“Any time you take a chance you better be sure the rewards are worth the risk because they can put you away just as fast for a ten dollar heist as they can for a million dollar job.”

Stanley Kubrick, “The Killing” (1956)

Behavioral Skew and Equity Options Volatility. Risk and Reward.

A Trader's Perspective

Scott Nations
Head Trader, Fortress Trading

Option pricing models take into account:

- Price of the underlying contract/security
- Exercise price of the option
- Time to expiration
- Volatility of the underlying security/contract
- Risk free rate of return

What is volatility?

Volatility is the speed with which the market moves.

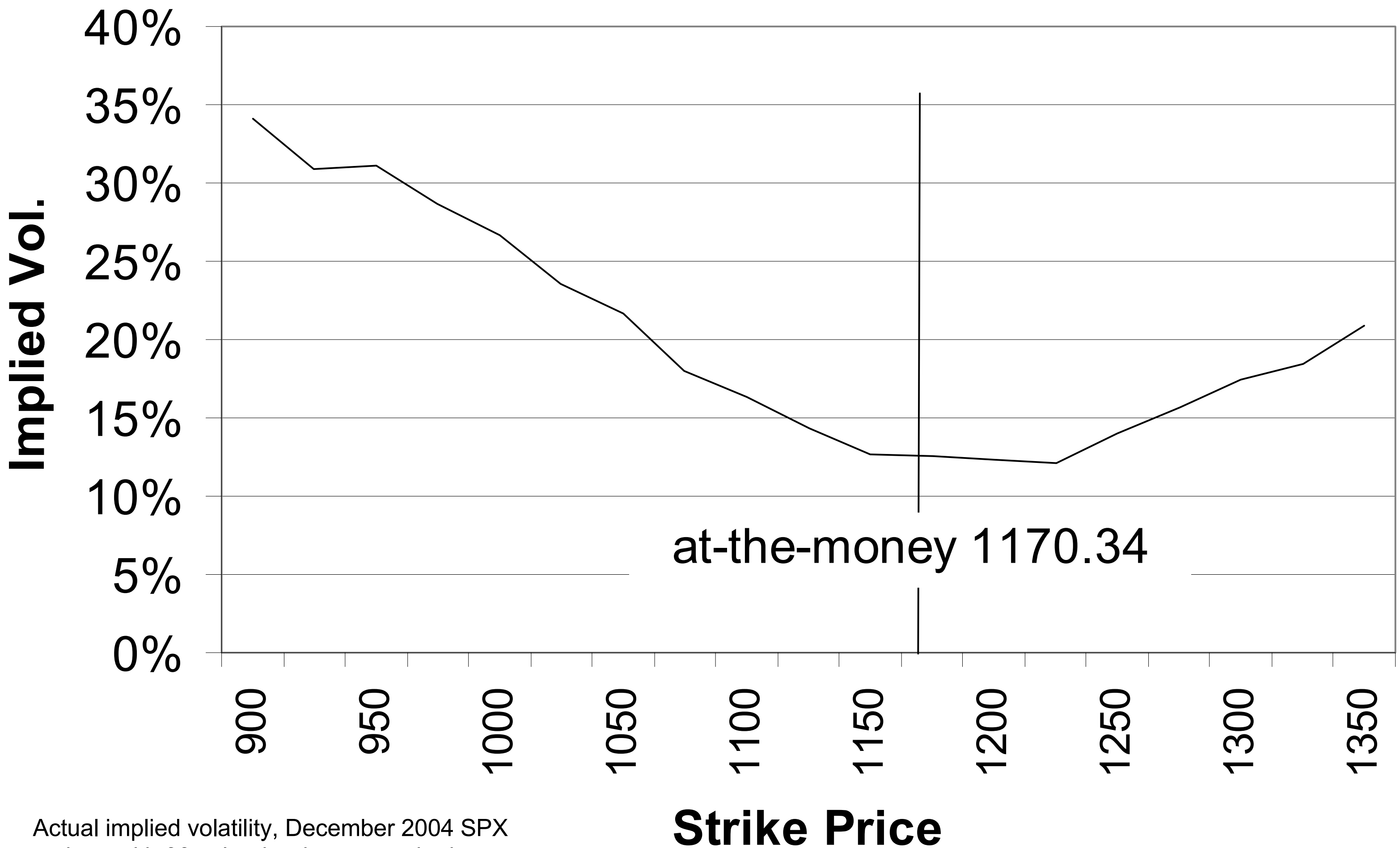
Volatility is the major variable of option pricing from a trader’s perspective. Most option traders would say they are actually volatility traders.

What is volatility skew?

Volatility is a property of the underlying instrument and the same implied volatility value should be observed across all options on the same instrument.

However, actual option prices imply different volatilities…

SPX Volatility Skew



Actual implied volatility, December 2004 SPX options with 30 calendar days to expiration

Why does this skew exist?

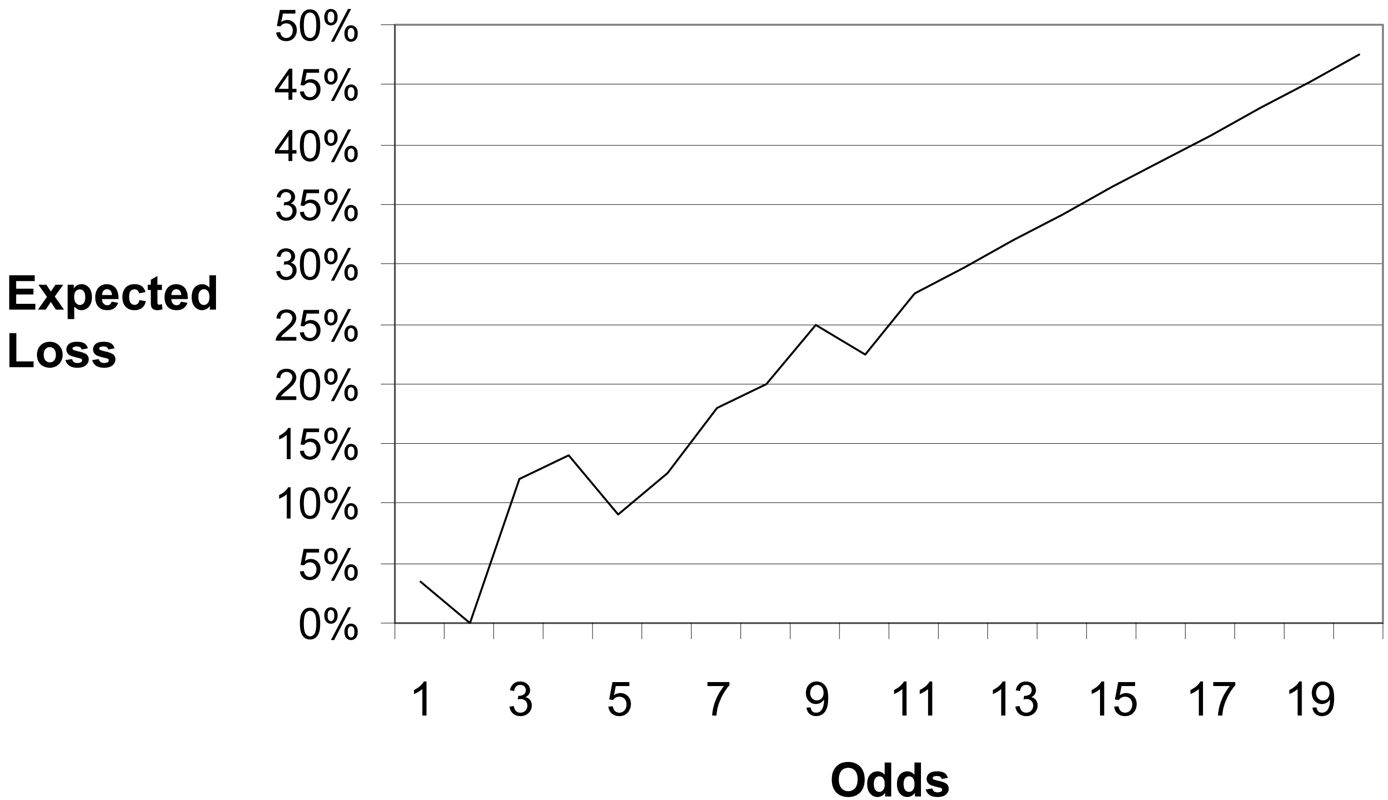
Let’s concentrate on put skew since it is the most severe.

- Excess demand by put buyers
- Lack of supply by put sellers
- Other issues

Excess put option demand

- Hedging downside risk
- Long shot/Favorite bias
  - Investors overestimate the odds of a crash while underestimating the odds of S&P rising 10%
- Fat tails
- Floor option position manager games

The Long Shot Bias



Empirical Evidence on the Preferences of Racetrack Bettors,
Jullien & Salanie, Sept. 2002

Put option demand

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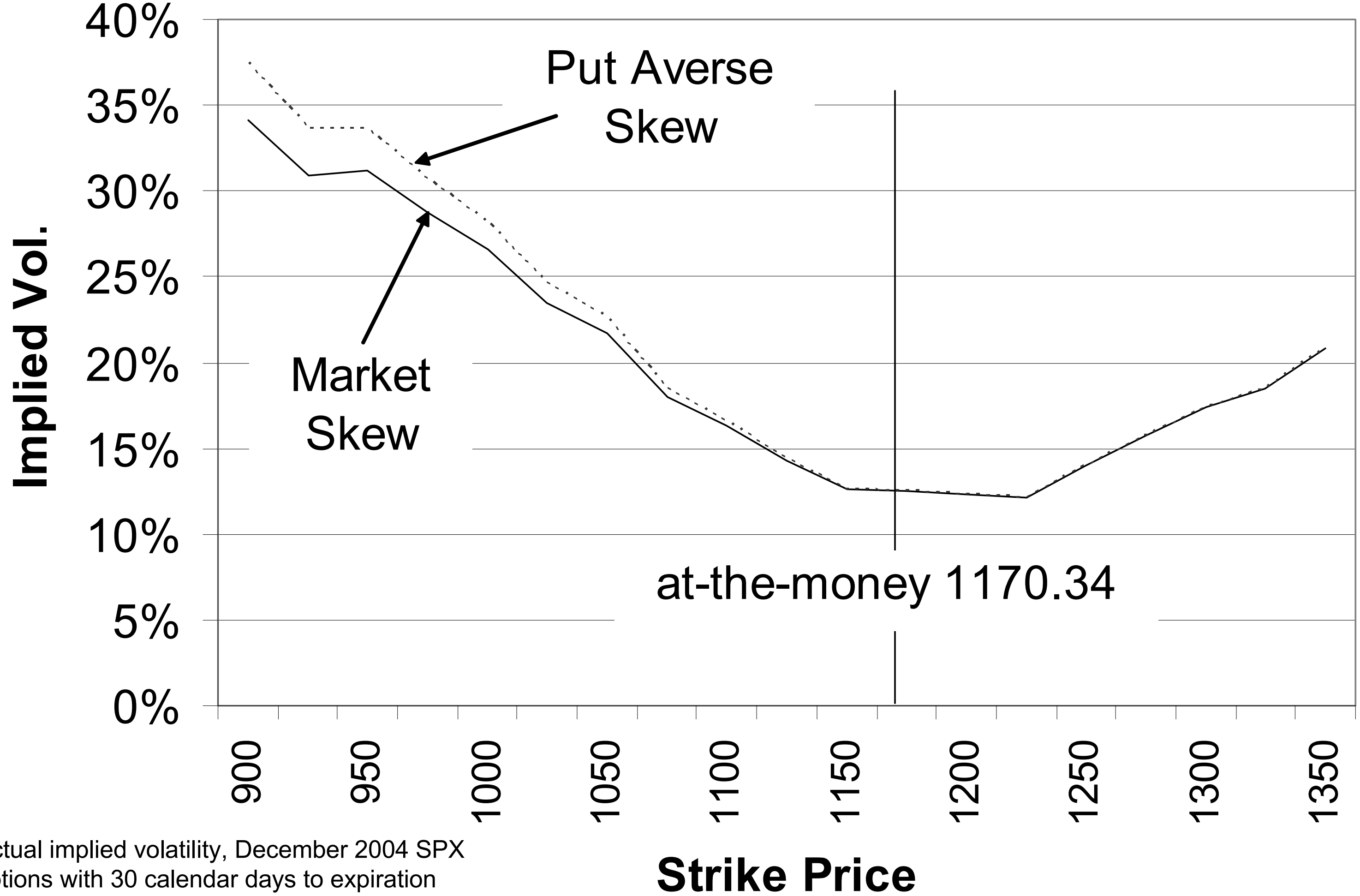
SPX Volatility Skew



Actual implied volatility, December 2004 SPX options with 30 calendar days to expiration

Put option supply, or lack thereof

- Market makers and prop traders
- Individual investors
- Institutional investors (mutual funds)
- Everyone’s going out of business risk

Put option supply

- Market Makers and Proprietary Traders
  - Very few are willing to consistently short puts

    “Great way to get rich slowly and broke quickly”

  - Employer/backer resistance
  - Clearing firm resistance
  - Option models and ‘junky’ puts

Put option supply

- Individual investors
  - Broker “reluctance”
    - Strategy is sound
    - Broker’s own risk/reward calculation

Put option supply

- Institutional Investors (Mutual Funds)
  - Filings and Shareholder approvals for new strategies
    - Shareholder approval via proxy
    - Amend registration statement and prospectus
    - Obtain SEC approval
  - Only option selling strategies allowed are:
    - Writing covered calls
    - Writing covered puts

Put option supply

- Going out of business sale
  - LTCM – Just a big vol. selling trade
- Put sellers viewed with disdain

Conclusions

- Skew exists because of:
  - Behavioral issues
  - Market structure issues