

POWERSHARES DB AGRICULTURE FUND  
Form FWP  
June 16, 2011

**Free Writing Prospectus**

**Filed Pursuant to Rule 433**

**Registration No. 333-163453-09**

**June 16, 2011**

## Optimum Yield

*Invesco PowerShares and Deutsche Bank (DB) strive to level the playing field for investors seeking to participate in the commodities market. The PowerShares DB product line was the first to give investors access to commodities by holding futures in an exchange-traded fund (ETF) vehicle. This piece seeks to explain some of the important considerations when it comes to investing in futures-based ETFs.*

For ETFs that hold futures contracts, there are some intricacies that investors need to be aware of. Total return on a futures contract is composed of three components which are spot return, collateral return and roll return.

$$\text{Total Return} = \text{Spot Return}^1 + \text{Collateral Return}^2 + \text{Roll Return}^3$$

In particular, the roll return<sup>3</sup> is impacted by the shape of the futures curve. Typically, futures contracts trade in a state of contango or backwardation. Contango occurs when the prices of futures contracts are higher than the current spot prices and the curve slopes upward over the given time period. On the other hand, backwardation occurs when the prices of the futures contracts are lower than the current spot prices and the futures curve slopes downward. Contango and backwardation are important to commodity index investors because of the cost associated with rolling the underlying contracts to contracts further away from the expiration date.

Most conventional indexes (Dow Jones-UBS Commodity Index and S&P Goldman Sachs Commodity Index) implement a rigid front month only roll process. In an index that uses a front-month roll process, the index will roll to the next available contract.

In a contango market, this will lead to the most negative annual roll yield. In a backwardated market, this will lead to the most positive annual roll yield. This is because the slope of the curve tends to be steepest in the front few months. Therefore, when markets are in contango, the investor incurs a high cost of roll which could have a negative impact on returns. This is assuming the curve stays the same shape.

Each of the PowerShares DB Commodity ETFs implements a roll methodology called Optimum Yield (OY). Optimum Yield is a process that is specifically designed for index investors to gain access to the commodities market the way many institutions or commodity professionals would. By implementing the OY methodology to roll futures contracts, the PowerShares DB product line seeks to minimize the negative impact of contango and maximize the positive impact of backwardation.

The following is a step-by-step example of how the OY process works as compared to a rigid front-month roll process utilized in most conventional commodity indexes.

<sup>1</sup> Spot return is the return generated from selling a commodity for cash.

<sup>2</sup> Collateral return is the return generated from holding U.S.Treasury Bills or other securities used to secure a futures contract.

<sup>3</sup> Roll return is the return, positive or negative, generated by rolling from a short-term futures contract to a longer term futures contract.

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### **Futures Market in Contango**

In this example, the futures contract curve is in contango with the price increasing and the curve upward sloping. The current contract is trading at \$100 and is about to expire.

Representative PowerShares DB Funds: *Optimum Yield Roll in Contango Term Structure*

*For illustrative purposes only*

### **Conventional Index Front-Month Roll Process:**

The front month contract is the contract which has the closest expiry date. The front-month rolling index is going to roll into the \$110 contract which is typically the steepest part of the curve. A front-month rolling index will execute multiple times a year which is four times in this example.

### **OY Roll Methodology:**

Optimum Yield, on the other hand, addresses a futures curve in contango very differently. The OY methodology will evaluate each of the available contracts and roll to the contract that has the best implied, annualized roll yield, ideally minimizing the negative impacts of contango. In this scenario, it will roll to the fourth contract which costs \$116. Once the OY methodology has rolled to this contract it does not need to roll for the rest of the observed period. (In most cases, one year.)

### **OY Roll Methodology Result:**

The total cost of roll for the front-month rolling index is \$40 (\$10 X four rolls) versus the total cost for the OY methodology of \$16 dollars (one roll).

### **Futures Market in Backwardation**

Below is an example of the futures curve in backwardation where futures contract prices are decreasing and the curve is downward sloping.

Representative PowerShares DB Funds: *Optimum Yield Roll in Backwardation Term Structure*

*For illustrative purposes only*

In this scenario, because the market is in backwardation, the roll will have a positive impact on return. Both the OY and the front-month rolling indexes will roll to the next available contract at \$90, locking in the steepest part of the curve and doing so as often as possible. In this example the roll is positive \$10 which takes place four times for a total gain of \$40.

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## **Optimum Yield Technology in Practice**

### Sample Contango Term Structure

Finally, we conclude with an example of a futures curve. In this scenario, the front contract is expiring. In evaluating where the index will roll next, consider the two options, front month rolling and OY methodology.

## **Commodity Price Curves**

### **Conventional Front-Month Roll Only Process:**

A front-month rolling index will simply roll to the very next available contract; Contract 1 trading at \$94.28 and incur a \$2.09 monthly roll cost. When this roll is annualized by 12 months, the yearly cost is \$25.08. Said another way, spot prices would have to move 24% in the investor's favor just to overcome the roll costs.

### **OY Roll Methodology:**

To contrast when compared to the flexible OY strategy, the indexes draw a very different conclusion. Given the same scenario as when the OY Index is rolling out of the expiring contract, OY will evaluate the next 12 available contracts and decide which contract will minimize the negative impacts of contango the most. In this scenario, the best option is Contract 12 trading at \$99.78. The monthly roll cost is \$7.59 but because the index has rolled 12 months out, this is the yearly roll cost as well. The OY process has minimized the negative impact of contango and the underlying spot price of the commodity would only have to move 7.6% in the investor's favor to overcome the cost of roll in this scenario.

### **OY Roll Methodology Result:**

The annual roll cost of the front-month rolling index was \$25.08. To overcome this cost, the spot price of the commodity would have to move 24% in the investor's favor. The annual roll cost for the OY Index was \$7.59. To overcome this, the spot price of the commodity would only have to move 7.6% in the investor's favor.

To learn more about PowerShares DB ETFs and Optimum Yield call 800 983 0903 or visit [invescopowershares.com/db](http://invescopowershares.com/db).

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PowerShares DB ETF offering utilizing the Optimum Yield methodology are shown below:

**DBC** PowerShares DB **Commodity Index Tracking** Fund

**DBA** PowerShares DB **Agriculture** Fund\*

**DBE** PowerShares DB **Energy** Fund

**DBB** PowerShares DB **Base Metals** Fund

**DBS** PowerShares DB **Silver** Fund

**DBO** PowerShares DB **Oil** Fund

**DBP** PowerShares DB **Precious Metals** Fund

**DGL** PowerShares DB **Gold** Fund

\* DBA does not use OY for all holdings.

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