



Some things can only be experienced. One of these is the experience of a live trading floor, where orders are submitted, prices are negotiated, activity is fast paced and competitive, and everyone reacts in real time to the actions of others.

The FTS Interactive Markets create this experience in an educational setting.

Here is how they work:

- What is traded is specified in a trading case (we offer over 30 tried and tested [cases](#))
 - You can easily create your own
- The instructor selects the case and starts the market (the markets are easy to run)
- Student's trade with each other in a competitive market: they submit bids and asks, buy and sell orders. Trade execution is instant, and after each trading period (of a few minutes), everyone gets immediate feedback on their performance.
- The trading cases have clear learning objectives
- The simulation is repeated a few times to give the markets time to converge and for the learning to become apparent,

Variations you can run include:

- Continuous double auctions
- Call markets, including pre-opening calls
- Pure order driven markets
- Pure quote driven markets
- A privately negotiated market
- A market with block trade requirements
- You can have all prices and orders determined endogenously by the student traders
- You can have them trade against an exogenous price process, including a replay of historical data
- You can have an exogenous order flow into the market
- You can allow private and public communication among the traders
- You can request forecasts and other information from the traders prior to trading
- You can run an ethics simulation and insider trading markets

What do students get out of it?

- *First*, they experience what it is like to be a trader, how a market really works. They get an intuitive understanding of the price discovery process, market efficiency, market impact, liquidity, and many other practical aspects of a financial exchange. They get a strong understanding of financial instruments; the [cases](#) cover a broad range of instruments, including stocks, bonds, options, forwards, futures, swaps, currencies, ...
 - It has proven to be one of the best ways to teach time value of money, market efficiency, option pricing, and forwards and futures.
- *Second*, they can go much further and **develop financial modeling skills in Excel**. The trading cases are designed to build the conceptual, analytical and modeling skills of students in this exciting, experiential learning environment. They can prepare their trading strategy as explained in the [Student Case Preparation Manual](#) which deepens their understanding of the valuation of securities as well as their use in portfolio management. This has the side benefit of helping developing modeling skills in Excel
- *Third*, they can learn to develop and implement [program trading strategies](#) using Excel functions and VBA. This is truly exciting and different: it is not back-testing, and it is not testing a “paper trading” strategy. The strategy is played out in a real market, so you have to think about how others will react to your actions and build in your reaction.

The Trading Cases

- We offer a rich set of over [thirty tried and tested trading cases](#) that are [simple to integrate](#) into and complement existing courses. It is also easy to create your own cases, and we can help you with that.
 - We now have a new [ethics](#) case that has application beyond finance courses.
 - A variety of [microstructure treatments](#) provide a rich framework for understanding liquidity, transparency, market impact, and the dynamic nature of markets. You can run a double auction market, quote and order driven markets, specialist markets, as well as call markets.
 - This system is also used for [experimental market research](#).
 - It has been used successfully around the world for over 20 years.
 - It is simple to run, reliable, and can handle large markets.

Easy to run, scalable

- The markets are easy to run, summarized in the [Quick Start Instructions](#) (you can also print out [this PDF file](#)). You can practice running a market on your own computer at home. We will be happy to conduct a web meeting to lead you through the basics, including suggestions on how to explain the system to students and get started.
- We have run markets with over 200 students participating at the same time; they can trade from their own computers or in a computer lab. They don't have to be in the same physical location (but must be connected to the internet).

Experimental Research

The FTS Interactive Markets are used for conducting market and behavioral experiments. They support a wide range of [microstructure treatments](#). We also have a second “general” [experimental system](#) that lets you conduct a wide range of non-market experiments.

The Cases and Concepts

The standard cases [are listed here](#), where you can read the case descriptions by clicking on each case. The next table shows the cases by subject matter:

Fixed Income Cases	Market Efficiency, CAPM Diversification and CAPM	Binomial Option Cases	Option Hedging Cases	Index Futures, Covered Interest Parity, Swap Cases
Case B01	Case RE1	Case OP1	Case ST1	Case IN1
Case B02	Case RE2	Case OP2	Case ST2	Case IN2
Case B02A	Case RE3	Case OP3	Case XR1	Case FX1
Case B03	Case CA0	Case OP4	Case XR2	Case FX2
Case B03A	Case CA1	Case OP9	Case RM1	Case SW1
Case B04	Case CA2			
Case B05	Case CA3			
Case B06				

The first case in a series is usually quite simple, and the cases increase in complexity. We also have a collection of many additional cases, usually created in response to an instructor’s need, and we also help create cases for instructors interested in exploring topics not covered by our standard cases.

Course Integration

Integration into courses such as financial management and investments as well as derivative courses is straightforward:

- When you teach time value of money, run cases B01 and B02
 - These focus on understanding the cash flows from coupon and zero coupon bonds, present and future values
- When you teach duration, run case B04
 - The case requires students to hedge a bond portfolio against shifts in the yield curve
- When you teach market efficiency, run cases RE1 or RE2 and then RE3
 - These cases focus on information aggregation: do prices reveal information?
- When you teach risk and return, run cases CA1 and CA3
 - These cases focus on determination of risk premiums and the effect of risk aversion
- When you teach the binomial option pricing model, run cases OP1, OP2, and OP3

- These cases take students through pricing and hedging in the single and multi period binomial models
- When you teach option hedging, use the continuous time option cases with their spreadsheet support (ST1, XR1)
 - These cases focus on using Black-Scholes calculators for hedging
- When you teach forwards and futures, you can use case B03 to start, then a selection from IN1, FX1, SW1
 - These include index futures, currency futures, and swaps
- Finally, a capstone risk management case is RM1
 - This case brings together forward rate agreements with interest rate caps and floors and their role in risk management.

Again, you get a clear idea of how students learn by focusing on how they prepare for cases, as described in the [Student Case Preparation Manual](#). Participation in an FTS Interactive Market trading session leads to an understanding of:

- market impact and price discovery
- the informational role of markets
- security valuation
- risk return tradeoffs
- the role of future cash flows
- opportunity costs
- arbitrage
- expectations
- attitudes toward risk
- market dynamics

The New Trading Screen:

FTS Trader Number: 99, connected on: 22 Version: v8.5 Market IP: ftsmarket1.dyndns.org

File Options Messaging Book Colors Font Size Layout **Excel Link** Program Trading Help

Trial: 2 Period: 2 Trading Name: Grade: 18.85064, Cum
 Time Left: 36 Case Name: B02 Market Value: 148360
 Cash: 61399.99999 Risk Free Rate: Rank

Security	Bid	Ask	Last	Position	Pay
Cp Bnd	95.10/4,270	104.00/17,840	104./100.	100.	
Zero 1				500.	
Zero 2	90.30/1,000	90.69/100	90.4/100.	500.	
Zero 3	78.20/100	78.40/5,280	78.4/200.	400.	

Bid	Bid Qty	Bid ID	Ask	Ask Qty	Ask ID
95.10	4,270	asdf	104.00	17,840	teamtrek2
95.00	290	giveme\$			
95.00	100	Tapper ...			
95.00	100	red			
95.00	200	R&B			

Trial	Period	Time	Security	Price
2	2	37	Cp Bnd	104.
2	2	37	Cp Bnd	104.
2	2	37	Cp Bnd	104.
2	2	37	Zero 2	90.4

Trial	Period	Time	Security	Trade
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Price: [] Submit Bid Sell to Bid Clear Bids
 Quantity: [] Submit Ask Buy at Ask Clear Asks

Price Chart: Y-axis 94-106, X-axis 0-240. Shows a sharp spike at time 200.

The Original "Classic" Trading Screen

FTS Trader Number: 103, connected on: 347 Version: v8.5 Market IP: ftsmarket1.dyndns.org

File Edit Support Options Book Messaging Help

Trial: 1 Period: 1 Trading Name: Trader103 Grade: 0, Cum Grade: 0
 Time Left: 106 Case Name: B02 Market Value: 142021.4
 Cash: 25329.5 Risk Free Rate: 0.040000 Ranks: 0.0, .00

Security Name	Bid	Ask	Position	Last	Payoff
Cp Bnd	100.5/100	100.8/50	100.	99.	
Zero 1		96.8/500	350.	96.2	
Zero 2	87.51/90	88.75/20*	490.	87.71	
Zero 3	75.46/50	76./50*	400.	75.36	

Trial	Period	Time	Security	Last Price	Last Qty
1	1	109	Zero 2	87.71	50.
1	1	110	Zero 1	96.2	10.
1	1	110	Zero 1	96.5	50.
1	1	113	Zero 2	87.71	30.
1	1	114	Zero 3	75.36	100.
1	1	114	Zero 3	75.36	500.
1	1	115	Zero 2	87.71	10.

Trial	Period	Time	Security	Trade	Price	Quantity	My Buy VWAP	My Sell VWAP	Market VWAP
1	1	124	Zero 1	Sell	96.2	40.	0.	96.28	96.3411
1	1	124	Zero 1	Sell	96.3	10.	0.	96.30909	96.3413
1	1	125	Zero 1	Sell	96.3	40.	0.	96.31	96.34212
1	1	125	Zero 1	Sell	96.4	10.	0.	96.31667	96.34183
1	1	126	Zero 1	Sell	96.3	50.	0.	96.3	96.3429
1	1	141	Zero 2	Sell	88.75	10.	0.	88.75	90.0281

Price: 76 Submit Bid Sell to Bid Raise .01 Raise 0.1 Raise 1.0
 Quantity: 50 Submit Ask Buy at Ask Lower 0.01 Lower 0.1 Lower 1.0
 Exercise Options Clear Bids Clear Asks Clear All
 Private Trade Transfer Cash Out

Mkt VWAP: 76.08458 My Buy VWAP My Sell VWAP

Bid	Bid Qty	Bid ID	Ask	Ask Qty	Ask ID
75.46	50	trademaster	76.	50	Trader103
75.36	300	asdf			
75.	10	Palpatine			

Price Chart: Y-axis 71.59-93.53, X-axis 1-240. Shows price fluctuations with a red bid line and a cyan ask line.

1 Bid: 75.46 Ask: 76.00 Last: 75.36 240

All trades are shown in the middle; your trades are shown above

In both, going clockwise, you can see the “price montage” at the top left showing shows the best bid-offer for each security. The trade entry area is to the right, followed by the blue box where trader-specific and public information is displayed. Just below it are the limit order books, followed by a real-time price chart. Trade confirmations, as well as all trades, are shown in the tables on the left.

Other features include a real time link to an Excel workbook. Students can design trading support in Excel. Developing trading support is an essential part of the learning, and you can see the strength of this approach from the [Student Case Preparation Manual](#). This shows you what they learn and how they learn.

The program trading capability (in the new interface) is summarized in [this document](#). The strategy is implemented in Excel/VBA, but advanced users can create their own add-ins in other programming languages.

Market Microstructure

You can also let students experience different market types, such as call markets, the (default) double auction market, specialist markets, even a completely non-transparent private trade market, in which every trade is privately negotiated; with each variation, your students can experience the effect of the market structure on price discovery. There is almost no other way to provide this experience.

Concepts

The next few tables show the concepts covered by the standard cases.

	BO1	BO2	BO2A	BO2R	BO3	BO3A	BO4	BO5	BO6
Opportunity Cost of Capital	X	X	X	X	X	X	X	X	X
Arbitrage	X	X	X	X	X	X	X	X	X
Price Discovery	X	X	X	X	X	X	X	X	X
Time Value of Money	X	X	X	X	X	X	X	X	X
Future Spot Rates and Bond Prices	X	X	X	X	X	X	X	X	X
Price and Spot Rates by Maturity		X	X	X	X	X	X	X	X
Cash Matching		X	X	X	X	X		X	X
Trading Forward Rates					X	X		X	X
Synthetic Security					X	X		X	X
Interest Rate Uncertainty			X	X		X	X	X	X
Bond Quotations: T-Bills				X					
Bond Quotations: T-Notes				X					
Private Information/ Market Efficiency			X	X		X			X
Public Information/Fixed Income Market Efficiency									
Term Structure of Interest Rates		X	X	X	X	X	X	X	X
Duration and Convexity							X		

Delta Hedging			X	X						
Black Scholes World						X	X	X	X	
Black Scholes OPM						X	X	X	X	
Applying the "Greeks"						X	X	X	X	

