Global
Derivatives

TABB GROUP

Options on Futures:

Use Cases in Efficient Risk Management

Recent market volatility is playing havoc with the investment strategies of portfolio managers around the world who are still trying to make sense of shifts in international economies, changes in market sentiment and spiking volatility across nearly all asset classes. The challenges of managing risk exposure never abate but recent market conditions are testing the wherewithal of all but the most placid investment strategists.

One area of continued investor interest has been in the options on futures markets, where volumes have continued to grow not only because of increased market volatility but also because of rising investor interest in using the more complex strategies. These strategies run the gamut from simple hedging to premium harvesting and increasingly, multi-legged trades across expirations designed to mitigate risk between production cycles and time horizons.

This report reviews options on futures products and strategies used by investment managers across the capital markets including institutional investors, corporate end users and broker dealers. It provides a number of use cases that illustrate how options on futures can help support the varied needs of users with exposures to energy, equity and interest rate assets.

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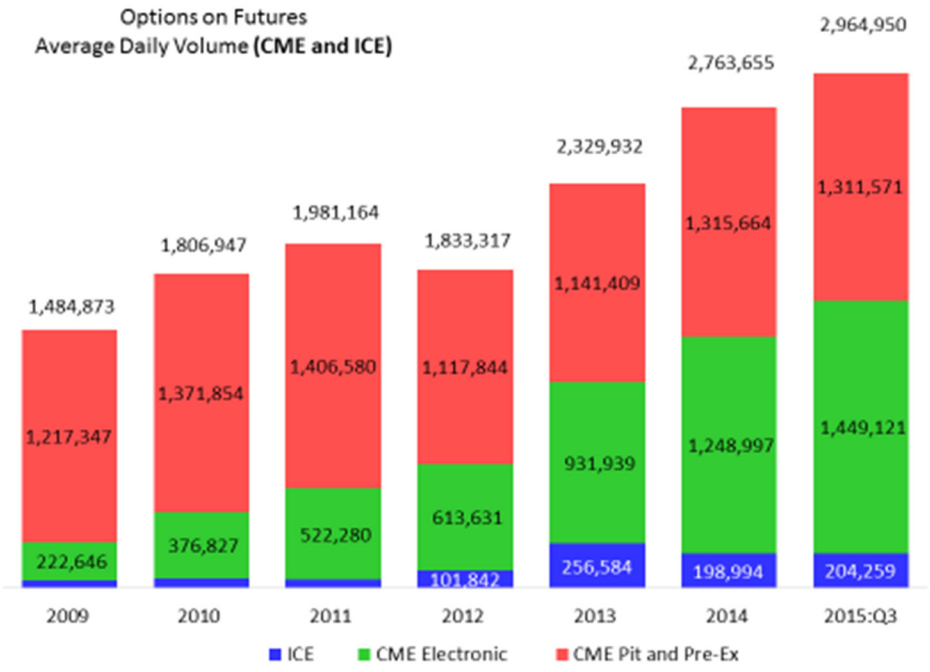
Introduction

The rising adoption of options on futures (OOF) has been facilitated by a number of structural shifts including the greater electronification of the trading environment and a corresponding rise in liquidity as more and more firms are including OOF in their strategies. There have been broad volume gains across most asset classes as liquidity has grown and institutions expand their use of OOF for risk and exposure management. Not surprisingly, the strongest growth has occurred in the foreign exchange and equity index segments, areas that have seen intense interest in recent years as capital flows among the global equity markets has attracted investor demand.

Total volumes have seen a compound annual growth rate (CAGR) of 12.8% since 2009, with trading volume averaging 3.0 million contracts a day in the first nine months of 2015, as compared to an average 1.5 million contracts a day in 2009. The transition to an electronic trading environment has been critical, with the impact seen across all asset classes. Electronic trading accounted for more than half (55.8%) of total trading in the first three quarters of 2015, up from just 18.0% in 2009 (see Exhibit 1).

Exhibit 1: Average daily trading volume in option on futures: Electronic vs. Pit/Pre-Ex



Source: CME, ICE, TABB Group

The benefits of introducing technology across the transaction chain are multi-fold. As OOF trading has evolved into an electronic marketplace as exchanges and trading platforms have built out global support and connectivity, institutions around the world have been better able to access the market. Technology vendors have also enhanced trading platforms to support OOF instruments, with improved execution capabilities, more powerful analytics and strategy development and back testing. Execution platforms have also expanded automated

trading tools to support OOF strategies, a development that can only be supported as electronic liquidity has grown.

It is not solely electronic execution that has driven increased product usage. As OOF markets have become electronic, firms also gain access to more comprehensive data sets, which feed analytics and allow for greater complexity in strategies. The ability to design a complex strategy involving multiple legs across multiple expirations and potentially multiple asset types and submit that trade to the market opens up an entire new trading constituency. Complex strategies have a liquidity benefit as well, since the expansion of strategies to multiple strikes and expirations results in more trading interest across multiple strikes. Ultimately, this expands opportunities for market participants seeking to manage risk at different time horizons and price points.

The electronic evolution also allows firms seeking the ability to use automated strategies to become a bigger part of the market, including not only electronic market makers but also funds using quantitative and stat-arb models, which thrive in an electronic market place. Perhaps most important for these firms is the ability to automate risk management protocols that can limit their risk exposures and allow for improved returns.

Exhibit 2: Growth Rates by Asset Class for Options on Futures Traded at CME: 2009 to 2015: Q3

Asset Class	Sample Products	Type of Execution	CAGR : '09 to '15:Q3
Interest Rate	Eurodollar, Fed Funds, 30-Year Treasury Bond, 2-, 5-, and 10-Year Note, U.S. T-Bond, Ultra T-Bond	Electronic	31.7%
		Pit and Pre-ex	4.2%
		Total	9.9%
Energy	Brent Crude Oil, Crude Oil, Carbon, Coal, Ethanol, Heating Oil, Jet Fuel, Natural Gas, Natural Gas, RBOB Gasoline, Nitrogen, Regional Greenhouse Gas	Electronic	79.0%
		Pit and Pre-ex	-2.5%
		Total Energy	44.8%
Equity Index	S&P 500, E-mini S&P 500, NASDAQ 100, E-mini NASDAQ 100, Russell 1000 Mini Index, Russell 2000 Mini Index, Nikkei 225, Mini Dow Jones	Electronic	38.7%
		Pit and Pre-ex	-0.4%
		Total Equity	29.4%
Agricultural/ Commodity	Apple Juice Concentrate, Butter, Cheese, Cocoa, Coffee, Corn, Cotton, Cattle, Lean Hogs, Lumber, Pork Bellies, Rice, Soybeans, Sugar, Wheat	Electronic	76.6%
		Pit and Pre-ex	-2.3%
		Total Agricultural/Commodity	13.6%
Foreign Exchange	Australian Dollar, British Pound, Canadian Dollar, Euro, Japanese Yen, New Zealand Dollar, Swiss Franc	Electronic	38.8%
		Pit and Pre-ex	-9.6%
		Total Foreign Exchange	31.4%
Metals	Copper, Gold, Iron Ore, Palladium, Platinum, Silver, Steel	Electronic	38.8%
		Pit and Pre-ex	-2.9%
		Total Metals	13.0%

Source: CME, TABB Group

All of these factors have contributed to growth across all asset classes. Even as pit-traded volumes have stagnated or even seen small declines, electronic trading across all asset classes has seen significant growth. The adage "Liquidity begets liquidity" is especially true in electronic markets. As connectivity to markets becomes more widespread, trading volume increases concordantly. The growing volume attracts new users and greater market

attention; especially from larger accounts seeking a more liquid trading environment (see Exhibit 2, previous page).

Key Attractions of Options on Futures

Although commonly used for directional trading based on market timing strategies, OOF have seen increased application in other areas, with sophistication of strategies a common theme. Key strategies used by OOF traders include hedging, replication and managing portfolio exposure. These strategies vary by asset type but all are seeking to leverage the inherent structural characteristics of OOF to create efficient exposures while at the same time minimizing execution costs. Key strategies and drivers include:

- Hedging: Predominantly the tool of choice in the energy complex, as participants look to protect against seasonality, change in storage costs, geo-political risks and changes in the shape of the futures market term structure. Other significant users of OOF for hedging purposes are refiners, utilities and airlines that face significant bottom line impacts from large swings in oil and natural gas prices.
- Portfolio Rebalancing: A growing strategy by asset managers who often seek a more efficient adjustment of bond and equity exposures after significant market moves. Rather than execute cash market purchases and sales of individual stocks to realign portfolios, OOF are being employed in a dynamic process of managing exposures.
- Managing Interest Rate Exposure: The shape of the U.S. Treasury yield curve has a significant impact across financial markets. OOF provide a powerful tool for mortgage originators who are exposed to interest rate risk between the origination and closing of a loan. Rather than sell the loan forward into the secondary market, they use OOF to manage that exposure. Likewise, bank lending arms have significant yield-curve exposure between their borrowing costs (deposits) and their loan books and portfolio holdings.

Capital Efficiency

Options on futures are also capital efficient tools that are useful as hedging instruments with low cost relative to the underlying futures contract. They also can be used as part of spread strategies that benefit from margin offsets for the defined and limited risk of the trade. And for the most part, regulatory reserve requirements for OOF contracts are lower than for regular futures contracts.

OOF also allow for more efficient exposure to an asset class than other competing products that may have less correlation and greater costs associated with getting requisite exposures. For example, asset managers seeking to effect rebalancing programs will have greater costs when purchasing a basket of underlying equities or bonds in terms of fees and market slippage.

OOF are also a useful tool to bridge liquidity gaps and allow asset managers to efficiently capture or hedge relationships between different asset classes where the underlying assets might be less liquid. For example, a portfolio manager with a large portfolio of high-yield

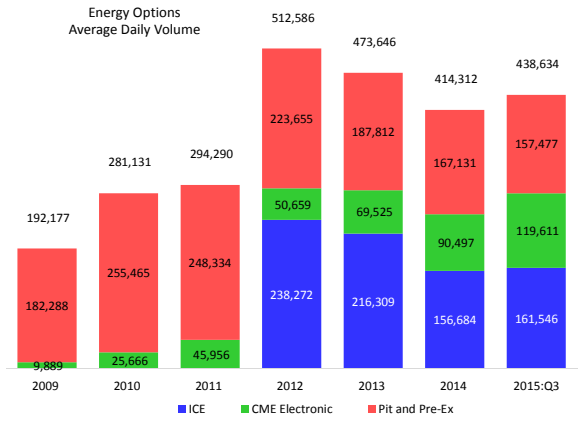
bonds of companies in the energy industry may use options on oil to hedge his exposure to those companies.

Although OOF are actively traded across a broad swath of other asset classes such as agricultural commodities, precious metals, and currencies, we focus on three key asset segments in this report: energy, equity and fixed Income. It is also important to note there has been an expansion in terms of the types of investors using OOF as investment managers seek increased exposure to non-correlated investments for diversification and alpha-seeking purposes.

Managing Energy Market Exposure

Energy market volatility in 2015 has roiled capital markets around the world. Not only have wholesale energy market prices collapsed but also so have the equity valuations of companies in the energy sector. The challenge for portfolio managers is to find ways to hedge against falling valuations, whether related to the capital structure of a company or group of companies or to the underlying energy asset itself. The demand for hedging exposure is readily apparent in OOF in the energy segment, which have seen sharp growth in recent years (see Exhibit 3).

Exhibit 3 Energy Options on Futures ADV: 2009 to 2015:Q3



Source: CME, ICE, TABB Group

One of the biggest issues facing a credit fund with significant high-yield bond exposure is a dramatic dichotomy in high-yield money flows. On the one hand, issuance of high-yield debt has exploded as lower rated companies take advantage of tight credit spreads, the absolute low level of interest rates, a robust M&A environment and a demand by investors for riskier assets.

At the same time, the market-making ability and balance-sheet capacity of Wall Street bond dealers has been significantly curtailed by regulatory initiatives and government mandates to reduce their overall credit exposure and market risk levels. This dynamic has caused a marked drop in secondary market liquidity and the ability for investors to hedge or reduce market exposure.

No area has been more affected than the energy sector, which accounted for almost one-third of total junk bond issuance in recent years. The collapse in oil and natural gas prices has led to a massive drop in the bond and stock prices of highly levered E&P and Oil Service companies.

The hedge fund community is faced with a conundrum on how to manage the portfolio risk represented by their exposure to energy company bonds. The historical solutions, such as hedging by shorting the underlying stock of the issuer are no longer suitable. The entire capital structure of these companies has moved lower in tandem thereby magnifying, not reducing risk.

Given that the single biggest factor affecting energy company bonds is the price of the underlying commodity, hedge funds have started to gravitate to the futures market to take advantage of the ability to wager on the future direction of oil and gas prices as a dynamic form of portfolio hedging.

However, using straight futures contracts brings an additional measure of risk to the table, as the shape of the futures curve (e.g. contango or backwardation) is highly dependent on factors out of the hedge funds control (storage costs, seasonality and geo-political risks). Poor hedging strategies that end up on the "wrong" part of the futures curve can actually exacerbate the underlying risks being hedged in the first place.

As a second order derivative, OOF possess the single greatest attribute of being low cost (i.e. capital efficient) because an investor gains the market directional exposure of the underlying energy futures contract, but only pays for it in the form of the OOF premium. The risk of being long or short an oil futures contract is theoretically limitless, but the use of an OOF confines that risk simply to the premium paid on the options contract.

In the case of a hedge fund, the greatest attribute of OOF might actually be the ability to construct a spread trade around different price points on the underlying commodity, further reducing their cost outlay. This strategy is not available in the regular futures market as the product is focused on an absolute price level at expiration of a futures contract, and not on gradations of price points within that same time span. As an example, a fund may wish to hedge against the possible drop in WTI oil prices from current levels (approximately $48 per barrel) to $40 per barrel, which is their view of the near-term downside risk.

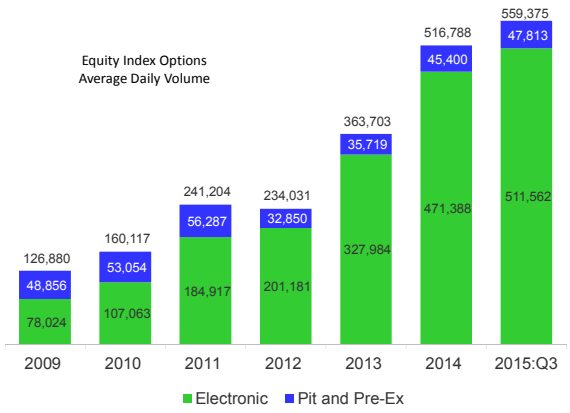
By purchasing a short dated (3 month or less) $45 put option, while simultaneously selling the $40 strike put option (known as "long a vertical spread"), the fund hedges out $5 of price risk in the near term. Should the price drop occur it would inflict further damage on energy company bond prices, but would be offset somewhat by the profits gained on the OOF position.

Conversely, if oil rallies to $55 per barrel, the spread would expire worthless, but the loss would be limited to the price paid for the spread and would theoretically be offset by improvements in the bond prices of energy companies. A short futures position would be far more costly as the fund would be exposed to the full $7 move from date of initiation ($48/barrel) to $55/barrel at the time of the futures expiration, assuming that the trade was not unwound prior to that point. There are many different variations of this spread trade within the OOF market that make it far more flexible than constructing hedges out of the regular futures market curves and their imbedded risk characteristics.

Managing Equity Market Exposures

Equity markets have seen a sharp return in volatility in 2015 as economic events in Europe and China have forced portfolio managers to be more aggressive in not only managing risk exposures on existing portfolios, but also their need to manage transitional inflows/outflows into their funds. Although they have a broad range of tools that they have traditionally used to support these requirements, they are also increasingly exploring the use of OOF as an alternative. The rising demand can be seen in equity-index OOF, as investors explore the advantages of using these instruments in their activities (see Exhibit 4).

Exhibit 4: Equity Index Options on Futures ADV: 2009 to 2015:Q3



Source: CME, TABB Group

An asset manager attempting to construct and monitor a balanced portfolio faces a significant problem in adjusting the portfolio mix over time to capture what is likely to be a coming period of extended market volatility as asset prices start to "normalize" (e.g. interest rates rise as the Fed ends its zero-rate policy and stock prices face the possibility of a correction after a sustained 6-year upside move).

Similarly, a transition manager handling a large portfolio restructuring faces a twin dilemma: managing the time lag between the decision to reallocate portfolios and the ultimate execution of the program, which could be several months in duration depending on the levels of approval required. Second, the size of the reallocation might be such that it would take several weeks to fully execute under normal market conditions, and even longer during periods of market stress, especially for illiquid assets.

The commonality between the above two manager types is clear: they both have the need to handle large asset flows in diverse sectors and asset classes over an extended period of time without causing undue secondary market disruptions.

The balanced account manager needs to find an efficient and cost effective way to monitor portfolio concentrations as markets move over time, while the transition manager faces extended periods of market risk between the receipt of cash transfers and the ultimate redeployment of those funds.

Both can use OOF to manage those risks. The balanced manager generally will employ a short strangle strategy that dynamically adjusts the percentage allocated to equities or bonds over time. The manager will sell upside call options on S&P 500 Futures (or other indices) as various strike prices while simultaneously selling downside put options on the same indices at lower strike prices. As stock prices rise, equity exposure is reduced by the short options position and vice versa on the downside, while the cash proceeds of the options sales can be reallocated to fixed income.

A transition manager has more direct, near-term exposure to market moves as he needs to liquidate positions received, move to cash and redirect the proceeds to the new manager. To hedge that cash exposure he employs an OOF by purchasing call options on equity indices and U.S. Treasury notes and bonds. To reduce the cost of this process he also can use long vertical spread trades as an alternative approach.

The key benefit in both of these scenarios is clearly cost effectiveness, as selling off positions quickly to either reduce exposure or transfer cash proceeds involves transacting in multiple securities, in multiple time periods, during potentially volatile market environments.

The use of OOF as an intermediate step allows the liquidation process to occur in a more orderly fashion, while simultaneously hedging market exposure. Plus, as noted above, the construction of spread trades further reduces transaction costs by creating bands of exposure instead of just outright long-only positions via the sale of the upside portion of the call spread range (or conversely downside portion of the put option range).

Lastly, liquidity in the OOF market for equity indices is substantial, often far greater than in single name stocks (especially mid and small-cap issues), allowing for quick construction of the hedges or spreads in very large sizes without causing market disruption.

Interest Rate Exposure and Bond Market Volatility

No other market has a greater range of investors or attracts the attention of global investors more than fixed income. It represents both a regional and international marketplace with investors transcending borders to manage interest rate exposures related to underlying portfolios of bonds and mortgages. Trading in fixed income instruments is also correlated to activity in OTC swaps, mortgage and FX markets as many of these instruments provide ways for investors to hedge exposure to foreign currency risk related to underlying holdings of instruments denominated in foreign currencies.

Exhibit 5: Interest Rate Options on Futures ADV: 2009 to 2015:Q3

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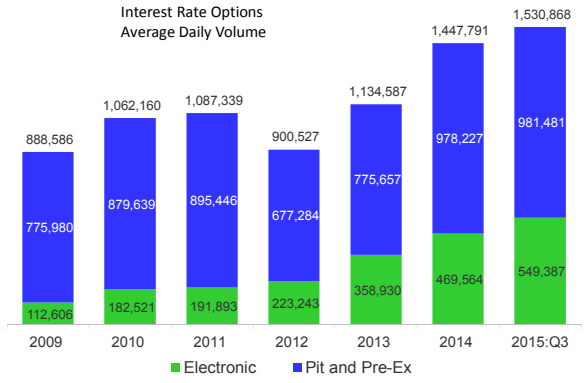

Source: CME, TABB Group

The dynamic nature of these markets requires portfolio managers to seek out products that allow them to manage their exposures. Increasingly, portfolio managers are exploring the potential of interest rate OOF. Although volume growth has been lower than for many other OOF segments, anticipated shifts in global monetary policy, especially in the US, will drive volumes going forward (see Exhibit 5).

One area of significant potential is the mortgage industry. Since the Great Recession of 2008 a number of structural shifts have created new challenges for a shrinking pool of mortgage originators (e.g. large banks and online lenders). The principal challenges include on-going regulatory initiatives to insure greater transparency for borrowers by widening disclosure windows and greater credit scrutiny of borrowers by lenders.

This has created a growing time lag between the rate-lock date and the ultimate loan-closing date. Whereas the old window might have been as short as 30 days, the new window can frequently stretch to 90 days. This exposes the lender to both significant interest rate risk and shape-of-yield-curve risk, especially if interest rates become more volatile due to perceived or actual changes in Federal Reserve policy.

Traditionally, mortgage lenders simply hedged their origination pipeline by selling their loans forward into the secondary market dominated by large Wall Street dealers and the twin government agencies Fannie Mae and Freddie Mac. Since it was a narrow time frame (e.g. 30 days), the financing haircut was often modest. With the reduction in balance sheet capacity on Wall Street for mortgage hedging, and heightened political scrutiny of the GSE's extending the time lag for closings, there has been reduced profitability for originators. Instead, they have had to explore alternative hedging strategies to a forward sale. However not all of them offer a clean direct hedge.

An alternative methodology is selling treasury securities short against their long position in mortgage loans. While somewhat offsetting the interest-rate exposure, it does not address

the yield-curve risk, as originators who retained their loans on their books (versus selling into the secondary market) fund these loans by borrowing at ultra-low short-term rates and lending at many different points on the yield curve. That lending spread also creates a duration mismatch and can easily erode the underwriting profitability should rates rise substantially before closing while the price of the mortgage loan drops in the secondary market. Depending on the mix of loan originations between adjustable rate mortgages and longer dated fixed-rate mortgages, the duration mismatch could be substantial on an aggregate portfolio basis. Moreover, selling treasury securities short (no matter on which part of the yield curve) creates further cost pressures because borrowing rates on the short sale can change.

That leaves mortgage originators with few choices other than the Treasury futures market, or more practically, the OOF market. One attractive benefit off OOF for mortgage lenders is their customizability. While the treasury futures market offers liquid, multi-month price quotes on maturities across the entire yield curve, prices are reflective of the immediate level of interest rates at the current point in time.

In the OOF market, the originator can create a package of hedges that more directly reflect the underlying timing and duration of his entire pipeline and the potential path of interest rates in the future.

If the originator determines a majority of its loans would close in 30 days and are predominantly 5-year adjustable rate mortgages then it may use an at-the-money 30-day put contract on the 5-year treasury, while simultaneously selling a 30-day OOF put contract struck several points lower in price. This would represent about 25 basis points of upward, future-interest-rate risk. That 25 basis points represented the originator's best estimate of the potential move higher in 5-year treasury rates over that narrow 30-day window.

This OOF pairs trade hedged the interest rate risk at a fraction of the cost of using regular futures contracts since it was a short-term spread and not an outright futures position. Again, while the loss on a futures short position is theoretically limitless, the loss on an OOF pairs trade is limited to the amount paid for the spread and nothing more. These types of trades can be constructed throughout the yield curve depending on duration mismatch and ultimate strategy of the portfolio.

Conclusion

Options on futures has become a rapidly expanding product set which is attracting the attention of a diverse set of market participants. Even more compelling is the role that OOF will take in the future, as they are uniquely positioned in the sweet spot of a rapidly changing financial market landscape. The characteristics of OOF are well situated to meet the challenges presented by ever more sophisticated and automated trading strategies.

Investment managers of all stripes are no longer restricted to their home markets, but rather often enjoy a mandate to invest across borders, asset classes and currencies. The increasing liquidity of OOF and the enhanced ability to execute electronically is a key attraction in today's environment. Under the classic "liquidity begets liquidity" mantra, OOF are bringing together both traditional and commercial users of financial derivatives. These varied market participants bring with them differing risk profiles that provide mutually beneficial trading opportunities for all participants across a diverse set of instruments.

The liquidity of the OOF marketplace is leading to a rise in automated trading strategies designed to take advantage of rapid market movements. This has spawned an increase in technology and vendor support for these clients. New trading tools, enhanced data sets and more powerful analytics are being offered to service this rapidly expanding segment of the market. As electronic tools are rolled out and adopted by a broader range of clients it will lead to further volume increases in the OOF market.

About

TABB Group

TABB Group is a financial markets research and strategic advisory firm focused exclusively on capital markets. Founded in 2003 and based on the methodology of *first-person knowledge*, TABB Group analyzes and quantifies the investing value chain from the fiduciary, investment manager, broker, exchange, and custodian. Our goal is to help senior business leaders gain a truer understanding of financial markets issues and trends so they can grow their business. TABB Group members are regularly cited in the press and speak at industry conferences. For more information about TABB Group, go to www.tabbgroup.com.

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