

What Drives Success in Derivatives Markets?

Robert I. Webb

Editor, *Journal of Futures Markets*

University of Virginia

© 2018

What Drives Success in Derivatives Markets?

- The last 50 years or so has witnessed numerous financial innovations. Within the world of derivatives markets there have been some spectacular successes such as Eurodollar futures, S&P 500 e-mini futures, crude oil futures, and many, many more failures.
- What causes some futures and option contracts to be successful and others not?

What Drives Success?--The Academic Literature

- William Silber [JFM 1981] examines the development of new futures contracts. Silber [AER1983] provides a framework for understanding how financial innovations arise and emphasizes that financial innovations provide real benefits to the economy.
- Merton Miller argued in his 1986 *Journal of Financial and Quantitative Analysis* article that taxes and regulations were catalysts for financial innovations.

What Drives Success?--The Academic Literature

- Peter Tufano [2003] has noted the limited literature in this area. To some extent the situation remains unchanged.
- To be sure, there have been articles on financial innovation per se, but the focus is rarely on the process of financial innovation and developing new securities.

What Drives Success?--The Academic Literature

- Some exceptions are:
 - Mao-Wei Hung, et al 2010 article in the *International Review of Economics and Finance* entitled: “Determinants of futures contract success: Empirical examinations for the Asian futures markets”
 - Joost Pennings and Raymond Leuthold [*JIMF* 2001] who examine the impact of the introduction of new futures contracts on existing futures contracts.
 - Wade Brorsen and N’Zue Fofana 2001 *Journal of Agribusiness* article entitled “Success and Failure of Agricultural Futures Contracts.”
 - Mark Holder, Michael Tomas, and Robert Webb, "Winners and Losers: Recent Competition Among Futures Exchanges for Equivalent Financial Contract Markets," *Derivatives Quarterly*, Winter 1999.
 - Elizabeth Tashjian’s 1995 article in the *Quarterly Review of Economics and Finance* entitled, “Optimal Futures Contract Design.”

What Drives Success in Derivatives Markets?

- Rather than focusing on the limited academic literature on this topic, I will focus on some practical examples.
- I will focus on futures contracts.
- Let's begin with a discussion of product failures.

A Tale of Two Nobel Laureates' Market Advice

- Yale University Professor Robert Shiller is a co-winner of the 2013 Nobel Memorial Prize in Economic Sciences and a brilliant financial economist. He has made numerous contributions to the financial literature
- He also was an early advocate of commercial and residential property derivatives—*real estate derivatives*.
- Shiller, R.J., “Macro Markets: Creating Institutions for Managing Society’s Largest Economic Risks” Oxford University Press, 1993.

A Tale of Two Nobel Laureates' Market Advice

- The rationale was logical and persuasive.
 - Huge market
 - Real estate is the largest single asset of many Americans
 - Potential for large losses such as occurred during the GFC.
- Did market participants embrace their introduction?

A Tale of Two Nobel Laureates' Market Advice

- At best, market participants have been slow to embrace them.
- Simply stated, real estate derivatives have failed to take off.
- Why weren't *real estate derivatives* the sure-thing that they appeared to be?

A Tale of Two Nobel Laureates' Market Advice

- Shiller [2008] attributed the lack of interest in the residential real estate derivatives to a *lack of liquidity*.
- Essentially, he argues that the lack of liquidity makes potential users reluctant to trust the prices generated in the market or use the contracts for hedging.
- Shiller, R.J., “Derivatives Markets for Home Prices,” NBER Working Paper #13,962, © April 2008. <http://www.nber.org/papers/w13962.pdf>

A Tale of Two Nobel Laureates' Market Advice

- How has the real estate derivatives market been since Shiller's 2008 assessment?
- Are there other explanations?

A Tale of Two Nobel Laureates' Market Advice

- Milton Friedman was a brilliant economist who made numerous contributions to the economics literature.
- He was awarded the Nobel prize in economics in 1976.
- On a personal note, Friedman was one of the reasons why I chose to study at the University of Chicago.

A Tale of Two Nobel Laureates' Market Advice

- Friedman played a pivotal role in the creation of the first successful financial futures.

A Tale of Two Nobel Laureates' Market Advice

- Milton Friedman was honored at the 10th anniversary of the creation of the IMM in 1982.
- Friedman was concerned that Fed Chairman's Paul Volcker's monetary policy would soon lead to a resumption of high rates of inflation and suggested that the Merc introduce inflation futures.

A Tale of Two Nobel Laureates' Market Advice

- It is hard to stress enough the large impact that high inflation during the 1970s had on academic finance.
- We found significant problems with potential inflation futures and the CME decided not to introduce them.

A Tale of Two Nobel Laureates' Market Advice

- However, two of our competitors in New York did introduce inflation futures contracts.
 - CRB futures—introduced by NYBOT
 - CPI futures—introduced by Coffee Sugar and Cocoa Exchange.
- Both failed the *market test*.
- Why did they fail?

A Tale of Two Nobel Laureates' Market Advice

- If success is defined as high trading volume, then the derivatives markets proposed by Shiller and Friedman failed—at least for now.
- The effective failure of derivatives markets proposed by two brilliant Nobel Laureates highlights the difficulty in creating successful derivatives.

What Drives Success?

- What are some factors found in successful derivative markets?
- What follows is a partial list. The factors are not necessarily in order of importance. And, as you will see some factors are related.
- Consider, if you will, the life cycle of a futures contract.

The Life Cycle of a Futures Contract

- The Chicago Mercantile Exchange introduced frozen pork bellies futures on August 18, 1961.
- The purpose was to meet the risk management needs of meat packers and others in the food industry. And, it provided a vehicle for speculators willing to take the other side.

The Life Cycle of a Futures Contract

- Pork bellies futures quickly became an extremely successful commodity futures contract as measured by trading volume.
- So much so, that pork bellies futures soon became synonymous with commodity futures in the mind of the public.
- However, success is often transient.

The Life Cycle of a Futures Contract

- A shift to eating bacon year round reduced the need to freeze pork bellies for seasonal consumption and, with it, the need to protect against price risk using futures. Futures trading volumes fell as the need to hedge fell.
- Although the CME considered possible changes to save the contract, pork bellies futures were delisted on July 18, 2011.

The Life Cycle of a Futures Contract

- The rise and decline of frozen pork bellies futures illustrates the often transient nature of contract success in futures markets.
- The transient success of many contracts is also illustrated in the changing names of futures exchanges. For instance, the Chicago Mercantile division of the CME Group began life as the Chicago Butter and Egg Board.
- Egg futures are no longer traded on the CME.

The Life Cycle of a Futures Contract

- However, that does not mean that egg futures aren't viable in other countries.

The Life Cycle of a Futures Contract

- Indeed, the Dalian Commodity Exchange (DCE) has experienced tremendous success with egg futures trading.
- Last Friday, August 10, 2018, the Dalian Commodity Exchange traded over 250,000 egg futures contracts with the vast bulk trading for January 2019 delivery.
- The DCE traded 21.76 million egg futures contracts during the first 7 months of 2018. Trading volume has fluctuated – sometimes wildly-- but has grown sharply since their introduction in 2013 when 3.9 million egg futures contracts were traded.

What Drives Success?

- What type of commodities are good candidates for futures contracts?
- What drives contract success in futures markets?

What Drives Success?

- It is easy to imagine that the products that are highly successful today were always highly successful in the past.

Success Factors

1. Price Volatility

- Volatility is the lifeblood of trading. It is the friend of futures exchanges too as it encourages greater trading.
- On Saturday, October 6, 1979, Fed Chairman Paul Volcker switched from targeting interest rates to targeting the quantity of money in order to control inflation. The action precipitated large changes in interest rates which increased the need to hedge to avoid losses.

Success Factors

1. Price Volatility

- Before the Fed action, U.S. Treasury bond futures traded 4,000 contracts per day. After the Fed action, trading in U.S. Treasury bond futures contracts soared.
- In a sense, financial futures owe their early success to monetary and fiscal policy induced volatility.

Success Factors

2. The Need to Hedge

- Price volatility is important but so is the need to hedge. The earliest users of most futures contracts are dealers, or others, who have tight profit margins. A small change in price can lead to large losses.
- Exception: Certain Asian markets where trading is dominated by individual speculators with no intrinsic need to hedge.

Success Factors

2. (No) Need to Hedge (or Trade)

- Richard Sandor who vies with Leo Melamed for the title, “father of financial futures”, founded both the Chicago Climate Exchange and the European Climate Exchange.
- Both exchanges were created to trade carbon emissions. A mandatory cap and trade system exists in Europe. None exists in the U.S.

Success Factors

2. (No) Need to Hedge (or Trade)

- The European Climate Exchange was a success (at least until an over supply of carbon permits was discovered) because strict carbon emissions rules effectively mandated its use. The Chicago Climate Exchange was far less successful.
- The U.K. listed parent holding company of both exchanges was sold to ICE on April 30, 2010 for £395 million or almost \$600 million at the time.

Success Factors

2. (No) Need to Hedge (or Trade)

- So why was the Chicago Climate Exchange a failure and the European Climate Exchange a success (at least for awhile)?

Success Factors

3. Public Order Flow

- Ignoring transaction costs, derivatives trading is a zero-sum game.
- The importance of public order flow (particularly from bona fide hedgers).
- This is most easily seen in a pit environment where without public order flow floor traders are simply “picking each other’s pockets.”

Success Factors

3. Public Order Flow

- Some observers argue that 30%-40% of trading volume in open outcry markets was done by locals trying to “scalp” the market.
- Consider the battle between the open outcry traded LIFFE bund futures market and the electronically traded Deutsche Termin Boerse bund futures market.
 - LIFFE was formed in September 1982.
 - DTB was formed in January 1990.
 - DTB became the dominant bunds futures market in late 1997.

Success Factors

4. Good Contract Design

- Good contract design is critical to success.
- The contracts should not create new profit opportunities for those with knowledge of the contract specifications or favor one party.
- Similarly, the rules that govern trading may need to change to prevent abuse.

Success Factors

4. Good Contract Design

- Simply put, traders should be incentivized towards determining the best price rather than taking advantage of other traders who are unaware of the contract design quirks during expiration.

Success Factors

- Although it may seem hard to believe now, there was a widespread belief in the early 2000s that the once dominant Chicago futures markets would succumb to a challenge by the Eurex's US subsidiary—Eurex USA.
- The press painted it as battle between open outcry and electronic futures trading.

Success Factors

5. First Mover Advantage

- It is difficult to introduce a futures contract when an actively traded similar futures contract exists. This is the first mover advantage.
- This is one of the reasons why EUREX—U.S.A. was defeated by the Chicago Board of Trade when it opened in 2004.

Success Factors

5. First Mover Advantage

- That said, there are instances where the first mover advantage is overcome.
- For instance, although the IMM introduced gold futures trading first in the U.S. it lost most gold trading volume to the COMEX.

Success Factors

6. Actively Traded Related Futures

- Another factor is if an exchange has actively traded related futures contracts that facilitate spread trading.
- Example: five year T-Note futures were successfully traded on the FINEX which introduced both 2 and five year T-Note futures contracts.
- However, 10 year and 30 year Treasury note futures and options were even more actively traded on the Chicago Board of Trade.

Success Factors

6. Exchange Competition and Actively Traded Related Futures

- Regulatory quirks and market microstructure differences across competing exchanges also matter.
- Another example is the loss of 30% of WTI trading to ICE from NYMEX. ICE traded the Brent futures contract and its predecessor—the International Petroleum Exchange—had secured permission to trade in the USA. The introduction of WTI trading quickly captured market share from NYMEX.
- Ultimately, it forced NYMEX into the arms of the CME when NYMEX signed a 10 year contract to use Globex in order to compete with ICE.

Success Factors

7. Liquidity

- Not surprisingly, one of the key determinants of market success is liquidity. The width of the bid ask spread is also an *implicit* cost of trading.
- Liquidity begets liquidity. In the old days, floor traders would trade new futures contracts among themselves to entice outside or public order flow. This was known as “puffing the market” and is no longer legal in the U.S.A.

Success Factors

7. Liquidity

- Market liquidity can also impact the choice of hedging vehicle.
- For instance, the market may prefer a “good” hedging vehicle to the “perfect” hedging vehicle if the “good” hedging vehicle is more liquid.

Success Factors

7. Liquidity

- For example, the perfect hedge for CBOE's S&P100 option market makers was the CME's S&P 100 stock index futures contract.
- Yet, when given the choice, CBOE option market makers chose to hedge with the S&P 500 stock index futures instead.
- Lesson: “Don't let the perfect be the enemy of the good.”

Success Factors

7. Liquidity

- Similarly, there are lots of different grades of oil yet the world focuses on two benchmark futures contract prices: WTI and Brent.
- Attempts to introduce other benchmarks— such as the Oman crude oil futures contract on the Dubai Mercantile Exchange—have failed. Trading volume on the DME is a small fraction of either ICE or NYMEX.

Success Factors

8. Lower Cost of Trading

- People respond to economic incentives. Not surprisingly, the same is true of traders. *Explicit* trading costs matter.

Success Factors

8. Lower Cost of Trading

- One of the factors that allowed the largely open outcry traded CBOT to prevail against the deep-pocketed all electronically traded EUREX in 2004 is that it cut brokerage commissions for traders right before EUREX started to trade.

Success Factors

9. Speculative Interest

- Just as it is important to have interest from bona fide hedgers it is also important that the contract attract the interest of speculators.
- Having a large base of individual speculators willing to risk their own capital as in places like Chicago facilitates the introduction of new contracts but does not guarantee their success.
- The public doesn't like to go short.

Success Factors

9. Speculative Interest

- Having speculators willing to risk their own capital is very important. Large institutions sometimes become risk averse just when the market needs them most.
- On October 20, 1987, in the wake of the stock market crash the day before, U.S. Treasury bonds experienced the largest one-day rally ever. Futures were lock limit up. No primary government securities dealer would make a market for T-bonds (even to the World Bank) because the futures market was closed.

Success Factors

10. Timing

- Timing is everything in trading. It is also important in listing new contracts.
- One little known fact is that FX futures were introduced in 1970 by the International Commodity Exchange in New York—no relationship to the Intercontinental Exchange or ICE today. They were the first financial futures. And FX futures failed. The first successful FX futures were introduced on the IMM Division of the CME in 1972. Timing is everything.

Success Factors

10. Timing

- It is possible that Milton Friedman's inflation futures contracts were simply introduced at the wrong time.

The Life Cycle of a Futures Contract

- Success is often transient. The introduction of new contracts sometimes diminishes or eliminates the need for even heavily traded existing contracts.
- T-bills were at one time the most important financial futures contract traded on the CME. The introduction of Eurodollar futures contracts led to the eventual replacement of T-bill futures as the dominant short-term interest rate futures contract in the U.S.A.

Success Factors

- 1. Price Volatility
- 2. The need to hedge
- 3. Public Order Flow
- 4. Good contract design
- 5. First mover advantage
- 6. Actively traded related futures

Success Factors

- 7. Liquidity
- 8. Low (explicit) trading costs
- 9. Speculator interest
- 10. Timing
- To be sure, other factors might be added to this list.

What Drives Success in Derivatives Markets?

- Finally, we should keep in mind that product failure is common and not unique to derivatives markets.
- Failure is common in the introduction of new products by established firms in other industries.
- Why should derivatives markets be different?

What Drives Success in Derivatives Markets?

- Thank you for your kind attention.
- I would be happy to answer any questions you might have.