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Industry Update

KBW ETF Spotlight v2: Clearing Up the Confusion About ETF Liquidity

Summary

We provide a follow-up to our 3/3 note, KBW ETF Spotlight: An Introduction to ETFs, and in this edition of KBW ETF Spotlight, explore ETF liquidity in greater detail, with a focus on how investors can properly assess an ETF's liquidity in today's market. We also provide a case study of two ETFs, KBWB and KBE, to demonstrate how to evaluate liquidity.

- **As highlighted in our first KBW ETF Spotlight, ETFs trade on both primary and secondary markets.** ETFs are unique in that they can also trade on the primary market whereby new shares can be created at any given time. ETFs can take in and distribute assets through the creation and redemption process in the primary market.
- **Don't judge an ETF by its cover! An ETF's underlying liquidity is not determined by its average daily trading volume or its assets under management (AUM).** Since ETFs trade on the primary market, their liquidity is not limited to secondary market constraints. The majority of ETFs trade infrequently in the secondary market in comparison to stocks. About 72% of U.S.-listed ETFs trade less than 100,000 shares per day, and just 8% trade more than a million shares daily.
- **ETF liquidity is dependent on how easy it is for ETF shares to be created or redeemed, which is ultimately dependent on the liquidity of the underlying components that compromise the ETF.** Therefore an ETF's liquidity is constrained by the least liquid security in the underlying ETF basket.
- **The liquidity of the underlying ETF components is often multiples of the ETF's overall trading liquidity.** For example, the largest ETF by AUM is the SPDR S&P 500 ETF Trust (SPY), which tracks the S&P 500 Index (SPX). On average, SPX components trade nearly 7x the average daily volume of SPY.
- **Investors can utilize the Bloomberg function ETF Implied Liquidity™ to quickly determine the limiting agent for the overall ETF.** This function provides the "Implied Daily Tradable Shares," as introduced by David Abner in his book, *The ETF Handbook: How to Value and Trade Exchange-Traded Funds.* It conveys how many ETF units can trade before impacting more than 25% of the underlying component's average trading volume, assuming that if the ETF units impact more than 25% of daily volume it will have a meaningful impact on the trading of the component stock. ETFs with low trading volumes but a highly liquid basket of stocks are not as illiquid as the ETF average volume indicates.
- **An ETF's composition is the most important factor used to gauge its liquidity.** An ETF tracking lower liquidity securities is likely to have reduced liquidity. Also, an ETF focused on a single sector or industry group can also be subject to greater volatility and illiquidity during adverse trading conditions for that sector or industry group.
- **Capital Markets desks at ETF Sponsors are a critical source for ETF investors.** Capital markets desks work with investors to facilitate efficient ETF trading, and help with the execution of large trades.
- **Large-Cap Domestic Bank ETFs Liquidity Case Study: On the surface, KBE appears more liquid than KBWB in terms of AUM and average dollar trading volume.** With over $3B in AUM, KBE is about 3x larger than KBWB, and trades more than 3x KBWB's 1-month average dollar trading volume.
- **But KBWB's underlying constituents and weighting structure actually render it significantly more liquid than KBE.** KBE's underlying index (SPSIBK) has a wider market cap range and modified equal weighting structure that ultimately results in KBE being more heavily weighted in lesser liquidity banks than BKX/KBWB. **Therefore, the underlying constituent liquidity of KBWB nearly 2.6x that of KBE.**
- ***Further, the implied liquidity™ of KBWB is 12.1M shares versus 8.9M share for KBE***, indicating KBWB can accommodate larger trades than KBE without having a material impact on its underlying constituents.
- ***Please view pages 2-11 for our full analysis.***

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Glossary of Terms

ETFs: Characteristics of Both Mutual Funds and Stocks with One Key Difference

ETFs are typically compared to both mutual funds and stocks given they have characteristics in common with each investment type. An ETF is similar to a mutual fund in that it is a pooled investment vehicle that owns a basket of securities. This underlying basket represents a specific investment objective and could be a broad based group of securities or a more focused segment of the market. The vast majority of ETFs are constructed to passively track a specific index. ETFs provide investors with exposure to a wide range of assets including equities (domestic and international), commodities, bonds, currencies and options. However, unlike a mutual fund, an ETF is a listed equity that trades intraday on an exchange. In this case, given its real-time pricing and trading, an ETF closely resembles a stock.

Exhibit 1: Characteristics Comparison: Stocks vs. Mutual Funds vs. ETFs

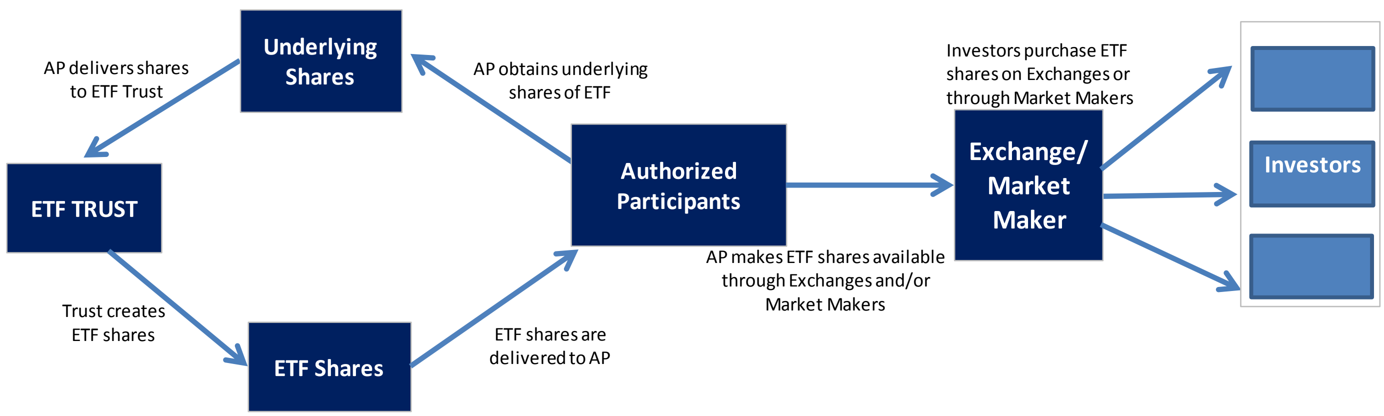
	Stocks	Mutual Funds	ETFs
Liquid?	Yes, intraday liquidity	No	Yes, intraday liquidity
Transparent?	Holdings disclosed quarterly on a lagged basis	Holdings disclosed quarterly on a lagged basis	Holdings disclosed daily
Pricing?	Intraday	Daily - End of Day	Intraday
Primary Market Trading?	No	Yes	Yes
Secondary Market Trading?	Yes	No	Yes
Trading Participants?	Market	Issuer	Issuer and Market
Diversified Investment?	No	Yes	Yes
Shares	Fixed by Issuer	Adjustable	Adjustable

Source: KBW Research.

The key difference between ETFs and both stocks and mutual funds is that <u>ETFs trade on both the primary and secondary markets.</u> In the secondary market, ETFs and stocks trade alike as investors can buy and sell existing issued shares throughout the trading day. Mutual fund shares trade in the primary market but can only be bought and sold at the end of the trading day. ***The biggest distinction between ETFs and both stocks and mutual funds is that they can also trade on the primary market whereby new shares can be created at any given time.***

This concept of a primary marketplace for ETFs is driven by the fact that an ETF continuously takes in and distributes assets through the creation and redemption process. ETF shares can be constantly created and redeemed. ETFs are sponsored by a provider that files with the SEC to create a new ETF based on a particular fund structure (ex: domestic large-cap equities). Once the SEC approves the plan, the sponsor can receive assets. The ETF sponsor then designates large self-clearing broker/dealers as authorized participants (APs).

Exhibit 2: The Creation and Redemption Process



Source: KBW Research.

APs serve an important function as a liaison between investors and sponsors, and help facilitate trades. APs begin creating "Creation Units" in the ETF, which represent the minimum size block of the ETF that can be traded. While Creation Units vary from fund to fund, the typical Creation Unit size is 50,000 shares. APs then deliver the underlying basket of assets to the ETF sponsor in exchange for ETF shares. This is known as the "creation process." These new shares are reflected in the ETF shares outstanding and consequently, the ETF's assets under management (AUM) will increase. APs are then free to sell the ETF shares in the open market.

APs play a critical role in the ETF cycle. APs sign a "participation agreement" with a fund sponsor to provide creation/redemption transactions. The majority of creations and redemptions are structured in what are referred to as "in-kind" transactions. In these types of transactions, as we described, ETF shares are created or redeemed for a sample of the current underlying holdings of the ETF. Therefore, APs purchase or borrow the required underlying securities for a given ETF and then provide the appropriate amount of shares to a custodial bank for bookkeeping and administrative and storage purposes. Once the delivered basket has been verified, the custodial bank issues ETF shares to the AP for sale in the secondary market.

ETF investors have two options when they want to sell their ETF shares: 1) they can sell their shares in the secondary market, or 2) they can accumulate enough shares to create a Creation Unit in the primary market. When investors have accumulated enough shares for a Creation Unit, they can leverage an in-kind transaction and redeem these shares directly to the sponsor for the appropriate amount of shares of the underlying securities. The ETF shares outstanding are subsequently reduced and the ETF's AUM declines.

In addition to APs, there are also market makers who serve as liaisons between investors and APs. Market makers are broker-dealers that help facilitate the trading of ETFs in the secondary market, and in turn are compensated by the bid-ask spread. Most ETFs have a designated lead market maker (LMM) that guarantees quotes for the ETF in exchange for incentives from the exchange. Both APs and market makers will arbitrage the price of the ETF and its underlying basket. It is this arbitrage process that keeps the ETF trading close to its net asset value (NAV).

In the exhibits below, we provide greater detail on how the arbitrage process works and about how APs are able to create liquidity and balance out the supply and demand for the ETFs and their underlying securities.

Exhibit 3: Creation/Redemption Process Helps to Provide ETF Liquidity

STEP 1- Supply/Demand for ETFS

If there is a supply/demand imbalance in ETF shares, the AP can buy shares from investors in the secondary market.

STEP 2- Redemption

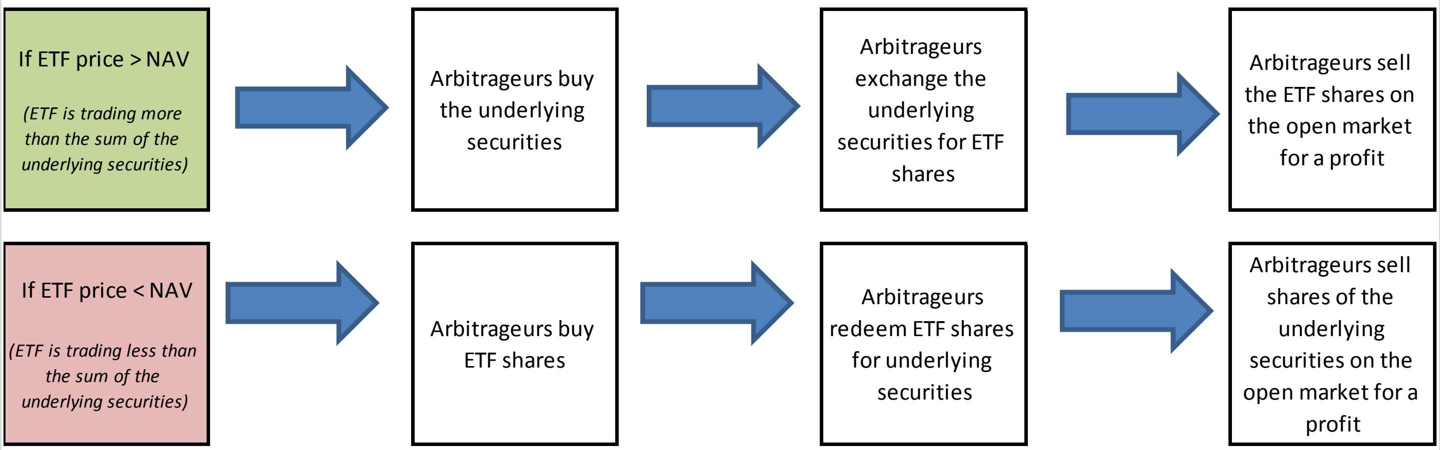
The AP's presence helps investors exit their positions when there is a supply and demand imbalance within the ETF. Once the AP has the necessary amount of shares for a creation unit, the AP can redeem those shares for the underlying securities.

STEP 3- Balancing out Supply/Demand

Redeeming shares reduces the supply of ETF shares and rebalances the secondary market. This is a key reason why Trading volumes of ETFs are not the only indicator of liquidity.

Source: KBW Research and ETF Handbook.

Exhibit 4: The ETF Arbitrage Process



Source: KBW Research .

Evaluating ETF Liquidity

- ***An ETF's underlying liquidity is often incorrectly associated with its average daily trading volume or its AUM.***

Since stocks have a fixed amount of shares outstanding, their liquidity is solely determined by the laws of supply and demand, and the amount of shares traded in the secondary market. ***But since ETFs trade on both the primary and secondary markets, their liquidity is not limited to the constraints of the secondary market.***

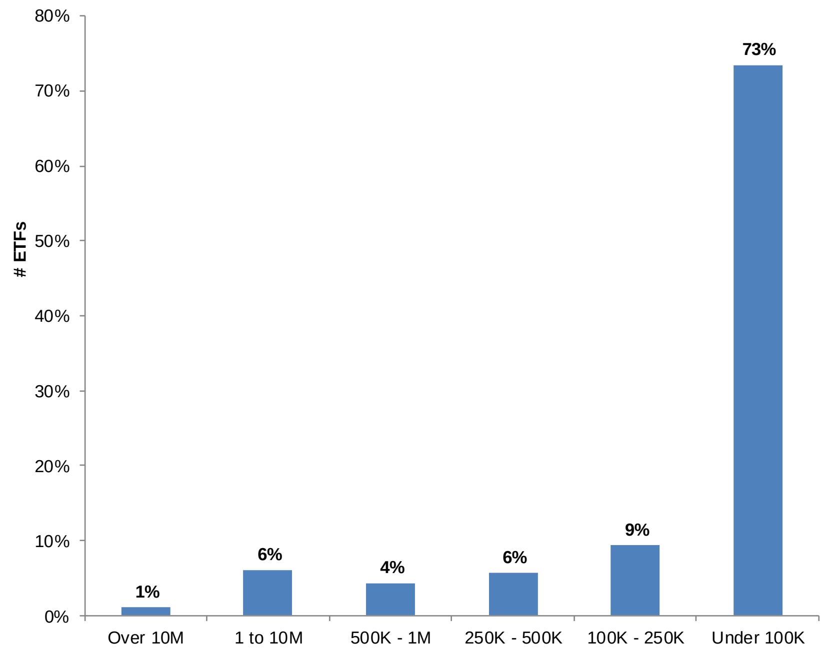
Recall that ETF shares can be constantly created or redeemed. ***ETF liquidity is therefore dependent on how easy it is for ETF shares to be created or redeemed, which is ultimately dependent on the liquidity of the underlying components that comprise the ETF basket.***

An ETF's liquidity is ultimately constrained by the least liquid security in the underlying basket.

The vast majority of ETFs trade rather infrequently in the secondary market in comparison to their stock peers. ***About 73% of all U.S.-listed ETFs trade less than 100,000 shares on a daily basis.*** Just 7% of all U.S.-listed ETFs trade more than one million shares per day.

Exhibit 5: Liquidity Breakdown of U.S.-Listed ETFs

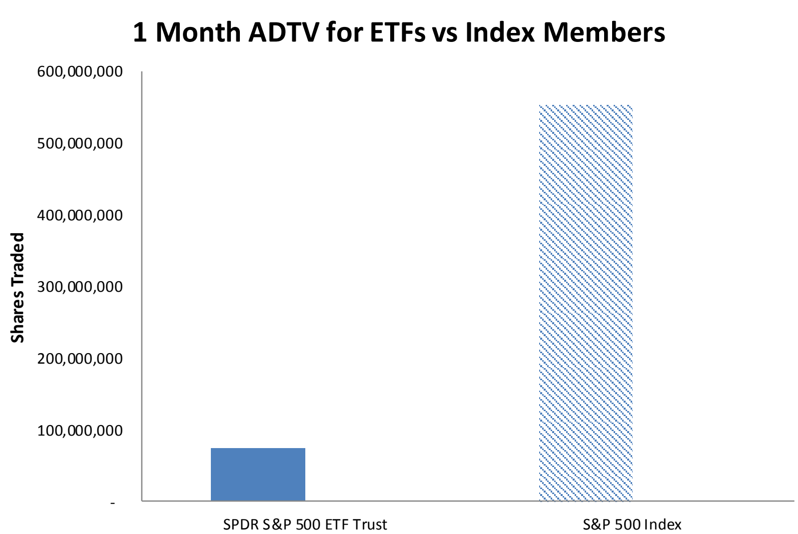
1-Month Average Daily Trading Volume Breakdown:		
Shares Traded	**# ETFs**	**% of Mkt**
Over 10M	22	1%
1 to 10M	119	6%
500K - 1M	86	4%
250K - 500K	112	6%
100K - 250K	184	9%
Under 100K	1439	73%



Source: KBW Research, Bloomberg and SNL DataSource.

The liquidity of the underlying basket of securities is often multiples of the trading liquidity of the ETF. For example, the largest ETF by AUM is the SPDR S&P 500 ETF Trust (SPY), which tracks the S&P 500 Index (SPX). On average, the components of SPX trades 7.5x the average daily volume of SPY.

Exhibit 6: SPY Liquidity vs. Underlying Basket Liquidity



1 Month Average Daily Trading Volume	
SPDR S&P 500 ETF Trust	74,362,432
S&P 500 Index	552,676,837

Source: KBW Research and Bloomberg.

- ***Investors can use a Bloomberg function to instantly gauge an ETF's liquidity.*** Investors can use the field, ETF Implied Liquidity™ (ETFL), which provides the "Implied Daily Tradable Shares," as introduced by David Abner in his book, *The ETF Handbook: How to Value and Trade Exchange-Traded Funds*. Implied liquidity uses the creation unit to determine how many shares of an ETF can be traded.

Implied Daily Tradeable Shares / ETF Implied Liquidity™ =

$$\frac{\text{(1-Month Average Daily Trading Volume of Component)*25\%}}{\text{(Component Share per Creation Unit) * (Creation Unit Size)}}$$

The component with the lowest Implied Daily Tradable Shares will be the limiting agent for the overall ETF. Therefore, ETF Implied Liquidity™ conveys how many ETF units can trade before impacting more than 25% of the underlying component's average trading volume. Note that this calculation assumes that if the ETF units impact more than 25% of the component volume it will have a meaningful impact on the trading of the underlying component stock.

ETFs that may appear illiquid based on their average daily trading volume but have a highly liquid underlying basket of stocks can be well-suited investments for investors who fully understand the concept of implied liquidity. A well informed investor is able to fully understand the full universe of cost-effective investable products. As mentioned in exhibit 6, SPY ETF trades 74 million shares on average in a 30 day time period, whereas the underlying basket of stocks trades 560 million shares over the same period. Therefore, by knowing and using the implied liquidity of the ETF, investors can gain access to more unique ETFs that don't trade as much on the surface, but are highly liquid choices because their underlying stocks trade a significant amount.

- ***An ETF's liquidity can be significantly more than what it appears to be***. Investors may be tempted to use the number of ETF shares available for trading as an indicator of an ETF's overall liquidity. However, market makers may not publicly disclose their complete liquidity, in order to hedge some of their market risk.

- ***An ETF's composition impacts its liquidity.*** An ETF tracking lower liquidity securities is likely to have reduced liquidity. In addition, an ETF that is focused on a single market sector or industry group can be subject to greater volatility and illiquidity during adverse trading conditions for that sector or industry group.

- ***Capital markets desks at ETF sponsors help with the execution of large trades.*** An ETF's sponsor will have a capital markets desk that works with investors to facilitate efficient ETF trading. These desks can often help investors by running analytics on the ETF portfolio and provide a real-time picture of trading liquidity of the ETF's underlying securities. The capital markets desk also manages relationships with APs, market makers and various sell-side firms to support primary market ETF activity.

- ***Bid-Ask spreads can also help investors gauge liquidity.*** Bid-Ask spreads are another datapoint that investors can use to determine the level of supply and demand for an ETF.

In the secondary market, market makers trade ETFs to provide liquidity and earn a profit. The bid represents the price that a buyer/market maker is willing to pay to purchase a security while the ask represents the price that a seller/market maker is willing to accept to sell a security. The spread between the bid and ask prices is one means by which market makers are compensated for their participation in the trading of the ETF. ***Liquid securities are generally quoted with a tight bid-ask spread (typically one cent) while illiquid securities typically trade with wider bid-ask spreads.***

However, as ETFs are unique from securities in that they trade on both primary and secondary markets, there are several other unique factors that can impact the bid/ask spread of an ETF:

- ***Trading Liquidity.*** As ETFs become more liquid, APs and market makers have to intervene less and less to improve liquidity. This in turn results in tighter bid-ask spreads because APs and market makers have to be compensated less for their role in the creation-redemption process and borrowing costs decline.

- ***The Bid-Ask Spreads of the ETF's Component Stocks.*** An ETF's bid-ask spread can be impacted if the component stocks of an ETF are lower liquidity securities that trade with wider bid-ask spreads than their more liquid peers.

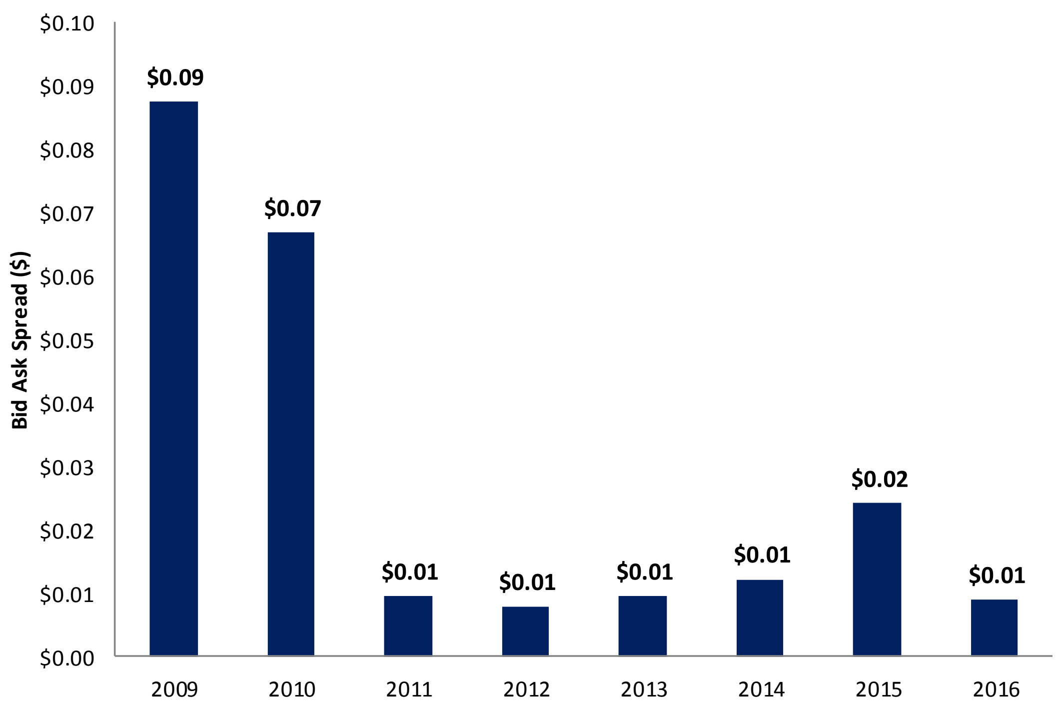
- ***The Implied Cost to Market Makers.*** ETF market makers take on costs associated with their role that might include hedging costs associated with having to take long or short positions in the ETF. The market maker's positions may be hedged through the use of derivatives (options, futures and swaps) or by going long or short the underlying ETF component securities.

- ***The Implied Cost to APs.*** APs serve an important role in the creation and redemption process. When creating or redeeming shares, APs must do so via creation units, which are typically comprised of 50,000 ETF shares. If the ETF's secondary volume is low and it takes the AP time to build their position, they may opt to hedge some of their market risk. The costs associated with these hedging activities are often passed on to investors via a higher bid-ask spread.

- ***As an ETF becomes more widely used, its trading volume typically increases and helps to reduce the average bid-ask spread.*** As seen in exhibit 8 below, on average, the bid-ask spread declined to $0.01 in 2016 versus $0.09 in 2009. As investors put more money into ETFs on the primary market, APs had to do less to balance out the market. In turn, the decreasing bid-ask spread for ETFs demonstrates how the market continues to evolve and become more efficient.

Exhibit 7: Historical Average Bid-Ask Spreads and $ Volume Traded

Bid Ask Spread Vs. Daily Tradeable Dollars		
XLF	Bid-Ask Spread ($)	$ Amount Traded
2009	$0.09	436,557,228,688
2010	$0.07	366,992,637,536
2011	$0.01	328,076,782,720
2012	$0.01	244,368,051,040
2013	$0.01	218,931,121,120
2014	$0.01	206,076,265,856
2015	$0.02	219,156,237,312
2016	$0.01	320,786,100,768



Source: KBW Research, Bloomberg.

Case Study: Large-Cap Bank ETFs in Focus: KBWB vs. KBE

We provide a case study to show how liquidity plays out in today's marketplace, and how important it is for investors to look beyond the surface level liquidity metrics.

We take a closer look at two ETFs currently available to investors: the ***PowerShares KBW Bank Portfolio (KBWB)*** and the ***SPDR S&P Bank ETF (KBE)***. Both of these ETFs are designed to provide investors with exposure to the domestic large-cap banking universe. KBWB tracks the ***KBW Nasdaq Bank Index (BKX)*** while KBE tracks the ***S&P Banks Select Industry Index*** (SPSIBK).

Exhibit 8: KBWB and KBE: Fundamental Liquidity Statistics

ETF Ticker	Underlying Index Ticker	ETF Name	AUM ($B)	ETF 1- M Avg. Volume Traded (M)	Underlying Index Components 1- M Avg. Volume Traded (M)	Implied Liquidity™ (M)	Underlying Index Weighting	Underlying Index # of Cos.
KBWB	BKX	PowerShares KBW Bank Portfolio	1.1	0.7	15.1	12.1	Modified Market-Cap Weighted	24
KBE	SPSIBK	SPDR S&P Bank ETF	3.4	2.4	5.8	8.9	Modified Equal Weighted	68

Source: KBW Research, Bloomberg, State Street Global Advisors, S&P Dow Jones Indices, Nasdaq, PowerShares

As shown in exhibit 8 above, on the surface, KBE appears much more liquid than KBWB. KBE is about three times larger than KBWB in terms of AUM and it trades more than 13x KBWB's 1-month average daily trading volume. ***However, when you dive deeper into the index components and their weighting structure, it is evident that KBWB is actually more liquid than KBE.***

Exhibit 9: KBWB vs. KBE: Fundamental Statistics

Index Name	Index Ticker	# of Stocks	Smallest Constituent Mkt Cap ($M)	Median Constituent Mkt Cap ($M)	Largest Constituent Mkt Cap ($M)	Total Constituent Mkt Cap ($M)	Largest Constituent Contribution (%)
S&P Banks Select Industry Index	SPSIBK	68	$2,168	$4,777	$326,049	$1,714,196	2.6
KBW Nasdaq Bank Index	BKX	24	$6,003	$22,992	$326,049	$1,591,701	8.7

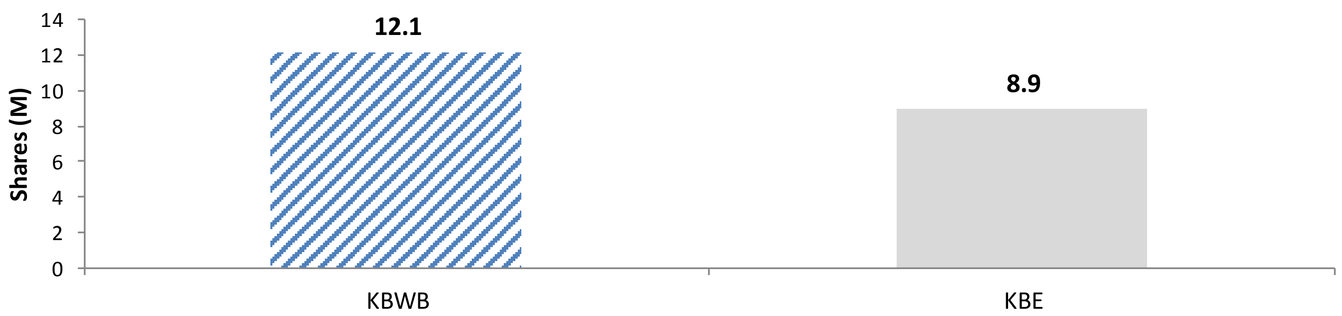
*All Mkt Cap Data and Weighting data as of 3/10/17

Source: KBW Research, Bloomberg, State Street Global Advisors, S&P Dow Jones Indices, Nasdaq, PowerShares

KBWB tracks BKX, which tracks 24 domestic large-cap banking institutions using a modified market-capitalization weighting methodology. KBE tracks SPSIBK which is a significantly broader index tracking 68 institutions using a modified-equal weighting methodology. The 24 companies in BKX range in market capitalization from about $6 billion to nearly $325 billion while the 68 companies in SPSIBK range in market capitalization from about $2 billion to nearly $325 billion. ***The median market capitalization of BKX member stocks is about $23 billion and nearly five times the $4.8 billion median market capitalization of SPSIBK member stocks.***

Consequently, the wider market capitalization range and modified equal weighting structure results in more illiquid banking institutions being more heavily weighted in the SPSIBK/KBE. The more narrowly defined market cap range of BKX and ultimately KBWB and its modified market capitalization weighting structure results in BKX/KBWB being more heavily weighted in the largest and most liquid domestic banking institutions. ***Therefore, the underlying constituent liquidity of KBWB is nearly 2.6x that of KBE.***

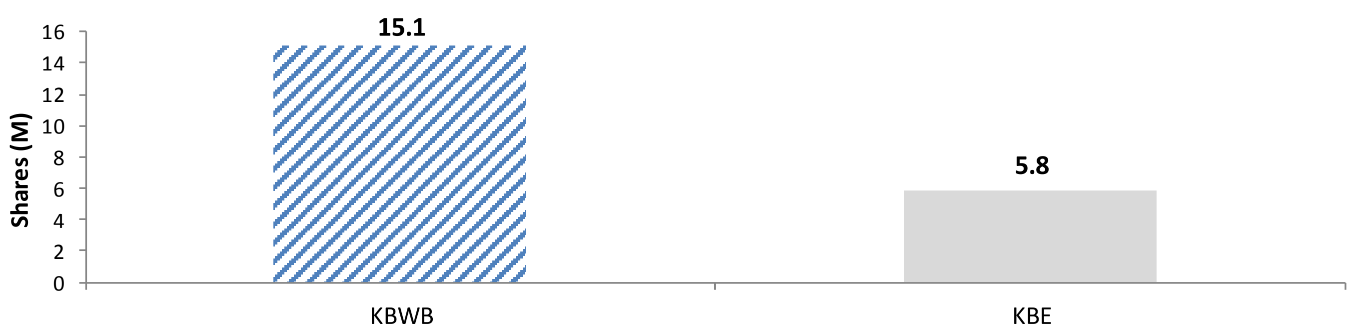
Exhibit 10: Underlying Constituent Liquidity of KBWB vs. KBE



Source: KBW Research, Bloomberg

Further, the implied liquidity™ of KBWB is 12.1 million versus 8.9 million for KBE. Therefore, given the higher implied liquidity™ relative to KBE, ***KBWB can accommodate larger trades without having a material impact on its underlying constituents.***

Exhibit 11: Implied Liquidity™ of KBWB vs. KBE



Source: KBW Research, Bloomberg

KBWB may appear illiquid relative to KBE based on its average daily trading volume but it is comprised of a highly liquid underlying basket of stocks, and can be a more optimal choice for investors who fully understand the concept of implied liquidity™.

IMPORTANT DISCLOSURES

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Distribution of Ratings/IB Services
KBW

			*IB Serv./Past 12 Mos.	
Rating	**Count**	**Percent**	**Count**	**Percent**
Outperform [BUY]	**189**	**30.19**	**69**	**36.51**
Market Perform [HOLD]	**377**	**60.22**	**124**	**32.89**
Underperform [SELL]	**40**	**6.39**	**8**	**20.00**
Restricted [RES]	**0**	**0.00**	**0**	**0.00**
Suspended [SP]	**20**	**3.19**	**2**	**10.00**
Covered -Not Rated [CNR]	**3**	**0.48**	**0**	**0.00**

* KBW maintains separate research departments; however, the above chart, "Distribution of Ratings/IB Services," reflects combined information related to the distribution of research ratings and the receipt of investment banking fees globally.**Note: All ratings for Keefe, Bruyette and Woods, Inc. as of January 15, 2015 reflect a relative ratings system.

Explanation of Ratings: KBW Research Department provides three core ratings: Outperform, Market Perform, and Underperform, and three ancillary ratings: Suspended, Restricted, and Covered-Not Rated. For purposes of New York Stock Exchange Rule 472 and FINRA Rule 2241, Outperform is classified as a Buy, Market Perform is classified as a Hold, and Underperform is classified as a Sell. Suspended indicates that KBW's investment rating and/or target price have been temporarily suspended due to applicable regulations and/or KBW policies. Restricted indicates that KBW is precluded from providing an investment rating or price target due to the firm's role in connection with a merger or other strategic financial transaction. Covered-Not Rated indicates that KBW is not providing an investment rating and/or price target due to the lack of publicly available information and/or its inability to adequately quantify the publicly available information to sufficiently produce such metrics.

North American Stocks and European Stocks are rated based on the share price upside to target price relative to the relevant sector index performance on a 12-month horizon. Outperform rated stocks have a greater than 10 percentage point ("pp") relative performance versus the sector, Market Perform rated stocks between +10pp to -10pp relative performance versus the sector, and Underperform rated stocks a lower than 10pp relative performance versus the sector. The 12-month price target may be determined by the stock's fundamentally driven fair value and/or other factors (e.g., takeover premium or illiquidity discount).

KBW Model Portfolio: "Model Portfolio Buy" - Companies placed on this list are expected to generate a total rate of return (percentage price change plus dividend yield) of 10% or more over the next 3 to 6 months. "Model Portfolio Sell" - Companies placed on this list are expected to generate a total rate of return (percentage price change plus dividend yield) at or below -10% over the next 3 to 6 months.

The purpose of the Model Portfolio is to inform institutional investors of KBWI's short-term (as described above) outlook for a particular industry sector. The Portfolio is not available for purchase or sale, cannot be duplicated as shown, is hypothetical and is for illustrative purposes only. For a more detailed description of the selection criteria and other specifics related to the construction of the Model Portfolio, please refer to the January 5, 2010 Model Portfolio Primer and/or contact your KBWI representative for more information.

The Model Portfolio should be viewed as a short-term outlook of a particular industry sector, not as individual security recommendations. The Model Portfolio uses a three-to-six-month time horizon and should not be considered when making longer term investments. KBWI Research publishes research with a 12-month outlook on each issuer of securities contained in the Model Portfolio. Investors who are interested in a particular security should request KBWI Research's coverage of such securities by contacting your KBWI representative. KBW research contains analyses of fundamentals underlying each issuer.

KBWI's long-term recommendations may differ from recommendations made for the Model Portfolio. These differences are the result of different time horizons—KBWI research has a 12-month outlook and the Model Portfolio has a three-to-six-month outlook.

Although the model portfolio is based upon actual performance of actual investments, KBWI did not recommend that investors purchase this combination—or hypothetical portfolio—of investments during the time period depicted here. As this hypothetical portfolio was designed with the benefit of hindsight, the choice of investments contained in it reflects a subjective choice by KBWI. Accordingly, this hypothetical portfolio may reflect a choice of investments that performed better than an actual portfolio, which was recommended during the depicted time frame, would have performed during the same time period. Moreover, unlike an actual performance record, these results do not represent actual trading wherein market conditions or other risk factors may have caused the holder of the portfolio to liquidate or retain all or part of the represented holdings.

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