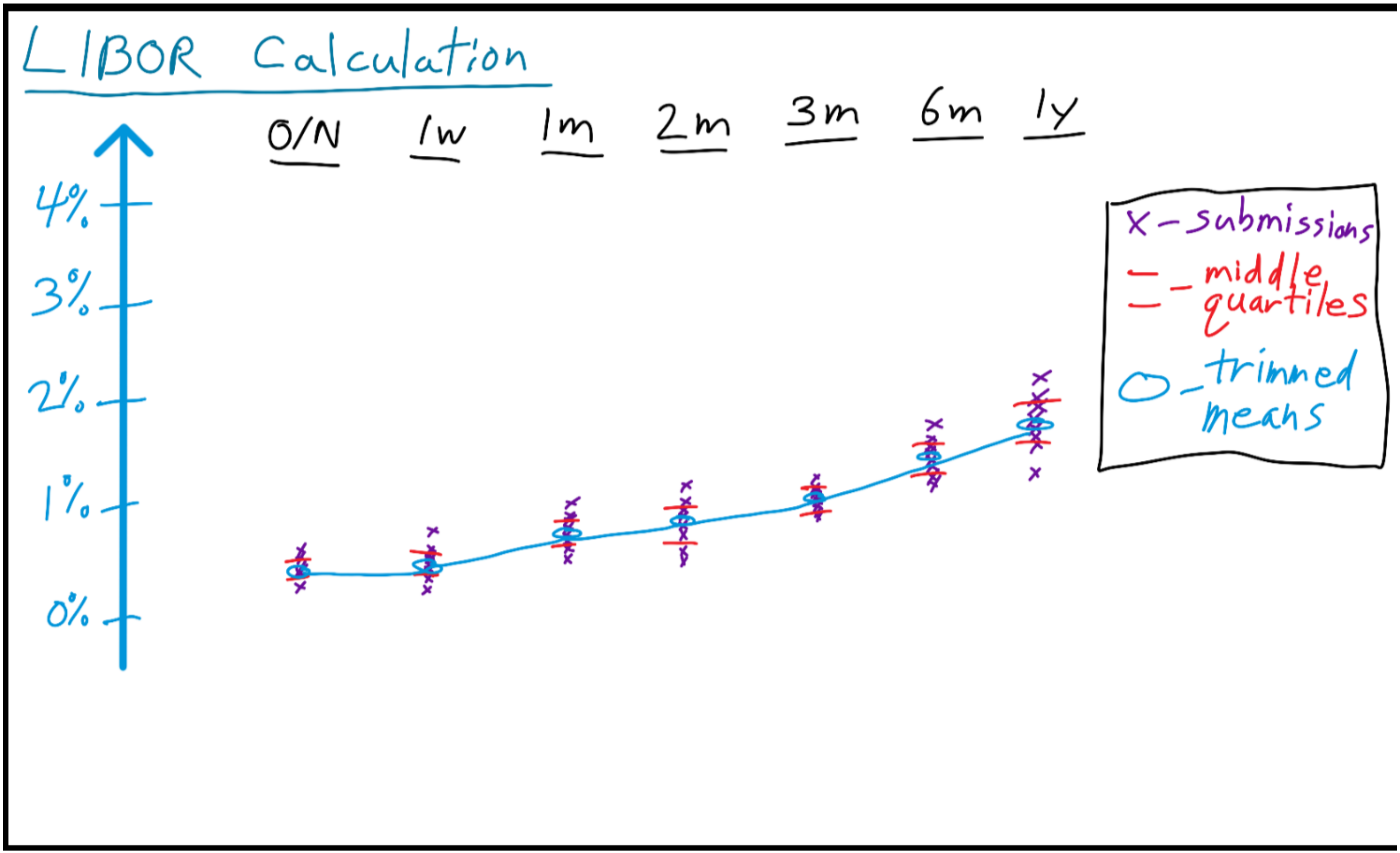
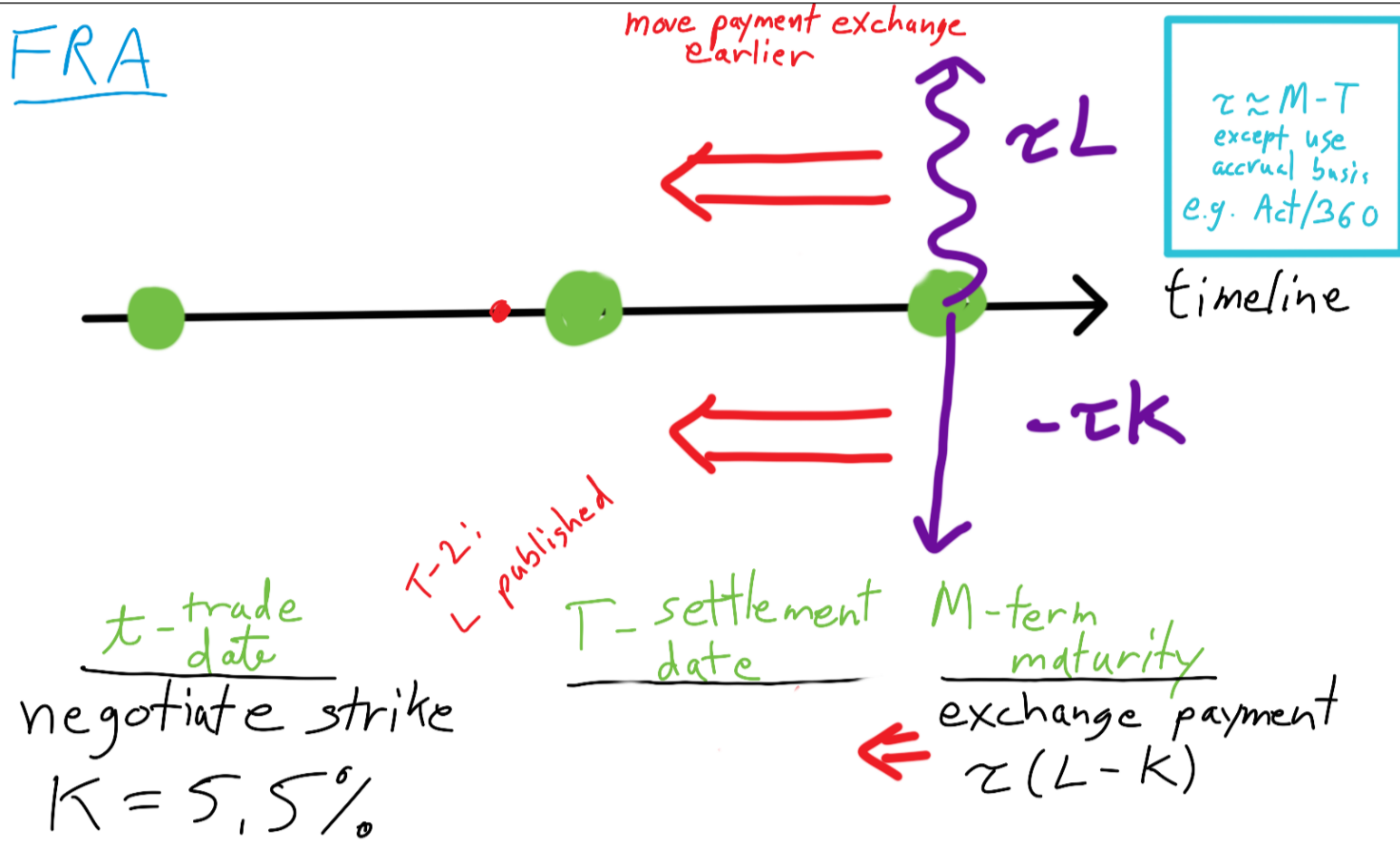
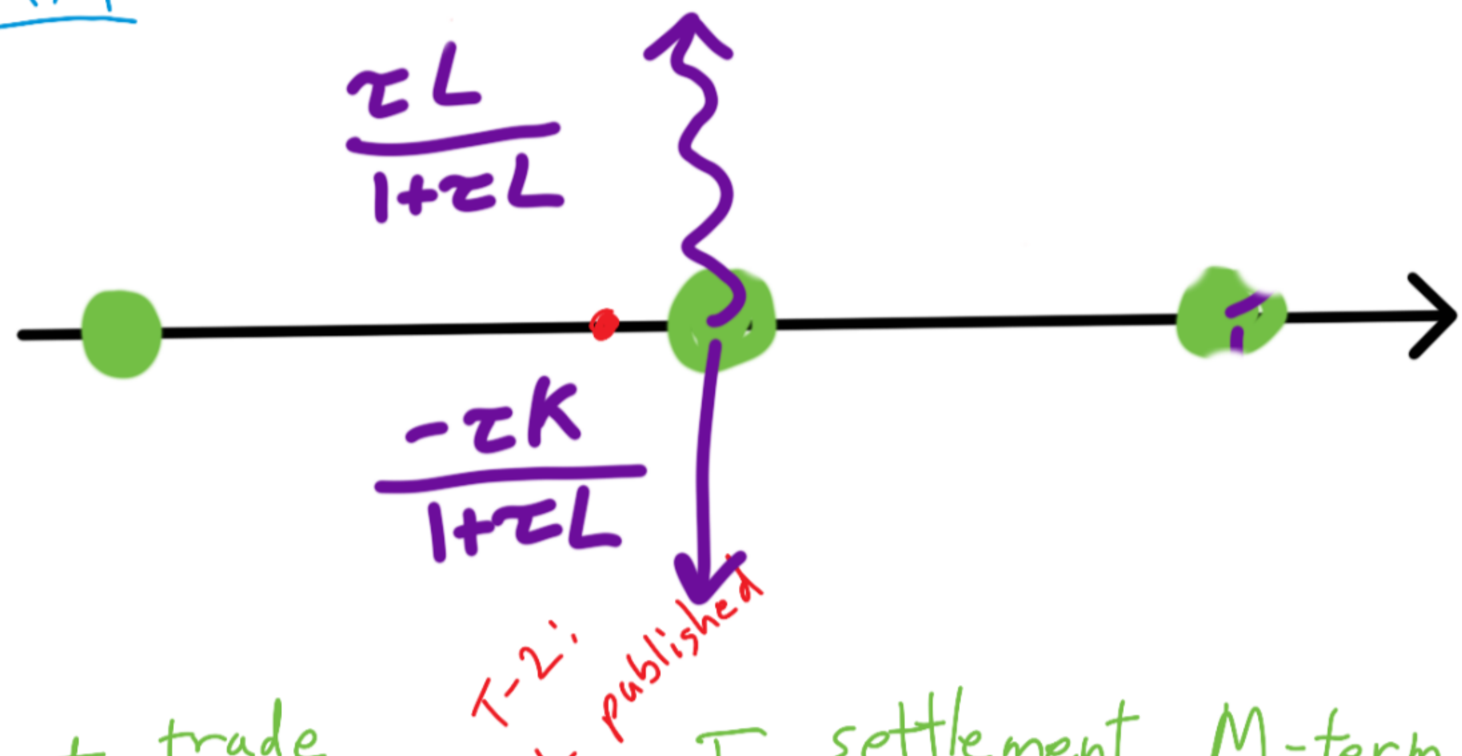

LIBOR Calculation
O/N
1w
1m
2m
3m
6m
1y
4%
3%
2%
1%
0%
x - submissions
- middle quartiles
O - trimmed means


FRA
move payment exchange earlier
τL
$-\tau K$
$\tau \approx M - T$ except use accrual basis e.g. Act/360
timeline
T-2: published L
t - trade date
T - settlement date
M - term maturity
negotiate strike
$K = 5.5\%$
exchange payment
$\tau(L-K)$

FRA

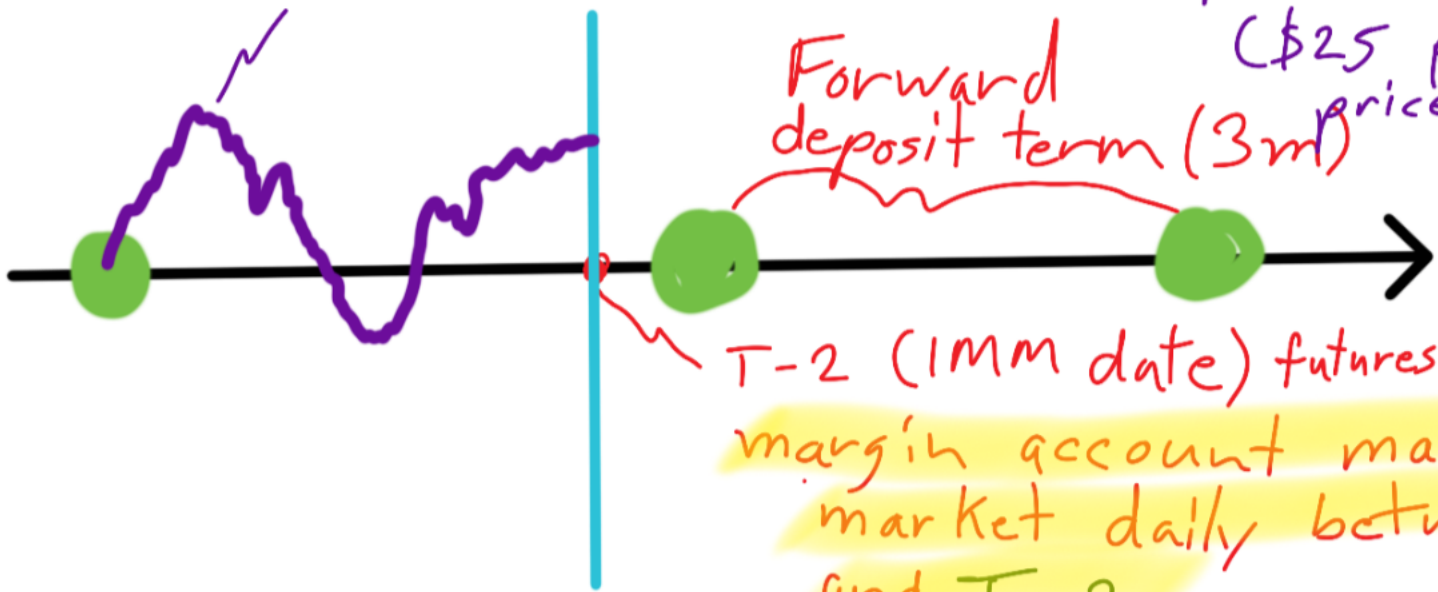
$\tau \approx M - T$
except use accrual basis
e.g. Act/360



t - trade date	T - settlement date	M - term maturity
negotiate strike $K = 5.5\%$	$\frac{\tau(L-K)}{1+\tau L}$ } prompt payment amount (FRA convetion)	

Eurodollar Futures

cumulative mark-to-market from futures price movement ($25 per 0.01 price "tic")



T-2 (IMM date) futures expires

margin account marked-to-market daily between t and T-2.

t - trade date

T - 3m LIBOR accrual begin date

M - 3m LIBOR accrual end date

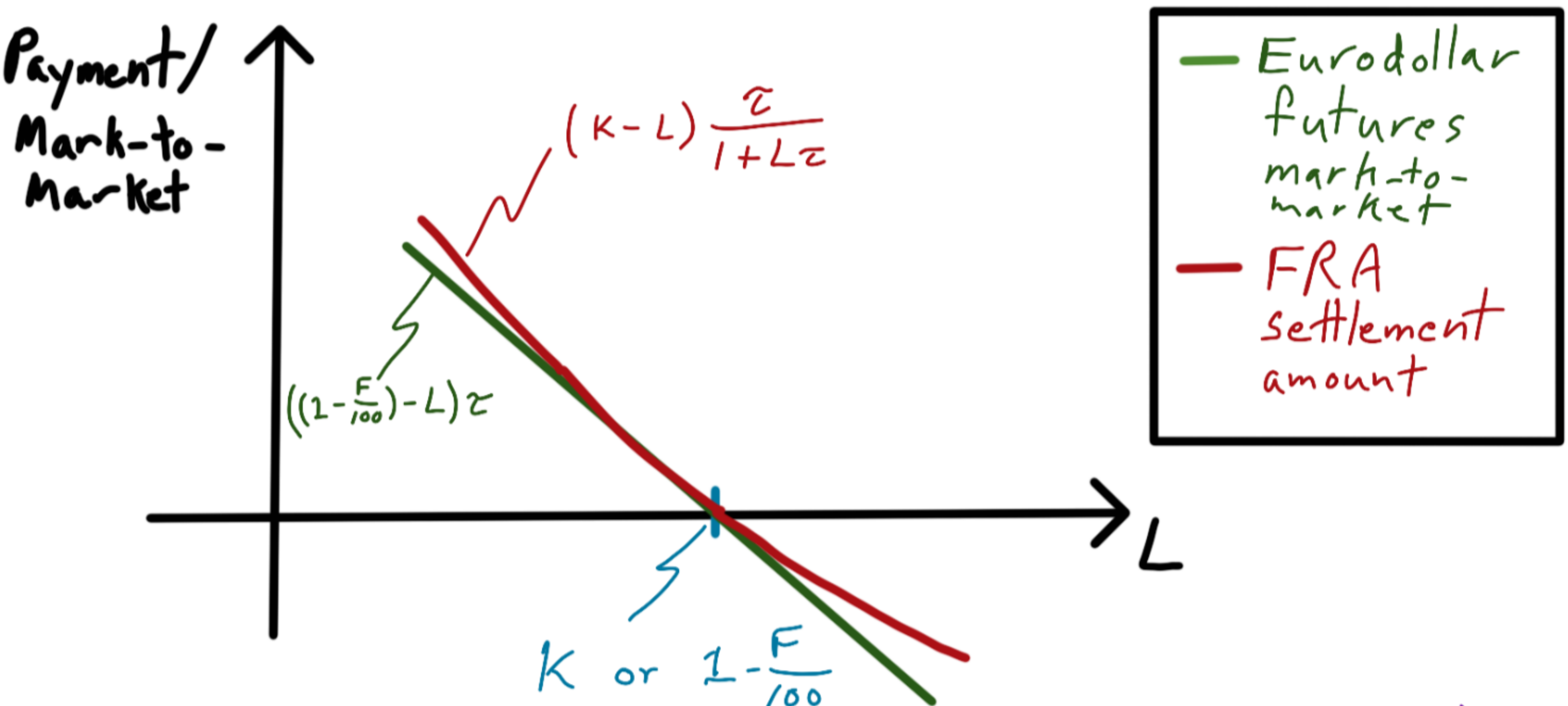
go long future contract at 93.50

T-2 final futures price settlement is

$100 \times (1 - L)$

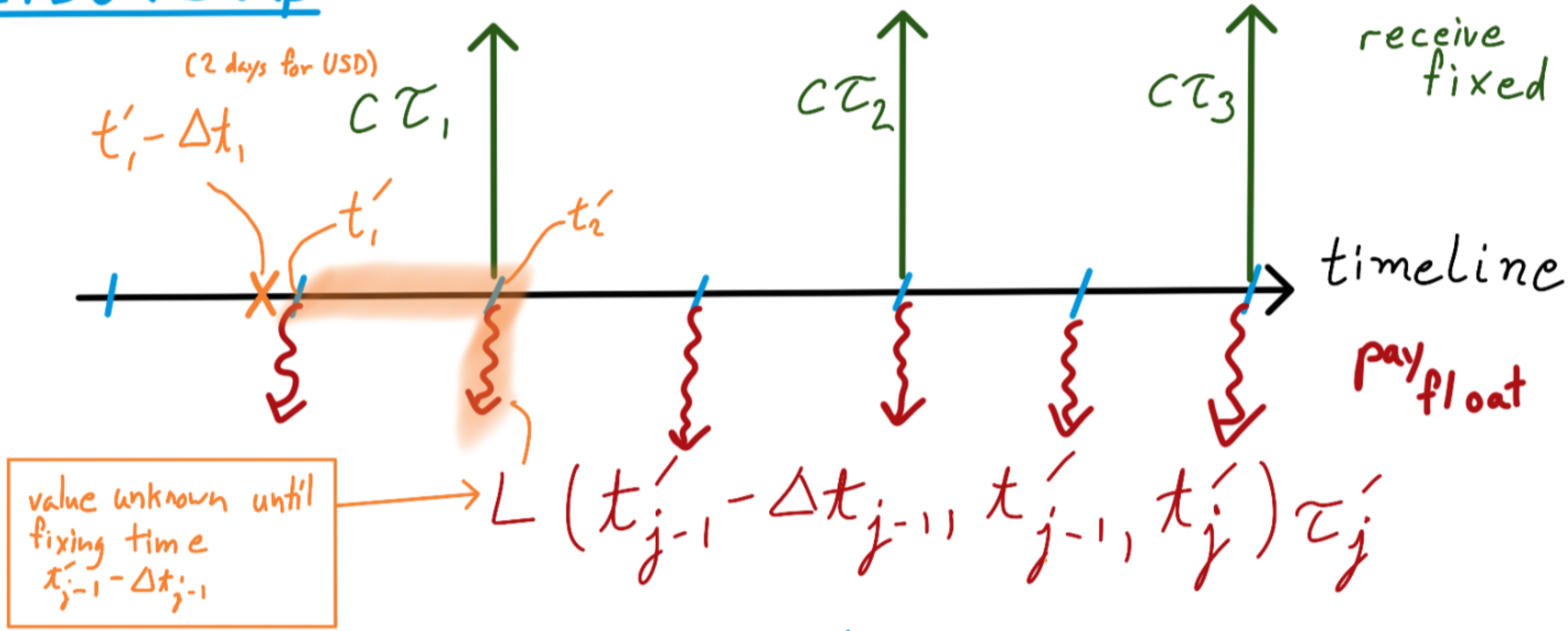
where L is in percentage terms, e.g. 0.06.

Eurodollar Futures Convexity



Eurodollar futures has negative convexity versus an FRA.

LIBOR Swap



$$t'_0 = t_0 < t'_1 \le t'_2 = t_1 \le t'_3 \le t'_4 = t_2 \le \cdots$$

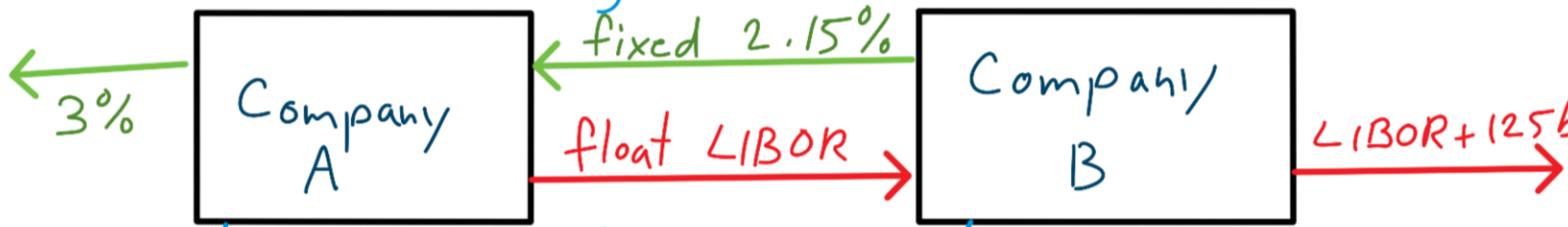
$$\tau'_j \approx t'_j - t'_{j-1} \qquad \tau_i \approx t_i - t_{i-1}$$

Swap -> Relative Funding Advantage

A issues fixed

enter swap agreement

B issues float



nets LIBOR+85 bp

can issue fixed note at 3%

can issue float at LIBOR+100 bp

prefers to issue float

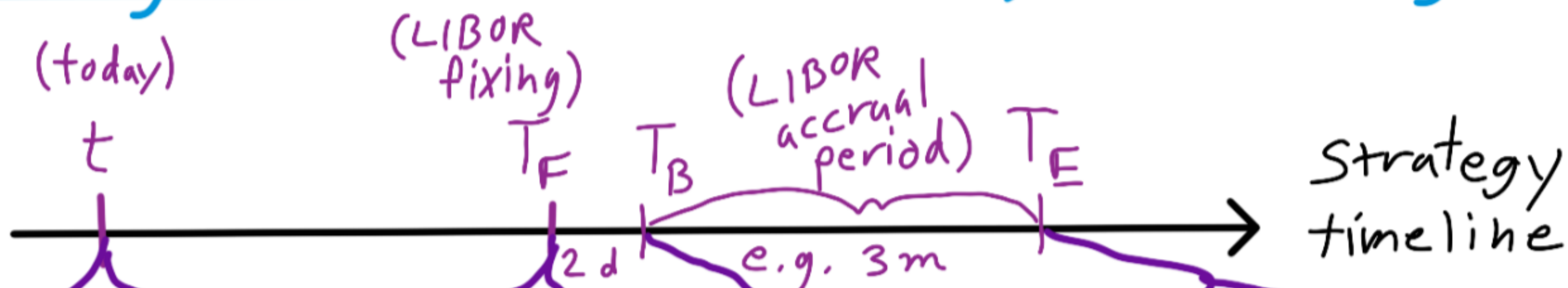
nets 3.40%

can issue fixed at 3.50%

can issue float at LIBOR+125 bp

prefers fixed

Swap Floating Payment Replication (Arbitrage-Free Pricing)



	t	T_F	T_B	T_E
actions	▷ buy T_B-maturity bond ▷ sell T_E-maturity bond ▷ agree to pay $L(T_F, T_B, T_E)$ at time T_E	▷ arrange Eurodollar deposit beginning on T_B and maturing on T_E		
net payments	$-P(t,T_B)$ $+P(t,T_E)$ $+\tau L(t,T_B,T_E)P(t,T_E)$ $=?$		$+1$ -1 $=0$	$-1-\tau L(T_F,T_B,T_E)$ $+(1+\tau L(T_F,T_B,T_E))$ $=0$

Either

$$P(t,T_E) - P(t,T_B) + \tau L(t,T_B,T_E)P(t,T_E) = 0$$

or this strategy supplies an arbitrage.

Hence in the absence of arbitrage,

$$L(t,T_B,T_E) = \frac{P(t,T_B)/P(t,T_E) - 1}{\tau}$$