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Futures Rollovers and Accounting for Profitability

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Abstract:

Calculation of profit from futures trading that involves rollovers is important for investors, regulators, and researchers who track returns earned by individual or fund traders. An accurate profit calculation for trading activity involving rollovers cannot be achieved with a manufactured continuous data series formed by applying an automatic rollover rule. Rather, a two-step process is needed where spreads are fully accounted for in the profit calculation. We present a two-step procedure which accounts for spreads. We demonstrate the profit calculation with an example of a November soybean futures contract rolled over to a January soybeans future contract, and show how the resulting profit with the two-step method differs from the resulting profit determined using a manufactured continuous data series.

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Key Words: Futures Contracts, Contract Rollover, Profit Calculation

JEL Classifications: Q02 (Commodity Markets), G13 (Contingent Pricing; Futures Pricing); G11 (Portfolio Choice; Investment Decisions)

Investors roll their futures positions by closing out their expiring futures contracts and replacing them with new contracts for the same underlying assets which have expiration dates that are further away. Investors in physically settled futures contracts typically roll their contracts in the first half of the month ahead of the expiry month to avoid the obligations and costs associated with physical delivery while maintaining their chosen exposure to the market. Investors in cash settled futures contracts typically roll their contracts a little later, perhaps in the first part of the expiry month, to maintain their chosen exposure to the market.

The calculation of profit for futures trading that involves rollovers is important for an individual investor to track how they are doing with regard to returns from trading their own account. The calculation of profit is also important for an investor, regulator, or researcher studying the profitability of funds which are actively trading and rolling futures.

When accounting for futures rollovers and calculating investor profit, the choice of method matters. An accurate profit calculation cannot be achieved using a manufactured continuous data series formed by using an automatic rollover rule. Rather, a two-step process is needed which makes an adjustment for the spread at each rollover, where spread is the difference in price between the expiring futures contract and the new futures contract. A detailed explanation of the method for a profit calculation with a rollover is provided and is demonstrated with an example of a profit calculation for an investor rolling over a long position in soybean futures. The resulting profit for the soybean investor using the two-step profit calculation is compared to the resulting profit using a manufactured continuous price series for the profit calculation.

The rolling of futures contracts is problematic for researchers who require a continuous time series of prices for analyses (Ma et. al, 1992, Geiss, 1995, Carchano and Pardo, 2009). To

manufacture a continuous series, the researcher establishes a rollover rule. This rule could be, for example, to rollover on the first Wednesday of the month ahead of the expiry month. The problem with a continuous price series manufactured in this way is that it omits the spread between the expiring futures contract and the contract with expiry further away. With omitted spreads, which are positive except in the rare occurrence of an inverted market, artificial jumps in prices will appear with the rollovers, exaggerating the volatility in the market and creating errors in analyses. Unfortunately, a rollover rule does not exist that provides a fully satisfactory solution to this problem.

Rollovers are also problematic for profitability calculations for investors in futures contracts. We present a two-step procedure which accounts for spreads. First, if the investor is long the futures for the current contract month, the current contract is sold at rollover; and, if the investor is short the futures for the current contract month, the current contract is bought back at rollover. In this way, the investor's gain or loss on the current contract up to the time of the rollover is calculated. Next, the sold or bought back current contract is replaced by buying or selling a new futures contract in the next expiring futures month. The gains or losses for the position in this contract are calculated continuously until the next rollover when the contract is either sold or bought back to close it out. In this way the investor's profit on the new contract is calculated. The summation of the profit on the current contract and profit on the new contract is the total profit.

Table 1 is an example profit calculation for a long soybeans investor at rollover. The investor is long one November contract and rolls that contract over to a January contract on the first Wednesday of October, 2017.

Table 1: Two-Stage Procedure and Continuous Series Methods of Accounting for Investor Profit for Soybean Futures Trading with a Rollover, October 2-6, 2017

Two-Stage Procedure					Continuous Series			
	Nov	Gain	Jan	Gain	Profit	Nov/Jan	Gain	Profit
	Futures	(Loss)	Futures	(Loss)		Futures	(Loss)	
02-Oct	957'2		967'6			957'2		
03-Oct	955'2	(2'0)	966'0			955'2	(2'0)	
04-Oct	958'2	3'0	968'6			968'6	13'4	
05-Oct	968'2		979'0	10'2		979'0	10'2	
06-Oct	972'2		983'0	4'0		983'0	4'0	
Profit		(1'0)		14'2	15'2			25'6

Note: Futures prices data from CME Group (2017).

To calculate profit for the two-stage procedure, the gains for the long November futures contract are cumulated until the rollover on October 4, when the November contract is sold, and those gains are added to the gains (losses) cumulated on the long January futures contract beginning with the January contract price on October 4. To calculate profit for the continuous series, a continuous series is manufactured for the same duration as the correct method, with the November futures prices being used until the October 4 rollover and the January futures prices being used thereafter. The gains (losses) are cumulated on this manufactured continuous series. The difference between the two-stage and manufactured price series profit calculations is the spread which is 10'4, the difference between the November futures price (958'2) and January futures price (968'6) at the time of rollover.

The two-step process is thereby shown to account for spreads in futures contracts when calculating profit from trading which involves rollovers, whereas the profit calculation using manufacture time series data does not account for spreads.

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