.

I also expect there to be an assessment of erroneous trade rules and market halts to make sure that the individual limits on halts do not prevent necessary halts to the whole market when an extreme event is taking place. There should be some form of synchronization across exchanges for handling these types of events. I do not expect that there will be any regulatory framework around using indicative value as a metric for halting ETFs. This would be limited in its available scope, having value only on ETFs with open underlying assets. An interpolated fair value also has such a great range of difference from one market participant to another that it would be useless as a mechanism for halts.

ADJUSTING INVESTOR BEHAVIOR

When managing portfolios of ETFs, investors need to be aware of the risk profiles of different order types. Many advisors are using stop-loss orders to try to protect their portfolios during moments of high volatility. Those orders are introducing more risk into the execution process even though the intent is to reduce risk. A stop-loss order uses a trigger price in the ETF (or another listed security) that becomes a market order sent to the exchange for immediate and swift execution. The market order is price indiscriminant with a sole goal of getting filled. If you set your stop-loss orders to trigger at levels that will only be set off during periods of extreme volatility, then, at the worst possible time to trade without reasonable limits, you are effectively sending market orders into the system. Investors should not be using the stop-loss order type in this way. If you must use stop-type orders, you should be using stop-limit orders. Those orders will be sending an order for execution not at market, but with a particular price limit which it cannot go above or below. There is a greater risk of not getting executed, but much less of a chance that you will be sending a market order into an extremely volatile market situation. If you place your stop-limits correctly, you can also increase the odds that not only will you get executed, but that execution will

take place within a reasonable tolerance for the portfolio. This is probably the single most important change you should make in your execution process upon understanding how to manage your portfolio before, during, and after a flash crash. If you incorporate these changes and work within the additional trading confines of the Ten Keys to Trading presented earlier in this book, then you will be adding safety and efficiency to your portfolio execution process and not adding unexpected risk. If you look at the charts from both flash crashes, you will notice that not long after these events, the markets returned to normalcy and traded to even higher levels in the next few days. If you can avoid trading completely, or at least execute necessary trades intelligently, then you can remain mostly unaffected by these types of events in the market. The next section of this chapter reviews the details of what happened during the original flash crash.

THE ORIGINAL FLASH CRASH: MAY 6, 2010

For a period of approximately 15 minutes on May 6, 2010, markets behaved abnormally, as many equity and ETF securities saw trades occur at prices in the range of 40 percent or more down from their most recent prior trade prices. Nothing about these corporations or the ETF fund structure containing the equity in these corporations had materially changed over that 15-minute period to warrant such excessive drops in valuation. Why did this happen, and why hadn't it occurred before? What has been done to prevent it from occurring in the future? What is this new term in the lexicon—*flash crash*?

Once you have learned about this and looked deeply into the markets, you can see that small, “mini” flash crashes happen on a somewhat frequent basis. However, swift and broad market moves and recoveries of large magnitude affecting broad swaths of the market have really only taken place twice: May 6, 2010, and then again on August 24, 2015. In this chapter I will provide some details about both events, highlighting major similarities and differences. At the end, I will provide some details about what to expect from market structure in the future and how to protect your portfolio from these events.

Why Did ETF Pricing Seem to Stray?

After the events of May 6, 2010, there was no shortage of theories and assumptions that attempted to explain their true cause. It took the SEC/CFTC until September 30, 2010, however, to release its official findings.⁵ The almost five-month delay by a governing regulatory body

displays the complexity of the inner workings of the various exchanges and the markets in general.

Regarding ETFs, secondary market trading and pricing is based upon several factors; two of the most important are the underlying basket and the proxy hedge vehicle. ETFs trade differently than single-stock equities. A significant portion of ETF trading typically takes place between a customer and a professional trader or liquidity provider. Very rarely are two customers trading with each other. This becomes more pronounced as you get beyond the top 30 highest-volume ETFs, as can be seen from the inverse correlation between NYSE/Arca Lead Market Maker (LMM) participation rates and volume.⁶ In many cases, a seller in an ETF is making a sale to an ETF liquidity provider or market maker, who is pricing the bid level based on where they expect to sell the underlying basket at the same time, or their proxy hedge, to lock in some arbitrage-style spread. Thus, most ETF transactions are dependent on the market maker being able to accurately price and value the underlying constituents in the ETF.

The public now knows that on the day of the flash crash the Nasdaq and other exchanges had declared self-help against NYSE/Arca, indicating detection of some form of pricing discrepancy on U.S. equities, and that several stocks had entered “slow” mode in the period just before the market dislocation. Both of these events would cause a distortion in the calculation of fair value for an ETF, which would in turn cause a market maker or other liquidity provider to widen its bid–offer spread so as to move away from the inside market until a fair price could be determined. A simple thought process tells us that, in an ETF with a domestic underlying basket, if you cannot price the underlying basket, then you cannot price the ETF. This is not an ETF structural problem but a real-time data problem: An ETF is simply a wrapper whose value is derived from the value of its underlying basket of securities, so if you cannot gather accurate data on the underlying, you cannot assess the value of the ETF. At that moment in time, for example, if a mutual fund had been offering real-time net asset value (NAV) calculation (something ETFs are known for), it also would not have had a good or valid valuation. Furthermore, had the 15-minute price dislocation occurred between 3:45 p.m. and the 4:00 p.m. close, many mutual fund NAVs would potentially have also been struck at much lower prices as defined by wildly lower prints in their underlyings. The valuation process is the same for both types of funds, but one product provides a mechanism for real-time pricing and trading of the actual fund (ETFs), while the other product does not (mutual funds). In essence, the price dislocations affected every equity product that trades intraday, as well as any wrapper on those products.



EXHIBIT 8.5 SPY ETF Trade Price and Volume on May 6, 2010

Source: Bloomberg

Volume is another parameter that can cause an ETF market maker to move away from the inside market to reevaluate the fair-value calculation. While the markets work in millisecond time frames (or faster), volume spikes in extremely short periods can be used as an indicator of underlying market events worthy of attention. In Exhibit 8.5 you can see a chart of one of the most highly traded U.S.-listed ETFs. The chart shows the price of the fund (top) and the volume traded (bottom) over five-minute periods throughout May 6, 2010. It is clear that volume started to increase dramatically in percentage terms between 2:00 and 2:30 p.m., and then in the five-minute periods approaching (and at) 2:45 p.m., volume spiked dramatically. If the ETF typically trades approximately five million shares every five minutes and then for two periods that volume spikes to 25 and then 30 million shares per period, it would naturally cause a reassessment of risk parameters and pricing verification by the trading community. When the volume spikes occurred at the exact same time as pricing discrepancies between the exchanges, causing price verification problems, withdrawals of liquidity providers from the

market to check their quoting system are a natural reaction. You can see from the dramatic price rebound that day that as soon as price verification was determined, market participants were able to reenter the market and bring ETF prices back in line. One critical point to realize is that, during the market dislocation, when several equity prices were in “slow” quoting mode, volume swung to the ETF market as the proxy. The overall volume traded in ETFs for the days of May 6 and May 7 were the third and fifth highest, respectively, in volume history.⁷ This clearly demonstrates that ETFs have a role in the investing world and that there are enough participants who believe in the merits of the product. It confirms their natural use for myriad purposes from positioning to hedging and beyond, especially during times of market duress.

Closer Look at the SEC/CFTC Report Findings According to the SEC findings, the timetable looks as follows:

- 2:05 p.m.:** On May 6, 2010, due to increasingly violent protests in Athens over the Greek debt crisis, the euro fell sharply.
- 2:23 p.m.:** The Nasdaq exchange issued alerts of unusual price movements.
- 2:32 p.m.:** Some high-frequency trading (HFT) models began betting that there would be continued price declines by increasing short positions on S&P 500 E-Mini futures contracts.
- 2:36 p.m.:** Due to the massive number of orders, the exchanges were unable to comply with the terms of Regulation NMS,⁸ leading to pricing discrepancies across exchanges.
- 2:37 p.m.:** Therefore, Nasdaq, CBOE, and BATS exchanges enabled a “self-help” function and stopped routing orders to Arca, the electronic trading platform of the NYSE.
- 2:40 p.m.:** Several trading firms pulled out of the market due to the high degree of uncertainty, leading to a dearth of buyers and sellers.
- 2:44 p.m.:** Volume in S&P 500 E-Mini futures contracts had spiked up to six times the usual volume.
- 2:45 p.m.:** The E-Mini futures contracts plunged in value in a very short period. This triggered a CME circuit breaker to halt trading for five seconds.
- 2:47 p.m.:** The S&P 500 hit its low point of the day, a 9.1 percent loss off the intraday high. Shares of many equity and ETF securities traded as low as one penny and as high as \$100,000.

3:01 p.m.: NASDAQ revoked “self-help” and resumed sending orders to Arca for price matching.⁹

Some very important features of the September 30, 2010, SEC report can shed some further light on what happened regarding ETFs. On page 39 of the report we read:

*A large majority of ETF market makers with whom we spoke, and particularly those that value underlying stocks as part of their normal market making activities, paused their market making for considerable periods of time starting at 2:45 p.m. on May 6. We believe that this is one of the reasons equity-based ETFs were disproportionately affected by the extreme price volatilities of that afternoon.*¹⁰

One notable aspect of what happened is described at the very beginning of the report. On page 4, as part of the executive summary, the report describes trading pauses undertaken by many automated trading systems in response to extreme and sudden price declines. A trading pause is a logical function embedded into an automated trading system to allow market makers to assess market situations:

*Participants reported that these assessments include the following factors: whether observed severe price moves could be an artifact of erroneous data; the impact of such moves on risk and position limits; impacts on intraday profit and loss (P&L); the potential for trades to be broken, leaving their firms inadvertently long or short on one side of the market; and the ability of their systems to handle the very high volume of trades and orders they were processing that day.*¹¹

There can be either data integrity pauses, based around price moves, or feed-driven integrity pauses, based around quote latency, that will cause a trading system to stop trading to determine whether the calculated fair value is reasonable before continuing to trade.

It is also important to understand the use of what are termed “stub quotes” in this context, and how they relate to a pause in market-making activities. On page 38 of the same report we read, “In order to comply with their obligation to maintain continuous two-sided quotations, market makers utilize stub quotes if they choose to discontinue actively quoting.”¹² Thus, on May 6, while in the process of reassessing whether to reenter the market, some market-maker quotations had extended to stub quote spreads—for

market makers on Nasdaq or NYSE/Arca, such stub quotes could be automatically generated upon a market maker's withdrawal from the market. When market makers are unable to determine a fair value for an ETF because of some form of system or quoting issue, they may step back from their inside quote to assess the market. Their system can automatically generate a stub quote (not intended to be traded against) while they are developing a valid fair value for the ETF. A stub quote is essentially a placeholder bid and offer at extremely low and high prices. They are still technically "making a market" in a security and fulfilling their obligation, but the bid and offer is so unreasonably wide that no one would normally trade there.

Then, more conclusively, on page 40 we read, "Therefore, when professionals pulled out because of data-integrity concerns, ETFs may not have had the same level of resting liquidity far from the mid-quote as did large-cap stocks, allowing a disproportionate number of ETF orders to hit stub-quote levels."¹³ Market makers were not sure of pricing, so they moved out to stub levels, expecting not to trade, but were getting executed against because of market orders that were fired off and low levels of bids/offers on the books to accommodate those orders.

Another reason a market maker might not be confident of its quote is if an NYSE LRP (liquidity replenishment point) has been hit.¹⁴ On page 68 of the report we can read, "An LRP may be triggered even when there is additional interest on NYSE's order book beyond the LRP price point. In these cases NYSE will suspend automated quotations in the security, and will identify its quote on the consolidated tape with a 'non-firm' indicator. This is referred to as a 'slow market' or 'going slow' in the security."¹⁵ In the case where two competing quoting systems are being used, as a main and a backup, respectively, and they begin to show different prices because one has gone "slow," you would move away from the inside market until you can determine which price is truly indicative of where the market is trading. This process can cause problems for market makers in ETFs if their systems are pricing the ETF off the underlying basket, because their valuation quotes can be affected by stocks in "slow mode."

Although the events of May 6, 2010, are widely known, pricing discrepancies as well as the declaration of the "self-help" rule have occurred numerous times before and continue to occur quite frequently. The BATS Exchange provides a feed for when the exchange has declared self-help and consequently revoked this declaration at <http://batstrading.com/alerts/>. Many of the declarations last no longer than a minute (and many are even shorter than that).

To summarize, ETF market makers widened their quotes, causing a liquidity vacuum. As the markets kept falling, they triggered an avalanche of stop orders, which became market sell orders that swept down the order

books. This explains why we see executions at random levels and not all at \$0.01. Some executions happened at \$0.15, and some occurred at various other prices along the spectrum. ETF funds with many client buyers in the systems were able to absorb the selling, while others with fewer buyers were trading all the way down to \$0.01, which is the level to which many market makers had moved their quotes (stub quote).

To contrast 2010 with 2015, ETFs and single stocks were open and trading in 2010; however, in 2015, listed securities either had a delayed open or went into continuous trading halts. In 2010 uncertainty was caused by dramatic price moves, increase in volume, and pricing latency (i.e., there were delays in receiving last price data), which made valuing an ETF extremely difficult. In 2015 uncertainty was caused by delayed opens and trading halts of all securities and related proxy hedges, which made valuing an ETF extremely difficult. To compare both events, uncertainty around value and lack of transparency created a situation in which market makers widened their quotes dramatically. During both these events, stop-loss orders triggered by the steep declines, which turned into market orders, hit and lifted some of those stub quotes. In essence, transparency of value is required for proper ETF trading and market orders should be used with extreme caution, especially during volatile times.

Can This Happen Again?

The SEC made several recommendations based upon conclusions drawn from the events of May 6, 2010.

The first move, and probably the one with the most impact on the markets, was the implementation of a volatility-based trading pause program on stocks and ETFs.¹⁶ The SEC has piloted a program aimed at stemming a recurrence of these events. The pilot was meant to last only through December 2011 but has been extended several times. It will work as follows:

- For stocks that are subject to the circuit breaker program, trades will be broken at specified levels, depending on the stock price, between 9:45 a.m. and 3:35 p.m.
- For stocks priced at \$25 or less, trades will be broken if the trades are at least 10 percent away from the circuit breaker trigger price.
- For stocks priced between \$25 and \$50, trades will be broken if they are 5 percent away from the circuit breaker trigger price.
- For stocks priced at more than \$50, the trades will be broken if they are 3 percent away from the circuit breaker trigger price.

Trading pauses in individual securities due to extraordinary market volatility.

Where circuit breakers are not applicable, the exchanges and FINRA will break trades at specified levels for events involving multiple stocks, depending on how many stocks are involved:

- For events involving between 5 and 20 stocks, trades will be broken that are at least 10 percent away from the “reference price,” typically the last sale before pricing was disrupted.
- For events involving more than 20 stocks, trades will be broken that are at least 30 percent away from the reference price.

The SEC/CFTC acknowledges the greater interconnections of equities and derivatives markets. We would stress that this has become more pronounced as the futures markets are often used to facilitate the arbitrage functionality of some of the largest and highest-volume ETFs. This should drive a more unified rules system between the two markets to eliminate any potential for inconsistencies.

The report acknowledges that there were inconsistencies in the regulations regarding broken trades, leading to uncertainty, and endeavors to clean up this process. While the report notes in many places the importance, speed, and advanced technology of many market participants, it does not acknowledge that the continued adherence of the NYSE to a process of slowing down markets to allow for human intervention can cause unintended problems in the highly automated trading environment of modern markets. We should endeavor to adopt a fully automated system by all players on all exchanges, as a human-in-the-loop model is simply incapable of keeping up with current trading speeds.

Another crucial acknowledgement is that many market participants will employ their own, often harsher, volatility-based system integrity checks and pauses. This should lead us to consider the proliferation of ETF use among investors and how liquidity is provided in those products. It is understood from the report, as well as from common sense, that in many ETFs, resting orders in the order book provide less liquidity, while liquidity typically comes from interaction with a professional market participant. What is not clarified in the report, but should become the subject of study, is the relationship between the issuers of ETFs and the market-making community. Currently, there are no formalized relationships and, therefore, no incentives in place to protect quotes to the benefit of investors. Current regulations,¹⁷ which were created many years ago, prohibit any formalized economic relationship between the issuer of an ETF and its market makers. These regulations were developed before these newer fund-type investment products were traded on exchange, and it was not anticipated that new products would actually benefit from the provision of liquidity in a more formalized manner. It may be

determined through further research that finding a way for the issuer community to provide a backstop to liquidity providers to assure participation during extreme market volatility would benefit investors.

Key Point—Restrict Use of Stop Orders

Avoid unmonitored stop-loss and stop-loss-limit orders. Soon after May 6, NYSE/Arca put out an informational note about order flow: “It is important to note the NYSE/Arca does not offer stop market or stop limit order type. If a broker offers such order types to their client, the order type is maintained at the broker member firm level and when triggered, the broker then submits the resultant order to be executed to the exchange in any variation of limit or market order we offer.”¹⁸ It is not uncommon in the community of advisors to manage risk in ETF positions with stop-loss orders. These orders do not show up on exchange order books until triggered and sent as market or limit orders. There is no consolidated reporting of how many of these orders reside hidden on the order books of the various order handling desks at any given time.

SUMMARY

It seems clear from my research, and from that of the regulatory bodies, that ETFs were not the cause of the original flash crash and they were definitely not the cause of Flash Crash II. You can see in the evolution of the markets from 2010 to 2015 that ETFs have become a much more important part of the market infrastructure. There is a need for the regulatory bodies to try to develop specific market structure in which those products can be protected from these types of events. I see clear developments in market structure with an eye toward protecting the liquidity provision network that is so critical to keeping the markets functioning in a way that protects investor positions in ETFs. Additionally investors are learning ways to protect their own portfolios during these periods by trading less during the actual event and using specifically limited order types instead of throwing caution to the wind with market orders. It is interesting to note that the day of Flash Crash II, August 24, 2015, stands, as of the writing of this book, as the highest-volume trading day in ETFs. You can see the chart of the top-ten ETF trading days in Exhibit 8.6. You can also see that the original flash crash has registered as number six on the list. While I expect it is impossible to protect our markets from every type of extreme volatility event, as more will likely occur,

EXHIBIT 8.6 Top-Ten Highest-Value Trading Days in ETFs

#	Date	Value Traded
1	8/24/15	\$253,328,630,005
2	9/18/08	\$250,366,668,430
3	8/9/11	\$221,760,340,567
4	8/8/11	\$214,803,120,123
5	8/5/11	\$209,135,497,498
6	5/6/10	\$199,741,594,659
7	9/17/08	\$199,556,075,584
8	10/10/08	\$197,800,390,120
9	10/15/14	\$196,454,754,998
10	9/16/08	\$192,155,764,749

Source: KCG

it is important to continue to learn from these events and incorporate that experience into future structures.

NOTES

1. http://nyserules.nyse.com/NYSETools/PlatformViewer.asp?selectednode=chp_1_3_7_14&manual=/nyse/rules/nyse-rules/

Rule 48. Exemptive Relief—Extreme Market Volatility Condition

- (a) In the event that extremely high market volatility is likely to have a Floor-wide impact on the ability of DMMs to arrange for the fair and orderly opening, reopening following a market-wide halt of trading at the Exchange, or closing of trading at the Exchange and that absent relief, the operation of the Exchange is likely to be impaired, a qualified Exchange officer may declare an extreme market volatility condition with respect to trading on or through the facilities of the Exchange.
- (b) In the event that an extreme market volatility condition is declared with respect to trading on or through the facilities of the Exchange, a qualified Exchange officer shall be empowered to temporarily suspend at the opening of trading or reopening of trading following a market-wide trading halt: (i) the need for prior Floor Official or prior NYSE Floor operations approval to open or reopen a security at the Exchange (Rules 123D(1); and/or (ii) applicable requirements to make pre-opening indications in a security (Rules 15 and 123D(1)).
- (c) A suspension under section (b) of this Rule is subject to the following provisions:
 - (1) (A) Before declaring an extreme market volatility condition, the qualified Exchange officer shall consider the facts and circumstances that are likely to have Floor-wide impact for a particular trading

session, including volatility in the previous day's trading session, trading in foreign markets before the open, substantial activity in the futures market before the open, the volume of pre-opening indications of interest, evidence of pre-opening significant order imbalances across the market, government announcements, news and corporate events, and such other market conditions that could impact Floor-wide trading conditions.

- (B) Such review shall be undertaken in consultation with relevant officers of NYSE Market and NYSE Regulation, as appropriate. Following the review, the qualified Exchange officer or his or her designee shall document the basis for declaring an extreme market volatility condition.
- (2) The qualified Exchange officer will, as promptly as practicable in the circumstances, inform the Securities and Exchange Commission staff that an extreme market volatility condition has been declared, the basis for such declaration, and what relief has been granted.
- (3) An extreme market volatility condition may only be declared before the scheduled opening or reopening following a market-wide halt of securities at the Exchange.
- (4) A declaration of an extreme market volatility condition shall be in effect only for the particular opening or reopening for the trading session on the particular day that the extreme market volatility condition is determined to exist. The Exchange may declare a separate extreme market volatility condition on subsequent days subject to sections (b)(1) through (b)(3) above.
- (5) A declaration of extreme market volatility shall not relieve DMMs from the obligation to make pre-opening indications in situations where the opening of a security is delayed for reasons unrelated to the extreme market volatility condition.
- (d) For purposes of this Rule, a "qualified Exchange officer" means the Chief Executive Officer of ICE, or his or her designee, or the Chief Executive Officer of NYSE Regulation, Inc., or his or her designee.

Adopted: December 6, 2007 (NYSE-2007-111).

Amended: October 7, 2008 (NYSE-2008-102); October 24, 2008 (NYSE-2008-46); December 10, 2008 (NYSE-2008-127); December 29, 2008 (NYSE-2008-139); March 31, 2009 (NYSE-2009-35); April 13, 2009 (NYSE-2009-18); August 15, 2013 (NYSE-2013-42); May 13, 2014 (NYSE-2014-23); August 13, 2015 (NYSE-2015-33).

2. While not specifically acknowledging the use of Rule 48 as a mistake on the occasion of August 24th, the NYSE has recently proposed scrapping the rule as portrayed in an article in the *Wall Street Journal* entitled, "NYSE Files to Scrap Controversial Trading Rule" by Leslie Josephs and Bradley Hope, April 7, 2016.
3. http://nyserules.nyse.com/NYSETools/PlatformViewer.asp?selectednode=chp_1_3_7_14&manual=/nyse/rules/nyse-rules/

Rule 80C. Limit Up—Limit Down Plan and Trading Pauses in Individual Securities Due to Extraordinary Market Volatility

The provisions of this Rule shall be in effect during a pilot to coincide with the pilot period for the Regulation NMS Plan to Address Extraordinary Market Volatility.

(a) Limit Up–Limit Down Mechanism.

(1) Definitions.

(A) “Plan” means the Plan to Address Extraordinary Market Volatility Submitted to the Securities and Exchange Commission Pursuant to Rule 608 of Regulation NMS under the Securities Exchange Act of 1934, Exhibit A to Securities Exchange Act Release No. 67091 (May 31, 2012), 77 FR 33498 (June 6, 2012), as it may be amended from time to time.

(B) All capitalized terms not otherwise defined in this Rule shall have the meanings set forth in the Plan or Exchange rules, as applicable.

(2) Exchange Participation in the Plan. The Exchange is a Participant in, and subject to the applicable requirements of, the Plan, which establishes procedures to address extraordinary volatility in NMS Stocks.

(3) Member Organization Compliance. Member organizations shall comply with the applicable provisions of the Plan.

(4) Exchange Compliance with the Plan. Exchange systems shall not display or execute buy (sell) interest above (below) the Upper (Lower) Price Bands, unless such interest is specifically exempted under the Plan.

(5) Repricing and Cancellation of Interest. Exchange systems shall reprice and/or cancel buy (sell) interest that is priced or could be executed above (below) the Upper (Lower) Price Band. Any interest that is repriced pursuant to this Rule shall retain its time stamp of original order entry.

(A) Market Orders. If a market order cannot be fully executed at or within the Price Bands, Exchange systems shall display the unexecuted portion of the buy (sell) market order at the Upper (Lower) Price Band.

(B) Limit-priced Interest. Both displayable and non-displayable incoming limit-priced interest to buy (sell) that is priced above (below) the Upper (Lower) Price Band shall be repriced to the Upper (Lower) Price Band. Exchange systems shall also reprice resting limit-priced interest to buy (sell) to the Upper (Lower) Price Band if Price Bands move and the price of resting limit-priced interest to buy (sell) moves above (below) the Upper (Lower) Price Band. If the Price Bands move and the original limit price of repriced interest is at or within the Price Bands, Exchange systems shall reprice such interest to its original limit price.

(C) IOC Orders. If an IOC order cannot be fully executed at or within the Price Bands, Exchange systems shall cancel any unexecuted portion of the IOC Order.

(D) DMM Interest. Exchange systems shall cancel DMM Interest to buy (sell) that is entered manually or via DMM-specific order entry methodology if such interest is priced above (below) the Upper (Lower) Price Band. DMM Interest to buy (sell) that is entered via

the same order entry methodology as off-Floor interest shall be repriced pursuant to paragraph (a)(5)(B) of this Rule.

- (E) Market Pegging Interest. Market Pegging Interest to buy (sell) shall peg to the specified pegging price or the Upper (Lower) Price Band, whichever is lower (higher).
- (F) Sell Short Orders. During a Short Sale Price Test, as set forth in Rule 440B(b), short sale orders priced below the Lower Price Band shall be repriced to the higher of the Lower Price Band or the Permitted Price, as defined in Rule 440B(e).
- (G) Floor Broker Cross Function. Exchange systems shall not execute orders crossed pursuant to the process provided for in Supplementary Material .10 to Rule 76, if the price of the proposed cross transaction is outside of the Price Bands.
- (6) Routing to Away Markets. Exchange systems shall not route buy (sell) interest to an away market displaying a sell (buy) quote that is above (below) the Upper (Lower) Price Band.
- (7) Trading Pause during a Straddle State. The Exchange may declare a Trading Pause for a NMS Stock listed on the Exchange when (i) the National Best Bid (Offer) is below (above) the Lower (Upper) Price Band and the NMS Stock is not in a Limit State; and (ii) trading in that NMS Stock deviates from normal trading characteristics.
- (b) Trading Pause. During Phase 1 of the Plan, a Trading Pause in Tier 1 NMS Stocks subject to the requirements of the Plan, shall be subject to Plan requirements and paragraph (b)(2) of this Rule; a Trading Pause in Tier 1 NMS Stocks not yet subject to the requirements of the Plan shall be subject to the requirements in paragraphs (b)(1)–(5) of this Rule; and a Trading Pause in Tier 2 NMS Stocks shall be subject to the requirements set forth in paragraphs (b)(1)(B)–(5) of this Rule. Once the Plan has been fully implemented and all NMS Stocks are subject to the Plan, a Trading Pause under the Plan shall be subject to paragraph (b)(2) of this Rule only.
- (1) Between 9:45 a.m. and 3:35 p.m., or in the case of an early scheduled close, 25 minutes before the close of trading, if the price of a security listed on the Exchange, other than rights and warrants, moves by a percentage specified below within a five-minute period (“Threshold Move”), as calculated pursuant to paragraph (b)(3) below, trading in that security shall immediately pause on the Exchange for a period of five minutes (a “Trading Pause”).
 - (A) The Threshold Move shall be 10% or more with respect to securities included in the S&P 500[®] Index and the Russell 1000[®] Index;
 - (B) The Threshold Move shall be 30% or more with respect to all Tier 2 NMS Stocks with a price equal to or greater than \$1; and
 - (C) The Threshold Move shall be 50% or more with respect to all Tier 2 NMS Stocks with a price less than \$1.

The determination that the price of a stock is equal to or greater than \$1 under paragraph (b)(1)(B) above or less than \$1 under paragraph (b)(1)(C) above shall be based on the closing price on the previous

trading day, or, if no closing price exists, the last sale reported to the Consolidated Tape on the previous trading day.

- (2) Re-opening of Trading following a Trading Pause. At the end of the Trading Pause, the Exchange shall re-open the security in a manner similar to the procedures set forth in Rule 123D, subject to the following:
 - (A) Indications may be published to the Consolidated Tape during a Trading Pause. Prior Floor Official approval is not required before publishing an indication. If an indication is published, it does not need to be updated before reopening the security and the security may be reopened outside of any prior indication. Any re-openings following a Trading Pause are not subject to the requirements that (i) a minimum of three minutes must elapse between the first indication and a security's re-opening, or (ii) if more than one indication is published, a minimum of one minute must elapse before a security's re-opening;
 - (B) After a Trading Pause has commenced, the Exchange will publish Order Imbalance Information, as defined in Rule 15(c), approximately every 15 seconds until the re-opening;
 - (C) In the event of a significant imbalance at the end of a Trading Pause, the Exchange may delay the re-opening of a security;
 - (D) The Exchange will issue a notification if it cannot resume trading for a reason other than a significant imbalance; and
 - (E) Any interest repriced pursuant to paragraph (a) of this Rule shall return to its original order instructions for purposes of the re-opening transaction following a Trading Pause.
- (3) Calculation of Threshold Move. Every second the Exchange shall calculate the Threshold Move by comparing each last consolidated sale price of a security ("Trigger Trade") during the preceding second to a reference price (the "Calculation Time"). The reference price shall be any transaction in that security printed to the Consolidated Tape during the five-minute period before the Calculation Time, except for Trigger Trades in the first five minutes following 9:45 a.m., for which reference prices will begin at 9:45 a.m. Only regular way, in-sequence transactions qualify as either a Trigger Trade or a reference price. The Exchange can exclude a transaction price from use as a reference price or Trigger Trade if it concludes that the transaction price resulted from an erroneous execution.
- (4) Notification of Trading Pauses. If a Trading Pause is triggered under this Rule, the Exchange shall immediately notify the single plan processor responsible for consolidation of information for the security pursuant to Rule 603 of Regulation NMS under the Securities Exchange Act of 1934.
- (5) If a primary listing market issues an individual stock trading pause, the Exchange will pause trading in that security until trading has resumed on the primary listing market or notice has been received from the primary listing market that trading may resume. If the primary listing

market does not reopen the security within 10 minutes of notification of a Trading Pause, the Exchange may resume trading the security.

Adopted: June 10, 2010 (NYSE-2010-39).

Amended: June 11, 2010 (NYSE-2010-45); September 10, 2010 (NYSE-2010-49); December 9, 2010 (NYSE-2010-81); April 7, 2011 (NYSE-2011-16); June 23, 2011 (NYSE-2011-21); August 10, 2011 (NYSE-2011-40); November 23, 2011 (NYSE-2011-57); January 11, 2012 (NYSE-2011-68); August 1, 2012 (NYSE-2012-31); January 28, 2013 (NYSE 2013-05); February 8, 2013 (NYSE-2013-09); February 7, 2013 (NYSE-2013-12); August 13, 2015 (NYSE-2015-33).

4. “Market Structure Update, Focus on August 24, 2015,” J.P. Morgan, Brett Redfearn.
5. “Findings Regarding the Market Events of May 6, 2010.” Report of the staffs of the CFTC and the SEC to the joint advisory committee on Emerging Regulatory Issues. Published 9/30/10.
6. NYSE/Arca CADV Buckets/LMM Participation rates, Jan–April 2011—less than 10,000/16.58%; 10,000–50,000/11.44% 50,000–100,000/8.47%; 1,000,000–5,000,000/7.56%; greater than 5,000,000/7.19%—Data supplied by NYSE/Arca. CADV=Composite Average Daily Volume.
7. “Credit Suisse AES Research Analysis: The Top Five Highest Days by Share Volume of ETFs in Order: 9/18/2008,10/10/2008,5/6/2010,11/20/2008,5/7/2010.” As of 2010.
8. The Order Protection Rule (Rule 611 under Regulation NMS) protects against a trade-through, which occurs when one trading center executes an order at a price that is inferior to the price of a protected quotation, i.e., a quotation that is immediately and automatically accessible, often representing an investor limit order, displayed by another trading center. Paragraph (b)(1) excepts a transaction if the trading center displaying the protected quotation that was traded through was experiencing a failure, material delay or malfunction of its systems or equipment when the trade-through occurred. The exception for a “material delay” would give trading centers a self-help remedy if another trading center repeatedly failed to provide an immediate (within one second under current trading conditions) response to incoming orders attempting to access its quotes.
9. Findings regarding the market events of May 6, 2010. Report of the staffs of the CFTC and the SEC to the joint advisory committee on Emerging Regulatory issues, September 30, 2010.
10. *Ibid.*
11. *Ibid.*
12. “Stub quotes are quotes at unrealistically low or high prices that fulfill a market maker’s obligation to provide continuous bids and offers, but at levels that the market maker does not expect to be reached under ordinary market conditions.” SEC/CFTC Report, Page 38.
13. Findings regarding the market events of May 6, 2010. Report of the staffs of the CFTC and the SEC to the joint advisory committee on Emerging Regulatory issues, September 30, 2010.

14. “LRPs are intended to act as a ‘speed bump’ and to dampen volatility in a given stock by temporarily converting from an automated market to a manual auction market when a price movement of sufficient size is reached. In such a case, trading on NYSE in that stock will ‘go slow’ and automatic executions will cease for a period ranging from a fraction of a second to a minute or two to allow the Designated Market Maker to solicit and/or contribute additional liquidity before returning to an automated market.”[SEC/CFTC Report, Page 68].
15. Ibid.
16. Rule 80C—Trading pauses in individual securities due to extraordinary market volatility. This rule was adopted on June 10, 2010.
17. Finra Rule 5250, Payments for market making.
18. NYSE/Arca informational document.

Three

ETF Valuation

One of the most important components of exchange-traded funds (ETFs) is how the market prices and underlying values are determined. Understanding the true valuation of the ETF you are trading helps in determining effective execution strategies to both minimize costs and avoid market disruptions. Understanding the price at which an ETF should be trading in relation to its underlying value will be crucial in moving along the curve of available ETFs to where interesting and unique products exist but where valuation and execution become a more important part of the trading equation. This will also help in determining whether the price in the marketplace is attractive or unattractive. I have encountered many client questions over the years as to why an ETF was trading at a certain price or spread. A frequent situation revolves around clients calling to inquire about an ETF buy order that is not getting filled by the liquidity providers. Typically, it is roughly 10 cents below the intraday indicative value (IIV) of the fund. Many times solving these issues is just a matter of clearing up misperceptions about intraday values and pricing relationships.

A main factor in valuing an ETF is understanding of the difference between the indicative optimized portfolio value (IOPV), alternatively called the intraday indicative value, and the net asset value (NAV). In many of the U.S. domestic ETFs, that understanding will be enough to trade them efficiently. When you get further down the curve of products, it is important to understand the relationship between the actual trading prices and the published IOPV and NAV information and whatever estimates are to be used for determining a real-time value.

There are many different types of exchange-traded products in the marketplace, and their variety and structure is changing almost daily. Chapter 9

Exposure	Number of ETFs	AuM	Percent of Category
Equity	983	\$ 1,671,658,000,000	81.2%
Fixed Income	208	\$ 319,094,000,000	15.5%
Commodities	34	\$ 11,572,000,000	0.6%
Active	137	\$ 22,928,000,000	1.1%
Alternative	13	\$ 1,517,000,000	0.1%
Mixed	22	\$ 4,941,000,000	0.2%
Leveraged	83	\$ 14,910,000,000	0.7%
Inverse	24	\$ 4,450,000,000	0.2%
Leveraged Inverse	64	\$ 8,686,000,000	0.4%
	1,568	\$ 2,059,756,000,000	

EXHIBIT III.1 Number of ETFs and Assets by Category

Source: ETFGI 12/31/15

focuses on the valuation of basic domestic ETFs, followed by ETFs with international stocks in the baskets in Chapter 10. You can apply this information to almost every other type of product. I then review some other types of ETPs, leveraged products, fixed income and currency, with a discussion of the critical features and nuances of their structures.

This is a good moment to review where the assets are as of the writing of this book. In Exhibit III.1 you can see the breakdown of ETFs listed in the United States and the assets in those funds by category.

Understanding the valuation techniques for the standard fund types will provide the base information for determining proper pricing levels for ETF order flow. There are two considerations to utilize and execute ETF order flow successfully: understanding proper pricing and valuation and understanding the various execution techniques available. Part Three explores the proper valuation techniques and what market pricing is indicating to investors. This will enable you to move to a place of understanding what the ETF pricing in the market is telling you. You will understand the full ETF story being told.

ETFs with Domestic Holdings

The purest form of the exchange-traded fund (ETF) structure is demonstrated in a product that trades at the same time as an underlying basket of domestic securities. This is where we start the discussion of valuation. We begin with the calculation of the net asset value (NAV) of the funds and then explore discounts and premiums and cash amounts, ending at the calculation of the intraday indicative value (IIV).

The ETFs with U.S. domestic constituents are the largest category of funds. Even after more than 20 years of asset growth and product development these products make up approximately 75 percent of all U.S.-listed ETF assets. A high-level breakdown of the number of ETFs available with domestic underlying constituents and their assets can be seen in the grid in Exhibit 9.1.

The structure of the ETF is based on holdings transparency. One of the keys to being transparent is publishing all of the numbers required to calculate the fair value of an ETF every day. Six elements involved in the valuation of an ETF are published every day:

1. Net asset value
2. Intraday indicative value
3. Total cash
4. Estimated cash
5. Shares outstanding
6. Accrued dividends (certain funds only)

The NAV shows the most recent official value of the ETF based on the most recent market close. The IIV is the calculation of the most recent value of the fund based on market prices of the underlying securities. The total and estimated cash amounts are the amount of excess cash in the fund. These numbers are used to calculate how much balancing cash will be required when doing a creation or redemption. The shares outstanding of the fund are how many shares have been issued and can change daily with creations and redemptions.

EXHIBIT 9.1 ETFs with U.S. Underlying Holdings and Assets (AUM)

Exposure	Number of ETFs	AUM	Percent of Category
North America	493	\$1,214,317,000,000	97.3%
Global (incl.-US)	99	\$ 34,237,000,000	2.7%
	592	\$1,248,554,000,000	

Source: ETFGI 12/31/15

TRADING TIP

You can access any of the relevant data about ETFs by using their ticker on the Internet. If you type in the ETF ticker and the word “quote” to most search engines, it will bring you a quick list of places you can get all the relevant data for that product, like last price, spread, and most recent NAV. If you are using a Bloomberg terminal, you can use the information in Exhibit 9.2 to customize your search to match the data you need. For specific NAV information, for example, you can type in the ETF ticker with “NV” appended to it, hit the index button, and you will be brought to the relevant screen.

EXHIBIT 9.2 ETF Tickers and Corresponding Conventions

ETF Ticker Conventions	Moniker	Bloomberg
Net asset value	NV	ETFNV
Intraday indicative value	IV	ETFIV
Total cash	TC	ETFTC
Estimated cash	EU	ETFEU
Shares outstanding	SO	ETFSO
Accrued interest	DV	ETFDV

CALCULATING THE NET ASSET VALUE

The NAV of an ETF is a daily calculation that is based off the most recent closing prices of the assets in the fund and an actual accounting of the total cash in the fund at the time of calculation. The official NAV of an ETF is calculated post-market close on a daily basis and is a static value. This gives the fund a standardized value that can be compared to other funds for performance statistics and accounting. The fund world is based on comparative statistics, so uniform reporting was critical in the development of ETFs.

The NAV of the ETF is calculated by taking the sum of the assets in the fund, including any securities and cash, subtracting out any liabilities, and dividing that by the number of shares outstanding:

$$\text{NAV} = (\text{Assets-Liabilities})/\text{Shares Outstanding}$$

All of these data points are provided on a daily basis, including exactly what the fund is holding. This transparency frequently is touted as a major benefit of an ETF. Mutual and closed-end funds are not required to provide portfolio holdings on a daily basis. A mutual fund provides a daily NAV but holdings are released quarterly. A closed-end fund provides an NAV either daily or weekly with holdings released usually quarterly. In an ETF, you are able to see the exact assets and aggregate liabilities of the fund at any time. This is also a factor that has worked to prevent against style drift in the products.

The easiest way to calculate the NAV of an ETF is to use the creation unit (CU) and total cash published daily.

$$\text{NAV} = \frac{\sum (\text{Shares per each component stock} \times \text{Last Price})}{\text{CU Shares} + \text{Total Cash}/\text{CU Shares}}$$

The NAV of an ETF is represented in price-per-share terms. This is why you would be dividing the asset totals by shares outstanding and the creation unit calculations by the creation unit share amount.

Daily Creation Basket

Every day files are made available containing all of the constituents of most ETFs. There are several ways to access ETF daily creation files. Data providers sell a file download of all the ETFs and their underlying baskets (see Appendix B). This is a consolidated file of all holdings of all ETFs. When you subscribe to the service, you can receive the file daily. Many ETF issuers also offer this information available for download right from their website or via a related file transfer protocol (FTP) site.

TRADING TIP

If you are a Bloomberg user, you can see the daily creation file by typing the fund ticker {Equity} and MHD {Go}. Then you would type 97 {Go}. For example, type EEZ {Equity}, MHD {Go}, then 97 {Go} on a Bloomberg terminal, and you will see the most recent creation unit file for the fund.

DGRW US Equity		View Holding Portfolio		90 Holdings Analysis		Page 1/16	ETF Creation Unit
WISDOMTREE U.S. QUALITY DIVI						Filing Date	3/7/2016
Asset Class		Equity		Cash Position		2.51k	USD
Creation Unit Size		50000		Create/Redeem Fee		500	USD
Name	Ticker		Position		Value(USD)	%Net	
1) Coca-Cola Co/The	KO	US	1,438		63,430.181	4.208	
2) Altria Group Inc	MO	US	831		52,336.380	3.472	
3) Microsoft Corp	MSFT	US	992		51,613.759	3.424	
4) Apple Inc	AAPL	US	474		48,826.741	3.239	
5) AbbVie Inc	ABBV	US	730		40,989.501	2.719	
6) International Business Machine	IBM	US	245		33,761.001	2.240	
7) McDonald's Corp	MCD	US	260		30,466.800	2.021	
8) Cisco Systems Inc	CSCO	US	1,067		28,595.599	1.897	
9) 3M Co	MMM	US	173		27,692.111	1.837	
10) Home Depot Inc/The	HD	US	212		26,618.719	1.766	
11) Intel Corp	INTC	US	865		26,494.949	1.758	
12) Reynolds American Inc	RAI	US	489		25,286.190	1.677	
13) Bristol-Myers Squibb Co	BMJ	US	387		25,042.770	1.661	
14) United Technologies Corp	UTX	US	258		25,026.000	1.660	
15) Las Vegas Sands Corp	LVS	US	463		23,983.400	1.591	
16) Amgen Inc	AMGN	US	164		23,940.719	1.588	
17) Comcast Corp	CMCSA	US	389		23,238.861	1.542	
18) Gilead Sciences Inc	GILD	US	262		22,849.020	1.516	
Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 319 2000 Copyright, 2016 Bloomberg Finance L.P. SN 325962 6729-1684-1 06-Mar-16 13:11:54 EST GMT-5:00							

EXHIBIT 9.3 ETF Creation Unit

Source: Bloomberg

Exhibit 9.3 shows what the first page of a creation unit looks like on a Bloomberg screen.

In the exhibit you can see the name of the fund, the amount of shares per creation unit (called creation unit size), the market value of those shares calculated using the most recent closing price of the stock, and its calculated weight in the portfolio. At the top left you can see the creation unit size of the fund as 50,000. And you can see that this is page 1 of 16 pages representing a basket of approximately 288 stocks. The various share amounts of the stocks are showing what is required in each name to make up one full basket equaling 50,000 shares of the ETF. As an example, there are 1,438 shares of KO required for every 50,000 shares of the ETF DGRW, and an AP must deliver in those 1,438 KO shares for every creation unit they place an order for.

In order to calculate the actual value of the ETF at any time during the day, you would utilize the available creation unit. The creation unit is utilized for building any model around ETF pricing. It shows the exact basket that must be delivered to the issuer in order to receive ETF shares during a creation. It is also the exact basket that will be received by an authorized participant (AP) when it has processed a redemption order. These creation units are usually in round lots of 50,000 shares and represent the minimum

and round lot size required to interact with the ETF fund. They also represent a pro rata slice of the holdings of the fund and can thus be used for real-time valuation.

Cash and Estimated Cash

For the standard equity ETFs, there are two cash numbers published daily, the total cash and the estimated cash. The Bloomberg quoting ticker conventions are TC and EU, respectively. These numbers represent any uninvested cash, accrued dividends, or values of securities not in the creation unit. These are published as actual amounts in dollars per creation unit. For a fund showing a total cash number of \$1,000 and having 250,000 shares outstanding with a 50,000-share creation unit size, the total amount of cash in the fund is \$5,000. This would be calculated with the equation:

$$\text{Cash in Fund} = \text{Shares Outstanding} / \text{CU Shares} \times \text{Total Cash}$$

Since the NAV of an ETF is reflected as a price per share, you will use the total cash number converted to a per-share amount. This is arrived at by dividing the total cash amount by the creation unit shares amount:

$$\text{Cash per ETF Share} = \text{Total Cash} / \text{CU Shares}$$

The total cash number, like the official NAV, is backward looking to ensure that creations and redemptions occur at NAV. When the fund is being traded throughout the day, the estimated cash amount is used to give the AP an idea of how much cash the fund will require for the creation or redemptions on the current day. When calculating the IIV or an estimated NAV (eNAV) of an ETF, the estimated cash number should be used. This number takes into account potential dividends, management fees, and other potential cash and portfolio changes in the basket. The estimated cash value is used until close of business that trading day and for intraday valuations. The total cash number is calculated post-close and is used for official NAV calculations. The value of any ETF is made up of the value of the constituents in the fund plus the cash in the fund. In its simplest form, when calculating an intraday value for an ETF, you need the value of a creation unit plus the estimated cash value, which is in terms of one creation unit as well.

DISCOUNTS AND PREMIUMS

A common misperception arising around the NAV is the discount and premium calculations for a fund. The importance that investors place on this

number is a holdover habit from looking at the prevalence of premiums and discounts in closed-end funds (CEFs). The two types of funds are listed, and the fund prices trade independently of NAV; the premium and discount numbers, however, are completely different in meaning. There are occasions where persistent premiums and discounts arise in ETFs, but that is most commonly due to an interruption in trading of the underlying assets or an interruption of daily allowable creation and redemptions. When a market is closed for an extended time period, for example, the ETF will trade based upon where investors think fair value for the fund should be. This will then be unrelated to the NAV because the underlying assets are not trading and not representing a real time value. Typical discount or premium patterns for an ETF will be very short-lived as the arbitrage function enables its collapse in the near term. If a large investor pushes the price of an ETF away from its fair value, the liquidity-providing community will come in and counteract that activity by closing that gap between the ETF price and fair value.

A premium and discount reported on a CEF will typically be long term and reflect investor sentiment regarding performance expectations or other structural anomalies, whereas ETF discounts and premiums are temporary. I consider the reported discount and premium numbers based on NAV and the market close price of ETFs to be marketplace noise. If you are executing a NAV-based trade on the underlying basket, then you will get the NAV price plus expenses regardless of whether the closing price of the ETF was in line with that NAV.

Under normal circumstances, the premium and discount that arises between an ETF NAV and its trading price at the end of the day is the result of late market activity and will narrow on the following open. This is true of ETFs with constituents that trade in the same time frame. We thoroughly discuss the details of international constituents in the next chapter. But here it is relevant to understand that those ETFs with international stocks in the underlying basket are essentially trading on expected valuations and can and generally do trade away from both their IIV and their NAV. A premium or discount in those funds would be a normal part of the price discovery process.

Many circumstances can and will push an ETF away from its NAV at the very end of the day, causing it to trade at either a premium or a discount compared to the basket. It could be that a large order came into the ETF at the very end of the trading day too late, or too large, for the arbitrage functionality. Additionally, as the trading day ends, spreads typically widen to prevent the occurrence of exposures that will have to be held overnight. This can cause late prints in ETFs to be somewhat erratic and can create the impression of a premium or discount versus the NAV. This is the reasoning behind investors with longer trading time frames who do not trade during the last 15 minutes.

Avoiding Discount or Premium Anomalies

First, I would like to point out that reasonable pricing dispersions away from NAV or iNAV are expected. The eNAV values are the last traded values of all constituents and do not include costs of creating, redeeming, or transacting. When buying or selling an ETF in the marketplace, the price will be based at NAV and these costs will be included. These costs are standard to any wrapper representing that exposure. If you went out and bought the underlying constituents yourself, you would pay your broker transaction costs. When mutual funds buy the same securities, they pay the same costs, but those costs are paid by the overall fund and its shareholders and are not as transparent as those for ETFs.

Most discounts or premiums in U.S.-listed ETFs with domestic constituents occur because of order flow that is less concerned with actual ETF value. When trading, you should try to avoid trading the ETF too close to the market open, before the underlying constituents have all opened. While it is intuitive to wait until the domestic underlying constituents are open before trading the ETFs, it is also valuable to wait until the correlated hedge of international ETFs start trading with full liquidity before trading those as well. This should explain why you see spreads in many names tighten a few minutes after the open. Also, as the trading day draws to a close, ETF liquidity providers have the risk that they will not get completely filled in a basket and would have to carry overnight positions that are not perfectly hedged. This is why spreads widen near the close. There is more risk to providing liquidity around market open and market close.

If there are extraordinary circumstances in one of the constituents of the ETF, then the fund can certainly trade out to a premium or discount. Perhaps a stock in the basket is halted at 1:00 p.m. This would not stop the ETF or the rest of the basket from continuing trading. When the NAV would be calculated at the end of the trading day, however, it probably would include the last traded price of the halted stock. In this circumstance, it would make sense for the ETF to be trading at a price away from NAV because it should be trading with an expectation of where that stock will be trading when it next reopens, as opposed to the price it was at when halted. There also have been circumstances in exchange-traded products where access to the underlying has been restricted for some reason. In one recent incident, an ETP was forced to halt the creation function on the product because of holdings limitations of the underlying securities. This would naturally cause the fund to move to a premium. This is easy to understand if you think about the liquidity provider typically prevalent in selling ETFs to buyers, pursuing an arbitrage against the underlying constituents. At the end of that trade, the liquidity provider typically would go about the process of creating ETF shares to cover its short, flattening its position. If that process is unavailable,

it loses the ability to unwind its short ETF versus long underlying position and therefore would continue to tie up its balance sheet. That becomes a more expensive and riskier trade, and therefore the market maker would want a higher price before making a sale of the ETF. That higher price is not in absolute terms of the ETF but in relative terms between the ETF and its underlying assets.

The characteristics of discounts and premiums are clear when you look at them over time. Exhibits 9.4 to 9.6 show three examples of discount and premium charts. Exhibit 9.4 represents the discount/premium graph on a U.S. domestic sector ETF. Because of the reasons just discussed and the inability to trade an ETF and the basket at exactly the same time at exactly the close, ETF prices generally close right around their implied value but not always on NAV exactly. The typical discount or premium will revert toward zero every day when the fund and the basket start trading simultaneously again. You can see in Exhibit 9.4 that the discount and premium are almost always under $\pm .10\%$ and are somewhat evenly distributed between premiums and discounts. The fluctuations are the discount noise I mentioned that is usually the result of late-day trading.

Exhibit 9.5 shows the discount and premium chart for an ETF that has international underlying stocks in Japan that do not trade while the ETF is

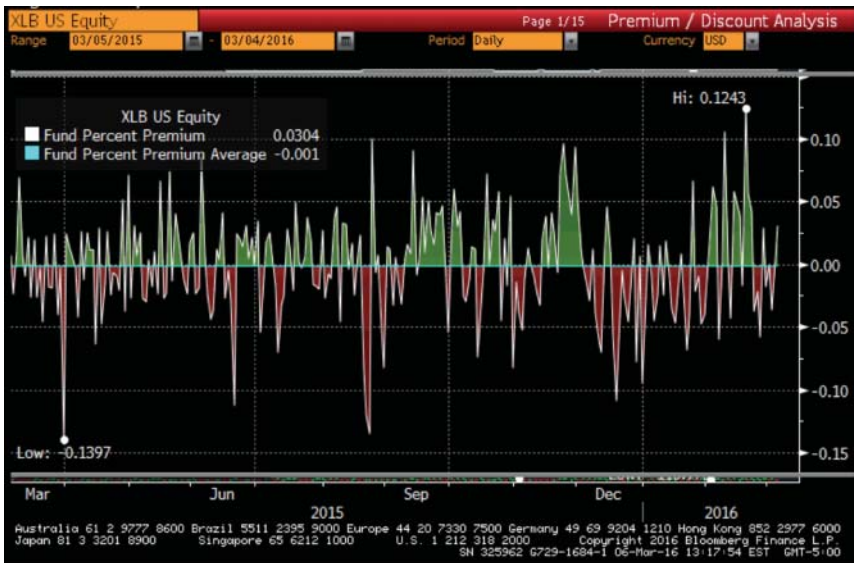


EXHIBIT 9.4 U.S. Domestic Sector ETF—Discount and Premium Chart

Source: Bloomberg

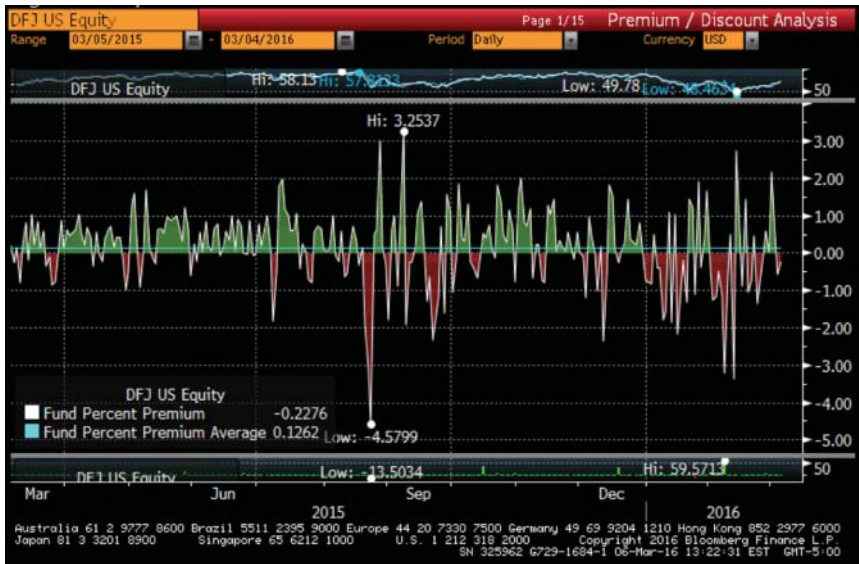


EXHIBIT 9.5 U.S. Listed International ETF—Discount and Premium Chart
Source: Bloomberg

trading. In this case, the ETF is trading as a price discovery vehicle during the U.S. trading day. The NAV of the fund is struck based on the closing price of the basket and a spot foreign exchange (FX) rate, which adjusts throughout the U.S. trading day. The closing price of the ETF at the end of the business day is then used as a comparison versus the stock basket close some 14 hours previously. And again, just to clarify, that closing price of the ETF includes the U.S. day's events and expectations for where the international market will open locally the next day. The pricing lag makes this discount premium chart relatively useless because it does not compare apples to apples. Because there is never a time when the basket and the fund are trading at the same time, the discount and premium of the fund versus its actual NAV do not exhibit the same snap-back effect that you would see in an ETF with U.S. domestic holdings. The creation and redemption process keep the value of the fund trading around the value of the assets, but the price does not snap back to the last price of the assets every morning.

Exhibit 9.6 shows the discount chart for a closed-end fund. The discount in the fund is large and was fairly consistent until it started to get cheaper toward the end of 2015 into the first quarter of 2016. The fund is composed of a basket of equities designed to S&P 500 index. As you can see, you were

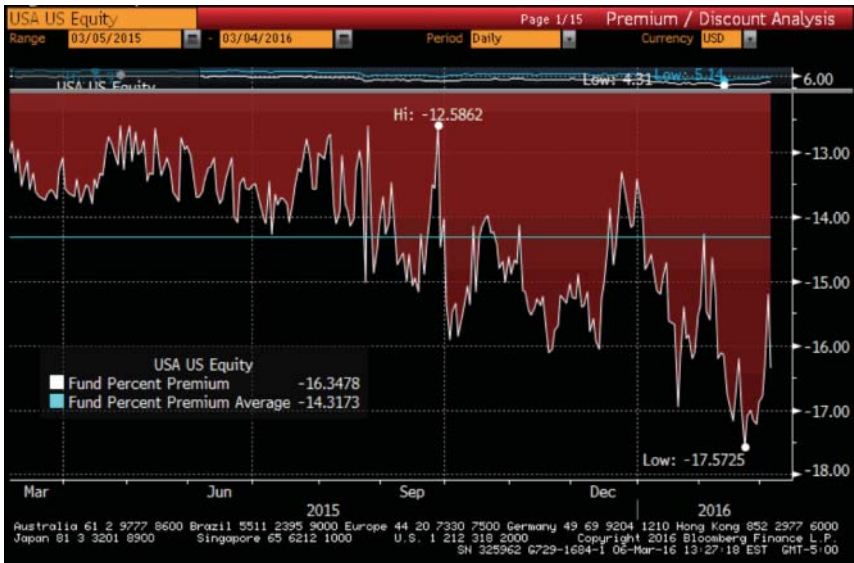


EXHIBIT 9.6 U.S.-Listed Closed-End Fund—Discount and Premium Chart

Source: Bloomberg

able to buy the fund at roughly a 15 percent discount in the beginning of 2016. That seems cheap; however, very few events will cause that discount to narrow dramatically. The ETF price is tied to the NAV on a daily basis via the creation and redemption process, and this keeps the price vacillating around NAV. There is no such tie to NAV for the CEF, leading to a more persistent discount or premium.

The CEF discounts are not always large discounts without any movement. In Exhibit 9.7 you can see the discount swings for a U.S.-listed CEF with a basket of international underlying stocks from India. You can see drastic swings from large premiums during 2004–2006, which then move toward discounts which were reasonably constant from 2012–2016. Rather than being short term, however, they tend to last for weeks and months as opposed to closing daily. With the introduction of ETFs that track similar baskets of international underlying components, the opportunities to trade the CEF and the ETF as a pair, attempting to capture discount and premium moves, have increased. The ETF has effectively become a proxy hedge for the CEF.

The discounts and premiums just described offer some insights into the respective funds. If you are looking at a CEF, for example, with a large discount, it is not necessarily cheap, as that discount may be a persistent

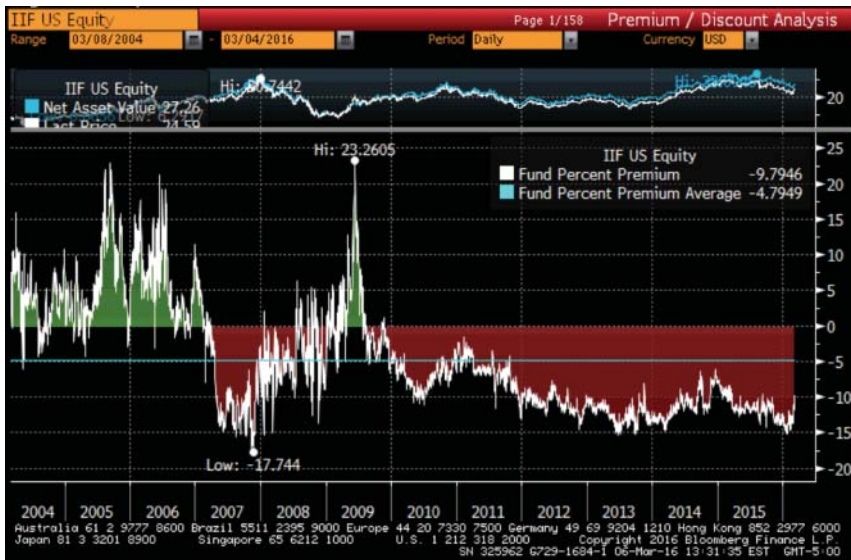


EXHIBIT 9.7 U.S.-Listed Closed-End Fund with International Underlying Stocks—Discount and Premium Chart

Source: Bloomberg

characteristic. An ETF with international constituents trading at a 2 percent premium to its IIV may be considered rich by some but could also be considered cheap, if it is late in the U.S. trading day and the market is up 5 percent. If an order to buy 100,000 shares of a U.S. ETF with domestic constituents came into the market at 3:58 p.m. and was filled at slightly above the basket value of the fund, you would potentially see a small premium number in the fund. This does not necessarily mean there is more buy pressure for the following day or that the fund is not working properly. It merely reflects some last-minute activity in the fund that had an effect on price without a correlating effect on the underlying basket. All of these discounts and premiums are related to the fair value of the fund. Let's take a look at how to calculate that value.

CALCULATING THE INTRADAY INDICATIVE VALUE

Although the NAV is important for the calculation of prior end-of-day valuation statistics, the indicative optimized portfolio value (IOPV) is critical for bringing you a step closer to the actual trading value of an ETF during

the trading day. It is important to distinguish what this number actually is for two reasons:

1. It goes by several different names.
2. At certain times during the day, it loses its relevancy because of trading anomalies as discussed previously.

The IOPV is also sometimes known as the intraday indicative value (IIV) or the indicative net asset value (iNAV). IIV is actually becoming the mainstream name because this is the one used for quoting conventions. The Bloomberg ticker quoting convention is IV appended to the ticker: for example, ETFIV or ETF.IV or ETF IV, depending on the system.

I have also seen this number referred to as the “underlying trading value,” a term that attempts to clarify what the number represents. What is important, no matter how you choose to refer to it, is that it is the number representing the most recent trading value of the assets of a creation unit. This number is designed to give investors and traders an almost real-time indication of the value of the assets underlying the ETF throughout the trading day. It is a tremendous idea that is unique to the structure of ETFs and is most useful for ETFs with underlying baskets of stocks that trade at the same time as the ETF in the market. This number is typically published at a frequency of every 15 seconds, which is why I call it almost real time. (Some firms are starting to make the number available to clients in real-time form.) A lot can happen in 15 seconds that makes the number more relevant as a guide than a mandate. If the fund’s price has moved slightly away, it probably would be a function of delayed quoting frequency of the IV rather than an erratic movement in the ETF price itself. This number is calculated from the creation unit that is published daily by the ETF issuers, using the estimated cash in the portfolio on a per-share basis and the last price of the underlying holdings.

The five steps for calculating the IIV are:

1. Use the CU to get the proper share quantities for each stock in the basket.
2. Multiply the last price of each stock by its representative share amount in the CU.
3. Sum the products to calculate total assets of the fund.
4. Divide this by the amount of shares per CU of the ETF.
5. Add to that the estimated cash value divided by the amount of shares per CU of the ETF.

$$\text{IIV} = \sum (\text{Shares per each component stock} \times \text{Last Price}) / \text{CU Shares} \\ + \text{Estimated Cash} / \text{CU Shares}$$

The IIV is the implied value of the ETF as calculated by the most recent trading prices of all the stocks in the basket. This value is calculated completely independently of the actual trading price of the ETF in the secondary marketplace. However, in a U.S.-listed ETF with a basket of domestic stocks underlying, those two independently generated values should trade in parity with one another because of the open conversion between the basket and the ETF. This is one of the core functionalities of the creation and redemption mechanism of the product wrapper and the one responsible for eliminating discounts and premiums. In many high-volume ETFs, a quote for the IIV and a quote for the ETF should be very close to each other. Differences could be because of the time lag and other occasional structural nuances. Since stock (and therefore ETF) trading now takes place in microseconds, a lot can happen in between two separate 15-second quotes. Professional traders are not using published IIVs as a basis for trading. Most, if not all, desks that are trading ETFs are calculating their own IIVs based on real-time quotes in the underlying baskets that they are generating within their systems. They will see their own IIV calculation in real time so they can act on pricing at the same frequency as their competitors. I can only imagine what would happen if I were a liquidity provider and I asked a client who wanted a risk market in an ETF to wait 15 seconds for the quotes to refresh. Most likely I would hear the click of them hanging up the phone.

Latency in the Published IIV

This brings up another point to understand about the IIV that is published on ETFs. It is strictly a last-price-based quote. The standardized published calculation of IIV is based on the most recent traded price of every stock in the underlying basket. This assumes, however, that every stock in the basket is extremely liquid and has traded within its most recently quoted market spread. Every stock has a bid and an ask price, the bid being the price that someone is willing to pay for the stock and the ask price being the price at which someone is offering to sell. If a stock trades at 2:00 p.m. at \$10 and the market in general rallies over the next 15 minutes, but the stock does not trade, the new spread or the new levels where people are bidding and offering the stock could be \$10.10 bid and offered at \$10.20. But the IIV will be publishing a quote based on the last traded price of \$10. Because the trading community is using advanced systems to price and trade ETFs, the market for the ETF probably will be showing a level higher than the IIV quote. It is not a real premium; it is just a function of latency in the IIV quoting structure. If you calculated a bid/ask market for the IIV, you would see that the market for the ETF is based around where the market for the

basket is now, not where it was trading at some time in the past. This also serves well to highlight the occurrence of ultra-fast-moving quotes in the ETFs, which seems incongruous compared to the slower-moving quotes in the published IIV. Most ETF spreads are generated by automated systems that are calculating the underlying basket's values in real time and are keeping their liquidity quotes around the basket at all times. If a basket has 500 stocks, the bid or ask of one of the stocks in that basket is probably changing, creating a constantly moving underlying value. The change of the underlying value causes an adjustment to where the liquidity provider would buy or sell the ETF, so ETF quotes are constantly being adjusted regardless of whether the actual ETF has traded. This is discussed further in the section regarding high-frequency trading.

TRADING TIP

Sometimes it is more appropriate to use the IIV quote or the ETF market price for understanding true value. Here is a generic set of guidelines for looking at ETF price versus IIVs.

- *Very liquid ETFs.* ETF market spread (bid/ask) and last traded price is a good market value determination point because of the frequency of trading and the advanced systems of the many participants.
- *Low-volume U.S.-listed domestic ETFs.* IIV is the best indicator available for pricing with the understanding that it is based on the 15-second lag. Typically, the markets are very wide in these ETFs. You can piece together a decent valuation by looking at the IIV showing your last traded price of the basket and where the current spread is to get an idea of a proper valuation price. The last traded price in a low-volume fund is not a good reference point for a new order.
- *Low-volume U.S.-listed international ETFs.* For these funds you would be best off using the market spread and an estimated IIV (eNAV), which I discuss in detail in the next chapter.

I am confident that as the popularity of ETFs continues to rise and broadens, the frequency of IIV quoting will increase to keep pace with

the underlying marketplace. Third-party providers are developing more real-time versions of the IIV and beginning to distribute those numbers to users in various forms. This is not a technically difficult issue as much as it is a bandwidth expense problem.

When I was actively trading, I sometimes was surprised that many of my large institutional clients used actual ETF price quotes as a proxy for fund values. This led clients to question why liquidity provider prices seemed different from what the consolidated tape was showing at the time. They did not understand that the trading desk systems were working faster than the quotes on the exchanges at the time and had a better determination of real value than what was trading on the screens. I would be quoting prices based on where the basket was trading, representing the true ETF value; the quote screens had not caught up with those prices yet. With the increases in algorithmic trading, this situation has somewhat reversed in the most liquid of ETFs. Because of their frequency of trading, they can now serve as valuable proxies of value. This was not always the case.

CONCLUSION

It is important to understand the different types of valuation mechanisms for ETFs, the nuances of each, and how to use them to get the best execution on your ETF order. For U.S.-listed ETFs with underlying constituents that are trading at the same time as the fund, the IIV should be on or close to the ETF price, and under normal circumstances premiums and discounts will be arbitrated away. The IIV is a base of almost real-time valuation for the ETF, which is unique to the ETF wrapper, as mutual funds and closed-end funds are priced either once a day or periodically throughout the month.

In the next chapter we turn our attention to U.S.-listed funds with international constituents. The information, however, will be relevant for any ETF with an underlying that is difficult to trade or is not trading at the same time as the fund itself.

ETFs with International Constituents

Many of the same valuation concepts of exchange-traded funds (ETFs) with domestic constituents also apply to ETFs with international underlying stocks. The main differences are functions of the timing and the currencies. If the underlying constituents trade in a time zone different from the ETF, the intraday indicative value (IIV) will remain constant state for the equity portion but will change based on a relative spot foreign exchange (FX) rate. In 2010, the concept of currency hedging embedded into the ETF was introduced and has grown rapidly as an asset class. Because the currency exposure in the underlying equity is being hedged out, this will cause the IIV to move only very slightly when the underlying equities are closed. The IIV of an un-hedged ETF with a closed underlying will move to the same degree as the spot moves during the U.S. trading day. In this chapter I cover the concepts of calculating net asset value (NAV) and IIV of hedged and un-hedged international equity funds. I look at ETFs with international constituents in terms of what their prices mean to the markets and the effect they may have on global exposures within investor portfolios.

ETFs available with international underlying exposures are seen in the grid in Exhibit 10.1. These products represent approximately 21 percent of the ETF universe by AUM in the United States as of December 31, 2015. ETFs have opened up the world for investors, enabling them to attain efficient exposures in a wide variety of global assets.

This chapter will go over the calculation of NAV, IIV, and the estimated NAV (eNAV) for ETFs with international constituents with hedged and un-hedged FX. For U.S. investors seeking to diversify their portfolios by investing abroad, these funds are incredibly important. U.S. investors can now access investments that cover a wide array of exposures including broad regions, sectors within those regions, and almost every tradable country available. You can trade anything from market-cap-weighted Japanese sectors to earnings-weighted India during U.S. hours. However, because of their diverse underlying components, the funds present an additional valuation challenge to the ETF: understanding what the price in the market is

EXHIBIT 10.1 ETFs with International Underlying Holdings and Assets (AUM)

Exposure	Number of ETFs	AUM	Percent of Category
Asia Pacific	55	\$ 51,496,000,000	12.2%
Europe	79	\$ 79,148,000,000	18.7%
Emerging Markets	161	\$109,462,000,000	25.9%
ME/Africa	3	\$ 152,000,000	0.0%
Global (ex-US)	93	\$182,845,000,000	43.2%
	391	\$423,103,000,000	

Source: ETFGI, 12/31/15

saying. They also bring the additional risks of timing differences and currency exposure. Currency-hedged ETFs remove the currency risk by giving investors exposure to only the equities in the fund. By the end of this chapter you will be able to interpret whether the market price of an ETF with international constituents is rich or cheap and what that might mean for trading the funds.

INTERNATIONAL ETFs

The advent of international ETFs has brought previously unavailable investment possibilities to anyone with a brokerage account. Now you can trade the likes of Malaysia, China, Brazil, Finland, South Africa, and every combination in between with the touch of a button for a reasonable management fee during the U.S. trading day. International ETFs have become so popular and some of them are so liquid during U.S. hours that the ETF actually trades more than the underlying itself. ETFs continue to prove themselves as tools that are shaping the way we trade and invest.

Calculating the Net Asset Value

The method of calculating the NAV for a U.S.-listed ETF with international constituents is very similar to the method used to calculate that of domestic ETFs. The calculation is done using the creation unit and the total cash and the amount of shares of the ETF represented by the creation unit. In addition, there is a currency conversion to bring the price back to U.S. dollars (USD) because the ETF is listed and quoted in USD.

$$\begin{aligned} \text{NAV} = & \left(\sum (\text{Shares per each component stock} \right. \\ & \times \text{Last Price}) / \text{Currency Rate} \Big) \text{CU Shares} \\ & + \text{Total Cash} / \text{CU Shares} \end{aligned}$$

Note: The currency rate is in terms of USD as the base rate. If the foreign currency is quoted as the base rate (e.g., EUR/USD), then you would multiply the notional value of the basket to get the USD equivalent. Also note that within the official NAV, the currency rate is determined by a specific daily benchmark while the IIV is calculating an updated USD value based on a spot rate. I will discuss the difference between the two later in the chapter.

Currency Considerations

When calculating the NAV of an ETF with international constituents, there is a currency conversion to bring the NAV price into dollars because the ETF is listed on a U.S. exchange. The assets themselves, however, are held in local currency; there is no actual currency trading done by the fund for the purpose of valuing the assets. The exception is trades done by the fund to account for corporate action changes, the conversion to dollars of dividends, and other cash payments potentially received or paid by the fund. But, in general, since the funds take in and disburse assets via the creation/redemption process, which in most cases involves the in-kind delivery and receipt of shares, no currency transactions are necessary. The shares are received into the fund and the ETF shares are delivered out with no exchange of cash. The brokerage community is doing the FX trading to account for their purchase of foreign stocks and their sale of a U.S.-listed ETF.

To Hedge or Not to Hedge! (Currency-Hedged ETFs) Currency-hedged ETFs are a powerful tool for investors because it allows them to invest easily in international markets and only take on the exposure of the underlying equity. It is important to understand what you are trying to achieve when investing. When you invest in stocks in foreign countries, understanding the ramifications of differing currencies on your investment returns becomes a critical piece of knowledge. Before currency-hedged ETFs, investors would have to short another ETF, a future, or the spot currency itself to hedge out the currency exposure in their underlying equity position. These are more complex strategies to implement and maintain and were typically reserved for asset managers and other institutional investors. Currency-hedged vehicles must still convert to the base currency to buy the equity, as discussed earlier; however, they will use forward contracts to hedge out the currency in the exact notional value at the time the assets come into the fund. These contracts are implemented during creation activity, taken off during redemption activity, and in most fund structures rolled forward on a monthly basis. This enables investors to achieve exposure to foreign stocks without unwittingly placing a bet on a foreign currency at the same time.

Currency-Hedged ETF Mechanics Currency-hedged ETFs work the same way as other international ETFs with one main caveat. To hedge out the currency exposure of the underlying equity, the portfolio manager of the fund will sell forward contracts in the exact notional amount of the assets coming into the fund on a creation or the total fund assets on a monthly roll. On an intra-month basis, the creation/redemption window for a fund will close before the daily FX and forward FX benchmark. At that point, the PM will know in what notional amount he or she must buy or sell in forward contracts. Since the fund NAV is benchmarked to a widely used FX fixing rate, the PM will execute as closely as possible to that rate to avoid any tracking error from the fund's underlying index. The mechanics of the monthly roll will work in the exact same way on or about the last business day of the month. One important aspect to remember is that, in general, currency-hedged equity funds do not hedge dynamically; that is to say that the value of the hedge and the value of the underlying equity will not match after the hedge is implemented because the value of the equity will fluctuate in different degrees than the FX fluctuation, hence causing the fund to be over-/under-hedged throughout the month.

Currency-Hedged ETF NAV and IIV Calculations Calculating NAV for a U.S.-listed currency-hedged ETF is similar to the calculation noted earlier in this chapter except for one main difference. The P&L of the forward contracts must be added in to the NAV as a separate component. Remember, because the hedge and the value of the equity in USD are not always an exact match, the forward P&L position must be calculated independently.

$$\begin{aligned} \text{NAV} = & \left(\sum (\text{Shares per each component stock} \right. \\ & \times \text{Last Price}) / \text{Currency Rate} \bigg) / \text{CU Shares} \\ & + \text{Total Cash} + \text{Forward Position P\&L} / \text{CU Shares} \end{aligned}$$

Similar to what was noted earlier, the currency rate for the underlying equity and the rate on the short forward contracts will be struck at a standard benchmark each day. The IIV will use the spot rate and the current forward rate for intraday valuation purposes.

International ETF Execution Example Let's look at the case of a U.S. customer wishing to receive an NAV execution in a U.S. ETF with Japanese constituents. These are the steps for the facilitation:

1. The customer gives an authorized participant (AP) an order to buy \$2 million notional of ETF-INTL (a U.S.-listed ETF with Japanese constituents) at the official NAV.

2. The AP buys the basket of Japanese constituents at or as closely as possible to the close of trading the following day in Japan.
3. In order for the AP to buy the basket of Japanese shares, it has to borrow yen to pay for the stocks.
4. The AP then delivers that basket of stocks to the issuer's agent and receives the ETF.
5. The AP then delivers the ETF to the client, receiving U.S. dollars as payment.
6. The AP is now flat in equity/ETF positions but has an up-and-down position in currencies. It is long U.S. dollars, having received them from the customer, and short yen, having borrowed yen to cover its purchases of Japanese stocks. It will buy yen with the U.S. dollars to repay the loan and flatten its currency position.

The FX transaction of the AP is important because it will determine the price of the ETF to the customer. The customer will receive the USD ETF based on executions of Japanese underlying constituents, USD/YEN execution, and cash per creation unit. The official NAV of the ETF uses a standard accounting practice to determine the FX rate while a customer transacting through the underlying will receive a value based on an actual FX execution.

Timing of Creations and Redemptions

An important difference between funds with domestic or international underlying constituents is the timing of NAV-based trades. If you are looking for an NAV-based price on a fund with domestic constituents, you will be able to place an order during the ETF's market hours and receive a fill on that order during the same trading day. If it is an order benchmarked to the official NAV of the fund, you will receive an ETF price that is equal to the closing price of the stocks in the basket plus the cash in the fund, all priced as of the same day. This is impossible in an ETF with constituents trading in a different time zone. In this case your pricing will probably be based on next-day execution. Let's use Japan again as an example to describe this process and compare it to a domestic ETF.

Comparing a Domestic and International Execution Starting with the U.S. fund, the time frame of order placement and execution would be as follows:

1. During the U.S. trading day (subject to various timing restrictions), place an order with an AP to buy \$10 million notional of ETF-US at NAV.
2. Before the close on the same day, the AP will send a market on close (MOC) order in each of the constituent stocks.

3. The AP will place an FX order to buy the foreign currency and sell the USD in the same notional as the basket that was bought and at the same time as the FX benchmark of the ETF's official NAV.
4. Just after the market close, a report will be issued based on the closing price of the stocks in the basket and the estimated cash in the ETF. The following day an adjustment will be made to account for the small difference between total cash in the fund and the estimated cash number published previously translated into USD based on the FX execution.

Now let's look at an example of the timing of a similar purchase of \$10 million notional of ETF-INTL at NAV, which has a basket of Japanese constituents:

1. In theory, anytime before the close of trading in Japan, a customer can place an order with an AP to buy \$10 million notional of U.S.-listed ETF-INTL at NAV. Note that if you are interested in an NAV-based price of the ETF with Japanese constituents, you should not be limited to U.S. trading hours for placement of that order, since because of the timing you are not actually trading during the U.S. market session. If you make the decision to buy today at 1:00 p.m., for example, the order will not be executed until the market on close in Japan on the next Japanese trading day. It is beyond the scope of this book to go into specific global market regulations on closing price calculation methodologies; you must discuss that with your broker in advance.
2. The AP will place the order to buy in Japan based on local MOC regulations.
3. On the U.S trading day that follows the close in Japan, you will receive the execution price based on the closing stock prices in Japan and the total cash in the fund.

TRADING TIP

ETF issuers place restrictions on creation and redemption times on APs to facilitate processing of those orders. These timing restrictions are essentially for the APs and are actually less relevant for the client in terms of executing flow. If you can contact an AP's international trading desk and give an order in an ETF for it to execute using the international basket, in many cases it will be able to handle it regardless of what the times were for creations and redemptions. On the back end, to facilitate the flow, it will end up with a long or short ETF position and the corresponding basket position; the desk will then use the creation and redemption process to clean it off their books.

When trading a fund with international constituents from multiple countries in an NAV-based transaction, you will be subject to the various closing times on the following trading day. The fund's prospectus will list the timing convention of the pricing of the currency. Remember that a U.S.-listed ETF based on international underlyings has inherent FX exposure. This means that even if the prices on all the stocks in the underlying basket do not move, and the currency moves between your purchase and sale dates, then the USD price of the ETF will move. You will have either a profit or loss on the position. Currency-hedged ETFs attempt to hedge that exposure, and P&L in this scenario will be minimal.

Transacting in various international underlyings will expose you to local regulations and potentially added costs. In some of the more regulated international markets, the ETF may have certain restrictions on timing of creations and redemptions and the ability to source local liquidity. Also, within the NAV-related price of the international ETF, there might be embedded fees, such as stamp taxes and additional broker costs, which the AP must recoup for transacting in those local markets. Be aware that these extra fees will also show up in the ETF spread while it trades during U.S. hours. All of these expenses and nuances are built into the ETF spreads that liquidity providers make. For instance, liquidity providers that are using the creation and redemption mechanism to do types of arbitrage or source liquidity in the underlying basket will have to pay these fees. They will then reflect them in the pricing of their spreads. It is important when pursuing executions based on NAV in international-based ETFs to speak in detail with the executing broker to understand all the various charges that will be involved as well as the timing of the transactions.

TRADING TIP

There are three ways to think about your currency exposure:

1. Using an un-hedged international ETF and a currency ETF combo:
If you want to hedge the FX exposure and just isolate your performance to the stock moves, you can either do an opposing FX transaction or use currency ETFs for hedging. That is one of the uses and benefits of the existence of currency ETFs. They give you the ability to hedge out your currency exposures in an international-based ETF isolating the stock price moves. This would be done from the long side with a long position in the ETF with international constituents and short the respective

currency ETF in the notional amount of the exposure. Alternatively, you can isolate your international exposure to the currency itself by just positioning in the currency ETF without any exposure to actual underlying equities. For example, if you are long an ETF with Japanese local constituents, you are inherently long yen exposure versus the USD. If the dollar strengthens against the yen, the U.S.-listed ETF will lose value in dollar terms even when the underlying equity prices do not move. To hedge against such FX exposure and thereby isolate the equity (or currency) exposure, a long holder of the ETF would either sell yen in the spot FX market or sell one of the available currency ETFs. If, however, you are just buying the fund to achieve some expected performance in the currency, you can just purchase the currency ETF directly, isolating your position away from any equity exposure. There will be different concerns and advantages to using each method.

2. Using a currency-hedged or un-hedged ETF: a solution for hedging currency exposure:

Over the last few years, investors have come to appreciate the potential return differentials in international ETFs due to currency fluctuations. In the early years of ETF trading many investors were so pleased with their newfound ability to actually achieve exposures in a variety of foreign locales that they did not dwell on the details of whether their returns in those funds were coming from stock or currency performance. Now investors have become more attuned to what is driving the returns in their funds. This has led to a tremendous rotation from un-hedged international equity funds to those providing a currency hedge back into dollars for U.S. investors.

There are two different pieces of exposure when using international ETFs, an equity component (or other underlying asset) and the currency component. An un-hedged international ETF provides a U.S. dollar investor with exposure to both pieces at the same time. For example, when you buy an ETF providing exposure to Japanese equities, your portfolio position becomes long Japanese equities and also long Japanese yen. As an investor, however, you should start with determining what exactly you are trying to place your bet on. Currency-hedged ETFs now provide the ability for

(Continued)

investors to isolate their exposure to just the underlying assets in the fund. So investors now can make a clear decision about their investment goals. To extend the example, an ETF providing exposure to Japanese equities that is currency hedged provides a portfolio position of just long Japanese equities, with the long yen exposure neutralized. This should be clear to investors: You do not get a short yen position in that ETF; you get currency neutralized. The exposure to the currency is removed. In theory, this is where all investors making investments abroad should begin.

A currency-hedged position should be the core holding for international exposures, with varying currency risks taken at appropriate times. In the United States over the last 20 years, before the existence of currency-hedged ETFs, that core international exposure was not currency hedged and, therefore, was deriving returns from both components. The difficulty that has arisen with the development of currency-hedged vehicles is that not all investors will know when is the appropriate time to add currency exposure by moving from their hedged core position to an un-hedged position. Dynamically hedged ETFs have been developed to solve this conundrum for investors.

3. Dynamic currency-hedged ETFs: wax on, wax off. Don't forget to breathe!

The first wave of currency-hedged ETFs provided investors with a static, completely neutralized currency position within the ETF. Investors could rotate from currency exposure to no currency exposure by buying and selling positions in the hedged and un-hedged funds. This can generate trading commissions and even potentially create taxable events in investor accounts. More recently, dynamic currency hedged products have come to market that actually manage the currency exposure within the ETF, providing investors with one vehicle that will provide international exposures and be hedged or un-hedged by varying degrees, depending on what may be happening in the underlying currency. These products present a sophisticated way for investors to hold exposures internationally. They are essentially bringing sophisticated transparent currency adjustment mechanisms to all investors in a tax-efficient, transparent, and liquid manner.

Intraday Indicative Value and the Estimated NAV

Understanding the intraday value of a U.S.-listed ETF with international constituents is somewhat more complicated than its U.S.-based counterparts. The timing of when the basket is trading and the fact that it is not trading at the same time as the ETF makes it far more complicated to value. It is critical to understand that a U.S.-listed ETF with international constituents is trading in the market as a price discovery vehicle. It is acting as a mechanism that estimates where the underlying basket will be trading when it begins trading at the local market open. This is quite different from a U.S.-based ETF, which is almost always trading in line with its underlying basket. Thus, international ETFs will usually trade at a premium or discount to their IIV because there is no arbitrage mechanism available if the underlying markets are closed. The price is trading independently from that of the underlying constituents.

Based on the timing, the published NAV of an international fund in the United States will be seen on a one-day lag on most systems. Keeping Japan as our example, last night's trading in Japan is not reflected in the NAV for a Japanese ETF that is published today. The NAV for the ETF will be officially published at the end of the U.S. trading day with the U.S.-listed ETFs. The IIV for that same fund, however, will be based on the most recent trading activity in the local market. So the IIV on a fund with Japanese constituents in the U.S. morning will be based on trading activity in Japan that occurred during the trading day. This information is valuable as a basis for pricing the ETF during the U.S. trading day. It shows where the basket traded at the close of business in Japan, but significant events since then may now be influencing the price of the ETF. There is no real-time arbitrage available between the ETF and its underlying basket during the hours the ETF trades, so the two prices will move independently of each other and most likely during different time zones. One will be representing the most recent close, while one will be representing expectations for the next morning's open.

TRADING TIP

What causes the IIV of an ETF with international constituents to move during the U.S. trading day? Unlike the NAV, which has a fixed currency rate for the conversion, the IIV does not. The currency rates are moving constantly, and the IIV is reflecting changes in those rates as they apply to the underlying basket. During the U.S. trading day, the IIV calculation is showing where the basket of international stocks most recently traded/closed converted to dollars at the currency spot rate. The IIV for currency-hedged ETFs will have minimal intraday fluctuation based on the amount the fund is over- or under-hedged as compared to the value of the underlying equity.

The best way to determine what would be a proper valuation for an ETF with international constituents that is trading in the U.S. market would be to make an estimation of sentiment and market movements at the time of trading based on some proxy assets. I call this the calculation of estimated net asset value (eNAV). Estimated NAVs have been used to value closed-end funds (CEFs) for many years prior to the invention of the ETF. Estimated NAVs attempt to estimate what factors would have an effect on the value of the underlying basket and build those factors into a new price estimation of the basket itself. This used to be important in the CEF world because only weekly or even less frequent NAVs were published. If you knew where the basket was on Friday, and it was Wednesday, in order to have an idea of the right value for the CEF, you would want to create an estimated change value to apply to the last known NAV. That would be the generation of an eNAV value. It is interesting that you can purchase eNAV values for CEFs, but currently no providers are selling them on ETFs for consumption by the investment community. This limits eNAV availability to the players with the resources to build the systems to calculate those estimating factors. At the moment the client base is mostly using market pricing to evaluate ETF prices, which is dependent on other valuations being generated by other people in the market.

There is currently an arms race in the process of calculating eNAV because it enables traders to price larger blocks of ETFs on risk into the marketplace, capturing order flow, commissions, and spreads in the process. This causes trading volumes to expand because there are so many different variables and combinations of events that can affect any one set of international constituents. There is no standard valuation for the eNAV; the process is subjective, and those differences of opinion are what make international ETFs valuable as estimates of future pricing.

A basic formula for calculating an eNAV:

$$\begin{aligned} \text{eNAV} = & \left(\sum \text{Shares per each component stock} \right. \\ & \times \text{Last Local Price} / \text{FX Rate} \times (1 + x) / \text{Creation Unit Shares} \\ & \left. + (\text{Estimated Cash} / \text{Creation Unit Shares}) \right) \end{aligned}$$

where x = the expected percentage change in the underlying constituents.

Notes:

1. For currency-hedged ETFs, add the daily P&L of the forward position.
2. Estimated cash: Note: While estimated cash is the most accurate level of cash in the fund, there may be other variables that need to be priced

into estimated cash to get a real-time value of a fund. Every ETF issuer structures each ETF differently to maximize the asset class efficiently. It is best to check with an issuer to get the most accurate understanding of all variables affecting the value of estimated cash.

In this formula, the variable x will be generated based on some set of correlating proxy assets. Also note that this formula is using estimated cash because it is attempting to formulate the real-time approximation of the value of the ETF. There is rarely a need to estimate actual NAV because it will be published on a backward-looking basis using the closing prices of the constituents and the total cash. When creating an eNAV for the approximation of fund value, you would use the estimated cash in the fund, which would approximate what would be required in doing a creation or redemption at the next available time.

PROVIDING LIQUIDITY

The process of making markets, or providing liquidity, in an ETF in which the underlying is not trading at the same time as the ETF is very different from doing so for the domestic version. In the example where the customer is a large buyer of the Japanese ETF, the liquidity provider will then sell the ETF to the customer. At that point, the liquidity provider (LP) will be pursuing one of two goals: either purchasing shares of the ETF back in the markets at a cheaper price, or purchasing some pre-designated hedge for its position. In a situation where the ETF and the basket trade simultaneously, the LP would buy the basket to be perfectly hedged. This situation is represented in Exhibit 10.2.

At a later point, the LP would potentially create the shares in the ETF, flattening its position and clearing its balance sheet.

In this case, the basket is not trading simultaneously with the ETF, and the LP is going to rely on the eNAV and the correlated hedge to reduce its exposure. Even with a great hedge, however, the process of unwinding the position is not as simple as creating the ETF at the next opportunity. In this example the LP has sold the ETF to the customer and put on a position that correlates to the ETF and trades during the same trading hours as the ETF. This can be seen in Exhibit 10.3.

Unlike in the domestic position, this position cannot be flattened via the creation and redemption mechanism. If the LP decided to do a creation of the ETF to try to unwind its short position, it would just end up with a short position in the creation unit, as can be seen in Exhibit 10.4.

Since the creation and redemption mechanisms are based on the in-kind transfer of one asset for a basket of other assets, they represent the same



EXHIBIT 10.2 ETF with Domestic Constituents—Hedged Position. The ETF and Basket Position Can Be Collapsed via the Creation/Redemption Mechanism



EXHIBIT 10.3 International ETF—Correlating Hedged Position. The ETF and Correlated Hedge Cannot Be Collapsed.

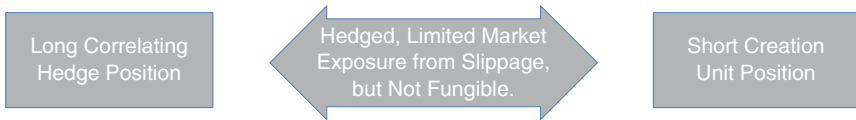


EXHIBIT 10.4 International ETF—Correlating Hedged Position, After the Creation. After Doing a Creation of the ETF, You Are Left Short the Basket versus the Hedge.

exposures. Since the correlating hedge is not the creation basket, the position is not flattened via the creation and redemption mechanism. This process can be utilized to gain access or switch positions between the ETF and the underlying basket if that is a more advantageous position. However, the correlated hedge position will still remain on the books until the market maker trades out of it.

There are some exceptions to these situations with the most prevalent being the cash creation and redemption of certain ETFs. In certain circumstances the AP is able to deliver or receive cash in exchange for receiving or delivering the ETF. This can be the case if the country of origin underlying the ETF has restricted trading privileges. In this situation, the LP could be selling the ETF and buying a correlating hedge during the day, and then at

the end of the trading day it could potentially unwind its hedge and take the risk between our market close and the close of market in the respective country. At that point, the LP would do a creation in the ETF, delivering cash and receiving ETF shares to cover its short position. This can be done in a variety of ways and is really a function of trading in the various markets. It is no longer pure arbitrage between an ETF and its underlying basket.

The combination of the variability of an eNAV calculation, the confluence of many different users, and the arbitrage mechanism of the ETF structure have combined to make some of the international-based ETFs very popular products within the trading and investment community. Compared to the arbitrage mechanism in ETFs with domestic constituents, where the main drivers are speed and financing, ETFs with international constituents require global systems and a sense for trading. A firm will be willing to go only so far on the faith in its automated correlation hedge before it is no longer willing to take risk. In the market dislocation of late 2008–2009, there were tremendous opportunities in ETFs that traders were able to pursue and benefit from. All the while they were providing liquidity in the ETF wrapper and bringing the discounts and premiums back into line when possible.

Note about Premiums and Discounts

Premiums and discounts in relation to IIV of an international ETF are a very valuable tool for understanding what might be happening in the markets. They generally are the result of the underlying basket being closed, so the pricing includes speculation on where that basket is going to open at the next trading session. Thus, in relation to CEF premiums and discounts, which typically are longer term and involve more than short-term market perceptions, international ETF premiums and discounts can represent a potential additional opportunity or even an added cost to trading. If you want to buy ETF-INTL based on Japanese underlying stocks and that ETF is trading at a 4 percent premium to its IIV because of some positive news event, you can either pay that premium during the U.S. trading hours or wait until the Japanese markets open and have an LP source the ETF liquidity from the underlying constituents. If the underlying stocks open only 2 percent higher than where they closed and you can buy your basket, you were able to save 2 percent versus the estimate of where those stocks were expected to open. If the Japanese market opens up 6 percent, however, then you will pay a higher price than anticipated during U.S. hours. When you are executing via the local underlying shares, you are trading at the implied NAV price of the ETF, avoiding any movements based on sentiment and news.

In a sense there is no correct price for ETFs with closed constituents; their valuation is subjective. The spreads that are present in the market include the risk that LPs are taking in terms of their correlation hedge breaking down before they are unable to unwind the position. It is important to understand what the premium/discount of international ETFs means. When trading ETFs with constituents that are closed during U.S. hours, you must understand the assumptions and risks you are paying for. This way you can decide to buy during U.S. hours via the ETF, or during local hours via the underlying basket.

CONCLUSION

International ETFs have continued to grow with the industry in both new assets and new products. Innovation has proven successful, as we have seen in currency-hedged products, but issuers will need to continue to innovate to meet investor demand.

International ETFs have given investors the ability to achieve exposures in different countries, regions, and sectors prior to their markets' opening, in a more efficient and liquid environment than any previously listed investment products. These ETFs are giving investors easy exposure to areas that previously could not be accessed, such as emerging market and frontier countries that typically require investor identification and local registration along with prefunded trading and advanced clearing agreements. They are also giving investors easy one-stop access to more complex strategies typically reserved for institutional portfolio managers. This has opened a whole new world up to both international asset managers and retail investors alike.

Another added benefit of these listed international ETFs is their unique and transparent structure, which allows liquidity providers to define risks, giving them the ability to hedge, even if with a proxy vehicle. Just as options pricing mechanisms added a quantifiable dimension to option trading, ETFs have similarly changed international trading. Their structure allows LPs to commit more capital and make larger risk markets on international exposures during the U.S. trading day, which is being supported by an explosion of volumes and investor assets. Volumes have become so expansive in some products that the size available surpasses that typically available in the underlying market.

The equity-based ETFs are far and away the largest category of ETF assets. Every player in the investing world is now utilizing these products

where applicable in their portfolio. And the ideas for new coverage areas and new ways to use the products continue to expand daily. Throughout the remaining chapters in Part Two, we explore the many other types of products that have become available in the world of exchange-traded products. It was important to focus on valuing the equity products first because they are the basis for many of the products we will encounter, whether they are currency or fixed income or commodity based. And the basic tenets of calculating the values of the ETFs for trading and execution purposes are consistent across the ETF structure.

Fixed-Income and Currency ETFs

Exchange-traded funds (ETFs) were firmly entrenched in the investing landscape by the early 2000s. They developed a strong following in the hedge fund and institutional communities as a cost-efficient way to access a broad range of exposures and to hedge portfolios and manage cash.

Regulatory delays held back the launch of the first fixed-income ETFs in the United States until 2002. The initial fixed-income products met with reasonable success in the marketplace. As SEC restrictions have eased, the array of products has grown dramatically. Since the first edition of the *ETF Handbook*, fixed-income ETFs have more than tripled in assets and grown almost 200 percent in the number of funds in the marketplace. The growth of the currency ETF market has followed a similar path in that regulatory hurdles have had a significant impact on the products available. The first U.S.-listed currency ETPs did not reach the market until 2005. In fact, because of regulatory hurdles, the initial currency products were grantor trusts and partnerships. These products are not investment companies and therefore avoided the lengthy SEC review. ETFs covering currencies did not make their debut on U.S. exchanges until 2008. The success of some of those products has provided evidence of structure over first-mover advantage.

As I have mentioned, first-mover advantage has always proven to be very strong in the exchange-traded product (ETP) market. Typically, there has to be some true differentiating factor for a fund to succeed where another fund is already present and offering a similar exposure. It could be a different fee range or diversity of underlying or another differentiating factor. In the case of the currency ETFs that are focused on developed market countries, structure (ETF, grantor trust, and note) is the differentiating factor. From what we have seen so far in the ETF landscape, even though the 40 Act structure of an ETF is superior, the first-mover advantage in some ETPs has held sway over investors' mind share and market share.

Currency ETFs offering exposure to emerging market currencies were launched within months of comparable alternatives and also offer distinct structural differences. The clarity in the debate over which advantage reigns supreme is made cloudier by the fact that many currencies are traded tactically instead of as long-term allocations. Assets dripping out of a certain

fund and into another product over the course of half a decade could very well be due to the fact that investors became less bullish on the currency, regardless of the structure; and when it was time to jump back into the asset class, newer funds could have been top of mind. Only time will tell if the investing public deems one structure to be better than the others.

While fixed-income and currency products were later arrivals, their growth has been notable in the milestones achieved in so short a time frame. The rapid growth in fixed-income funds continues to attract most of the major liquidity providers and institutional investors, which have developed robust technology to create billions of dollars of daily liquidity in the asset class. Exhibit 11.1 lists the important developments in fixed-income and currency ETFs.

The fixed-income and currency funds as a group make up only about 15 percent of the overall assets in the ETF universe as of December 2015. This number is low as compared to the generally higher percentage of household assets in fixed-income products. That 15 percent continues to be overwhelmingly dominated by fixed-income funds. The currency funds as a group still compose only a small fraction of overall ETP assets. I would attribute this to three factors: late entrance to the ETF world, the somewhat heavier educational requirements of the product suites, and the largely tactical nature of currency investing in general. Currencies in particular do not traditionally have the heavy retail-dominated client base that has been driving growth of the ETF industry recently. Continuing to educate investors about the benefits of non-correlating asset classes and the uses of currency products alongside

EXHIBIT 11.1 Timeline for Developments in Fixed-Income and Currency Exchange-Traded Products

Date	Event
July 26, 2002	Launch of the first U.S. fixed-income ETFs
September 26, 2003	Launch of the first broad-based fixed-income ETFs
December 5, 2003	Launch of the first TIPs ETF
December 12, 2005	First currency ETP (grantor trust)
September 18, 2006	First strategy and multicurrency ETP (partnership)
March 16, 2007	Launch of the first mortgage-backed securities ETF
September 10, 2007	Launch of the first municipal bond ETFs
October 5, 2007	Launch of the first international bond ETF
February 12, 2008	Launch of first actively managed bond ETF
May 1, 2008	Launch of the first leveraged bond ETFs
May 14, 2008	First currency ETFs—single currency
May 6, 2009	First multicurrency ETFs

Source: Bloomberg, sponsor press releases.

or instead of foreign equities will help those product sets to grow over time. Lastly, many of the types of investors who use currencies tactically or strategically do not need the convenience and added cost of an ETF wrapper to implement their strategies, especially for single currencies. The initial currency products focused on the most widely traded currencies outside the U.S. dollar, typically referred to as G10 currencies. The newer products are helping investors access a broader universe of currencies, including emerging markets, and achieve more of an investment theme in their currency exposures.

The growth of assets in currency funds was followed by a sharp decline in AUM of non-G10 currency strategies since 2011. What are the reasons for this? One popular theory, but largely erroneous, is that sophisticated investors who would use currency ETFs for hedging vehicles and tactical speculation are able to access the currency markets directly without the need for ETFs. While this is true for medium-to-large hedge funds and some sophisticated RIAs, it is important to note that these asset managers were not using ETFs as their primary vehicle for most of their assets anyway. Another erroneous assumption would be that currency ETFs were a fad that has largely passed. Some established asset managers choose to make the claim that this is the case not just for currency ETFs, but for ETFs of many different asset classes as well. This is erroneous as the growth of ETFs at the expense of other structures has been an undeniable trend for essentially every year since 2007.

The main cause for the fall in assets of foreign currency ETPs is the fact that, since 2011, the U.S. dollar has experienced a generally bullish run at the expense of nearly every currency, G10 or otherwise. This was most evident during 2014 and 2015, when nearly every major currency in the world depreciated against the dollar. Further evidence of the erroneous nature of the theories is that assets of G10 currency funds and especially U.S. dollar funds have increased during the same time period.

Exhibit 11.2 shows the number of funds and assets currently available in the fixed-income category broken down by focus.

In this chapter we explore the various nuances in the fixed-income and currency products. We look at the difficulties of calculating the intraday indicative value (IIV) in the fixed-income funds and the unique requirements of wrapping a fixed-income product into an equity-style wrapper. We then turn to the currency products and look at the characteristics of the various structures available. We see how those exposures are achieved and how they trade.

As two of the largest asset classes in the global investing arena, there is a tremendous amount of potential growth for fixed-income and currency ETFs. They are very new to the ETF wrapper and have only just begun to

EXHIBIT 11.2 Fixed-Income ETFs and Assets (AUM)

Exposure	Number of ETFs	AUM	Percent of Category
Broad/Aggregate	14	\$77,757,000,000	24.4%
Convertible	2	\$2,522,000,000	0.8%
Corporate	55	\$64,754,000,000	20.3%
Covered	1	\$7,000,000	0.0%
Emerging	18	\$10,118,000,000	3.2%
Government	58	\$64,016,000,000	20.1%
Govt./Corp.	7	\$29,602,000,000	9.3%
High Yield	30	\$37,929,000,000	11.9%
Inflation	16	\$22,466,000,000	7.0%
Mortgage	7	\$9,924,000,000	3.1%
	208	\$319,095,000,000	

Source: ETFGI, 12/31/15

develop their potential. A long list of products is scheduled to launch in these categories over the next year, and I expect that the assets will continue to grow significantly.

FIXED INCOME

The fixed-income market had been in the sights of ETF issuers for many years before they were launched. The race to launch the first fixed-income ETF pitted Barclays Global Investors against a small startup, ETF Advisors. After years of development, the initial launch of four ETFs under the iShares brand included three Treasury ETFs and one ETF comprised of investment-grade corporate bonds. ETF Advisors followed a few months later with four Treasury products focusing on key Treasury benchmark securities. As has been mentioned, the first mover is always in an advantageous position in the ETF world, and eventually ETF Advisors succumbed due to its late arrival in the market and liquidated its ETFs in 2003.

When a generic listing standard for ETFs was passed, the time frame to launch new funds shrank dramatically. Many of the fund filings had been with the SEC for years. Sponsors adapted the traditional in-kind creation and redemption process to address the unique needs of various fixed-income sectors.

With the exception of the corporate fund, the initial fixed-income ETFs all incorporated representative sampling and optimization in tracking their benchmark, with duration being the leading consideration. There were

only six fixed-income ETF listings from 2003 to 2010. But more than 70 fixed-income ETFs were launched in the two years that followed and 150 new funds since 2010.

Let's look at some key differences in the ways that the fixed-income and currency markets function in comparison to the equity markets. They embody many of the obstacles that these funds have to overcome when listing in an equity-style wrapper.

Fixed-Income ETP Growth Trends

In this section, we'll discuss some trends in the fixed-income ETP landscape. The launch of fixed-income ETPs trailed that of equity funds by 10 years. By the time they launched, however, investors were familiar enough with ETFs that the rampup in AUM was not as slow as it was for equity funds. For example, it took roughly nine years for equity funds to break \$50 billion in AUM. Fixed-income ETPs did it in about seven years after they were first introduced. The chart in Exhibit 11.3 shows how assets grew after the launch of the first fixed-income or equity ETF.

In Exhibit 11.4, you can see the asset growth in the fixed-income ETFs as a percentage of overall U.S.-listed ETFs. In terms of asset class breakdown, fixed-income ETFs had a similar start to their equity counterparts, where core allocations were the first to launch and non-core, or periphery, allocations followed gradually.

Fixed-income ETFs have experienced an interesting growth pattern (Exhibit 11.5). While these days hundreds of ETFs are launching annually,

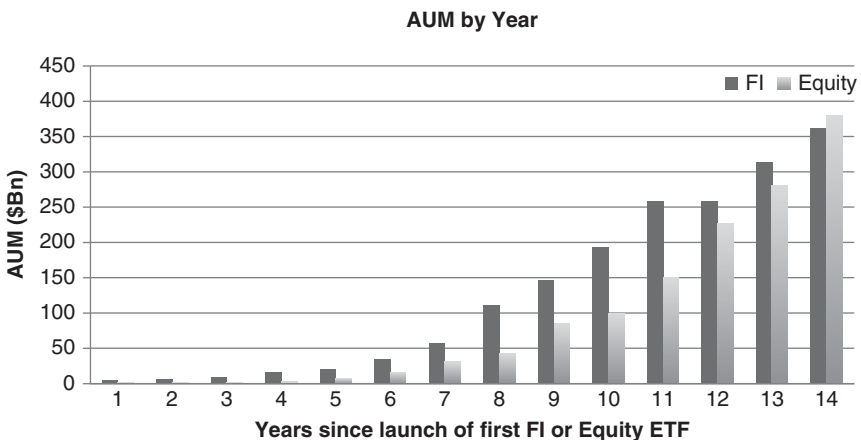


EXHIBIT 11.3 Asset Growth in Fixed-Income and Equity ETFs

Source: Bloomberg, 12/31/15

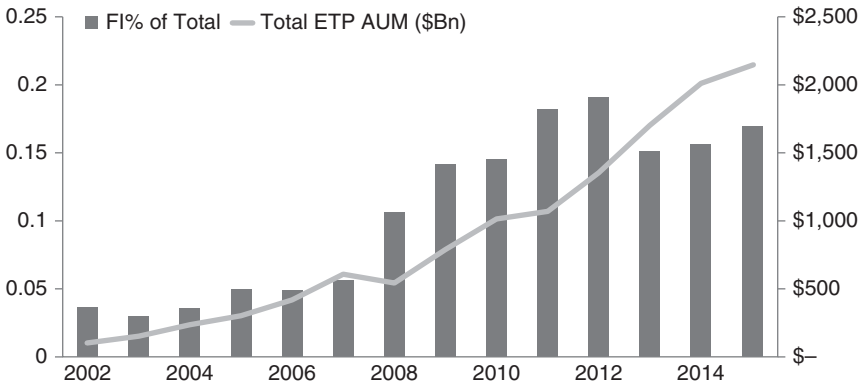


EXHIBIT 11.4 Fixed-Income ETPs as a % of Total ETPs
Source: Bloomberg, 12/31/15

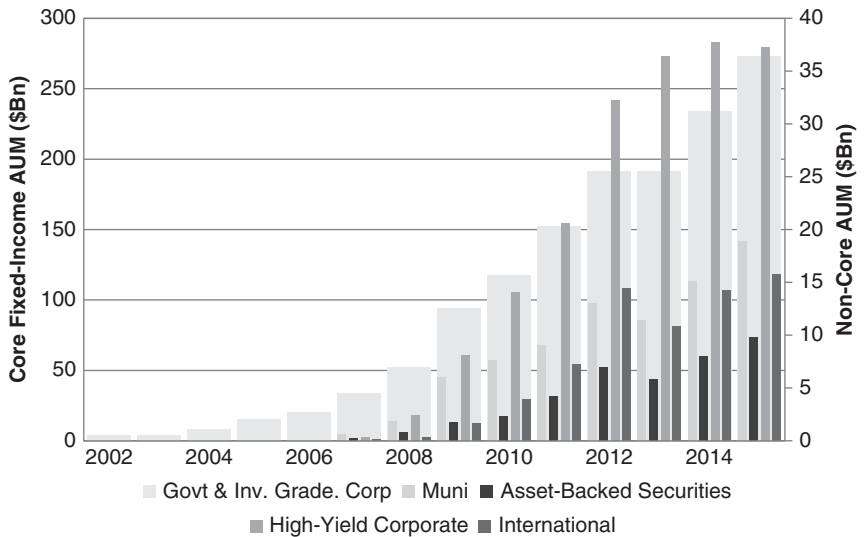


EXHIBIT 11.5 Asset Growth by Fixed-Income Asset Class
Source: Bloomberg, 12/31/15

many in the fixed-income category, in 2002 only four fixed-income funds were launched. The first funds were all core strategies. Largely comprised of U.S. government and investment-grade corporate bonds, core strategies are those that usually have a place in most investor's portfolios. Only after core strategies found a firm footing did non-core fixed-income funds start garnering much attention. The graph below shows the trend with core fixed

income represented by the wide bars on the left scale and non-core fixed income on the right scale. Core fixed income had over \$30 billion in assets by the time non-core funds came into prominence.

This trend has several reasons. First, in the United States, the size of the core fixed-income market dwarfs that of non-core fixed income. Also, U.S. investors have historically had minimal allocations to international debt. Therefore, it would make sense for ETF sponsors to focus their launch efforts on asset groups that command assets currently. Another reason issuers would lean in on core fixed income is these assets tend to be more sticky, meaning investors are not likely to switch in and out of their core allocations and instead would look to enhance them with peripheral strategies. Last, we return to the notion that early ETFs were simply there to provide beta exposure to the asset class. Given the nature of credit risk, government and highly rated corporate bond funds, as well as mortgage-backed securities, will largely trade in lockstep with similar bonds. Therefore, replicating performance of an index containing thousands of U.S. Treasuries can be done with a portfolio of only 10–15 bonds. Similarly, without allocating across too many different issues, ETFs with few assets can quickly achieve analogous performance to the benchmark by investing in a small subset of high-grade corporates and mortgage-backed securities.

How fast funds grow is another interesting trend to examine. The first four fixed-income ETFs were launched with around \$600 million each, except for LQD, which launched with around \$1 billion. This is usually not the case these days as funds are usually launched with seed capital anywhere from \$1–10 million. There is definitely a positive correlation between funds that launch with significant assets and their ultimate success both in the near and long term. Whether that money comes into the fund before the launch date as seed or is committed client money that enters on the first few days of trading is generally not relevant.

The first U.S.-listed equity ETF, SPY, took just under three years to reach the much-celebrated \$1 billion AUM mark. The second fund to do so, MDY, took around three and a half years. As mentioned earlier, LQD was launched with around \$1 billion in assets, so it is not a fair comparison. These days, for a fund, especially a fixed-income fund, to reach \$1 billion in assets within its first year or even its first few years is quite remarkable.

The Investment Company Institute reports that as of the end of 2014, bond mutual funds accounted for about 22 percent of the total mutual fund AUM, with money market funds comprising another 17 percent. ETFs break down differently, with fixed-income ETPs, including short-term funds, comprising roughly 17 percent of the total ETP market and only peaking at 20 percent. If the trend of ETFs taking assets from mutual funds continues, given that equity funds comprise 80 percent of the total ETF asset pool, it is

likely that fixed-income ETFs will have a higher growth trajectory over the coming years than equity funds.

Key Differences in the Fixed-Income Markets

Pricing Is Different Fixed-income markets are over-the-counter markets. There is no official open or close and no exchange-based official pricing center. Trading desks price their own portfolios of bonds at the close by polling multiple sources to determine a fair valuation. Mutual funds often rely on several sources for final valuation. If you ask multiple market participants for the closing price on a particular 10-year Fannie Mae note, for example, you can potentially get several different yet close answers. The variability of marked prices for a given bond as well as the spread between bid and ask prices is inversely related to the liquidity of the bond. On-the-run Treasuries are some of the most liquid securities in the world. They will show limited variability in closing prices between vendors and feature minuscule bid/ask spreads. A high-yield corporate bond, however, that trades infrequently, will have estimated values that could differ greatly between pricing venues.

This over-the-counter structure and lack of official pricing initially made it difficult to build ETFs around bonds. ETFs typically require final closing prices to generate the net asset value (NAV), similar to a mutual fund, but also need an intraday estimate on the value of the fund (IIV). Product designers were forced to adapt to a dramatically different world without exchange pricing.

Bonds Are Not like Stocks ... Or Are They? Common stocks represent a percentage of ownership of a public company. The value fluctuates with the supply and demand on the transparent exchanges. Bonds are debt instruments with an interest rate component, set stated maturity, and unique payout structure. One issuer can have several different types of bonds with varying components and varying values. The prices are set by the pricing source the trader chooses. The trader does not have the benefit of the consolidated tape the equity market provides.

Unlike shares of common stocks, no boilerplate structure or valuation method applies across the wide variety of bond sectors. Treasuries, corporate, mortgage-backed, and municipals and other fixed-income sectors all face unique risk factors. Interest rate risk is a common factor to all fixed-income securities, but sensitivity levels differ wildly. Specialization among the fixed-income sector is common and almost essential in the trading and investing arena.

Market Sizes Are Different One of the starkest differences between the fixed-income and the equity markets is the typical size of a trade. The

fixed-income markets are dominated by the institutional trading community whose sizes are generally large and in round lots. The market participants are not traditionally set up to facilitate the small-lot trading sizes that might be required in an ETF creation or redemption.

The beauty of the ETF structure is its ability to bring this mostly institutional trading arena to smaller institutions and individual investors. The creation units of fixed-income and currency funds try to bridge the gap between the large players in the underlying markets and the smaller players in the ETF markets by shrinking the balance needed to provide liquidity. There is a delicate balancing act among issuers trying to keep the creation unit size small, investors wanting a broad-based exposure to a sector, and the fixed-income and currency markets not being extremely accommodating to small-size trades. Creation unit size is very important in ETFs for helping clients to achieve liquidity in the products. If the size of a creation unit is very large in a fund, it is hard for liquidity providers (LPs) because they potentially will have large residual positions on their balance sheet. Keeping the creation unit size small enables LPs to clean up residual positions via the creation and redemption mechanism. The odd-lot trades within a typical equity basket are not an issue because of the traditional small-lot size prevalent in that marketplace. The odd-lot bond and currency positions that can be generated from the creation and redemption mechanism are an innovation in the fixed-income and currency worlds.

Building a Trading Bridge Fixed-income arbitrage has been described as hedge fund and fixed-income proprietary desks picking up nickels in front of steamrollers. The larger bid and ask spreads and the occasional noticeable premiums and discounts that occur on many of the fixed-income ETFs would suggest that currently many of those nickels are getting flattened. This is because of the fundamental differences between stocks and bonds and the fitting of one asset class into the wrapper of another.

Fixed-income and currency ETFs are basically equitized derivatives of the underlying alternative asset class. The final product fits nicely into the platform of investors, but trading and hedging the individual components has created a steep learning curve for the community of ETF LPs. Several of the differences between the asset class trading communities highlight why these ETFs trade so differently in the marketplace:

- **ETF trading desks are typically equity traders.** The ETF trading community largely grew out of the equity derivatives desks of authorized participants (APs) and specialist communities. Only a few of the trading professionals have a strong fixed-income background.
- **ETF traders are from Mars; fixed-income and currency traders are from Venus.** The rapid growth in product variability offered in the ETF marketplace has presented an interesting situation for the standard APs. The

ETF desks primarily have equity backbones, and they are now involved with products that ordinarily trade in very separate and distinct areas of their firms. It was not uncommon just a few years ago at the large investment banks to have minimal or no interaction between the ETF/equity traders and their counterparts in fixed-income and foreign exchange (FX). Now client demands make collaboration a necessity. Divisions had to come together to coordinate hedging and means of providing liquidity across asset classes. If arrangements within a firm could not be made, LPs have sourced the functionality from competing firms in order to facilitate flow in the products.

- **Equity systems do not typically handle bonds.** Many ETF trading desks operate using systems designed for equities. Many fixed-income portfolios and currency positions are tracked and hedged using applications specifically designed to handle their nuances. Robust systems reduce operational risk and foster greater conviction in trading and thus liquidity. The growth of the products is driving a rampup in technology needed on the ETF desks to handle multiple asset classes and an enormous amount of underlying products for hedging and risk management purposes. Additionally, many of the available fixed-income ETFs utilize in-kind creation and redemption baskets. Properly trading fixed-income ETFs starts not only with building a model to estimate the IIV but also securing reliable pricing sources to feed that model. So while investor demand continues to develop in the ETF wrapper of this asset class, so does the LPs' ability to handle its nuances.

TRADING TIP

It is interesting that ETF traders have branched into the fixed-income and currency worlds and are utilizing their new access to make money between the ETFs and the underlying market. I have not, however, seen much crossover, where currency traders and fixed-income market participants are watching the ETFs that cover their respective products and attempting to arbitrage away any spread that might appear. As the industry matures, I would expect more multiproduct trading to occur. I would expect to see merging of the typically diverse systems used to trade the multiple products. It would only be natural, as volumes and sizes increase, for fixed-income and currency traders to trade and manage risk in the ETF markets. This would bring further liquidity into the markets and tighten spreads, thus benefiting end investors. Currently, however, there are still some opportunities for traders in these funds because of potential market inefficiencies.

INNOVATIONS IN FIXED-INCOME ETFs

Active vs. Passive

A topic we have not discussed so far in this chapter is the notion of active versus passive fixed-income ETFs. The overwhelming majority of equity ETFs are passively managed; that is, they track an index and do not deviate from the investments of the underlying benchmark. For most of their history, to the general public and even to most of the investing community, ETFs have been synonymous with passive investing. This held true for the first fixed-income ETFs and is still the case today with more than 95 percent of fixed-income ETF assets tied to an index. If you look at non-ETF fixed-income assets, however, you'll notice that the vast majority of them are actively managed, some by "stars" and others by a team of professionals employed by large investment houses. There are several reasons for this, mostly owing to the intricacies of bond investing itself. Regardless of the mandate of the fund, whether it be income or total return, fixed-income portfolio managers have much to consider when investing in bonds. Many of these constraints require bond portfolios to be actively managed if they are to insure good execution, sound risk management, and proper adherence to the investment mandate. Like equity managers, they must know the fundamentals of the company, as well as its growth prospects and relative strength in the industry. They have the added burden of judging whether the company will be able to meet its debt obligations after recouping business costs. In addition, while the majority of corporations have one share class of stock, it is most often the case that a company's debt is issued in several tenors, or maturities. A company could have debt maturing in one, two, five, or any number and combination of years. This puts an added burden on the manager to manage default risk for the company at various points in time along with interest rate risk relative to the rest of the portfolio. Adding to these complexities is the fact that, as mentioned earlier, minimum trade sizes in bonds can be quite large, and trading bonds in small sizes can lead to less liquidity and poor execution. If a fund manager has only a certain number of assets to manage, and large-size bond executions to make, this will limit the number of bonds he can have in his portfolio. Because of this and taking into account the duration and credit risk constraints mentioned earlier, bond managers are forced to have fewer names in their portfolio compared to equity managers, and with a high degree of conviction.

While these constraints have made active management somewhat a norm for fixed-income funds outside the ETF space, we should not forget that for the first fixed-income ETFs, the concentration of assets was in passive funds. The first active fixed-income ETFs came out a few months prior to the active equity ETFs in early 2008. This was well after the launch

of the first fixed-income ETF, and was followed by several issuances of passive funds.

While the scope of fixed-income funds narrows and widens with shifts in trends, launches continue in both active and passive funds. Beginning in 2012, fixed-income managers who were known for their success in mutual fund and separate account platforms offered ETF versions of their flagship funds. AUM accumulated quickly for some of these funds while others had a hard time picking up assets.

The foray into ETFs by active managers has not solely been from single managers. As large, well-established fund managers with many active funds continue to see their assets depart for ETFs, they find themselves at a crossroads. Some companies are banking on the fact that ETFs will never take the lion's share of assets from mutual funds, and that although they may give up assets in the near and intermediate term, ultimately they will keep most of their assets and continue to grow. The other camp believes that ETFs will continue to take asset share. These managers, too, are at a fork in the road. One option is to build out a whole platform from which to launch ETFs under their own banner. While the costs of such an endeavor may be high, the real challenge is to build out a whole team with enough experience across ETF product management. The second option is to partner with established ETF providers and manage the fund in a sub-advisory capacity where the ETF provider would market, sell, and distribute the fund.

Each option is not without its own drawbacks, the biggest one, of course, being the give-up in fees. The new ETFs would undoubtedly cannibalize the assets of the higher fee mutual fund, and thus reduce the total revenue coming into the fund. Many asset managers are realizing that this may still be a better alternative than losing the assets completely. The sub-advisory arrangement further reduces the fees to the mutual fund sponsor, but has nonetheless proved most common out of the two options. This process lends itself well to actively managed strategies, as the active managers behind the mutual fund can focus their expertise and proceed the way they did in non-ETF structures while the ETF sponsor handles the rest.

It remains to be seen how successful these funds become and whether their success or downfall comes at a cost to passive beta funds.

As the fixed-income ETF market has grown in products and assets, investor demand for the asset class has created innovation. One such introduction to the marketplace has been the duration-hedged fixed-income ETFs at the end of 2013. This strategy is very common among institutional fixed-income portfolio managers, who use various instruments to manage the overall duration exposure of the underlying portfolio of bonds. Essentially, duration-hedged ETFs are similar to traditional fixed-income ETFs. The underlying bonds are constructed to track a broadly held fixed-income

benchmark, but use derivatives to bring down duration to a specific target. Most duration-hedged ETFs will use short Treasury futures to bring the overall portfolio duration down to the designed target. It is important for investors to understand that when hedging out duration risk, there is no free lunch. Being short a bond or Treasury future in this case, the fund must pay the coupon rate. This cost of hedging will come out of the overall NAV of the fund on a daily basis, which will impact investors' overall return. That being said, these tools can protect investors from the negative convexity they will experience in the value of the underlying bond portfolio during a rising interest rate environment. Investors will still receive the monthly or quarterly income distribution from the coupons of the underlying bond portfolio, as they would in a traditional fixed-income ETF. This new product type has given investors a tool in an exchange-traded structure that was typically reserved only for institutional investors.

Another major innovation to the fixed-income ETF world is the emergence of rules-based active and transparent active fixed-income ETFs. Rules-based active ETFs give investors exposure to a portfolio of bonds that have been selected by a portfolio manager or a committee; however, the bonds selected stay within the guidelines of the funds' stated methodology. One example would be a tiered structure, where tiers would have an equal weight of bonds determined by the tier weight. The tier weights are determined by the decision maker(s), thus giving the ETF an "active" element. Transparent active ETFs, on the other hand, have a fully active management aspect to the portfolio. Similar to mutual funds, a portfolio manager is making the investment decisions inside the portfolio. The main difference is that the holdings are published daily, and investors have intraday liquidity and better tax efficiency, typically at lower cost than non-transparent active mutual funds. If the active manager needs to make changes to the portfolio, this rebalance can be done with a trading counterparty to realign the portfolio to its desired exposure, while attempting to minimize any tax implications.

Fixed-income ETFs are following the innovations in equity ETFs, where sponsors look to break away from market-cap-weighted indexes and use one or more fundamental factors to determine the weights of the securities. One of the flaws of market-cap weighting in fixed-income funds is that the fund is investing more with companies that are more indebted, a process that can be fundamentally unsound. Instead, sponsors look at a variety of factors specific to a company's ability to pay down their debt, as well as factors relevant to a company's overall strength in determining its weight in indexes and funds. Such methods are leading to another ETF arms race in the widely quoted "smart beta" space. While smart beta equity ETFs have existed since 2006, the advent of smart beta fixed income is upon us now.

IIV and NAV Pricing Sources There can be a high degree of variability in the trading frequency for certain bonds. Some bonds, such as Treasuries, trade frequently while other bonds, such as corporates, may trade only occasionally. This is an understandable attribute in the fixed-income world but somewhat unacceptable in the ETF world. In order to account for the fact that an ETF has to publish a daily NAV, matrix pricing is the common method in ETF bond pricing. Matrix pricing is a method of valuing bonds using historical relationships and prices to estimate a current value for similar bonds. Matrix pricing groups bonds that have similar risk characteristics and prices them in a similar fashion.

A variant of matrix pricing is also incorporated into the intraday pricing of the IIV for many fixed-income categories. For municipals and corporate bonds, spread relationships to London Interbank Offered Rate (LIBOR) often drive the algorithms until fresh market data can be incorporated.

In times of high market volatility, the level at which investors and traders would consider transacting in the underlying bond of an ETF can deviate significantly from the last trade data, indicative levels, or the matrix pricing approximation that is incorporated into the IIV. During the fall of 2008, complications with estimations of LIBOR, the basis for intraday pricing of many credit-specific ETFs, created an unforeseen level of uncertainty. While there was some short-term deviation from the underlying values in the fixed-income ETFs, the return to more normal volatility levels has dampened these divergences. This is not a function of the arbitrage mechanism failing, but a function of a lack of true liquidity and pricing transparency in the underlying baskets. Assembling in-kind fixed-income baskets, particularly more sensitive credit investments, often involves higher costs for ETF trading desks. In the over-the-counter market of fixed-income and FX, the ETFs based on less liquid underlying constituents are actually taking on the role of price discovery for their underlying assets. The pricing of the ETF as it is trading in the market can be used as a combination of the most recent valuation and sentiment of the underlying products that do not have a real-time price. This is somewhat similar to the function of ETFs with international constituents, which convey the market sentiment of markets that are closed. In this case, however, the ETF price will be discovering valuations of an underlying basket of less liquid securities.

Given these hurdles and solutions to overcome them, several companies have emerged that take on the sole responsibility of pricing bonds. They use their own matrix pricing schemes to determine prices for bonds. It is very rare for any one company to have 100 percent coverage. There are just too many issuances of bonds by many issuers. The leading data providers, however, have an extremely high degree of coverage. Over decades of accumulating bond prices, yields, and other metrics, these companies have become

repositories of bond data. Many license out their data to big bank and index providers to serve as the source of pricing for their indexes. In some cases, these data providers create their own bond indexes, which bond funds use as benchmarks. ETF issuers and other fund companies utilize the data to price the NAV of their funds, thereby adding a degree of legitimacy to the NAV marking process. Even though this data seems thorough, there are several instances where bond traders may disagree with the NAV price. This can lead to consternation as prices in the market may differ by several points.

Once a pricing source and matrix is picked, a fund sponsor also has a choice of whether to price the bonds for NAV at the bid, mid, or ask. Some sponsors choose to price the bonds at the bid. They justify this as it represents the potential value an investor would receive if the fund were sold, as a market order to sell the fund and therefore its bonds would transact at the bid. Pricing at the bid can also increase the stated yield of the fund due to the inverse relation of bond prices and yield. A higher yield is beneficial to the funds, as they will look attractive when compared to other funds in the same category. Pricing at the mid-price is a common practice as it is neutral to the yield implications irrespective of buying or selling the fund.

Arbitrage in FI ETFs Similar to equity ETFs, arbitrage mechanisms can exist in FI ETFs. However, the degree to which mispricing can occur is greater in FI ETFs given the OTC nature of bond trading. As bonds are traded OTC, there is no standardized price and traders may be able to find the same bond that is in a fund, at a price significantly away from where the NAV is going to mark it. Given that ETFs can trade at a large premium/discount to NAV, combining that with price discrepancies of OTC-traded bonds can yield even larger profits if executed successfully. But traders need to weigh liquidity of bonds with greater importance. If it takes a trader too long to unload the bond, the price may move away and force a loss that could partially or completely erode the profits from the entire trade.

Currency ETFs

Overall, currency products continue to make up a very small portion of the ETF universe. This is understandable as asset allocators have a harder time making currency strategies part of core portfolios, and as currency investing is seen as largely short term. Out of the available 19 products in 14 categories, 47 percent have assets greater than \$100 million in the various funds offering exposures in that category.

There are several uses of currency ETFs. First and most simply, an investor could be speculating on the value of a certain currency. For these investors, there are several funds that go either long or short a currency.

It is often easier to buy an ETF the same way you would a stock on an exchange than it is to open a currency or derivatives account with a broker. Currency ETFs can be used to hedge existing international, foreign currency–denominated, equity positions. If you were long an ETF consisting of European stocks denominated in euro, you could go short an ETF that invests in the euro or conversely buy an ETF that goes short the euro. Lastly, certain currencies and currency strategies have been calculated to be negatively correlated to other asset classes. Incorporating currency strategies into an alternatives bucket of an asset allocation could benefit a portfolio's risk/return characteristics.

Structure of Currency Products

The first currency products came to the market in 2005 in the grantor trust structure; the ETF structure was not launched into the marketplace until 2008. The currency ETFs are issued as registered investment companies (RICs) and are registered under the Investment Company Act of 1940. As registered investment companies, these funds have added flexibility in managing their underlying investments to shape their risk–return profiles. These funds have the protections characteristic of funds structured as registered investment companies, including:

- Diversified credit risk
- Limitations on leverage and lending
- Oversight of a board of directors
- Assets that are segregated and maintained with a qualified custodian

It is interesting to note that the currency ETFs came to the market under the actively managed fund exemption because they are not tracking indexes even though they are attempting to provide reasonably passive exposure to currency movements and non-U.S. money market rates. The benefits to this active management exemption are mostly in operational efficiency within the structure. Given their flexibility, the funds can alter their investment approach to delivering the desired exposure to shareholders. The FX markets are among the most liquid in the world, but access to locally denominated money market instruments and spot exchange rates differs between various regions. In a few developed markets, the currency ETFs take a direct approach, as they invest directly into locally denominated money market investments. As can be seen in Exhibit 11.6, this is a distinctive structural feature available for taxable investors in ETFs versus the earlier grantor trust products.

Only a few countries have local money markets with the combination of issuer breadth, development, and accessibility necessary for this direct

EXHIBIT 11.6 Characteristics of Currency Fund Structures

	Currency Exchange-Traded Fund	Currency Grantor Trust	Currency Exchange-Traded Note
Structure	Actively managed registered investment company (RIC)	Unmanaged trust	Unsecured debt instrument issued by bank
Underlying Investments	Investments in money market securities; some use forward currency contracts	Foreign bank deposits	No underlying holdings
Distribution Policy	Variable	Variable	Variable
Income Distribution	If distributed, taxed at ordinary income tax rates	Taxed at ordinary income tax rates, even if no distribution	If distributed, taxed at ordinary tax rates
Year-End Gain Distributions	Realized gains on security sales (minimal expectations); realized and unrealized gains on derivatives (taxable in part as ordinary income)	Limited, potential foreign exchange (FX) gains	None
Sales	Gains taxed as capital gains; long-term capital gains tax rates if held for more than a year. Ordinary income tax rates if held for less than a year	Gains taxed at ordinary income tax rates	Gains attributable to currency fluctuations and accrued interest built into note likely to be taxed at ordinary income tax rates

Source: WisdomTree Asset Management.

approach to structuring funds. The currency ETFs providing exposure to less accessible markets utilize currency forward contracts, combined with U.S. cash-type investments, to manage and achieve their exposures. This combination produces a risk–return profile that is economically similar to that of a locally denominated money market instrument. While currency forward contracts are derivatives, their risks, especially within an ETF structure, can

be mitigated to a large degree and will be discussed later in this chapter. In nearly all of the markets for which the ETFs use this approach, trading volume in FX is high enough to support product growth. Because of the liquidity of the underlying portfolios, which combine emerging market currencies with U.S. cash-type products, these ETFs typically feature bid/ask spreads narrower than many credit-specific fixed-income ETFs. Currently there are three main types of currency products available: ETFs, grantor trusts, and exchange-traded notes (ETNs). I mention several times that structure will be the new battleground where products compete with similar exposures. Nowhere is this more apparent than in the currency products landscape. A look at some of the characteristics of the various currency structures available is shown in Exhibit 11.6.

Types of Currency Strategies There are several distinctions between currency funds and they can be stratified several different ways: single currency vs. multi-currency, levered vs. unlevered, active vs. passive, long vs. short. Most of these names are self-explanatory, but some are not as straightforward. For many investors, currency investing is largely thought of as tactical, as opposed to long term or strategic. Currency movements are largely volatile and even hard currencies largely thought of as stable, such as the euro, Swiss franc, and U.S. dollar, have exhibited large swings in movements and long, directional trends in recent years.

One of the most basic forms of currency investing in ETFs is using currency forwards to gain exposure to the currency itself. Currency forwards have an implied yield, where a country's local money market rates in that currency are embedded into the forward contracts themselves. In most developed nations, these rates may not amount to much, but in many emerging market countries, these rates can be north of 5–6 percent, and in some cases, over 10 percent. When ETFs invest in currencies using forward contracts, they are able to pass through gains from these rates to the shareholders. Besides this key yield advantage, ETF investing using currency forwards is often more practical than investing using currency held in a trust or foreign bank account for several key reasons. These contracts are traded with known counterparties in other banks and trading desks. Large sums do not have to be held in the foreign currency, hence no actual conversion of assets has to take place. Only the collateral backing these securities needs to be transferred to custodians, which are also often domiciled in the same country as the clients. The currencies are simply valued using a specified conversion rate at a specified time, and that in turn values the contract.

The tactical nature of currency investing lends itself well to levered and short strategies. Leverage in investing is a common way to express your views while allocating less capital to do so. Prior to currency ETFs, however,

retail and even some institutional investors were unable to use leverage to express views on currency movements. Many registered investment advisors (RIAs) have restrictions on what portion of assets can be held in derivative assets, regardless of whether they are levered. Over the past several years, issuers have launched a variety of products for many popular currencies; these involve both long or short, double, and triple leveraged exposure. Now even an investor sitting at home can express his views that the euro will fall relative to the dollar without setting up any additional account, or without calling a currency trader at a bank to make him a quote. Levered and long/short currency ETPs are generally set up as ETNs.

Most currency ETPs are set up to provide exposure to single currencies, whether they're levered or providing an inverse exposure as mentioned previously. Multi-currency ETPs come in a few different variations. Some multi-currency ETPs seek to provide exposure to a basket of currencies. These funds can have a specific theme, such as emerging market currencies, G10 currencies, or commodity currencies, where the fund manager would choose currencies pertinent to those themes in various weighting schemes to provide exposure to those markets.

Other multi-currency strategies can provide exposure via an active manager who makes the decisions of which currencies to be long or short. Managers could base these decisions on technical or fundamental reasons and generally are targeting a total return strategy, as opposed to merely proving exposure.

Lastly, even multi-currency ETPs can also be targeted toward a single currency, but provide exposure via several currencies. Remember, currency trading is always a pair-trade, meaning you have to sell one currency to buy another. Generally, if you are a U.S. investor, and you wish to gain exposure to a foreign currency, let's say the Japanese yen, you would most likely be selling the U.S. dollar and buying the yen. If, for example, you wanted to profit from a rising dollar, as you are already a U.S. investor, you would need to sell, or go short, another currency and buy the dollar in order to express your view. However, by shorting only one currency, you may be more exposed to that one currency's movements, as opposed to a general trend in the dollar. Therefore, it may be better for you to short a basket of securities relative to the dollar to express this view. Expressing the dollar as a basket of currencies is not a new concept. The U.S. Federal Reserve Bank, as well as several prominent banks, exchanges, and data providers each have their own trade-weighted and broad dollar indexes. Two of the largest currency ETPs track the U.S. dollar based on two different indexes.

As can be expected, AUM of single currency strategies can be almost as volatile as the currencies themselves. Luckily for investors, due to the overwhelmingly large size of the currency market, large movements in and out of

currency funds—using the creation/redemption method of ETPs—seldom, if ever, have an effect on the remaining shareholders or the currency market itself. The vast majority of these strategies employ either futures or forwards, and are in turn largely cash settled, as opposed to the currency being physically delivered. For this reason there is never a liquidity event in currencies, and there is seldom one market participant (other than a country's central bank) who can manipulate the price of a major currency.

ETFs, and currency ETFs in particular allow investors to adequately manage risk or express currency views without the hassle of margin accounts, derivative restrictions, or the archaic nature of OTC trading.

Currency ETP Growth Trends

The chart in Exhibit 11.7 shows how asset levels have shifted over the 10-year history of currency ETPs. It is clear that that total AUM has decreased by half of what it was at its peak in 2011.

As previously mentioned, the U.S. dollar's broad appreciation caused two trends to emerge in currency funds, having to do with the two facets of AUM growth or decline. The first is that, for the assets still in the funds, market value fell as other currencies depreciated relative to the dollar. The second reason is that AUM in the products was redeemed by investors. They were reacting to the broad dollar strength and the reasons for its possible continuation. To that effect, you see that AUM in USD ETFs has shown

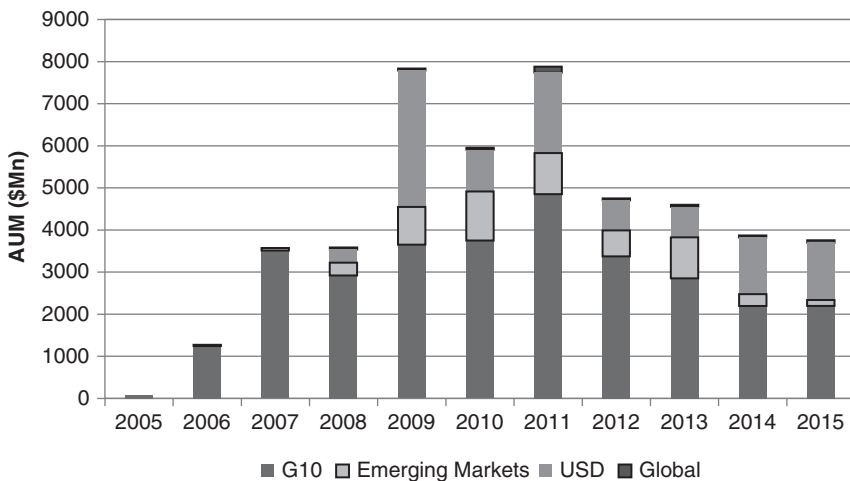


EXHIBIT 11.7 Currency ETP Assets

Source: Bloomberg, 12/31/15

a pickup after 2011's initial decline. Lastly, you don't see a wide inflow of assets into U.S. dollar ETPs as most investors are not completely educated on how investing in a broad dollar bull currency strategy can help the risk/return characteristics of their portfolio.

The chart in Exhibit 11.8 shows the number of currency ETPs available by year. There has definitely been some consolidation as about 20 percent of the ETFs have closed down in 2015. This has largely been in the global and G10 space, although the effects have been felt across categories. An interesting observation between the charts is how the number of funds does not necessarily correlate to AUM by categories. USD funds account for about 37 percent of total currency ETP assets in early 2016; however, the majority of those assets are in two funds. It is also important to note that many currency strategies are short, levered, or both. It is not the case that simply being designated a G10 or global currency strategy implies a bullish conviction on foreign currencies, as a triple short euro fund takes a negative view on the euro and a positive view on the dollar. In fact, of the \$2.1 billion in AUM of the G10 currency ETPs, roughly \$800 million are in funds that short the euro and yen relative to the dollar in early 2016. Thus, the clear trend has remained that assets are flown into funds that are inherently long the U.S. dollar. Funds that short the dollar and long foreign currencies had a brief but profitable history but will likely have their day in the future. I believe

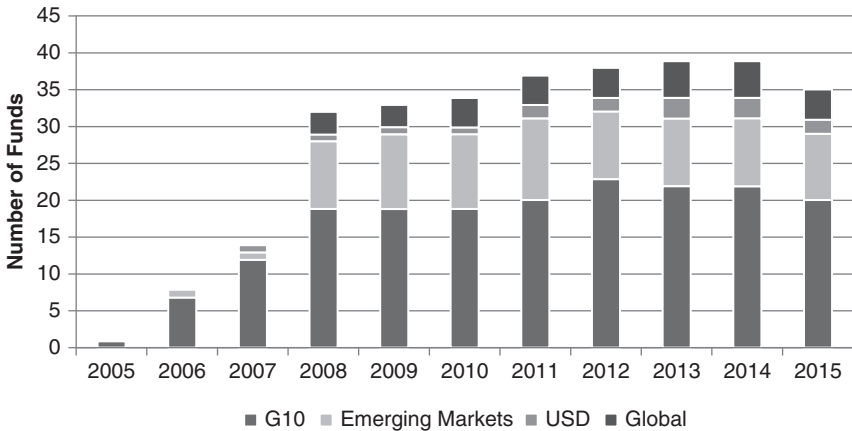


EXHIBIT 11.8 Currency Funds Available

Source: Bloomberg, 12/31/15

that the end of the secular dollar bull-run will bring about an increase in both the number of these funds as well as their collective AUM.

Risks to Currency ETFs As is usually the case for ETFs, the risks involved in investing in currency ETFs is largely a function of the underlying investments and not the ETF structure itself. Even though it is one of the largest and most liquid markets, currency investing is not without its risks. These risks, if not mitigated properly, can transfer through to an ETP.

If a currency fund is using forward contracts to achieve currency exposure, then there is a degree of counterparty risk. Forward contracts are written between two parties, whereby, at a given future point in time, both parties agree to settle the difference in the price of an asset by either delivering the asset itself or by settling in cash. Financial assets such as interest rates and currencies are largely settled in cash. There is a risk that the counterparty, especially the party on the losing side of the trade, may fail to come through with the payments. This can happen for several intuitive reasons and was a large concern in the financial crisis. As such, both parties can choose to collateralize a portion of the amount of the contract (the notional amount) with a third party or in trust. This process lends itself well to ETFs, as ETFs largely place their assets with a third party custodian under a trust. These trusts can require that the entire notional amount of the derivatives must be collateralized using short-term money market securities, such as U.S. Treasuries or repurchase agreements. This allows for only the gain or loss to be at risk between rolls, the time before a contract is closed out and a new one is initiated.

As mentioned earlier, currencies can be quite volatile, with even hard currencies moving over 2 percent in a single day's trading. A currency fund that tracks a certain currency can often move as much if not even more than the currency itself, depending on what specific instruments are in the ETFs.

Nuances of the Currency Markets Currencies trade 24 hours a day, but the volume in particular currencies is typically concentrated around the local market hours and trading times at the nearest of the three main trading hubs: Asia (Tokyo, Singapore, and Hong Kong), Europe (London), and the Americas (New York). Although futures exist on many currencies, the bulk of FX transactions occur in the over-the-counter interbank markets through spot transactions, forward transactions, and swaps. Tullett Prebon Group Inc., ICAP, and the WM Reuters Company provide commonly followed fixing times, but nearly every broker-dealer also provides fixing

prices at other designated times. Real-time quotes are becoming increasingly available via Bloomberg and Reuters data services. For example, Bloomberg produces real-time composite quotes, while Tullett Prebon Group and others have real-time feeds for contracts on currencies available via Reuters and Bloomberg. The less liquid and less accessible the currency, the greater will be the variability in pricing. The general point is that the currency market is an over-the-counter marketplace with varying times of liquidity and accessibility. The ETP issuer has the challenge of defining an IIV and creating an investment strategy using the currency and money market instruments to best serve the end investor.

IIV and NAV Pricing

The main aspect of calculating the value in the currency funds is converting the assets in the fund into U.S. dollars because they are traded on a U.S. exchange in dollars. For a fund that holds either foreign currencies or money market contracts denominated in local currencies, you would calculate their value in dollars, add to that the value of any U.S. cash products, subtract other fees and expenses, and divide that by the shares outstanding to get to a value for the fund.

The main difference between the IIV and the NAV will be the time of the exchange rate conversion. Since there are no underlying equities, there are no closing prices that need to be converted. When the fund launches, the sponsor specifies the rate provider and the time at which the rate is recorded. These rates will be used to value the NAV. When calculating the IIV, you would utilize the most recent spot rate or market in the underlying derivatives.

If you are looking at the funds in the grantor trust (ETV) structure, you would:

1. Convert the underlying currency holdings into U.S. dollars.
2. Add and subtract the relative accruals and fees.
3. Divide by the number of shares outstanding.

If you are looking at the currency ETFs, which invest directly into locally denominated money market instruments, you would:

1. Calculate the value of the underlying holdings in local currency contracts.
2. Add the current profit and loss on the underlying derivatives.

3. Convert this value into U.S. dollars at the current spot rate.
4. Add or subtract the value of any relative accruals or other expenses and fees.
5. Divide by the number of shares outstanding.

If you are looking at the currency ETFs that utilize forward contracts, you would:

1. Calculate the value of the underlying investments in U.S. money market instruments, primarily government securities.
2. Calculate the value of the currency contracts.
3. Add the current profit and loss on the derivatives.
4. Add or subtract the value of any accruals or other expenses and fees.
5. Divide by the number of shares outstanding.

Some practitioners opt to focus primarily on the spot exchange rates in valuing the funds investing in local money markets, or the currency forward contracts in monitoring the funds that follow less accessible currencies.

Structural Arbitrage There are euro and Japanese yen currency products in both the ETF and ETV structure. This creates potential arbitrage opportunities between the two if there is a mispricing in one or both products. There are also differing tax treatments and slightly different management fees that open up some other potential trading opportunities. In the wake of the financial crisis, regulations have caused most larger banks to shut down their proprietary trading desks. It would generally be under these desks' purviews to take advantage of these arbitrage opportunities. In their absence, market makers and independent prop traders have taken up the mantle. Several of these firms have become quite adept at taking advantage of not only currency ETPs, but ETPs of all asset classes. Currency ETPs can potentially provide more opportunity due to the fact that there are many vehicles providing exposure to the same currency. For example, an ETF that uses currency forward contracts can be traded against a basket of currency futures and even these currency futures are traded on multiple exchanges. As such, there are a growing number of desks that are able to take advantage of these opportunities as well as provide more liquidity in currency ETPs.

TRADING TIP

If possible, align trading of the currency ETP with peaks in trading volume for particular currencies. This is when bid/ask spreads will be at their tightest. Trading in developed market currencies is active throughout any 24-hour period. The volume in Asian currencies (except for Japan) is more based around Asian trading hours, but relatively tight bid/ask spreads on the underlying components are still available in the U.S. morning. European and Asian currency trading in general slows dramatically after the London close in the late morning, New York time. Latin American currencies remain active through much of U.S. equity trading hours.

CONCLUSION

It is difficult to log a specific view of fixed-income and currency ETFs into book form because the product set is evolving very rapidly at the moment. Several new entrants are gearing up to become competitors in the fixed-income space. I would expect that we will continue to see a tremendous amount of asset growth in those products over the next decade. This will benefit the newer advisory and retail-based client base converting portfolios to the ETF structure. As the use of these products expands in personal accounts and 401(k) plans, the fixed-income and currency categories will be in very high demand.

In the currency world, there is a whole new asset class for investing that has previously been hard to access for individual investors and advisors managing assets. Several new methods of accessing global currencies are converting to formats available to the investing public. Along with currency ETPs, there are ways to access some global currency markets via foreign bank accounts and electronic brokerage accounts. For the investing public, currencies wrapped into the ETF structure will sit nicely within the broader portfolios and provide convenience as well as low-maintenance exposure.

The ETF structure, initially for equity products only, has taken a giant leap into alternative asset classes. It is trying to provide investors with easy access to fixed income and currencies with the convenience of an equity wrapper that can be traded simply in a brokerage account. This leap of innovation is challenging the market participants to connect the equity divisions to all other trading divisions and share market knowledge, trading systems, and risk management systems. This challenge is being met with

enthusiasm and gusto, but it will take time for these products to trade as efficiently as their equity brethren.

This is definitely the area I will be watching for expansion as investor appetite and familiarity, and liquidity provider coordination, catch up to what these products offer. In Chapter 12 we explore in detail some products that are even farther from the realm of traditional portfolio holdings. The leveraged and commodity product sets are changing the way investors look at portfolio management.

Leveraged, Inverse, and Commodity Products

The leveraged, inverse, and commodity groups of funds always receive more media attention than they should for the size of the assets they manage. The reason for this is that they have quickly become very popular products for use in the statistical arbitrage and investing communities. The products are very attractive for short-term tactical strategies and for use as short-term hedges without the need to roll futures. According to a report written in 2009 on leveraged products, “Leveraged ETFs represent only 5.1% of the ETF market by market cap, yet they have accounted for roughly 15%–25% of the dollar volume and 30%–45% of the share volume of the ETF market over the past several months.”¹ The leveraged and inverse products have since been somewhat eclipsed by growth in the rest of the ETF asset class, and at the end of 2015 represented only approximately 2 percent of overall assets in the United States. They are potentially valuable tools for investors, but the complicated nature of the products keeps many investors away. As of the end of 2015 there were approximately \$64 billion in assets globally in the leveraged and inverse products. At that time there were also approximately \$93 billion globally in the commodity-focused funds, according to ETFGI.

The commodity funds have brought the individual investor access to both hard and soft commodities. Many of these products were never previously available for portfolio allocations on such a broad scale. This is leading to changes in the way they are applied in the development of both large and small investment portfolios.

As of early 2016, the combined assets of the commodity and leveraged products made up about 2 percent of overall U.S.-listed exchange-traded fund (ETF) assets. Exhibit 12.1 shows the breakdown of the funds in these categories, in terms of assets and number of available funds.

The basic mechanisms for calculating net asset value (NAV) and intraday indicative value (IIV) and valuing these funds on a daily basis are similar to what was described in the chapters regarding domestic and international funds. In this chapter we discuss significant differences between these ETFs

EXHIBIT 12.1 U.S.-Listed Leveraged, Inverse, and Commodity ETFs and Assets

Exposure	Number of ETFs	AUM	Percent of Category
Broad Commodities	10	\$4,332,000,000	10.9%
Agriculture	5	\$904,000,000	2.3%
Energy	4	\$108,000,000	0.3%
Industrial Metals	5	\$256,000,000	0.6%
Precious Metals	10	\$5,972,000,000	15.1%
Leveraged	83	\$14,910,000,000	37.6%
Inverse	24	\$4,450,000,000	11.2%
Leveraged Inverse	64	\$8,686,000,000	21.9%
	205	\$39,618,000,000	

Source: ETFGI, 12/31/15

and examine performance and other distinguishing characteristics of these exciting asset categories.

INTRODUCTION TO LEVERAGED PRODUCTS

For advisors and independent investors, the ability to obtain leverage via equity products without using margin is very enticing. The question to be asked is whether the leverage being sought is for a short- or a long-term position. In the ETF marketplace, products available today are structured more to satisfy the former by providing daily leverage on a wide variety of underlying categories.

Understanding what the term *daily leverage* means will help you use the products correctly to achieve your goals. The products are structured with the aim of providing two times, three times, or even greater leveraged daily performance, as compared to their underlying index. If the index is up 10 percent today, your performance in the ETF should be up 20 percent today. It is not easy to build leverage into a structure that trades on an intraday basis. In order for the product to achieve the desired multiple of performance versus the underlying on a daily basis, the products have to be reset to 100 percent exposure on the close of every trading day. What that means is that the leverage performance applies only to day-over-day price movements, not to the basis at which you entered into the trade. You are not guaranteed that multiple of performance versus the benchmark over a longer period of time than one day. In this unique product design, the portfolio is essentially marked to market every night. It starts with a clean slate the next day, almost as if the previous day had not existed. This process produces daily leverage results. However, over time, the compounding of this

reset can potentially cause the performance of the fund versus its underlying benchmark to diverge. This can result in either greater or lesser degrees of final leverage over individual holding periods.

Major research providers have produced a tremendous amount of information on the ETF marketplace. They have written volumes on how the ETF products work and the various effects of leverage factors. I present the subject with the hope of making it more easily understood by the broad market. Leveraged products can play a very valuable part in a portfolio if they are approached with a proper understanding of the potential return results. You need to closely examine the product structure to understand what the potential holding performance can be and how that compares to your investment intentions.

I focus specifically on two important attributes of these products: the daily compounding and how this results in performance variation, and the potential ramifications of the rebalancing activity pursued by fund providers to maintain their leverage factors.

Compounding of Returns

Daily compounding of leveraged long ETFs can result in increasing percentage gains in rising markets and decreasing percentage drops as markets are trending lower. If an index is rising for several days in a row, the trending movement is very important, as that will translate into ETF growth at a faster pace. A long leveraged product will outperform its benchmark in a rising market and will underperform its expected goals in a falling market.

In Exhibit 12.2 we can see the data grid for a market that is rising at 10 percent each day for 10 days in a row. The index and the double-leveraged ETF tracking that index both started out at 100. As the market rose 10 percent on day one, the index also rose 10 percent to 110, and the ETF rose two times 10 percent to 120. On the second day, from this new higher base the index rises another 10 percent, resulting in a gain of 10 percent of 110 to 121. At the same time, the two-times-leveraged ETF will produce a gain of 20 percent on its new base of 120 to 144. The ETF is producing returns from a higher base after the first day's gain. You can see that every day the ETF is producing its anticipated return of 20 percent as compared to the 10 percent gain of the index. In essence, the ETF is doing what it is supposed to do: produce results that equal two times the daily performance of the index. However, because of an increasing price, those gains are driving the value higher at a faster pace. On the bottom of the grid, I show the 10-day percentage returns on both the index and the ETF. It would be incorrect to expect the 10-day return of the ETF to be twice that of the underlying index because of the compounding just described. In a market that is trending up because

Market up 10% Daily for Ten Days				
Days Elapsed	Daily Mkt Performance	Expected Index Level	Expected ETF Level	Daily ETF Performance
0	0.00%	100.00	100.00	
1	10.00%	110.00	120.00	20.00%
2	10.00%	121.00	144.00	20.00%
3	10.00%	133.10	172.80	20.00%
4	10.00%	146.41	207.36	20.00%
5	10.00%	161.05	248.83	20.00%
6	10.00%	177.16	298.60	20.00%
7	10.00%	194.87	358.32	20.00%
8	10.00%	214.36	429.98	20.00%
9	10.00%	235.79	515.98	20.00%
10	10.00%	259.37	619.17	20.00%
Ten-Day Cumulative Change		159%	519%	

EXHIBIT 12.2 Rising Market Data Grid—Market Up 10% Daily for 10 Days

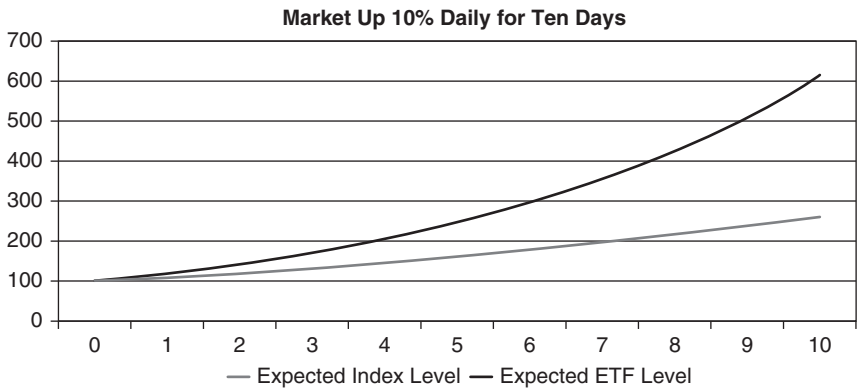


EXHIBIT 12.3 Rising Market Chart—Market Up 10% Daily for 10 Days

of daily compounding, you achieved a return of much greater than twice the index return.

Exhibit 12.3 shows the returns over the period graphically to present a visual understanding of what that performance will look like. You can clearly see the performance spread widening between the two benchmarks.

In Exhibits 12.4 and 12.5 you can see the grid and graphic depicting the opposite event. In this situation the market is declining at 10 percent per day for 10 days straight. (At certain points in late 2008 and early 2009, it felt as if that might actually be occurring!) In this example, as the index drops from

EXHIBIT 12.4 Falling Market Data Grid—Market Down 10% Daily for 10 Days

Market Down Ten Percent Daily for Ten Days				
Days Elapsed	Daily Mkt Performance	Expected Index Level	Expected ETF Level	Daily ETF Performance
0	0.00%	100.00	100.00	
1	−10.00%	90.00	80.00	−20.00%
2	−10.00%	81.00	64.00	−20.00%
3	−10.00%	72.90	51.20	−20.00%
4	−10.00%	65.61	40.96	−20.00%
5	−10.00%	59.05	32.77	−20.00%
6	−10.00%	53.14	26.21	−20.00%
7	−10.00%	47.83	20.97	−20.00%
8	−10.00%	43.05	16.78	−20.00%
9	−10.00%	38.74	13.42	−20.00%
10	−10.00%	34.87	10.74	−20.00%
Ten-Day Cumulative Change		−65%	−89%	

100 to 90, producing a 10 percent move of 10 points, on day two the down move will be 10 percent and only 9 points. The daily compounding of the leveraged ETFs will magnify this effect. While the ETF will be achieving a negative 20 percent move on a daily basis over the longer-term horizon, the compounding will result in a much less significant move downward than two times the index drop. In this example, with the index down 65 percent over the 10-day period, the ETF is down only 89 percent because it was losing progressively less in notional points every day. This highlights an important facet of returns on the leveraged products: The price of the product cannot move below zero. As you can start to see in the graph in Exhibit 12.5, the value of the ETF will get closer to zero but will not reach it, and will not go negative. In this form of leverage you can only lose what you invested.

In Exhibits 12.6 and 12.7, you can see the results from a market that is range bound, although in a high-volatility drift. The market is up 10 percent and down 10 percent alternatively for 10 days straight. This gut-wrenching movement would exacerbate the drag on a leveraged long ETF position. Although the movements are of equal size daily and the ETF is still achieving its daily two-times-return goal, it endures significant drag on its long-term performance.

These are the types of results that you can expect to receive if you hold a leveraged ETF position for more than a day. They demonstrate how there is a path-dependent function of leveraged ETF returns that will have a direct effect on their long-term return results. Your leveraged ETF position is not

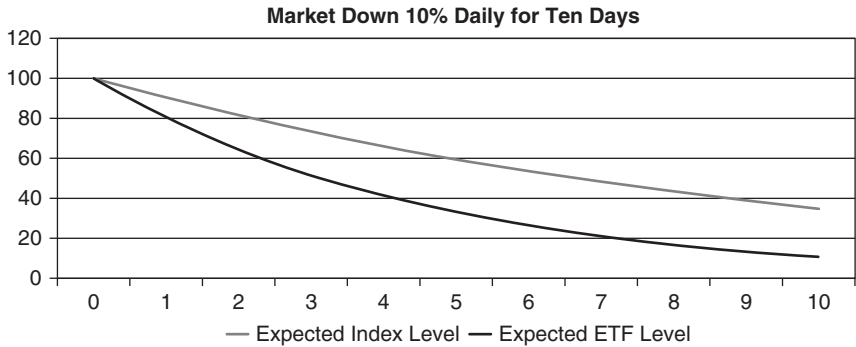


EXHIBIT 12.5 Falling Market Chart—Market Down 10% Daily for 10 Days

EXHIBIT 12.6 Flat and Volatile Grid—Market Up 10% and Then Down 10% for 10 Days

Market Up 10% and Then Down 10% for Ten Days				
Days Elapsed	Daily Mkt Performance	Expected Index Level	Expected ETF Level	Daily ETF Performance
0	0.00%	100.00	100.00	
1	10.00%	110.00	120.00	20.00%
2	−10.00%	99.00	96.00	−20.00%
3	10.00%	108.90	115.20	20.00%
4	−10.00%	98.01	92.16	−20.00%
5	10.00%	107.81	110.59	20.00%
6	−10.00%	97.03	88.47	−20.00%
7	10.00%	106.73	106.17	20.00%
8	−10.00%	96.06	84.93	−20.00%
9	10.00%	105.67	101.92	20.00%
10	−10.00%	95.10	81.54	−20.00%
Ten-Day Cumulative Change		−4.90%	−18.46%	

only affected by the performance of the exposure but also by the path it takes to get there. If your timing and positioning are correct, then this effect can be a benefit to your positioning, and if not, it can be a drag on your portfolio. You have to be correct on your market direction and your timing. This will help position you when trends begin. These examples do not include slippage of the ETF versus its daily performance goal because of the use of derivatives beyond the swaps, taxes, and other expenses.

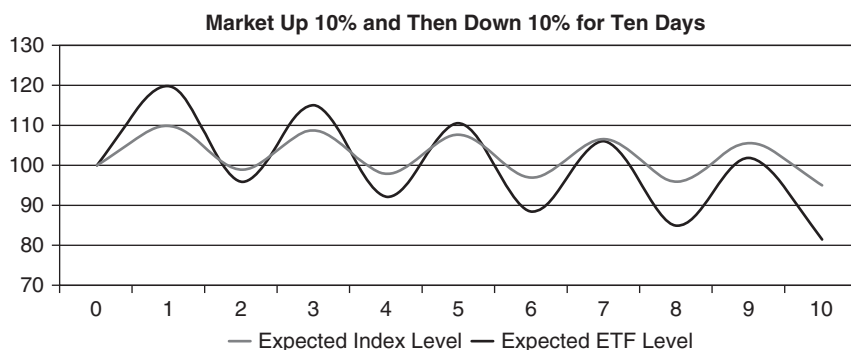


EXHIBIT 12.7 Flat and Volatile Chart—Market Up 10% and Then Down 10% for 10 Days

Path-Dependent Risk Something else that can occur when a market is experiencing high volatility is referred to as a “flip.” A flip occurs when the returns in a leveraged ETF are the opposite of what they should be based on the returns of the underlying index. For example, the investor has a position in a two-times-leveraged long ETF tracking the Standard & Poor’s (S&P) 500 index. If the index at the end of the measured time period has achieved a gain, the investor might expect the leveraged long ETF to report results that are close to two times that gain. However, it must be remembered that, because of compounding, the results over time respond in a path-dependent fashion; and results are a function of market volatility. At the end of the measured time period, if the ETF reports a net loss in terms of performance, it would be considered a flip with regard to return results.

Daily Reset to Provide Constant Leverage

In order for the leveraged funds to achieve appropriate levels of assets so they can provide their implied leverage, they have to rebalance daily. They leverage up their exposure to assets to provide the desired returns. In the case of an ETF providing long two-times-leveraged exposure, they would typically attain exposure to a notional of assets of two times their NAV. An example would be an ETF that takes in 100 units in assets that does a swap with a counterparty to provide exposure to 200 units in performing assets. The rebalancing activity of these funds will almost always be in the same direction as the market.

Let’s walk through an example of the required hedging activity for a long leveraged ETF. The initial index level in our example is 100 on day 0, as can be seen in Exhibit 12.2. In order for the ETF to achieve two-times the move

EXHIBIT 12.8 One-Day Asset Change Results for Leveraged Long and Short ETFs

Leveraged Long ETF—10% Market Drop			
Day	Index	ETF	Assets Producing Returns
0	100	100	200
1	90	80	180
Leveraged Short ETF—10% Market Drop			
Day	Index	ETF	Assets Producing Returns
0	100	100	–200
1	90	120	–220

versus the index, it would need exposure to assets equal to 200. If the index falls from 100 to 90 on day one (a 10 percent drop), the ETF's NAV should drop to 80 while the exposure of the underlying assets also drops 10 percent, to 180. At this point, however, with the NAV at 80, the ETF only needs exposure to assets worth 160 to provide its required two-times exposure on the following day. This will facilitate the need for the fund manager to sell 20 units of assets to bring the underlying exposure to 160.

The result would be the same in an ETF providing leveraged short exposure. In Exhibit 12.8 you can see the results from a one-day move in both a leveraged long and leveraged short ETF. The leveraged short ETF, in order to bring the levels of assets to the required short 240 to generate two-times returns for the 120 level, would have to short an additional 20 units of assets within the exposure vehicle. These resets typically happen on the close, which means the leveraged funds are truing up their exposure and trading in the close daily.

There is a transaction cost to this daily rebalancing. There are potential negative tax implications, and there are the physical costs of trading the underlying notional amounts on a daily basis. Because much of the exposure is achieved via swaps, and the funds hold Treasury-like investment vehicles, some of those costs will be offset by the interest income generated.

UNDERSTANDING INVERSE ETFs

The leveraged and inverse categories typically are combined because, like leveraged products, inverse ETFs use gearing to provide their expected returns. In the case of a normal inverse ETF, the gearing ratio will be -1 , while with a leveraged short fund the gearing might be -2 or even -3

times. There are many more leveraged short products than products that provide inverse exposure. The inverse funds exhibit the same traits as the leveraged funds in terms of compounding and rebalancing, but those effects are muted because of the low gearing in the products. The effects are also dependent on volatility and will increase and decrease proportionally.

Essentially, like leveraged products, these funds hold swaps to achieve their exposure. A short S&P 500 fund would hold a swap, paying the returns of the index to the counterparty. If the index trades up on any given day, the ETF would have to pay returns on the index to the counterparty, causing the value of the ETF to decrease. If the index trades down, the ETF would be receiving the return of the index, thus driving its NAV higher on the day.

In order to achieve the daily return of the index on a rolling basis, the funds will reset their holdings daily in the same manner as the leveraged products. Theoretically, on leveraged inverse products there is no daily reset needed, but the fund pays out management fees and financing fees for hedging daily. That small amount of liability will need to be accounted for on the close. So there is a daily reset, but very small; the compounding effects, therefore, are also very small. Inverse funds bring an important tool to the investing community in the form of long negative exposure. The next section discusses the implications this type of exposure brings to product trading and liquidity.

Trading and Liquidity

You can trade and access liquidity using inverse ETFs in the same manner as any other ETF. If you are a buyer of the inverse S&P fund, for example, you can buy it in the market electronically or you can go to a liquidity provider for an NAV-based execution or ask them to provide you with a risk market. In this scenario, the liquidity provider (LP) would be shorting the inverse S&P fund to you, so effectively they would have long exposure to the S&P 500. In order to hedge itself, the LP would have to sell some form of correlating exposure, either the basket, futures, or another derivative, to offset the long exposure. This is opposite the scenario of the LP selling a long-based ETF to a client.

Some important factors about the inverse ETF should be understood when trading them. They are a great way to achieve downside market protection in accounts that typically cannot achieve that type of access, such as individual retirement accounts (IRAs). You can buy a product that will increase in value as the market declines. This opens up an entirely new way to position or protect your portfolio. Formerly, long-only-type investors had the opportunity to have long market exposure or cash; now they can take advantage of, or protect against, expected down moves in the market. This

could have a profound effect on the way people manage their investment portfolios in the future.

Another characteristic of inverse products is the changes in their exposure. For those who were able to short listed products previously, these products offer a way to short the market without the risk of unlimited losses. When you short a stock or ETF in the market, you are exposed to that position going potentially infinitely higher. Your portfolio could suffer devastating losses. When using an inverse ETF, the losses are limited to the amount that you invested into the position. When you are correct in your positioning, however—when you are using an inverse ETF and your underlying exposure is going down—your exposure to that position is also increasing. As the market is moving lower, your ETF NAV should be moving higher, increasing your notional exposure to the position, if the cumulative direction is correct. This is the opposite effect of a typical short position in which your notional exposure decreases as the market moves lower. The consequence of a higher notional exposure might mean more balance sheet usage than if you were outright and short the exposure.

COMMODITIES

Over the last few years, growth in usage of the commodity ETPs has been tremendous while the price levels of many of the commodities that they track have been dismal. You might have heard commodity experts on TV exclaiming about the end of the commodity super-cycle. As of the writing of this book, at the start of 2016, oil (the most frequently traded commodity) is breaking multi-year lows below \$40 per barrel. While assets in the products have been muted because of market pricing, the number of shares outstanding in some of these products has increased dramatically. This can be seen in Exhibit 12.9, which shows the shares outstanding and the price of the SPDR S&P Oil and Gas Exploration and Production ETF. The shares outstanding in the fund have increased dramatically since the beginning of 2014 because of interest on both the long and short side. While sometimes shares outstanding can spike over short time periods for short usage, in this case short interest in the fund has remained fairly constant over this time period. This would indicate more investor long positioning activity and reminds me of an important lesson in trading parlance: “Don’t catch a falling knife!”

Various structures are providing exposure to an asset class that had been difficult to access for many investors. Within the category you can obtain broad or narrow exposures to single commodities or baskets of commodities. Some products are even attempting to actively manage baskets of various commodities based on different strategic trading models and various factors.



EXHIBIT 12.9 Shares Outstanding and Price

Source: Bloomberg, 3/6/16

The products fall into three main categories of commodities:

1. Agriculture
2. Energy
3. Metals

But within these categories are many variations of products offering different combinations of exposures. ETVs use several methods for providing exposure to commodities. These include holding:

- The physical commodity
- Futures tracking a single commodity
- Futures tracking baskets of commodities
- Equities with exposures to commodities in various forms

The funds holding various baskets of equities will be exactly like any other Investment Company Act of 1940 ETF with either domestic or international holdings. They utilize various weighting schemes to provide exposures via equities to companies that have commodity-related activities.

Futures-Based Funds

Beyond the equity-based funds providing exposure to commodity-focused equities, are funds that utilize futures, swaps, or other derivatives to attain their desired exposures. There are two effects to consider when using commodity funds with futures as the underlying:

1. The potential effects of position limits due to either the notional size of fund holdings or regulatory concerns
2. The potential effects of rolling those futures' positions

The expanding size of futures-based funds and their size relative to the underlying markets that they track led to a market review, in the summer of 2009, by the Commodity Futures Trading Commission (CFTC) about their potential influences within the commodities markets.

Example of What Can Happen in a Futures-Based ETF During the summer of 2009, the natural gas ETF temporarily halted creations, which limited the issuance of new shares. This happened initially, not because of any concerns regarding the fund's size, but because of its need to increase its number of shares available to be sold. Because the fund has holdings of futures or other derivatives, it acts like a commodities pool rather than a typical 1940 Act ETF. A vehicle, in which many investor assets are combined and trade futures contracts as a single entity in order to gain leverage, is considered a commodity pool. This type of fund registers a specific amount of shares to be issued and then has to formally request an increase if it needs to expand further. In many cases this is a problem of being overly successful. Although new share issuance was approved, the fund did not immediately restart the creation process because of the fund management company's concerns regarding potential future position limit rulings from the CFTC. At the time of this writing, the management has adopted a wait-and-see perspective on any regulatory changes before restarting the issuance of new fund shares. This has caused the fund's price to rise relative to its NAV. When an ETF halts, even temporarily, creating or redeeming shares, it assumes the premium and discount trading characteristics of a closed-end fund. The share price will diverge from the underlying NAV based on forces of supply and demand. In the case of an ETF limiting creations, the fund price should theoretically move out to a premium. That is exactly what occurred.

Several potential demand factors are driving this premium. Natural demand for the fund shares could drive fund prices higher relative to the NAV. Market makers would build in the costs of financing a position that could not be collapsed via the normal creation process while providing liquidity to the market. Additionally, there would be added demand from

liquidity providers to borrow shares to cover the short positions occurring because of the lack of new share issuance.

In addition to these two related drivers is the new entrance of arbitrage players attempting to make money on the spread between the fund and its NAV. Arbitrage players could potentially pursue two actions. If they view that this will end quickly with new position limits, arbitrage players would want to short the ETF (because of its premium) and buy the underlying futures contracts. Shorting the ETF becomes difficult because the stock borrow gets used up quickly, and even the sell pressure from the shorts does not drive the price to NAV. Or the contrary view is that the CFTC will limit the amount of contracts available to the funds, causing them to have to reduce the amount of shares outstanding. This can potentially drive the premium much higher than its current level. If the fund decides to restart creations, the real arbitrage between the ETF shares and the underlying futures positions will resume and cause the premium to narrow immediately. Now, with a premium reflecting demand for ETF shares, there is a benefit to owning shares of the ETF; this benefit would be reflected in a high rate of stock loan rebate paid to long holders for loaning out the ETF shares. Although this seems like a short-term trade while awaiting a decision, if the CFTC decides to permanently limit fund holdings, the shares could trade at a premium for an extended time.

A commodities futures contract is a standardized contract to buy or sell a commodity at a specific date in the future based on a price agreed to today. Important to note is that futures have an expiration date at which point the contracts expire; then you have to deliver either the underlying asset or cash, depending on the specific futures contract you have positioned. A fund holding futures will have to roll those positions at every expiration date. This is necessary so that the fund does not lose its exposure to its underlying asset class. In order to roll your futures position, you would have to sell the contract you hold (called the near-month contract) that is about to expire and buy the next-period contract that is available (the far-month contract). Because of this periodic selling of the near contracts and buying of the far contracts, futures-based funds sometimes can be subject to the effects of either “backwardation” or “contango.”

Backwardation is a condition in the futures market where the future contract price is lower than the spot price, which is essentially the value of the expiring near contract. The opposite condition is contango, where the futures contract price is higher than the spot price. These two conditions of the marketplace can cause performance variations in the ETF NAV relative to its benchmark. It is important to look closely at what the funds are doing and read each prospectus. It is important to know how funds handle these conditions in the futures markets and what effects they possibly can

have on the fund's performance. These conditions in certain futures markets can cause your ETF investment to diverge in performance from the physical commodity in which you are looking for exposure.

Physical Commodities

The biggest fund in the commodities realm is the SPDR Gold Trust. At the end of August 2009, this fund held approximately \$30 billion in assets while in the beginning of 2016 the fund AUM was still approximately \$30 billion. The price of the fund had topped out in September 2011 near 186 and at time of writing was trading at approximately 122. Sometimes it is hard to tell the dramatic movements over time by looking at point-to-point comparisons.

Storage costs are probably the most important consideration of the ETFs that hold physical commodities. It is relatively easy to hold gold bullion as compared to similar notional amounts of natural gas or oil, which is why certain funds are based around derivatives and others are not.

The physical commodity funds in general are reasonably easy to value. On the website of the Gold Trust, for example, you can see the actual holdings of ounces of gold and the number of shares outstanding on a daily basis. When calculating the value of the fund, you would calculate a real-time value for the gold held by multiplying the number of ounces by the most recent mid-price of gold bullion. Then you would divide that number by the number of shares outstanding. This would give you a value before expenses of the gold in the trust in share terms.

An important point to understand when investing in the commodity funds is taxation. In the case of the Gold Trust, gold is treated as a collectible for long-term capital gains purposes. If held for more than a year, individuals will be subject to a capital gains rate of 28 percent. According to the Gold Trust website, it also received a private letter ruling permitting investment by retirement plans. Remember that this is not tax advice; it is important to determine your own situation regarding taxes through discussions with your accountant.

CONCLUSION

There is a need to understand any product in which you invest and its potential investment risks. Although leveraged and inverse ETFs do provide a very important and functional tool, how they are utilized is critical to your end investment performance. Distinguishing your investment goals and time horizons and understanding what potential market activity can do to the performance of your portfolio is extremely important.

Commodity and leveraged products, in many cases, are far from having the transparent and easy-to-understand structure of a 1940 Act ETF. However, these products can be very valuable in an investment portfolio when properly understood. There is a wealth of information available on the websites of the various issuers and a tremendous amount of research and analysis provided by the industry for investors.

Much of what we have discussed in terms of valuation of funds throughout Part Three of this book can be interpolated into the valuation of these funds. Whether they hold futures, physical commodities, or swaps will add additional twists that need to be considered. The concepts remain the same. Products with underlying assets that trade at the same time as the fund are subject to immediate arbitrage trading. Products with baskets that are difficult to trade or are domiciled in a different time zone will lead to price discovery valuation during the U.S. trading day. In Part Three we look at the trading volumes of ETFs, how they are traded, and best methods for execution, and we discuss the various market participants and several of their trading strategies.

NOTE

1. Jon D. Maier and Joseph Zidle, "ETF Research: Leveraged ETFs," Bank of America/Merrill Lynch, June 29, 2009.

Structure of an ETF

The landscape of listed investment products has become populated with a variety of different structures that often get lumped under the term *exchange-traded funds* (ETFs). ETF traditionally refers to an investment company with redeemable shares that trade on an exchange. There are a variety of newer products that offer similar exposure and tradability but are not “investment companies” or “funds.” Nonetheless, many people lump these products together with traditional ETFs. This can be confusing to investors because of the various different structural qualities that many of these products possess. Because these products can have very different tax treatment and risk profiles, this confusion can have significant negative consequences for investors. The main focus of this book is on the largest group of products by assets within the exchange-listed product universe, exchange-traded funds. It would be remiss, however, to ignore the different types of structures available in the marketplace or to lump them all under the ETF moniker. This chapter delineates the different structures available and their identifying properties. It then discusses some of the consequences of the varying structures with regard to trading, taxes, and other advantages and disadvantages.

There are opportunities to use all of the different structures profitably in an investment portfolio. This chapter does not make any determination as to which vehicle is best for your unique portfolio. Much more could be written about the various structures and their particular nuances. This chapter is meant as a broad overview of what is available in the marketplace to enable you to identify the various structures and their main characteristics. Understanding this will enable you to make the appropriate decisions.

What is important to realize going forward is that, now more than ever, structure matters. When exchange-listed products were in their infancy, there was not much choice in what product type to use with regard to a specific exposure. As the industry has matured, there are now similar exposures available in different product structures. Each structure has a different impact on the portfolio in which it is utilized. Product development teams are focusing new products on investment categories where they can compete with a better structure for investment assets. It has been reported that

some products did not provide their expected exposures, whether they were leveraged, futures-based, or other. Most times it was not the product acting improperly; it was the investor making incorrect assumptions about how the various structures will react under differing circumstances. Understanding the various structures, how they achieve their exposures, and how they will react under particular market circumstances will help you to utilize them for a profitable investment strategy. The information provided is meant as a guide and should not be utilized as investment advice or tax guidance. Any decisions you make regarding tax consequences or structure should be discussed with your accountants and attorneys.

CATEGORIZING EXCHANGE-TRADED PRODUCTS

There are now different product structures that people refer to as ETFs but do not meet the definition of a traditional ETF. It is important to distinguish among the four main product categories and what products should be included in each. Without a standard convention, the public, the media, and even issuers sometimes blur the lines, creating unnecessary confusion. It would be helpful for everyone to utilize the same naming conventions so that the investing public can more easily identify the various product types. The New York Stock Exchange (NYSE) uses some baseline definitions that make sense for classifying products. The definitions are:

Exchange-traded product (ETP): The term for the overriding product category. This includes funds, index-linked notes, limited partnerships (LPs), and trusts listed and traded in the secondary market on exchanges.

The common characteristics are:

- Issuers do not sell shares directly to investors. They issue shares to authorized participants (APs) in large blocks (typically 50,000 shares or more) that are known as creation units.
- Those creation units are typically not purchased with cash. Instead, a basket of specified securities is exchanged for ETF shares utilizing an in-kind exchange mechanism. This leads to advantages in taxes and portfolio management. This also includes some funds and notes that are cash-create-and-redeem vehicles.
- The shares of the ETP are traded throughout the day on a public exchange.

- Market liquidity is provided in many ETPs by market makers who utilize the creation and redemption features to exchange underlying baskets for ETP shares.

Exchange-traded fund (ETF): It is what most people think of as ETFs, the most widely used product in the category. ETFs are similar to mutual funds in that they offer public investors an undivided interest in a pool of securities and other assets, but unlike a mutual fund, shares can be bought and sold like stocks on an exchange through a broker-dealer. ETFs have several distinguishing characteristics:

- The portfolio is managed by an investment advisor with a mandate to track the index or portfolio benchmark (except in the case of a UIT—see below.) ETFs may be actively managed or index based. If it is index based, the portfolio manager has discretion on the way to track the index (e.g., full replication versus sampling of the index). The structure permits management of cash inside the fund (e.g., reinvestment of dividend income), tax-loss harvesting, securities lending, and some other items.
- ETFs are registered under the Investment Company Act of 1940 (1940 Act), which provides investors with certain regulatory protections.
- Like traditional mutual funds, they generally have an independent board of trustees that has oversight over the fund. There are, however, unit investment trusts (UITs), such as the SPDR S&P 500 ETF, that do not have a board, have virtually no investment flexibility as UITs are managed by a trustee as opposed to an investment advisor, and cannot lend securities or manage cash.

Exchange-traded note (ETN): A debt security issued by an underwriting bank to track the return of a specific underlying benchmark. The debt is typically senior, unsecured, and unsubordinated. ETNs have a maturity date like most other debt securities. The main identifying risk characteristic is that an ETN is backed only by the credit of the issuer. The ETN is also subject to specific tax treatment discussed later in the chapter.

Exchange-traded vehicle (ETV): This term is not as widely utilized as ETF and ETN. Many of the products in this category are also sometimes called broadly ETPs, which is correct but does not help in distinguishing them from the ETF and ETN structures. The exchange-traded commodity (ETC) name is also sometimes used interchangeably in this category but does not sufficiently mark the

structures as unique. “An ETV is a trust or partnership unit that is registered under the Securities Act of 1933 and traded by investors on a national securities exchange. This includes commodity and currency trusts.” [NYSE Euronext] Unlike an ETF, shareholders do not have the protections associated with ownership of shares in an investment company registered under the 1940 Act. The tax implications may vary. This category is where the most naming drift occurs. Many people refer to these products as ETPs instead of going deeper to actually use the ETV label. At the time of this publication in mid-2016 the use of this term has almost completely been abandoned in favor of ETP.

It is helpful to view the products in terms of how they relate to the 1940 Act. Exhibit 13.1 shows that products either fit into the ETF structure because they clearly satisfy the requirements or they do not. Although it makes sense to refer to all listed funds as ETPs, that product delineation can include closed-end funds as well, and some providers have been using tETP as well as ETF for those products for many years. This blurring of the lines makes products more difficult for the investing public to understand.

In Exhibit 13.2 you can see a graphic depiction of the ETP umbrella. While ETFs are just a piece of the ETP umbrella, they have garnered the lion’s share of the assets. This is based upon their inherent features of transparency and tax efficiency among others. It is important to realize that for issuers the goal is to bring the benefits of the ETF structure to investors. Typically a product is not wrapped that way because of limitations in the underlying assets. Either the assets are complicated to trade (like physical commodities) or can only be replicated via swap against another counterparty (like notes). There are many products that appear similar to ETFs and some will try through marketing and other methods to have investors believe that all products present the same sets of benefits. This is why, with the growing suite of products, it is more important than ever to understand the different structures and their ramifications.

EXHIBIT 13.1 Understanding the Different Product Structures

1940 Act/1933 Act	1933 Act
ETF	Exchange-traded notes (ETNs)
Open-end funds	Grantor trusts
Unit investment trusts	Limited partnerships
	Exchange-traded commodities (ETCs)

EXHIBIT 13.2 The ETP Umbrella

ETP	Product	Regulatory	Recourse	Structure	Examples		Taxation
	ETF	1940 Act/ 1933 Act SEC N1-A	Portfolio of securities	Unit Investment Trust	SPDRs, Diamonds, QQQ, BLDRs		Ordinary Income
				RIC—Registered Investment Co	Physical Replication	FXI, GXC, EPI, PIN, GDX, SIL	Ordinary Income
					Derivatives Based	WDTI	Ordinary Income
	ETV or ETC	1933 Act SEC and CFTC S-1	Custodian credit	Grantor Trust	GLD, IAU, Currency Shares		Ordinary income or 28% max long-term rate for collectibles
				Commodity Pool/ Limited Partnership	USO, UNG, DBC, GCC		60% long-term rate 40% short-term rate blend for derivatives
	ETN	1933 Act SEC S-1	Counter- party credit	Unsecured Note	iPath, Elements and GCE		Ordinary Income

Source: *The Visual Guide to ETFs*, David Abner 2013.

ETF REGULATION

ETFs are regulated by multiple divisions of the Securities and Exchange Commission (SEC).

According to the Investment Company Institute, there are four principle securities laws that govern investment companies. These are the most clear and concise descriptions of them that I have found:

“The Investment Company Act of 1940—Regulates the structure and operations of investment companies through a combination of disclosure requirements and restrictions on day-to-day operations. Among other things, the Investment Company Act addresses investment company capital structures, custody of assets, investment activities (particularly with respect to transactions with affiliates and other transactions involving potential conflicts of interest), and the duties of fund boards.”¹ Most ETFs are registered under this act, which is often referred to as the “1940 Act” or the “Investment Company Act,” that provides for various protections for investors.

“The Investment Advisers Act of 1940—Regulates investment advisors. Requires all advisers to registered investment companies and other large advisers to register with the SEC. The Advisers Act contains provisions requiring fund advisers to meet recordkeeping, custodial, reporting, and other regulatory responsibilities.”²

“The Securities Exchange Act of 1934—Regulates the trading, purchase, and sale of securities, including investment company shares. The 1934 Act also regulates broker-dealers, including investment company principal underwriters and others that sell investment company shares, and requires them to register with the SEC.”³

“The Securities Act of 1933—Regulates public offerings of securities, including investment company shares. The 1933 Act also requires that all investors receive a current prospectus describing the fund.”⁴ This is typically used by ETNs, grantor trusts, ETCs, and limited partnerships.

The SEC Division of Investment Management regulates the “fund” aspect of the ETF. In parallel, the SEC Division of Trading and Markets regulates the “exchange-traded” aspect of the ETF. Both of these divisions require ETFs to comply with certain rules. The U.S. Commodity Futures Trading Commission (CFTC) also regulates certain ETPs that hold commodities; the Division of Investment management does not have jurisdiction over these types of products. The CFTC does not have any regulatory oversight over ETFs or ETNs; it regulates only those ETPs that operate as commodity pools. ETVs and ETNs file a registration statement with the SEC’s Division of Corporation Finance.

The Division of Investment Management (IM) regulates all investment companies (such as mutual funds, closed-end funds, UITs, ETFs, and interval funds), including variable insurance products and federally registered investment advisors. ETF sponsors typically are also registered investment

advisors. Therefore, they are required to interact with the Division of Investment Management on two levels: at the ETF level and as a registered investment advisor.

Because ETFs do not fit neatly into the regulations governing mutual funds and closed-end funds, ETF sponsors are required to obtain “exemptive relief” from the Investment Company Act of 1940 to operate an ETF. In order to obtain this relief from the 1940 Act, sponsors submit a detailed application with the SEC. The exemptive relief usually covers a broad spectrum of asset classes (e.g., equities, fixed income) and is a requirement before a sponsor can launch its first product. The SEC approved the first index-based ETF in 1993 but did not approve the first actively managed ETF until 2008.

Exemptive Relief

ETFs are launched under the provisions of the Investment Company Act of 1940. Because ETFs operate in a manner not contemplated by the 1940 Act, ETFs need exemptions from that act to operate. Doing this typically is referred to as “exemptive relief.” Having exemptive relief enables ETF issuers to bring products to market under their specific exemptions and an ETF cannot operate without exemptive relief. Applying for such relief can take several months or even years, and may cost a tremendous amount of money in legal bills and other administrative costs.

Here are some typical exemptions that the product issuers/ETFs apply for:⁵

- They need to be enabled to issue shares redeemable only in large blocks called creation units. [Sections 2(a)(32) and 5(a)(1)]
- They desire to allow ETF shares to be purchased and sold at market prices in the secondary market. [Section 22(d) and rule 22c-1]
- They want to allow for longer delivery of foreign securities. [Section 22(e)]
- They seek the permission for the in-kind purchase and redemption of creation units with the ETF by APs as 5 percent or great holders of the ETF. [Sections 17(a)(1) and (2)]
- Although not required for the ETF to operate, they want an exemption for other investment companies to be able to purchase shares of the ETFs in excess of the act’s fund-of-fund regulations. [Section 12(d)(1)]
- Other exemptions sought after fall under the Exchange Act for rules pertaining to, among other things, activities of broker-dealers related to the distribution of ETF shares. Additionally, relief is required from Reg. M, which involves being able to trade and redeem shares while they are considered part of a continuous offering. Relief is required to allow a fund to act like a trading security available to all investors.

The growth of the ETF business created a large increase in requests for very similar exemptions by the various ETF issuers. In 2008, the SEC announced a proposal for Rule 6c-11. The rule would provide several exemptions from the Investment Company Act to permit ETFs to form and operate without the need to obtain individual exemptive relief from the SEC. It would codify most of the exemptions previously granted by the SEC to index-based ETFs and, pursuant to several recently issued exemption orders, to fully transparent, actively managed ETFs. The proposed rule was not adopted by the SEC and, due to the passage of time, it is anticipated that any future rule would likely start from scratch.

Each ETF is required to file a prospectus (similar to traditional mutual fund) pursuant to Registration Statement Form N-1A. This regulatory filing contains the fund prospectus and statement of additional information (SAI).

SEC Division of Trading and Markets

The SEC Division of Trading and Markets, known as the Division of Market Regulation before November 2007, regulates all the major stock exchanges in the United States. There are currently approximately 16 securities exchanges registered with the SEC under Section 6(a) of the Securities Exchange Act of 1934 and subject to oversight by the SEC, including the NYSE, Nasdaq, BATS, and other regional and electronic exchanges.

The Division of Trading and Markets' oversight includes the exchange listing rules for all securities, including ETFs. A "generic" listing standards for domestic equity ETFs was adopted in the early 2000s. The international equity and others followed in 2006 and thereafter. The generic standards substantially sped up the time to market for new ETF listings. As long as the sponsor/ETF had its "exemptive relief" and the ETF met the generic listing standards, the ETF could be listed once the prospectus was declared effective.

Requirements for Listing Products

Exchange listing rules spell out a lengthy list of requirements for ETF listing, including minimum shares outstanding and index calculation rules. The stock exchanges require a minimum of 100,000 shares to be outstanding at commencement of trading, but there is no specific notional dollar amount or minimum share price. The minimum price variation for quoting is \$0.01.

The listing rules also spell out constraints for an index based ETF. The five key rules for domestic equity index ETF portfolios at the time of launch are presented next.⁶

1. Component stocks that in the aggregate account for at least 90% of the weight of the index or portfolio each shall have a minimum market value of at least \$75 million;

2. Component stocks that in the aggregate account for at least 90% of the weight of the index or portfolio each shall have a minimum monthly trading volume during each of the last six months of at least 250,000 shares;
3. The most heavily weighted component stock shall not exceed 30% of the weight of the index or portfolio, and, to the extent applicable, the five most heavily weighted component stocks shall not exceed 65% of the weight of the index or portfolio;
4. The index or portfolio shall include a minimum of 13 component stocks; provided, however, that there shall be no minimum number of component stocks if (a) one or more series of Units or Portfolio Depositary Receipts constitute, at least in part, components underlying a series of Units, or (b) one or more series of Derivative Securities Products account for 100% of the weight of the index or portfolio; and
5. All securities in the index or portfolio shall be US Component Stocks listed on a national securities exchange and shall be NMS Stocks as defined in Rule 600 of Regulation NMS under the Securities Exchange Act of 1934.

Key requirements for international or global equity index ETFs are slightly different from the rules for domestic equity ETFs, with more stringent liquidity requirements on the underlying basket of securities. Five key rules include:⁷

1. Component stocks (excluding Derivative Securities Products) that in the aggregate account for at least 90% of the weight of the index or portfolio (excluding such Derivative Securities Products) each shall have a minimum market value of at least \$100 million;
2. Component stocks (excluding Derivative Securities Products) that in the aggregate account for at least 90% of the weight of the index or portfolio (excluding such Derivative Securities Products) each shall have a minimum worldwide monthly trading volume during each of the last six months of at least 250,000 shares;
3. The most heavily weighted component stock (excluding Derivative Securities Products) shall not exceed 25% of the weight of the index or portfolio, and, to the extent applicable, the five most heavily weighted component stocks (excluding Derivative Securities Products) shall not exceed 60% of the weight of the index or portfolio;
4. The index or portfolio shall include a minimum of 20 component stocks; provided, however, that there shall be no minimum number of component stocks if (a) one or more series of Units or Portfolio Depositary Receipts constitute, at least in part, components underlying a series of Units, or (b) one or more series of Derivative Securities Products account for 100% of the weight of the index or portfolio; and

5. Each US Component Stock shall be listed on a national securities exchange and shall be an NMS Stock as defined in Rule 600 of Regulation NMS under the Securities Exchange Act of 1934, and each Non-US Component Stock shall be listed and traded on an exchange that has last-sale reporting.

Six key requirements for listing: fixed-income index ETFs include:⁸

1. The index or portfolio must consist of fixed-income securities (as defined in the listing rules);
2. Components that in aggregate account for at least 75% of the weight of the index or portfolio each shall have a minimum original principal amount outstanding of \$100 million or more;
3. A component may be a convertible security, however, once the convertible security component converts to the underlying equity security, the component is removed from the index or portfolio;
4. No component fixed-income security (excluding Treasury Securities and Government Sponsored Enterprise Securities) shall represent more than 30% of the weight of the index or portfolio, and the five most heavily weighted component fixed-income securities in the index or portfolio shall not in the aggregate account for more than 65% of the weight of the index or portfolio;
5. An underlying index or portfolio (excluding one consisting entirely of exempted securities) must include a minimum of 13 non-affiliated issuers; and
6. Component securities that in aggregate account for at least 90% of the weight of the index or portfolio must be either a) from issuers that are required to file reports pursuant to Sections 13 and 15(d) of the Securities Exchange Act of 1934; b) from issuers that have a worldwide market value of its outstanding common equity held by non-affiliates of \$700 million or more; c) from issuers that have outstanding securities that are notes, bonds, debentures, or evidence of indebtedness having a total remaining principal amount of at least \$1 billion; d) exempted securities as defined in Section 3(a)(12) of the Securities Exchange Act of 1934; or e) from issuers that are a government of a foreign country or a political subdivision of a foreign country.

Index-based ETFs that do not meet the generic listing standards and all actively managed ETFs must receive specific permission from the SEC before listing on the stock exchange. Typically in such cases, the ETF sponsor will collaborate with the exchange on the specific rules regarding the fund,

and the exchange files a 19b-4 filing with the SEC Division of Trading and Markets to amend the exchange rules.⁹ Certain exchanges have proposed to the SEC generic listing rules for actively managed ETFs, but such rules have not been approved at time of publication.

Funds Holding Funds: The Section 12(d) Exemption One particular item that has helped to enable the growth of the ETF industry is ETF use by the institutional community. ETFs can be utilized for cash management and employed, during transitions or other times, for easily accessing sometimes hard-to-achieve exposures and for other institutional portfolio management needs. However, Section 12(d)(1) of the Investment Company Act limits the ability of an investment company (or a portfolio that would be an investment company) to invest in other investment companies (such as ETFs) absent a specific exemption from the 1940 Act. In order to enable greater investment in ETFs by mutual funds ETFs and their sponsors obtain relief from Section 12(d)(1) of the Investment Company Act. The section reads:

1. It shall be unlawful for any registered investment company (the “acquiring company”) and any company or companies controlled by such acquiring company to purchase or otherwise acquire any security issued by any other investment company (the “acquired company”), and for any investment company (the “acquiring company”) and any company or companies controlled by such acquiring company to purchase or otherwise acquire any security issued by any registered investment company (the “acquired company”), if the acquiring company and any company or companies controlled by it immediately after such purchase or acquisition own in the aggregate—
 - i. More than 3 per centum of the total outstanding voting stock of the acquired company;
 - ii. Securities issued by the acquired company having an aggregate value in excess of 5 per centum of the value of the total assets of the acquiring company; or
 - iii. Securities issued by the acquired company and all other investment companies (other than treasury stock of the acquiring company) having an aggregate value in excess of 10 per centum of the value of the total assets of the acquiring company.¹⁰

In the middle of 2003, Barclays Global Investors received an exemption from Section 12(d)(1) for the iShares product set. This exemption enabled mutual funds to hold substantially larger positions than those dictated by the rule. Approximately one year later, the large trusts SPDR S&P 500

ETF (SPY), Diamonds Trust (DIA), and S&P Mid-Cap Depository Receipt (MDY) received similar exemptions. Today, most ETFs have received exemption from the restrictions in Section 12(d)(1). It is up to individual issuers to each obtain this exemption to enable larger holdings by mutual funds. Then it is up to each institutional investor to sign an agreement with the ETF/sponsor (as required by the exemptive relief, among other requirements) so that it can achieve its desired position sizes in the ETFs.

EXCHANGE-TRADED NOTES

Exchange-traded notes are senior, unsecured, unsubordinated debt securities registered under the Securities Act of 1933. ETNs are designed to provide investors with exposure to the return of an index or specific investment strategy after fees. These notes are issued by a bank or specialty finance company; the shares are listed on a stock exchange. Like equities, ETNs trade on an exchange and can be shorted. Like an index fund, they are linked to the return of a benchmark index and provide investors with convenient exposure to the returns of market benchmarks, less investor fees. They also can be created or redeemed for cash only at a frequency delineated in the prospectus, which might not lead to the same tax advantages as the in-kind create/redeem process affords the ETF structure. The ETN structure is transparent in that it gets the return of the underlying index or security reference. It does not have to disclose holdings. The ETN structure allows investors to gain exposure to difficult-to-reach market sectors or strategies due to regulatory constraints on other types of structures. ETNs also have different tax implications from other ETPs that certain investors may find attractive. However this tax treatment is uncertain.

ETNs convey no ownership or assets, just a promise from the issuer that the return of the benchmark index (net of fees) will be paid upon redemption or maturity. The value of the note is determined by the total return of the index it tracks and by the creditworthiness of the issuer. ETNs are not ETFs, equities, or index mutual funds, but they share some similarities in providing exposure to end investors via a listed equity-type security.

Below is a list of risks that distinguish ETNs from ETFs:

- Principal is not protected, and you may lose all of your investment in the securities if the issuer declares bankruptcy.
- The index sponsor may adjust the index in a way that affects its level, and the index sponsor has no obligation to consider your interests.
- There may not be an active trading market in the securities; liquidity of the market for the ETN shares may vary materially over time.

- ETNs are debt securities and have no voting rights, since the investor owns a debt instrument, not the underlying security.
- Individual ETNs are not rated but generally rely on the ratings of the issuer. Changes in the issuer's creditworthiness may have a significant effect on the value of the exchange-traded price of the ETN.
- Most ETNs contain a call feature that allows the issuer to repurchase the notes at its option, which may result in the principal repayment being earlier than anticipated.
- ETNs are debt securities issued by a bank and are not regulated by CFTC. However, if ETNs hold futures contracts on the underlying relevant market index, those contracts may be regulated by the CFTC and may restrict the ability for the bank to access those markets. This could cause a disruption in access to the ETN shares.
- ETNs are not registered under the Investment Company Act of 1940.

The concept of index-linked notes and similar types of structured products has existed on Wall Street for decades. The ability to list notes on the stock exchange in the form of ETNs provided banks the opportunity to capitalize on the popularity of ETFs, albeit in a different structure. In the middle of 2006, Barclays Bank listed the first exchange-based products utilizing the ETN structure. The initial issuance was driven by: (1) the assertions on favorable tax treatment relative to other exchange-traded products; (2) access to strategies and asset classes that were not available in the traditional ETF structure registered under the 1940 Act; and (3) issuers could bring the products to market very quickly as compared to the more traditional structures that needed review by the SEC Division of Investment Management. The only practical limitation, from an ETN sponsor's point of view, is the ability and desire of the issuer to offer a specific investment strategy. The structural features of ETNs as debt instruments have driven some innovation in the ETF space—specifically in the hard-to-access asset categories such as commodities, alternative strategies, and volatility. A list of key participants in an ETN offering follows:

- **Platform:** This is the sponsor of the ETN products. Platforms can be open architecture (e.g., The Elements Group of products) that offer a variety of third-party indexes or a closed architecture (e.g., UBS) that only offers proprietary index strategies.¹¹
- **Index providers:** The role of the index provider is to calculate, maintain, and publish the necessary information on the index benchmark. The index provider is usually a third party.
- **Issuers:** The ETNs are senior unsecured obligations of investment-grade issuers.

- **Distributors:** The distributor is responsible for the marketing and promotion for the ETN. The distributor generally receives a fee based on assets under management. The ETN often carries the brand name of the distributor, but this is not a requirement.
- **Stock exchanges:** The listing venues for the ETNs that require the indexes and notes to follow certain rules in order to gain approval for listing.

TAXATION

The tax benefits of the ETF structure are a key feature that sets it apart from other competing products. Most ETFs are considered extremely tax efficient as compared to traditional mutual funds. Funds registered under the Investment Company Act of 1940, which include mutual funds and ETFs, are required to distribute capital gains to shareholders on an annual basis, in addition to any income (e.g., dividends). Capital gains are generated inside a portfolio when the portfolio manager buys, and consequently sells, securities. Portfolio managers sell stocks to raise cash to meet shareholder redemptions or due to a reallocation of assets. Mutual fund shareholders may receive capital gains from a mutual fund, even if they have not sold their shares and/or have an unrealized loss on their position. Index mutual funds tend to be more tax efficient than actively managed mutual funds simply because the turnover in the portfolio tends to be lower, hence there are less frequent buys/sells at the portfolio level. Portfolio managers can take advantage of capital loss carryforwards from prior fiscal years, tax-loss harvesting, and other tax mitigation strategies to diminish the impact of trading.

The main characteristics of the tax advantages for ETFs are listed next:

- Investors buy and sell the ETFs in the secondary market. This enables much of the daily flow of ETFs to be offset against each other away from the ETF portfolio. The ETF portfolio manager is then able to trade less frequently and to create fewer taxable events within the portfolio. Additionally, some of the trading and execution expenses are passed down to the individual investor level rather than having all investors pick up the fees for each individual's movements in and out of a fund.
- The ETF creation and redemption mechanism utilizes an in-kind exchange of the underlying basket for the shares of the ETF. When a mutual fund receives share creations or redemptions, the portfolio manager has to buy and sell shares of the underlying stocks. When an ETF has share creations or redemptions, the portfolio delivers or receives the required underlying basket of securities without creating taxable events, trading expenses, or portfolio slippage.

- By executing portfolio rebalances and other event-driven (e.g., corporate actions) portfolio trades, ETF managers can manage any other tax consequences that might not have been eliminated by the in-kind procedures.
- Many ETFs are index-tracking funds that exhibit very low portfolio turnover as compared to actively managed funds.

The creation and redemption process gives the ETF structure a taxable advantage compared to many other pooled and structured investments available in the market. Because standard creations are done where the ETF receives in stocks/bonds, and redemptions are where the ETF delivers out stocks/bonds via an in-kind transaction, the portfolio manager is able to manage the gains within the ETF basket efficiently. During the redemption process, the ETF manager can choose to deliver low-cost stocks/bonds from an accounting perspective, clearing the balance sheet of potential gains. The substantial majority of index-based ETFs do not pay out a capital gain. However, there are now index ETFs using stocks and/or bonds along with derivatives to achieve investment strategies. Those derivatives do not share the same tax treatment as stocks/bonds and thus may produce capital gains.

The general tax treatment for ETFs is like that of stocks and mutual funds. Any capital gains or dividend income are treated similarly. ETFs offer investors the ability to hold positions for longer than one year for long-term holding treatment. And they offer the ability to move between different but somewhat similar market exposures. This potentially enables investors to maintain similar exposure to an asset category without violating wash-sale regulations.

It is important to note that the tax treatments and related implications for investors may be significantly different for certain international stock/bond ETFs, leverage/inverse ETFs, currency-linked ETPs, and commodity-linked ETPs.

Certain international ETFs, specifically with exposure to the emerging markets, have the potential to be less tax efficient than domestic and developed market ETFs. Many emerging markets have restrictions on the ability to perform in-kind deliveries of securities. Therefore, an emerging-market ETF may have to sell securities to raise cash for redemptions instead of delivering securities. Lack of in-kind delivery gives emerging-market ETFs one fewer weapon to mitigate tax liability, but all of the other features apply. History has shown that capital gains in these funds have been minimal to nonexistent.

Leveraged/inverse ETFs have proven to be relatively tax-inefficient vehicles. Many of the funds have had significant capital gain distributions—on both the long and the short funds. These funds generally use derivatives,

specifically swaps and futures, to gain exposure to the index. Derivatives cannot be delivered in kind and must be bought or sold. Gains from these derivatives generally receive 60/40 treatment by the Internal Revenue Service (IRS), which means that 60 percent are considered long-term gains and 40 percent are considered short-term gains regardless of the contract's holding period. Historically, flows in these products have been volatile, and the daily repositioning of the portfolio in order to achieve daily index tracking triggers significant potential tax consequences for these funds.

Commodity ETPs have a similar tax treatment to leverage/inverse ETFs due to the use of derivatives and the 60/40 tax treatment. However, commodity ETPs do not have the daily index tracking requirement, use leverage/short strategies, and have less volatile cash flows simply due to the nature of the funds. Commodity ETPs typically are given a Schedule K-1 for tax purposes. There are some further details about funds holding physical commodities in Chapter 12.

ETN Tax Treatment

The potentially favorable tax treatment of ETNs has been a major aspect of their popularity since the first notes were launched in June 2006. Issuers have made the argument, supported by their tax advisors, that ETNs should receive similar tax treatment to index-linked structured products. This tax treatment puts the notes at an advantage compared with open-end mutual funds and traditional ETFs. The Internal Revenue Service is questioning this tax treatment. Investors using these products should carefully consider potential tax issues and their possible tax liability.

U.S. tax consequences for ETN investments are uncertain. On December 7, 2007, the IRS and the Treasury Department issued Notice 2008-2, stating that they are considering issuing new regulations or other guidance on the products. The notice indicated the IRS and Treasury Department were considering whether investors should be required to accrue income and expenses during the term of the ETN. Without firm guidance, the current practice for ETN tax treatment, as put forth by ETN sponsors, is that equity- and commodity-linked ETNs generally are treated as prepaid forward contracts for tax purposes. Investors recognize a gain or loss upon the sale, redemption, or maturity of the ETN in an amount equal to the difference between the amount of the proceeds and the cost basis in the securities. If this tax treatment is respected, equity- and commodity-linked ETNs should not be treated as debt for U.S. federal income tax purposes, and investors should not recognize taxable income due to interest inclusions or original issue discount during the holding period of these ETNs. Therefore, under this treatment, investors only recognize a capital gain or loss upon the sale, maturity, or repurchase by the issuer of their equity- and commodity-linked ETNs.

Some market participants believe that the IRS may be concerned that ETNs could become a significant tax shelter. It might be difficult to change the tax treatment of ETNs while preserving the tax treatment for other structured products. The major risk to investors is that the IRS would require ETN holders to accrue interest over the term of the ETN even though investors may not receive any payments with respect to the security until maturity. In a worst-case, but relatively unlikely scenario for investors, the IRS could apply this test retroactively.

Currency-Linked ETN Tax Treatment The IRS has ruled that currency-linked ETNs are to be treated as foreign-currency debt instruments for federal income tax purposes. Investors are required to include the coupon payments in their annual tax return as ordinary income at the time such coupon payments are accrued or received by such holders. This is true if investors do not receive any payments until maturity. Gains or losses recognized in connection with the sale, maturity, or repurchase by the issuer of these currency-linked ETNs generally will be treated as ordinary income or loss to the extent attributable to fluctuations in exchange rates.

Taxation of Wrappers for Non-U.S. Investors As the ETF phenomenon has grown in the United States, it has also developed a firm footing globally. Non-U.S. domiciled investors who were previously entering the U.S. market to invest in ETFs are now able to access similar products in their home markets. Understanding the tax treaty and withholding requirements across structures from U.S. ETFs to UCITS to other locally listed products is becoming more important for investors. In a similar manner to making products available with a variety of currency hedges to accommodate local investors, ETF issuers are also making their products available in a variety of structures so investors can more appropriately manage their individual tax situations.

Other Tax Consequences

The holders of most ETVs not registered under the Investment Company Act of 1940 are subject to taxation as a partnership. As a result, they will receive a Schedule K-1 tax form. Whether these ETVs are held for one day or the whole year, investors still receive a K-1 reflecting their prorated share of the gains, losses, income, and deductions.

The grantor trust products investing in non-U.S. currencies are taxed at ordinary income rates. There will be no distributed realized capital gains and no interest income. When investors are positioning the funds with holdings in actual underlying precious metals, there is a potential tax liability applicable to collectibles. Under current law, gains recognized by individuals from the sale of “collectibles,” such as gold and silver bullion, held for

more than one year are taxed at a maximum rate of 28 percent, rather than the 15 percent rate applicable to most other long-term capital gains.

With the diversity of product structures, investors need to consider a potential minefield of tax consequences. This book does not offer any tax advice, and any comments regarding the way certain products are taxed may be different, depending on your personal tax situation.

WHEN STRUCTURAL ISSUES ARISE

There can be problems with various structures that may not have been expected when the product was initially launched. For example, some products have been temporarily unable to issue new shares or even have been liquidated due to issues with underlying investments.

Credit Risk of an ETN

One of the most significant characteristics of the ETN structure is the credit risk embedded in the product. In ordinary times, this credit risk was treated with skepticism because the ETN issuers were historically large and stable financial institutions. The financial crisis that began in 2008 proved that even the most unexpected events can occur and that risk in general was mispriced in the markets and particularly with regard to the Lehman Opta series of ETNs.

In the ETN structure, there are no specific assets underlying the note. You have a promise from the underwriting bank to pay a stated rate, like an exchange-listed swap. When Lehman Brothers declared bankruptcy, holders of its Opta ETNs were completely exposed. Two years later they were still in line with other creditors to see what remained of the firm's assets. Although ETN products may appear preferable to their competitors for investors who are looking to minimize potentially taxable income, the risk of issuer default is something that should be taken into consideration. The further investors get from issues with credit the more acceptable these products become for portfolios. Memories are generally short among the investing public searching for unique or better returns.

Discounts and Premiums from Issuance Restrictions

Restricted market access has also taken its toll on the ETN market in recent years. The iPath MSCI India ETN (INP), which is linked to the iPath MSCI India Total Return Index, ran into difficulties in issuing shares in late 2007. At that time, the Securities Exchange Board of India (SEBI) implemented



EXHIBIT 13.3 INP Discount/Premium Chart

Source: Bloomberg

restrictions with respect to derivative instruments linked to Indian equity securities. The iPath MSCI India ETN was accessing the Indian equities market through over-the-counter derivatives. When SEBI restricted access, the iPath ETN lost its ability to create new shares. When an open-ended product loses its ability to issue new shares, it begins to act like a closed-end fund. It loses the connection between the price of the underlying assets and the price of the ETN. When a product is no longer able to issue new shares, the price of the ETN should move to a premium to net asset value. This would be the result of fewer liquidity providers willing to sell the ETN shares and buy the underlying pursuing the typical arbitrage available between those assets. If the trader cannot create shares, being short the ETN and long the underlying basket would leave it with a perpetual up-and-down position that cannot be collapsed using the creation mechanism. As you can see in Exhibit 13.3, when INP halted creations in late 2007, far left of the chart, the premium on the fund spiked for an extended time period. This is just one example of what can happen when the arbitrage mechanism is interrupted by some event. When the fund was later able to issue new shares, the large premium disappeared.

Each of the issues mentioned are not necessarily problems in the structure of ETFs as much as potential issues that can arise by using ETNs as an

investment vehicle. Problems like this do not occur when the ETF structure is used with a basket of securities that is representative of the fund's underlying assets. The transparency of the ETF portfolio or basket is what enables successful trading of the product when the underlying assets are closed, if just overnight, or for extended periods. The marketplace is able to make their own assessments of what they think the underlying assets would be worth if they were trading and translate that value into the ETF price. This is why ETF volumes grow during market turmoil, system failures, and other market hiccups because the ETFs trading enables many different kinds of users all meeting in a transparent place to interact based upon their individual valuations.

CREDIT LIMITS AT BROKER-DEALERS

An interesting incident happened in June 2013 during a period in the markets known as the "Taper Tantrum." There were large outflows occurring in U.S.-listed fixed-income ETFs, and volumes were extremely high. A large broker-dealer was forced to suspend its ability to accept redemption orders in ETFs for an afternoon. This led to a variety of articles being written by an ill-informed media concluding that there were potential cracks in the ETF infrastructure. What actually had taken place was a story about a trading desk that attracted so much one-way flow that they reached their own firm-imposed internal limits on how much collateral they could have outstanding against trades.

The trading volumes in ETFs are primarily facilitated by ETF liquidity providers. They are making markets and executing orders in the products. Each of these trading desks has internal limits on how much risk it can potentially take on any given trading day. In this case one particular desk reached its own internal firm limit and was forced to turn its customers away. This was in no way an ETF issue. Those traders that were looking to redeem shares simply had to call any of a number of other ETF liquidity providers to process their redemption. This is similar to having to drive further down the block when your favorite gas station has closed. There was actually a benefit to the industry: As a result of this incident, ETF volumes have been reassessed in relation to credit and risk limits; and many ETF liquidity providers have increased their internal limits to account for growth of the industry.

WHEN MARKETS UNDERGO CLOSURES

Prior to the unrest and subsequent overthrow of the Mubarak government, Egypt had been considered a popular frontier market. The Egyptian market closed for trading at the beginning of 2011, however, from January 27

through March 23, because of the political revolution that was occurring in that country. During the nearly eight-week closure, the Egypt ETF continued to trade in the United States despite the fact that creations and redemptions were halted because of the inability to access the underlying basket. Through weeks of turmoil and unrest, the ETF traded over a wide range representing more than a 20 percent move in the markets. Shorting became very expensive, as it was limited to the percentage of shares outstanding in the stock loan program; and no more shares could be issued to facilitate share loan requirements when an investor sold short. The ETF was still free to trade, and it acted as a very valuable price discovery tool during the period. The ETF became one of the only tools that investors could use to express their views during this volatile market situation.

In Exhibit 13.4 you can see the market dislocation and the premium that the ETF moved to as a result of the inability to create new shares over that time period. On the left of the chart the ETF moved to a premium above 10 percent for the eight-week period in 2011. You can also see the blank space where positive fund flows would be apparent underneath the premium area. The solid functioning of the product is also exhibited by the fact that the fund snaps back to trading at standard small premiums and discounts again as the market reopened and began trading more normally.



EXHIBIT 13.4 An ETF Moving to a Premium During a Market Closure

Source: Bloomberg, 3/4/16

TRADING TIP

Allowing an ETF to continue to trade even though creations and redemptions are halted enables natural market forces to move it to a level of expected fair value. This has enabled the generation of a wide variety of price discovery tools for previously hard-to-value assets. It is incumbent upon investors to understand the potential ramifications of market events and how they may affect the pricing of the funds in which they have positions.

CONCLUSION

There is still confusion in the marketplace about the differences among all of the available products and their structural characteristics. I have tried to highlight the most important things to be aware of when making investment decisions. One product structure that is potentially coming to market over the next few years will be non-transparent ETFs. There will be ramifications of those structures that investors will need to understand from differing liquidity profiles to performance differences due to unknown holdings. The job of the investment advisor will become more difficult as they try to decipher the components of each fund structure. As the industry expands and exposures in varying types of structures also begin to be replicated, it will become much more important to understand the different characteristics.

NOTES

1. 2011 Investment Company Fact Book, Investment Company Institute, Appendix A, pg. 191.
2. Ibid.
3. Ibid.
4. Ibid.
5. Sourced from “ETF Regulatory and Operational Considerations”, Citibank Transactional Services.
6. NYSE Arca Bylaws and Rules: <http://wallstreet.cch.com/PCX/>.
7. Ibid.
8. Ibid.
9. As a registered securities exchange, the New York Stock Exchange is subject to the regulatory oversight of the SEC. Accordingly, all rules and rule amendments proposed by NYSE must be submitted to the SEC via what is known as a 19b-4

filing. A 19b-4 filing contains the proposed rule text, its intended purpose, and its statutory basis. Once a proposed rule change is filed with the SEC, the substance of the change is published in the U.S. *Federal Register* for a prescribed period of time, giving interested parties the opportunity to comment on it. Comment letters are forwarded to NYSE for response. If necessary, and when appropriate, the NYSE will amend the original filing in response to comment letters and resubmit the amended filing to the SEC. When the SEC approves a proposed rule change, it will issue an “approval order” for publication in the *Federal Register*. Shortly thereafter, the NYSE typically issues a corresponding Information Memo, alerting membership to the rule change, its history, and its effective date.

10. www.law.uc.edu/CCL/InvCoAct/sec112.html.

Bloomberg ETF Reference Guide

This reference guide provides a glimpse and overview of some of the more commonly used functions on the Bloomberg terminal related to exchange-traded funds (ETFs). This document is designed to give you a variety of functions pertaining to:

- Bloomberg ETF Basics
- Finding ETFs
- Analyzing ETFs
- Holdings Analysis
- ETF Trading

SECTION 1: BLOOMBERG ETF BASICS

Bloomberg has standardized formats for typing commands. All ETFs, regardless of underlying asset class, are considered equities because they trade on the secondary markets. When looking to access data on an ETF, type in the ticker, hit the EQUITY button, type the specific commands you are interested in, and then type the GO, or enter, button. A standard command to pull up the description page on DTN, the WisdomTree Dividend ex-Financials ETF, would look as follows in Figure A.1.

The command in Figure A.1 would bring up the screen seen in Figure A.2, the main description page for DTN. Here you can see a broad, comprehensive range of ETF information in one place. DES is divided into five data pages along the top of the screen, each of which provides different types of information on the selected ETF:

1. **Profile Page:** The Profile page provides an overview of fund information such as a brief description of the fund and a snapshot of key data. This allows you to quickly see relevant data points such as NAV, INAV, expense ratio, volume, and implied liquidity.

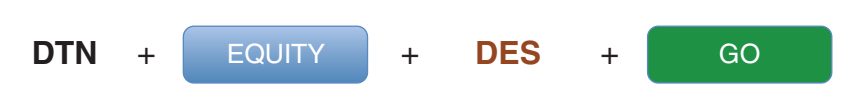


FIGURE A.1 Bloomberg Typing Code = DTN DES



FIGURE A.2 ETF Description Page (DES)

Source: Bloomberg.

2. **Performance Page:** The Performance page provides an overview of fund performance, including a comparison to the index that the fund attempts to mirror as well as additional relative measures and dividend information.
3. **Holdings Page:** The Holdings page provides an overview of the fund's holdings and weightings so you can quickly see the composition of the fund.
4. **Allocations Page:** The Allocations page provides an overview of the fund's allocations by geographic region, sector, and asset class.
5. **Organizational Page:** The Organizational page provides key pieces of information, such as operational data and information about the issuer.

Once you have pulled up a specific ETF ticker, there is no need to retype the whole command to change the variety of functions available. Typing the



FIGURE A.3 Bloomberg Typing Code—DTNIV DES

code for the command that you want to see will bring up the appropriate screen on the ETF you have loaded.

Underlying ETF Data

A variety of standardized codes for ETFs bring you to relevant pages for the following:

- NAV (NV)
- Indicative Value (IV)
- Shares Outstanding (SO)
- Estimated Cash (EU)
- Total (TC)

By appending the two-letter code to the end of the ticker and using the INDEX button, you can get directly to the index that tracks the desired information. A standard command to get to the description page of the DTN Indicative Value can be seen in Figure A.3.

SECTION 2: FINDING ETFs

Bloomberg offers a variety of ways to search for ETFs, but the most comprehensive search tool on the system is ETF<GO> (Figure A.4). ETF allows you to find and compare ETFs that match your investment criteria based upon specifications such as asset class, sector, or geographic focus. You can then compare the output by a variety of metrics such as cost, performance, and allocations.

Additional Functions for Finding ETFs:

- FSRC<GO>:** Fund screening tool that allows you to generate a list of funds based on specific criteria
- BI ETFS<GO>:** Learn about trends and new products on the Bloomberg Intelligence research dashboard
- NI ETF<GO>:** ETF-related news from Bloomberg and outside sources
- NI ETFMKT<GO>:** ETF fund flow news



FIGURE A.4 ETF<GO>

Source: Bloomberg.

Additionally, to find a specific fund by name, you can type the name of the fund into the command line, and the autocomplete functionality will provide you with a list of related securities. You can also use the command FL<GO> to search by keyword.

SECTION 3: ANALYZING ETFs

Whether you are analyzing a specific ETF or comparing a group of securities, Bloomberg offers a multitude of tools to help you take a deeper dive.

ETFL<GO> is a key tool that allows you to analyze the liquidity of the underlying shares of any equity exchange-traded fund where holdings data is available (Figure A.5). This analysis is known as **ETF IMPLIED LIQUIDITY**, which is an essential component of accessing and understanding ETFs.

Implied liquidity is an important metric to assess liquidity based on the underlying basket. The calculation first looks at how many shares of each underlying component are in a creation unit. The final output assumes that if transacting in the underlying securities, how many ETF shares would that translate into before impacting more than 25 percent of the 30-day average



FIGURE A.5 ETFL<GO>

Source: Bloomberg.

daily volume of the least liquid security. Liquidity is measured on a daily basis and can change at any moment based on market volatility.

Graphing Tools

Bloomberg offers a suite of graphing functionality that allows users to visually compare and contrast funds of interest. Users can access multiple security analyses via **COMP<GO>** (Figure A.6) or **CORR<GO>**, or you can graph a wide variety of ETF data points such as price, return, shares outstanding, market cap, and volume via **G<GO>** (Figure A.7). **G** is extremely customizable, and these graphs can be saved for future reference.

Additional Analysis Functions:

- DVD<GO>**: Displays the dividend/split history of an ETF
- CN<GO>**: News related to a particular ETF
- CF<GO>**: Access to all of the publicly available filings
- BETA<GO>**: Graphs and displays the historical sensitivity of a selected ETF compared to any broad-based market index

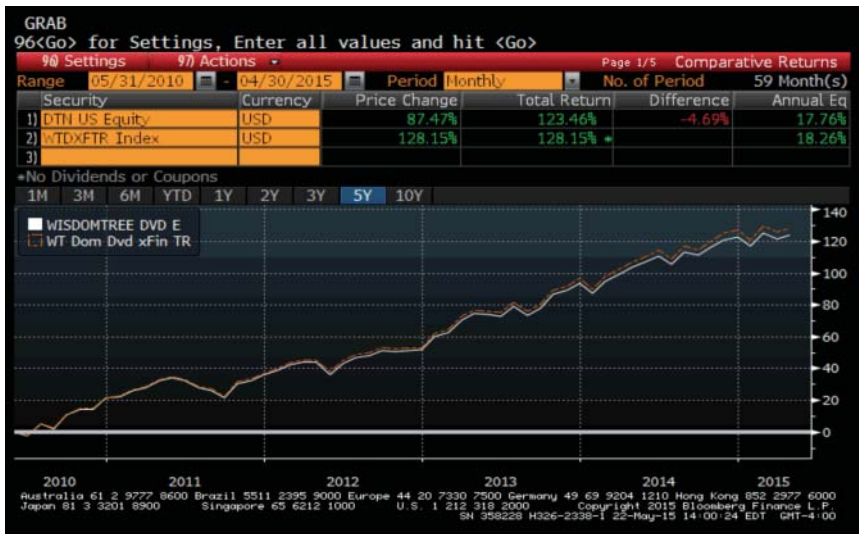


FIGURE A.6 COMP<GO>
Source: Bloomberg.



FIGURE A.7 G<GO>
Source: Bloomberg.

- FREP<GO>: Generates a PDF report on a specific ETF
- HS<GO>: Charts the historical spread between two ETFs over a specific time
- HFA<GO>: Analyzes historical risk and performance of a fund or a portfolio of funds
- FLNG<GO>: Searches through 13F filings for firms that hold ETFs
- RV<GO>: Relative value analysis on a selected ETF versus a preselected group of peers

SECTION 4: HOLDINGS ANALYSIS

Bloomberg provides detailed information on both institutional and insider holders of any given ETF. There are several functions to be aware of on the terminal, but most importantly **HDS<GO>** is a key tool to see both current and historical holders of a fund (Figure A.8).



FIGURE A.8 HDS<GO>
Source: Bloomberg.

Additional Holdings Function:

HDSM<GO>: Holdings matrix that shows multiple holders of multiple ETFs

OWN<GO>: Detailed breakdown of the institutional ownership of an ETF

SECTION 5: ETF TRADING

Bloomberg offers a variety of functions to access key information regarding ETF trading. From top trades to corporate actions, this is essential data, particularly for ETF traders.

AQR<GO>: Displays the top trades contributing to VWAP. This is useful for seeing the largest block in a particular fund (Figure A.9).

If you click on the additional tabs on AQR, you can see a **Summary Matrix**, analysis of the consolidated volume at price **VAP**, and a price table **TSM**, which displays prices and volumes traded over a specified period.



FIGURE A.9 AQR<GO>

Source: Bloomberg.



FIGURE A.10 QR<GO>

Source: Bloomberg.

QR<GO> is an additional trading tool that allows users to see trades in a specified period and includes information such as size, price, and condition code (Figure A.10). You can click on the “quote recap” tab for more details on quotes at a specified time as well.

Additional Trading Functions:

HP<GO>: A table of historical price and volume as well as high, low, and average price details for the specified period

MDM: Market depth monitor

QM<GO>: Displays quotes and market share data from all exchanges on which an ETF trades

HCP<GO>: Displays a table of historical price and volume along with the change and percentage change from the previous period

OMON<GO>: Provides real-time data and pricing for options on a particular ETF

CACS<GO>: Corporate action calendar

SI<GO>: Displays short interest information for an ETF

MBTR<GO>: Monitors block trades worldwide and can link in a particular portfolio or Launchpad monitor

VBAR<GO>: Graph history of the daily trading volume distribution

RANK<GO>: Provides brokers' advertised trade volume on a post-trade basis; this can provide insight on which broker has the best liquidity in a particular name

ETF Issuers

This appendix lists some U.S. ETF issuers and their websites.

#	Issuer	Website
1	ALPS	www.alpsfunds.com
2	Arrow Investment Advisors	www.arrowfunds.com
3	BlackRock [iShares]	www.ishares.com/us/
4	Calamos	www.calamos.com
5	Cambria	www.cambriafunds.com
6	Columbia	www.columbiathreadneedleetf.com/
7	Deutsche Bank [X-trackers]	www.etf.deutscheam.com/GLOBAL/ENG/Entry
8	Direxion	www.direxioninvestments.com
9	Emerging Global Shares	www.emergingglobaladvisors.com
10	ETF Securities	www.etfsecurities.com
11	Exchange Traded Concepts	www.exchangetradedconcepts.com
12	Fidelity	www.fidelity.com
13	First Trust	www.ftportfolios.com
14	Franklin Templeton	www.franklintrust.org
15	Global X	www.globalxfunds.com
16	Guggenheim	www.guggenheiminvestments.com
17	Highland Capital Management	www.highlandcapital.com
18	Huntington Strategy Shares	www.huntingtonstrategyshares.com

#	Issuer	Website
19	IndexIQ	www.indexiq.com
20	Invesco PowerShares	www.invescopowershares.com
21	JPMorgan	www.jpmorgan.com
22	KraneShares	www.kraneshares.com
23	LocalShares	www.localshares.com
24	Merk	www.merkfunds.com/
25	Northern Trust	www.flexshares.com
26	OppenheimerFunds	www.revenueshares.com/
27	PIMCO	www.pimco.com
28	Precidian	www.precidianfunds.com
29	ProShares	www.proshares.com
30	PureFunds	www.purefunds.com
31	QuantShares	www.quant-shares.com/
32	Recon Capital	www.reconcapitalpartners.com
33	Renaissance Capital	www.renaissancecapital.com
34	Schwab	www.schwab.com
35	SSGA (SPDR)	www.ssga.com
36	Teucrium	www.teucrium.com
37	US Commodity Funds	www.unitedstatescommodityfunds.com
38	Van Eck	www.vaneck.com
39	Vanguard	www.vanguard.com
40	Velocity Shares	www.velocityshares.com
41	Victory CEMP	www.vcm.com
42	WisdomTree	www.wisdomtree.com/
43	Yorkville	www.yetfs.com

An Overview of the Japanese ETF Market

SUMMARY

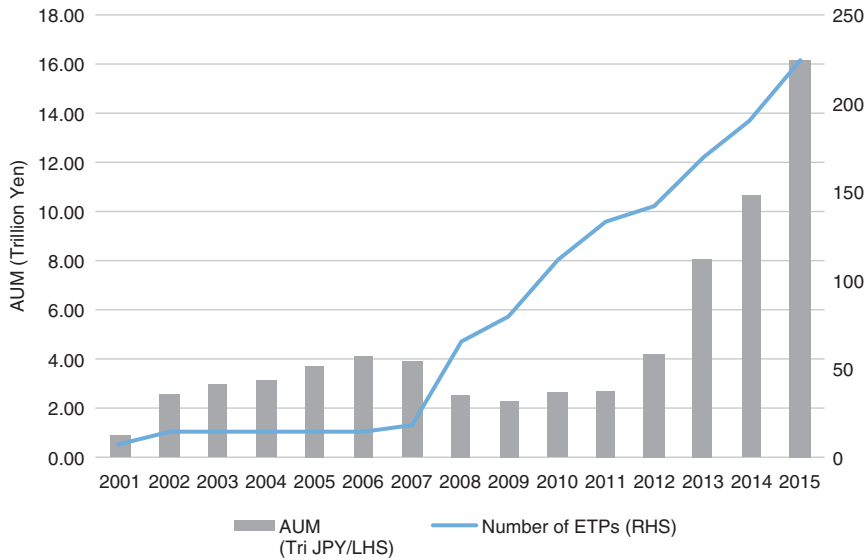
The ETF market is generally viewed as having started to grow in Japan in 2001,¹ when issues linked to widely recognized benchmarks such as the Nikkei 225 and TOPIX were listed. Subsequently, on the back of monetary easing, ETF volume grew rapidly with the start of the Bank of Japan (BoJ) purchases.

A distinguishing feature of the Japanese ETF market is that financial institutions are the key investor base, accounting for a high proportion of total holdings, unlike the U.S. market, which is typically described as a market largely dominated by advisors. In addition to the difference in investor base, leveraged ETFs represent a substantial proportion of the trading volume in Japan.

Recently, more Japanese investors are purchasing ETFs listed on foreign exchanges directly. Investments in both domestic and overseas ETFs are increasing.

JAPAN'S ETF MARKET

As of the end of 2015 in Japan, there were 225 ETFs (ETPs), with the vast majority listed on the Tokyo Stock Exchange. Since the creation of a New Listing Group at TSE in 2007 to proactively support ETFs, there has been a steady increase in the number of issues. AUM growth has been significantly supported by sustained purchases of TOPIX- and Nikkei 225-linked ETFs (JPX Nikkei 400-linked funds were added in 2014) by the BoJ from November 2010, as a part of monetary easing measures. This can be seen in Exhibit C.2. The listing of leveraged and inverse ETFs since 2012 has also contributed to the growth in market scale and trading value.

**EXHIBIT C.1** Growth of the Japanese ETP Market

Source: Tokyo Stock Exchange (TSE), Investment Trusts Association

Exhibit C.1 takes into account the following facts:

- BoJ had bought approximately seven trillion yen in ETFs as of the end of 2015.
- At its December 2015 Monetary Policy Meeting, BoJ decided to expand its purchases to include ETFs that invest in the shares of companies actively making capex investments and investing in human resources.
- AUM of investment trust structures only (data from the Investment Trusts Association).

CATEGORIES AND TYPES OF JAPANESE ETFs

Most Japanese ETFs (ETPs) are Japan-domiciled investment trusts, but there are also funds structured under the Trust Act, foreign-domiciled funds, and ETNs. Historically, the majority of funds had significant exposure to Japanese equities, but recently there has been an increase in funds that have exposure to foreign equities/bonds or commodities. Since 2012, there has also been an increase in leveraged and inverse ETFs. Exhibits C.2 and C.3 show the number and types of ETFs and indexes, respectively.

EXHIBIT C.2 Number of ETPs by Type

Structure			Number of ETPs
Foreign ETP	Cross List		25
	ETF-JDR ^a		22
Japan Domicile ETF/ETC	Investment Trust Act Structure ^b	In-kind Creation/ In-kind Redemption	81
		Cash Creation/Cash Redemption	61
		Cash Creation/In-kind Redemption	3
	Trust Act Structure		4
ETN			29

^aJDR = Japanese Depositary Receipt.

^bIn Japan, a clear regulatory delineation is made between in-kind and cash creations. This is different than the more flexible approach taken in the United States or other countries.

Source: TSE as of Dec. 2015

EXHIBIT C.3 Number of ETPs by Index Type

Underlying Indices	Number of ETPs
Japanese Equity	80
Foreign Equity	41
Fixed Income	6
REIT (Japan and Foreign)	9
Commodity	38
Leverage, Inverse, Enhanced	45
Other	5

Source: TSE as of Dec. 2015

ISSUES

On an AUM basis, the majority of the largest ETFs in Japan are Nikkei 225- or TOPIX-linked (Exhibit C.4), reflecting the fact that BoJ and financial institutions are the key investors. One feature of the Japanese market is the existence of multiple issues linked to the same index.

By trading volume, leveraged and inverse funds, particularly those linked to the Nikkei 225, generate significantly higher trading volumes than other types of ETFs (Exhibit C.5). This can be attributed to the popularity of such funds with individual investors who have a preference for shorter investment horizons.

Given that leveraged (and inverse) ETFs amplify (or invert) daily returns, ensuring the investors fully understand that such instruments are unsuitable

EXHIBIT C.4 AUM Top 10

Code	Name	AUM (bil. JPY)
1321	Nikkei 225 Exchange-Traded Fund	3,239.5
1306	TOPIX Exchange-Traded Fund	2,945.7
1330	Nikko Exchange-Traded Index Fund 225	1,576.6
1320	Daiwa ETF–Nikkei 225	1,491.1
1305	Daiwa ETF–TOPIX	1,377.2
1308	Nikko Exchange-Traded Index Fund TOPIX	1,325.9
1346	MAXIS NIKKEI225 ETF	823.2
1570	NEXT FUNDS Nikkei 225 Leveraged Index Exchange-Traded Fund	734.5
1348	MAXIS TOPIX ETF	422.1
1591	NEXT FUNDS JPX-Nikkei Index 400 Exchange-Traded Fund	255.4

Source: TSE as of Dec. 2015

EXHIBIT C.5 Average Daily Volume Top 10

Code	Name	ADV (bil. JPY)
1570	NEXT FUNDS Nikkei 225 Leveraged Index Exchange-Traded Fund	169.6
1357	NEXT FUNDS Nikkei 225 Double Inverse Index ETF	15.1
1321	Nikkei 225 Exchange-Traded Fund	12.4
1579	Nikkei 225 Bull 2x ETF	10.7
1306	TOPIX Exchange-Traded Fund	6.4
1568	TOPIX Bull 2x ETF	5.6
1330	Nikko Exchange-Traded Index Fund 225	3.9
1320	Daiwa ETF–Nikkei 225	3.7
1360	Nikkei 225 Bear-2x ETF	1.9
1365	Daiwa ETF Japan Nikkei 225 Leveraged Index	1.9

Source: TSE, ADV is average of 2015

for long-term investment is considered extremely important. Providers and the exchanges are actively engaged in numerous initiatives to educate potential investors.

ETF INVESTORS IN JAPAN

Unlike the United States, given the limited presence of the RIA model in Japan, ETF holders in Japan are typically either institutional or retail/individual investors (Exhibit C.6). Eighty percent of Japanese ETFs

EXHIBIT C.6 ETF Holders in Japan^a

	Category	Total	Japanese Equity Index	REIT Index	Foreign Equity Index	Others	ETN
	Number of Listed Issues	164	84	7	30	14	29
	Total(1)+(5)+(6)+(7)	153,764	100.0	100.0	1,253	1,458 I	1,392 I
(1)	' Govt. & Local Govt.	-	-	-	-	-	-
(5)	Domestic Corporation	131,944	85.8	81.5	316	26.4	144
	Subtotal (2)+(3)+(4)						
(2)	Financial Institutions a+b+c+d+e	122,648	79.8	77.6	237	10.0	15
	a City& Regional Banks	19,849	12.9	56.5	69	27	-
	b Trust Banks	88,226	57.4	63	5	"	1
	(Out of a+b Investment Trusts)	134	0.1	2	2	32	-
	(Out of a+b Annuity Trusts)	131	0.1	-	-	66	-
	c Life Insurance Companies	4,360	2.8	0	-	-	-
	d Non-life Insurance Companies	258	0.2	39	0	-	-
	e Other Financial Institutions	9,954	6.5	610	161	19	13
(3)	Securities Companies	7,399	4.8	92	57	70	70
(4)	Business Corporations	1,895	1.2	40	21	168	59
(6)	Foreigners	12,624	8.2	322	208	159	745
(7)	Individuals	9,196	6.0	307	728	913 I	502 I
							36.1

^aThere are some foreign players, but this group also includes non-japan-based market makers and HFTs.

Source: TSE, July 2015. Excludes cross-listed issues. Does not include issues for which data was not available at the time of data aggregation

are held by financial institutions. By type, trust banks are major players, although the majority of their holdings are in fact the result of BoJ's monetary easing policy. Individual investors are only approximately 6 percent of total holdings.

OVERSEAS ETFs

Japanese investors also have direct access to ETFs listed on foreign exchanges. A qualified institutional investor is basically able to transact in ETFs listed around the world. Other investors, including retail investors, can also transact in overseas ETFs, provided the appropriate notifications under the Japanese Investment Trust Act for the ETF have been submitted, and the issue is handled by a brokerage firm in Japan.²

NOTES

1. A fund linked to the Nikkei 300 was listed in 1995.
2. An estimated 400 ETFs listed in the United States, Asia, and Europe have submitted the appropriate notifications and are handled by brokerages in Japan.

An Overview of European ETF Market

THE EUROPEAN ETF MARKET

The European ETF market recently surpassed its fifteenth anniversary since the first product launch on the Deutsche Börse in April 2000. While inflows are continuing and assets are reaching record numbers, the European ETF landscape faces significant hurdles compared to the much more mature and streamlined ETF market in the United States.

The geographic fragmentation of liquidity is a major hindrance for the European ETP market. Trading occurs across a wide range of exchanges and venues causing liquidity to be isolated and scattered. An ETF can be listed on multiple exchanges and sometimes even in multiple different currencies at each exchange. Each exchange then has its own central counterparty (CCP) and central securities depository (CSD) causing each listing to settle in a separate location. In order to process any post-trade imbalances, ETFs need to be transferred from one location to another potentially causing operational inefficiencies. These inefficiencies can range from a variance in settlement cycles, to lack of connection between CSDs, and other potentially lengthy delays. Solutions such as Euroclear Bank's International ETF Structure are being pursued to reduce transactional costs and centralize settlement. The ECB is also working on a new securities settlement platform.

Another potential difficulty for the ETF market in Europe is the lack of reporting requirements across the region. This drives a lack of transparency as compared to the ETF market in the United States. That market has benefited from the increases in transparency that ETFs can bring to the marketplace. The ability to centralize trading in a transparent manner is very beneficial for uniform pricing for investors.

Despite the fact that the market has the difficulties of fragmentation and regulation to overcome, a compelling opportunity exists for continued growth, maturation, and acceptance.

The investor bases are also somewhat different between Europe and the United States. While the institutional space in Europe is far more penetrated, the retail investor space remains somewhat less charted territory. Retail ownership of ETFs was approximately 15 percent as compared to almost 45 percent in the U.S.¹ While some European platforms offer ETFs, many have an extremely limited choice with even more limited information. Product issuers are hoping the Retail Distribution Review will help to increase the retail appetite for the products. The goal is to raise the professional standards in the industry, introduce greater clarity between the different types of retail services available, and bring transparency to fees. Accessibility and availability of information of the array of available ETFs along with continuing investor education should continue to cause increases in assets.

The first ETF products in Europe, iShares Stoxx Europe 50 UCITS ETF and the iShares Euro Stoxx 50 UCITS ETF,² launched on April 11, 2000, on the Deutsche Börse, offering exposure to European equities.

As of the end of 2015, there were 2,443 ETPs (including ETFs and ETC/ETNs) domiciled in Europe. From 2003 to 2015, the total assets of European ETPs increased from \$20 billion to \$513 billion, with an approximate Compound Annual Growth Rate (CAGR) of 31 percent. This can be seen in the chart in Exhibit D.1 demonstrating asset growth and number of products over time.

European ETPs by Structure

While assets in European ETPs have continued to grow, they only represented approximately 5.5 percent of the total investment fund assets in Europe as of September 30, 2014. This is much lower than in the United States where that number is closer to 11 percent. Furthermore, the European ETP offering is actually larger than that of the United States in product numbers despite being approximately one-fifth the size in AUM terms. The number of different country exchanges requiring multiple listings and the availability of funds having multiple share classes leads to a vastly greater number of products than you would find in the U.S. markets. In addition the investors across Europe invest using a variety of different currencies leading to further product segmentation.

According to Morningstar Direct, ETFs are the main ETP structure in Europe, with 1,630 ETFs and \$497 billion in AUM at the end of 2015. ETCs and ETNs only represented a fraction of the overall ETP market in terms of AUM with approximately \$16 billion.

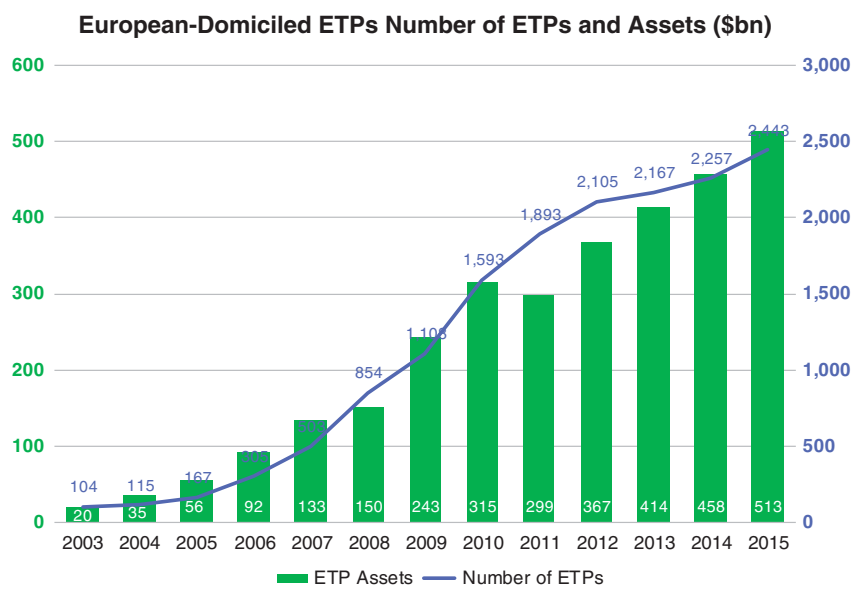


EXHIBIT D.1 European-Domiciled ETPs (\$ billions)

Source: BlackRock Landscape Report—January 2016, Morningstar Direct

EXHIBIT D.2 European ETPs by Structure

ETP Structure	Num of ETPs	AuM(\$ billions)
ETFs	1630	497
Other ETPs (ETCs, ETNs)	813	16

Source: Morningstar Direct, 12/31/2015

European ETPs by Asset Class

At the end of 2015, the largest ETP asset class in Europe was equities, with 1014 ETPs and approximately \$348 billion in total assets. Fixed-income and commodities were the second and third largest asset classes by AUM, while other categories, including active, short and leveraged, and cash funds, had a large number of products at 775 ETPs but contained a small number of assets at only approximately \$16 billion. You can see the asset and product number breakdown by asset class category in Exhibit D.3.

EXHIBIT D.3 European ETPs by Asset Class

Asset Class	Num of ETPs	AuM(\$ billions)
Equities	1014	348
Fixed-Income	303	118
Commodities	351	30
Other	775	16

Source: Morningstar Direct, 12/31/15

European ETPs by Listing Countries

By the end of 2015, Germany had the largest number of ETP listings, where 3,057 ETPs were listed, including share classes.

European ETPs by Issuers

The largest (in terms of assets) ETP issuer in Europe is BlackRock iShares, which had 275 ETPs and AUM of approximately \$233 billion as of the end of 2015. BlackRock had approximately 47 percent of the market share at the end of 2015 with the remainder being split across roughly 45 other competitors. Many of the available products are index tracking based on similar market cap weighted indexes. Exhibits D.4 and D.5 show European listings by Country, and AUM by Issuer respectively, both as of the end of 2015.

EXHIBIT D.4 European ETPs by Listing Countries

Country	Num of Listings (by Share Class)
Germany	3,057
United Kingdom	2,873
Switzerland	1,280
Italy	1,008
France	481
Netherlands	169
Norway	109
Spain	70
Denmark	46
Luxembourg	45

Source: Morningstar Direct, 12/31/2015

EXHIBIT D.5 European ETP Issuers and Number of Products

ETP Issuer	Num of ETPs	AuM(\$ billions)
iShares	275	233
db X-trackers	233	61
Lyxor	241	52
UBS	131	27
Amundi	99	22
Source	84	19
Vanguard	17	19
State Street	79	13
ETF Securities	359	12
Deka	47	8

Source: ETFGI, 12/31/2015

EXHIBIT D.6 Smart Beta ETPs in Europe

Smart Beta ETPs	Num of ETPs	AuM(\$ billions)
Non-Smart Beta	2208	467
Smart Beta	235	45

Source: Morningstar Direct, 12/31/2015

Smart Beta ETPs in Europe

Smart Beta ETPs have become an attractive alternative to market-cap-weighted ETPs by employing factor or fundamental weighting strategies. By the end of 2015, there were 235 Smart Beta ETPs with approximately \$45 billion, or 8.8 percent of total ETP AUM in Europe. You can see the product breakout in Exhibit D.6.

NOTES

1. "ETF Providers Eye Europe's Retail Market," FT.com, 9/7/2014.
2. Source: <http://www.funds-europe.com/home/news/15535-15-years-since-the-first-etf-hit-europe>.

About the Author

David J. Abner has been on the senior management team of WisdomTree Asset Management since 2008. He has been involved in many aspects of the firm's growth as it developed into a top five ETF asset manager. He was the head of the Capital Markets group until 2016. The Capital Markets group is involved in all aspects of the WisdomTree ETFs, from product development and relationship management, through education on best execution techniques and trading strategies for the products. More recently Abner has been focused on the organization and growth of the WisdomTree expansion into Europe.

Prior to joining WisdomTree in 2008, Abner spent two years as a managing director and the head of ETF Trading Americas at BNP Paribas. Abner started his career at Bear Stearns in 1992. While at Bear Stearns, he managed the Closed-End Fund trading group and traded Japanese convertible bond arbitrage and Asian equities; and in 2000 he was tasked with building the ETF trading business, which he ran until his departure from the firm in 2006.

Abner holds an M.S. in Management and a B.A. in Economics from Stony Brook University on Long Island. He is the author of the two principal books on the industry: *The ETF Handbook* (Wiley, 2010) and *Visual Guide to ETFs* (Bloomberg, 2013). He leverages 20 years of industry experience to speak globally about the ETF industry, focusing on techniques for execution and portfolio management of exchange-traded funds, and is a trusted trading advisor to portfolio managers around the world.

At home, Abner lives with his wife; their three children, Sophie, Sam, and Lucy; three hermit crabs; and three fish. While they broadly embrace technology in their lives, they enjoy spending as much time as possible playing outside in the sunshine.

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