

Trading the TED Spread

Advantage Futures, 20 May 2010

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Outline

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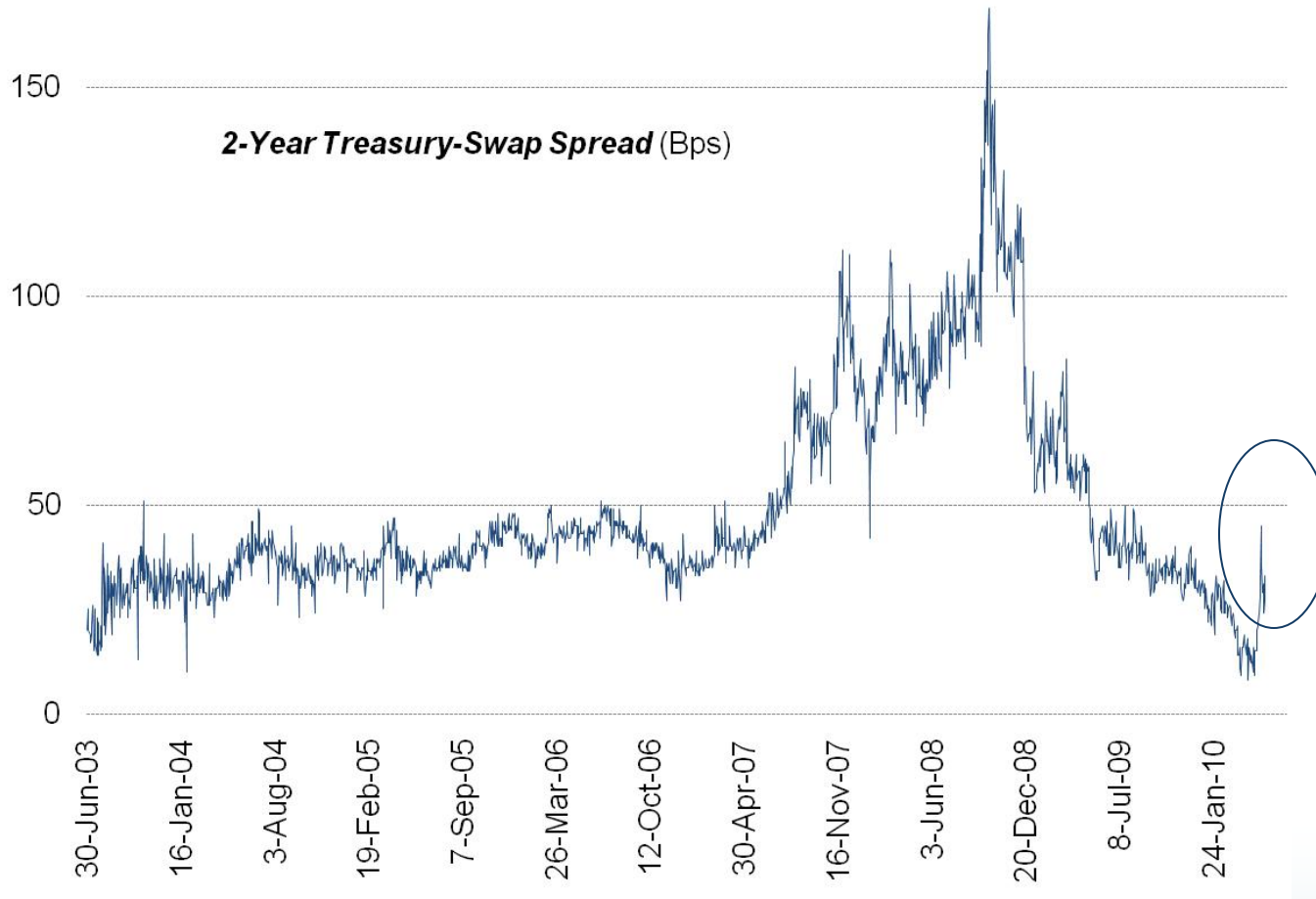
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Why TEDs? Why now?

Volatility has picked up...

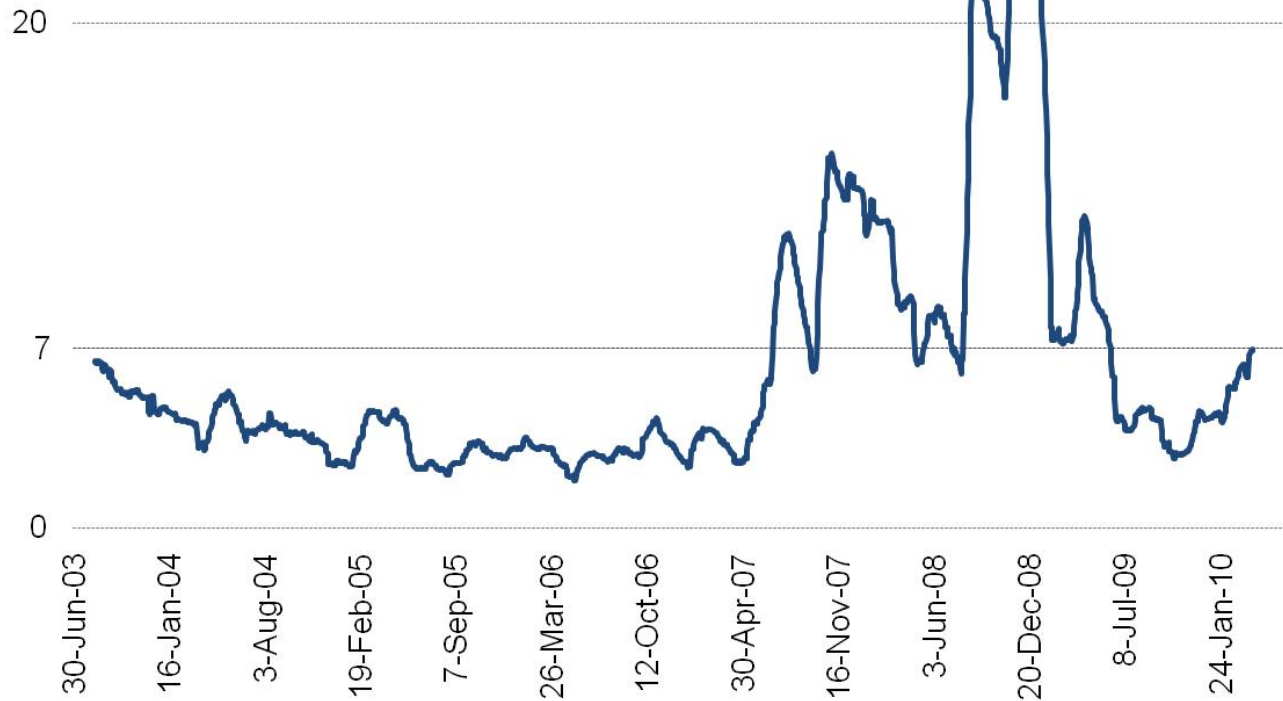


Why TEDs? Why now?

...in a good way.

2-Year Treasury-Swap Spread Volatility

(Moving 3-Month Standard Deviation of Daily Spreads, Bps)



TED Spread Definitions

Long TED = Long Treasury Exposure vs Short ED Futures
Short TED = Short Treasury Exposure vs Long ED Futures

Treasury Leg

Cash (eg, on-the-run 2-year or 5-year Treasury notes)
Futures (eg, front ZT or ZF)

Eurodollar Futures Leg

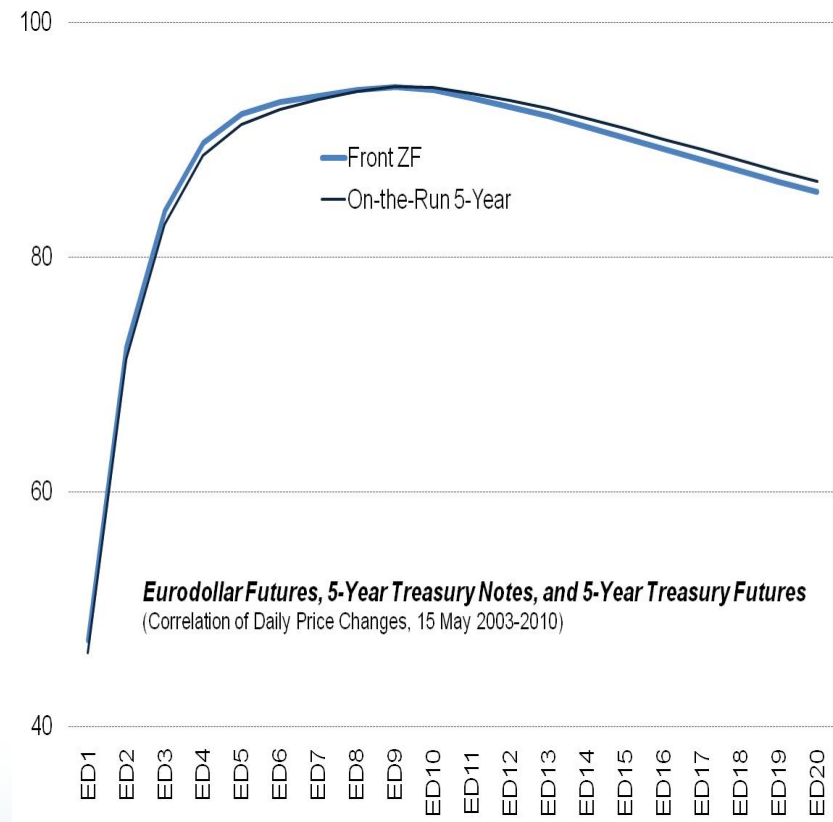
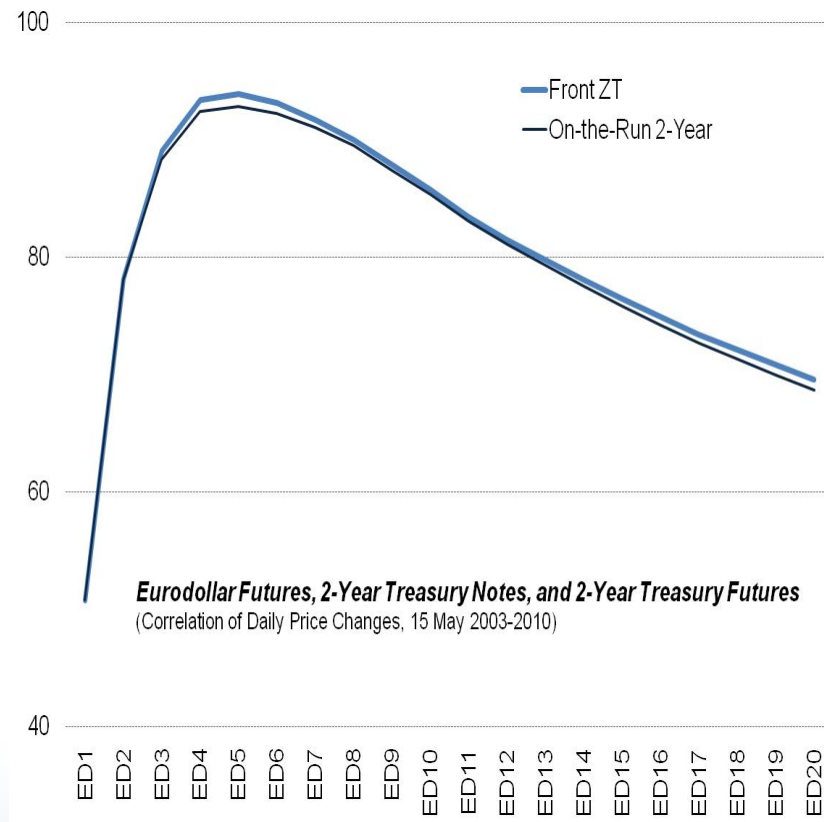
Whatever you want

One Rule: ED Leg DV01 = Treasury Leg DV01

Structuring the ED Leg via Correlation

Check which ED contracts or contract structures correlate well with Treasury exposure.

Correlations of daily price changes in ED futures, Treasury notes, and Treasury futures



Structuring the ED Leg via Correlation

Stacks

Packs

Bundles

Last 7 Years: Mid-May 2003-2010

OTR 2-Year	1 st Red	92.8	Red	91.6	2-Year	91.5
ZT	1 st Red	93.9	Red	92.4	2-Year	92.3
OTR 5-Year	1 st Green	94.6	Green	94.5	5-Year	94.9
ZF	1 st Green	94.5	Green	94.1	5-Year	94.8

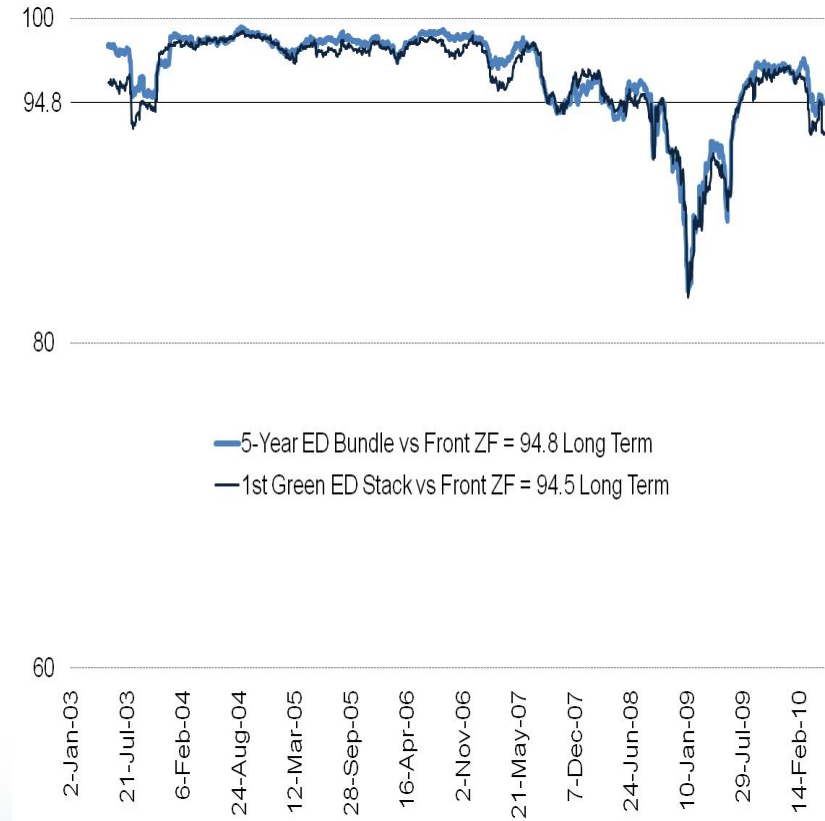
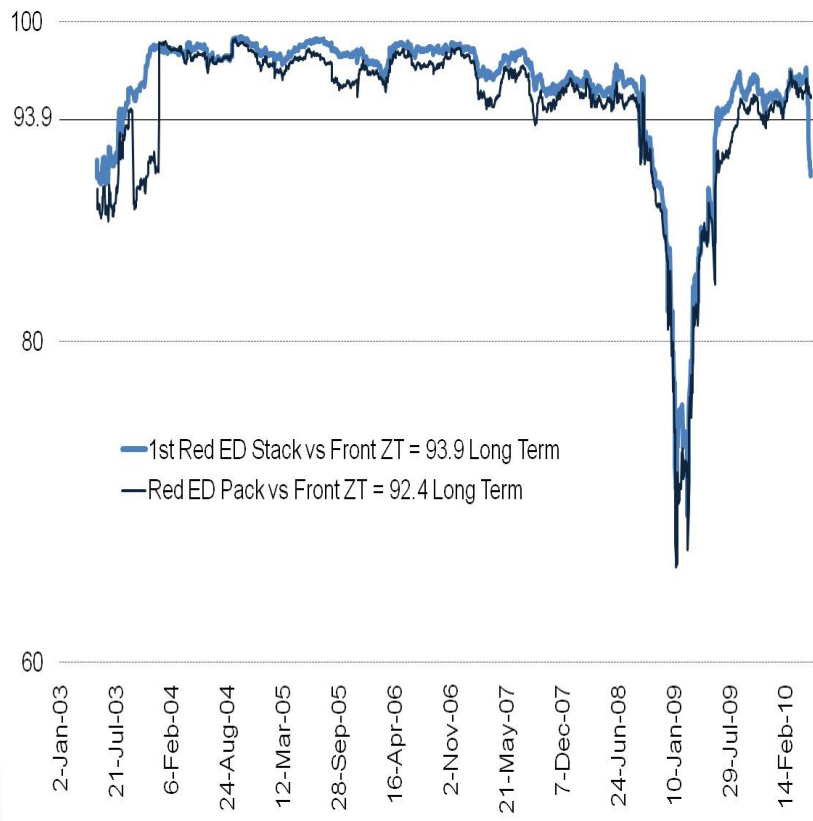
Last 3 Months: Mid-Feb to Mid-May 2010

OTR 2-Year	3 rd Red	94.9	Red	94.7	2-Year	83.4
ZT	3 rd Red	95.2	Red	95.4	2-Year	85.9
OTR 5-Year	2 nd Green	95.1	Green	95.2	5-Year	94.6
ZF	2 nd Green	93.6	Green	93.7	5-Year	94.8

Structuring the ED Leg via Correlation

Check recent short-term correlation values in addition to long-term secular values.

Moving 3-Month Correlations of Daily Price Changes, 15 May 2003 to 15 May 2010



Structuring the ED Leg: ED DV01 = Treasury DV01

Examples: 15 April 2010

	ZTM10	ZFM10
Treasury Futures DV01	\$36.50 per contract \$18,250 per 500-lot	\$39.24 per contract \$39,236 per 1000-lot
Number of ED Futures = Treasury Futures DV01/\$25	730 ED per 500-lot	1,569 ED per 1000-lot

Digression: How It Used to Be

Popular approach in the 1990s:

Use term structure of ED futures rates to construct synthetic Eurobond that mimics Treasury leg.

Example: 15 April 2010

Use ED contract rates and money market rates to get term structure of discount factors.

	ED Prices, 15 April 2010	ED Rates (Pct)	CVX Bias (Bps)	Adjusted Rates = ED Rates minus CVX Bias	ED Maturity Dates	Discount Factors
2-Mo Libor		0.280		0.2800	16-Jun-10	0.99953
M10	99.635	0.365		0.3650	15-Sep-10	0.99860
U10	99.500	0.500	0.25	0.4975	15-Dec-10	0.99734
Z10	99.240	0.760	0.50	0.7550	16-Mar-11	0.99541
H11	98.895	1.105	0.50	1.1000	15-Jun-11	0.99263
M11	98.515	1.485	1.00	1.4750	21-Sep-11	0.98860
U11	98.145	1.855	1.50	1.8400	21-Dec-11	0.98395
Z11	97.790	2.210	2.25	2.1875	21-Mar-12	0.97843
H12	97.485	2.515	2.75	2.4875	20-Jun-12	0.97218

Digression: How It Used to Be

Example Contd: 15 April 2010

Treasury Leg = 1s of 31 March 2012

Use ED discount factors to interpolate discount factors for 2-year Treasury note cash flow dates.

ED Deposit Maturity Dates	Discount Factors	Treasury Cash Flow Dates	Interpolated Discount Factor Values
16-Jun-10	0.99953		
15-Sep-10	0.99860	30-Sep-10	0.998396
15-Dec-10	0.99734		
16-Mar-11	0.99541	31-Mar-11	0.994953
15-Jun-11	0.99263		
21-Sep-11	0.98860	30-Sep-11	0.988143
21-Dec-11	0.98395		
21-Mar-12	0.97843	2-Apr-12	0.977605
20-Jun-12	0.97218		

How It Used to Be

Example Contd: 15 April 2010

Treasury 1s of 31 March 2012

Closing price	99-30+
Closing yield	1.024
Synthetic Eurobond yield	1.157

TED Spread = 1.157 minus 1.024 13.3 bps

Apply ED discount factors to 2-year Treasury note cash flows to get synthetic Eurobond price

Cash Flow Dates	Discount Factors	Synthetic Eurobond Cash Flows	Present Values	Treasury 1s of 31 Mar 2012	Term TED Spread (Bps)
30-Sep-10	0.998396	0.5	0.499198		
31-Mar-11	0.994953	0.5	0.497477		
30-Sep-11	0.988143	0.5	0.494072		
2-Apr-12	0.977605	100.5	98.249340		
		All-In Price	99.740086	99.996841	
		Clean Price	99.696370	99.953125	
		Yield	1.157	1.024	13.3

Structuring the ED Leg: Analytical vs Quick & Dirty

TED spread ratios vs \$100 million face value of Treasury 1s of 31 March 2012 on 15 April 2010

	Synthetic Eurobond	Correlation Stack	Correlation Pack	Bundle
M10	157			97
U10	100			97
Z10	100			97
H11	100			97
M11	107	775	194	97
U11	99		194	97
Z11	99		194	97
H12	13		194	97
Total	775	775	776	776

Structuring the ED Leg: Analytical vs Quick & Dirty

Analytical TED spread ratios

Always held greatest appeal for strategic users.

Pro: Synthetic Eurobond structure has notional yield comparable to Treasury yield.

Con: Requires great care and effort to enter and exit.

Quick & dirty TED spread ratios

Pioneered by government securities dealer desks and swap dealers for tactical use.

Pro: Speed and tractability.

Con: Lacks yield that is directly comparable to Treasury yield.

Managing the Trade: What's the Right Framework?

Price spreads

Not recommended. Easy to compute, but messy to interpret:

ED leg is a forward interest rate.

Treasury leg is a forward asset price.

Interest Rate Spreads

Reasonably easy to compute, especially for tactical trading purposes. Simple to interpret:

TED spread = Forward Libo rate minus Treasury yield

Because spread is DV01-weighted, you know the dollar worth of any change in TED spread.

Managing the Trade: Implementing Interest Rate Spreads

Where Treasury leg is a cash note

Easy! Just monitor spread between: ED leg's interest rate vs Treasury yield

Where Treasury leg is a futures contract

One of several methods is to monitor spread between:

ED leg's interest rate

vs

Forward yield on cheapest-to-deliver Treasury note *as implied by Treasury futures price*

Managing the Trade: Examples

15 April 2010

Futures-to-futures TED spreads –
ED vs ZTM10 and ED vs ZFM10

TED spread = ED rate minus Treasury yield

What's the Treasury yield?

(Futures price x CTD conversion factor) plus basis guesstimate



Forward price of CTD issue



Forward yield of CTD issue

Basis guesstimate = CTD basis (in futures numeraire) from previous night's close

Managing the Trade: Examples

15 April: Prep work for trade on 16 April

	ZTM10	ZFM10
CTD	4-1/2 of 31 March 2012	2-3/8 of 31 Aug 2014
Price for 16 Apr regular settlement	106-247	100-09
Carry, 16 Apr to 6 Jul futures delivery	30.27/32nds	15.31/32nds
Forward price = Price minus Carry	105-26+	99-25.68/32nds
Forward yield	1.0989 pct	2.4249 pct
Futures conversion factor	0.9753	0.8681
Futures equivalent forward price	105-26+ / 0.9753 = 108-162	99-25.68/32nds / 0.8681 = 114-30.93/32nds
Actual futures price	108-16	114-292
Basis	0.25/32nds	1.68/32nds

Managing the Trade: Examples

16 April: Trade Setup

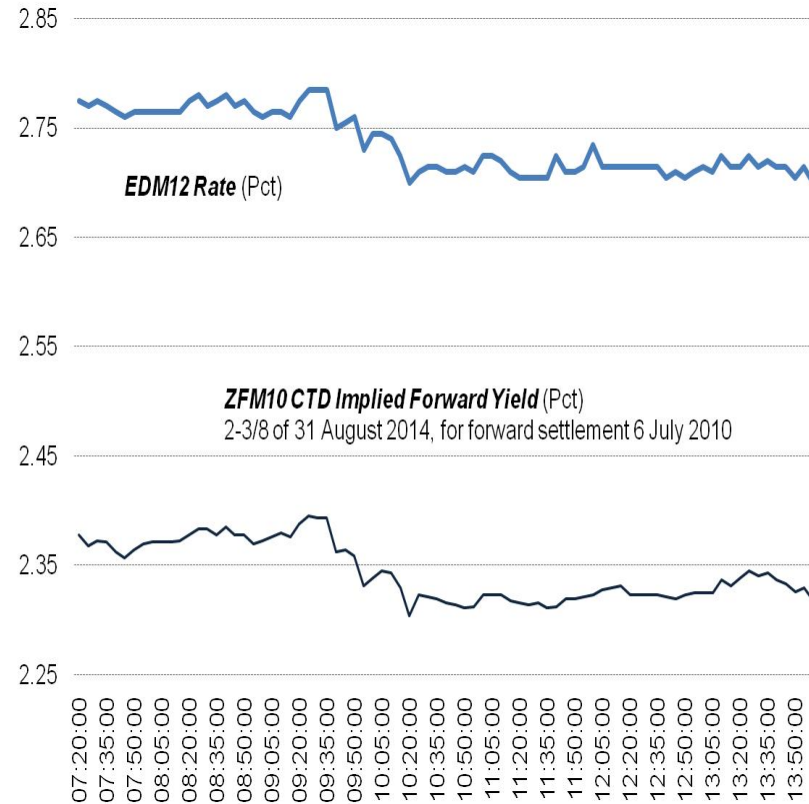
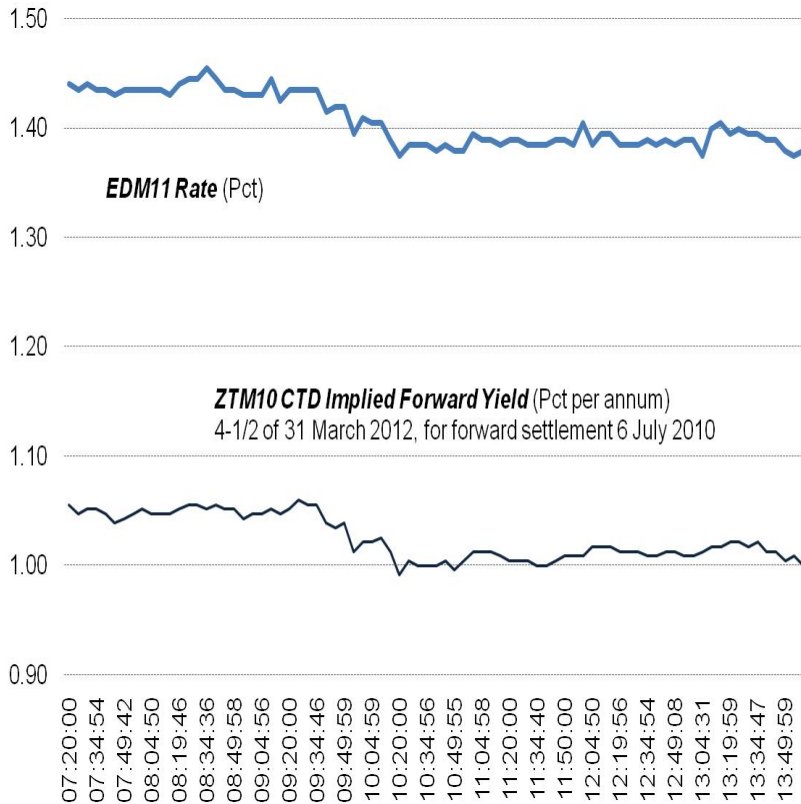
	ZTM10	ZFM10
Treasury Futures DV01	\$36.50 \$18,250 per 500-lot	\$39.24 \$39,236 per 1000-lot
Number of ED Futures	730	1,569
ED Contract	1 st Red = EDM11	1 st Green = EDM12

16 April: Trade Monitoring

TED Spread	500 ZTM10 vs 730 EDM11	1000 ZFM10 vs 1569 EDM12
ED Contract Rate	EDM11	EDM12
minus		
Forward Treasury Yield for 6 July settlement	4-1/2 of 31 March 2012 Price = (ZTM10 x 0.9753) plus 0.25/32nds	2-3/8 of 31 Aug 2014 Price = (ZFM10 x 0.8681) plus 1.68/32nds

Managing the Trade: Examples

16 April: 5-Minute Globex Snapshots

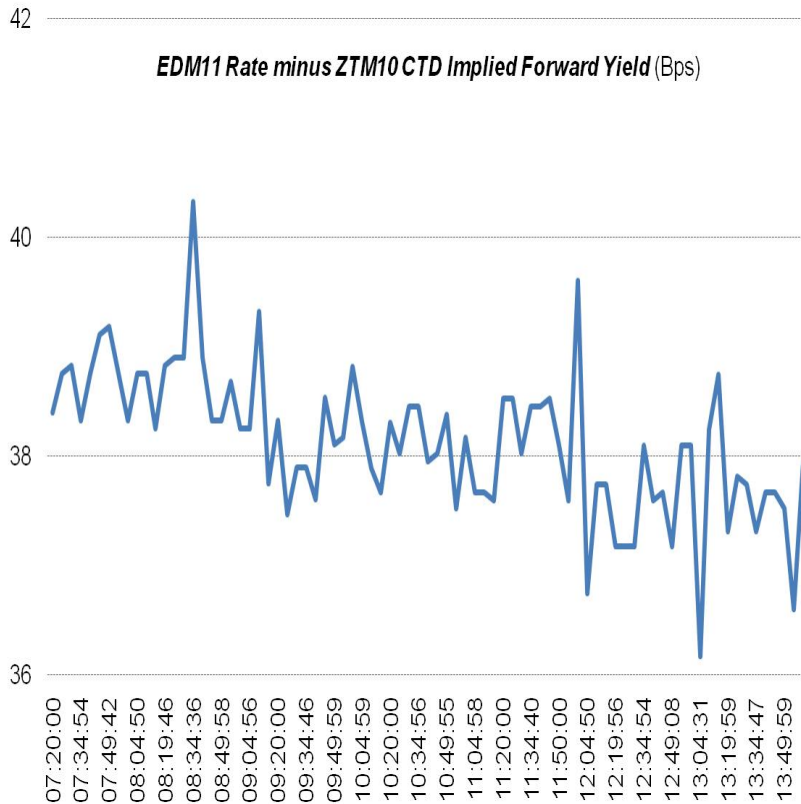


Managing the Trade: Examples

16 April: 5-Minute Globex Snapshots

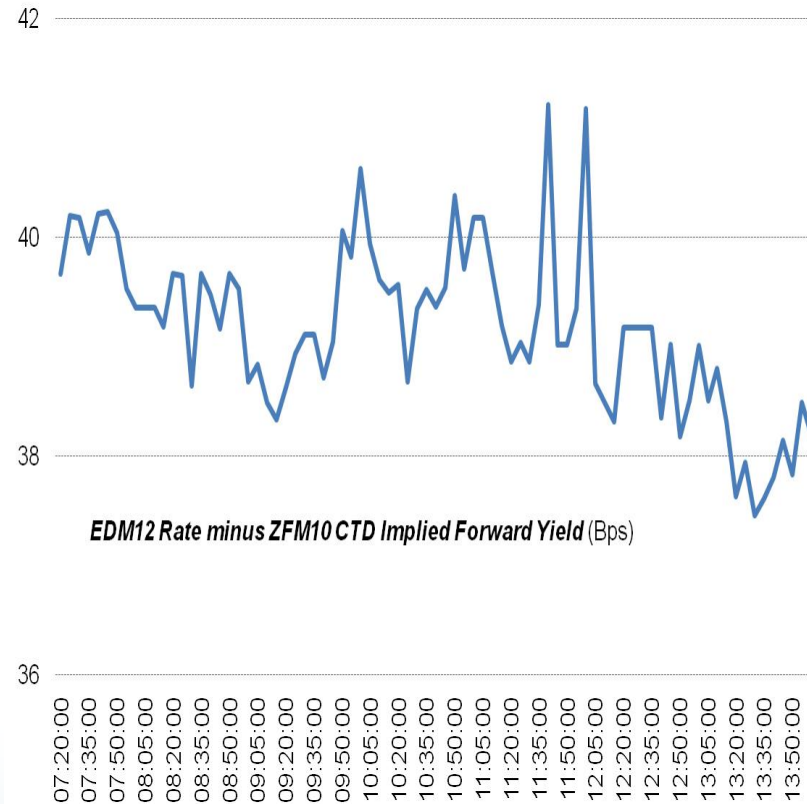
2-Year TED

For 500 ZTM10 vs 730 EDM11, DV01 = \$18,250



5-Year TED

For 1000 ZFM10 vs 1569 EDM12, DV01 = \$39,236



Sources and Resources

Data Sources:

Bloomberg LP, CME Group, Federal Reserve Board, IHS Global Insight

Resources:

Burghardt, Galen, **The Eurodollar Futures and Options Handbook**,
Chicago Mercantile Exchange and McGraw-Hill, 2003

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