

AMF MEMBER ARTICLE

Fair value adjusted IIVs for global equity ETFs

Encouraging market efficiency with new market information

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INTRODUCTION

One of the appealing characteristics of the ETF structure is that it promotes price discovery. By design, creation and redemption activity encourages the ETF market price and the value of the underlying basket of securities to converge. For example, if the ETF market price is perceived to be lower than the value of the underlying basket of securities, authorized participants (APs) can redeem ETF shares in exchange for the basket of securities. Conversely, if the value of the underlying basket of securities is perceived to be lower than the ETF market price, APs can exchange the underlying basket of securities for new shares of the ETF (“creation units”). Similarly, arbitrageurs and high-frequency traders can take off-setting long-short positions in the ETF and the underlying basket of securities (or representative proxy for the basket) until prices converge to equilibrium. By taking advantage of perceived trading opportunities in this way, this trading behavior can also support market efficiency.

For U.S.-listed ETFs comprised of U.S. equities, this process is intuitively efficient since market participants can readily access the marketplace throughout the day to either buy or sell shares comprising the underlying basket of U.S. equities or shares of the ETF.

Alternatively, for U.S.-listed ETFs comprised of international equities, access to the underlying basket of equities is limited in comparison to access to shares of the ETF during U.S. trading hours. For example, consider a U.S.-listed ETF comprised solely of equities listed on the London Stock Exchange (LSE). The ETF will trade in the U.S. until 4:00 p.m. ET; however, the underlying basket of equities will only trade on the LSE until 11:30 a.m. ET. This timing mismatch introduces a layer of complexity for APs and other market participants, since the local closing prices of the underlying equities on the LSE may not be indicative of the current value of the securities.

In this example, trade information for the equities is available from 9:30 a.m. to 11:30 a.m., whereas trade information for the ETF itself is available from 9:30 a.m. to 4:00 p.m. Given the timing differences across exchanges, it is expected that all market participants, from novice to sophisticated, would benefit from additional information regarding the value of the

basket of international equities following the close of the LSE – i.e., from 11:30 a.m. to 4:00 p.m. ET.

CURRENT INDUSTRY PRACTICE WITH IIV CALCULATIONS FOR GLOBAL EQUITY ETFS

ETF sponsors publish intraday indicative valuations (IIVs) every 15 seconds throughout the trading day to provide investors with a real-time estimate of the ETF’s underlying basket value.¹ For U.S. equity ETFs, the IIV calculation process is straightforward, as current market prices for the ETF constituents are readily available throughout the day. With respect to international equity ETFs, however, the current industry practice is to incorporate traded prices for the equities while available, and then convert the last traded local market prices to USD based on real-time FX rate data.

CONSTRUCTING A FAIR VALUE MODEL FOR INTERNATIONAL EQUITIES

The availability of real-time fair value information for the underlying basket of equities throughout the day could provide an improved benchmark for investors to compare against current ETF market prices, facilitating market efficiency. Fair value information can be calculated, for example, through modeling techniques such as multi-factor regression. Through regression, we can determine the relationship between international equities trading in their local markets to broad and specific market indicators available following local market close. In this sense, the idea is first to determine the level of influence that these market indicators have on the individual equity historically, and then take into account current market activity to continuously estimate fair value of the international equity throughout the U.S. trading day, following local market close. For example, consider a simplified 1-factor model using a broad-based equity index future that trades around the clock and has a strong relationship to an LSE-listed equity’s price movements. Suppose the beta (price sensitivity) between movements in the index futures contract and the UK equity happens to be 0.50 based on the historical regression. In this case, a 1% movement in the index futures from LSE close time

¹ Intraday Indicative Value (IIV) is sometimes referred to as indicative optimized portfolio value (IOPV), intraday net asset value (iNAV), or an intraday valuation.

to 3:45 p.m., for instance, would result in a 0.5% adjustment to the UK equity's local close price at 3:45 p.m., reflecting the positive correlation from historical trading patterns between the two time series. In practice, examining the effectiveness of a model-driven, fair value methodology can include testing procedures which help to answer the following two questions:

- (1) Is the fair value adjusted price closer to the next day's local market open price than the local close price, on average?
- (2) Is the fair value adjusted price an "unbiased" estimate of value, i.e., is it generally void of any systematic tendency to over-adjust or under-adjust to the next day's local market open price?

SIMULATING REAL-TIME FAIR VALUE IN PRACTICE

Using sound statistical techniques, it is possible to estimate the current value of an international equity if there were a liquid market throughout the U.S. trading day. One could then aggregate the fair value information for each of the ETF basket constituents, based on their specific weightings in the basket, to calculate a fair value adjusted IIV for the international equity ETF.

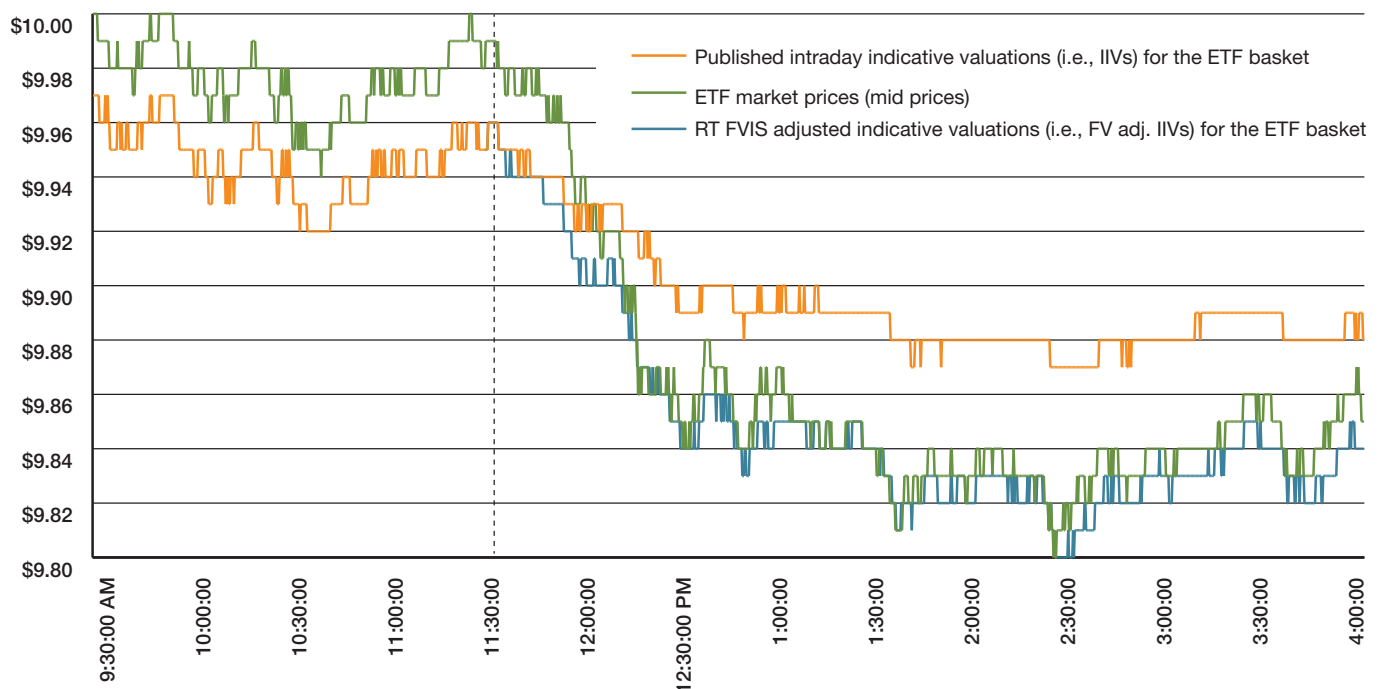
To illustrate this valuation approach in practice, we have simulated the use of Interactive Data's Real-Time Fair Value Information Service (RT FVIS) to calculate real-time fair value adjusted indicative values for a sample U.S.-listed ETF investing in European equities. This simulation was performed for May 11, 2011, and the ETF market price has been normalized

to start at a price of \$10 at 9:30 a.m., with all natural price movements intact. This chart displays the intraday movements (15-second intervals) of three time series:

- Published intraday indicative valuations (i.e., IIVs) for the ETF basket, in orange
- ETF market prices (mid prices), in green
- RT FVIS adjusted indicative valuations (i.e., FV adj. IIVs) for the ETF basket, in blue

CHART 1: SIMULATION OF REAL-TIME FAIR VALUE INFORMATION APPLIED TO A EUROPEAN EQUITY ETF (MAY 11, 2011)

In this example, we can see that from 9:30 a.m. to 11:30 a.m. the ETF market price movements are closely tied to the movements in the underlying basket of European equities, trading at an average premium of 30 basis points (bps). This premium is fairly consistent over these two hours with a standard deviation of 3 bps. Following local market close at 11:30 a.m., the IIV based on converting local closing price to USD using current FX rates no longer tracks the ETF market prices in the same way, which in this case results in the ETF trading at an apparent discount to the IIV. However, the FV adjusted IIV time series, which begins at 11:30 a.m., demonstrates a stronger relationship to the ETF market price movements from 11:30 a.m. to 4:00 p.m., with high directional change correlation. On the other hand, the average premium between the ETF market prices and the FV adjusted IIVs from 11:30 a.m. to 4:00 p.m.



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shrinks to approximately 11 bps, with greater variability demonstrated by a standard deviation of 10 bps.

If we conclude, based on the statistical evidence, that the FV adjusted IIV series provides a reasonable, unbiased estimate of value for the basket of underlying equities, this new information illustrates that the ETF market price is trading intraday at a level well below the average premium of 30 bps above the underlying benchmark. This additional information can support investment decisions by market participants, promoting greater efficiency in ETF market prices.

SUMMARY

As we reflect on global equity ETFs, it is important to consider the dynamics between the trading behavior of the ETFs and the associated underlying basket of international equities, before and after local markets close. The availability of real-time fair value adjusted indicative values, could provide an improved benchmark for investors to compare against current ETF market prices, especially for the period following local market close. This additional reference point could assist market participants in forming their opinions of value, support trading decisions, and ultimately facilitate increased market efficiency.

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Interactive Data recently announced the availability of the Real-Time Fair Value Information Service, a new service designed to provide fair value adjustments to international equities prices every 15 seconds following local market close during U.S. trading hours. This content will also be available as an input into the Company's Basket Calculation ServiceSM, to provide the capability to calculate fair value adjusted IIVs for global equity ETF baskets every 15 seconds.