

Those Sellers of Covered Calls

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1. Introduction

Here I attempt to show that there exists a systematic bias that underprices deep out-of-the-money options in entrepreneurship and venture capital. I introduce entrepreneurs as writers of covered call options and discuss the role of oversupply and salience in pricing these options. I also discuss the role of small-sample effects in power-law environments resulting in unpricable options. Survivorship bias effects are introduced to support the persistence of this underpricing.

2. Covered Call Options

Entrepreneurs tradeoff some of their upside for cash in the early stages to help fund further development and growth. At this stage the assets that the entrepreneur has developed might consist of a prototype or simply a business plan.

Selling a fraction of the upside can be modeled as covered call writing against a fraction of the asset in question. In fact, transactions between VCs, entrepreneurs, and employees are usually in the form of stock options and this is not a new formulation of the process.

VCs buy the covered call options hoping to cash in on a future liquidity event, usually in the form of an acquisition or IPO when the call options are sold at a higher price or exercised for profit.

Extremely early stage funding can be seen as a purchase of deep out-of-the-money options while later funding cycles, from series-A through series-C can be seen as progressively more near-the-money and less "speculative" compared to the really early-stage funding.

3. Unpricable and Underpriced

3.1 Unpricable

VCs and entrepreneurs operate in a highly skewed environment where most ventures fail and few big wins make for the bulk of the returns. This results in small-sample effects completely washing out the confidence levels of the options pricing process. When entrepreneurs write the covered options, the price they set for it cannot be regarded as "fair," "overpriced," or "underpriced" a priori.

Any attempt to price deep out-of-the-money options represent an attempt at arriving at a probability for a specific rare-event (actually an integral over a series of successive rare-events). Any price that is arrived at will have negligible data points to support the valuation, since only a handful of companies go on to become massive.

Any attempt at extrapolating a model based on a stable power-law distribution will be similarly weak because of small-sample effects marring the estimation of the tail-exponent (Weron 2001).

These effects are compounded by the fact that in technology ventures, each company is unique and rarely resembles past companies (the point of "innovation") and hence past data points may not even be valid for any form of statistical inference.

Given this, it will frequently appear that these options were "underpriced" or "overpriced" after the fact - once all parties see that the company failed or succeeded.

The more out-of-the-money the options are, the less confidence one can have on the valuation. Really early-stage valuations are necessarily of low confidence.

So these options are unpricable and end up being mispriced. The next section shows that there is a persistent bias that makes the options underpriced.

3.2 Oversupply

Since entrepreneurs are writing calls on fractions of the asset, they will still share in the upside if the company does go on to do well. Entrepreneurs realize that a companies success usually hinges on some influx of capital in the early stages to build momentum.

Furthermore, in the last decade there has been an oversupply of entrepreneurs willing to startup risky ventures in return for the potentially massive upside. As one goes down the asset size from a well-developed prototype to still brewing idea, the supply only increases. There are many more entrepreneurs with barely working prototypes than entrepreneurs with well-developed market-tested products. As one goes deeper out-the-money, one will find more and more covered call sellers.

So the oversupply tends to get higher as one gets more speculative.

Survivorship bias plays a crucial role in skewing entrepreneurs towards overoptimistic risk-taking since they fail to account for the cemetery of failed companies. Hollywood offers an even more absurd form of this bias with inordinate attention being payed to a few wealthy and "successful" celebrities. This results in a vast pool of aspiring actors vying to capture the massive upsides evident in these environments. The same applies to publishing and other environments that show massively skewed successes but make it difficult to sample the failures.

3.3 Underpricing

The combination of an oversupply of these options and the inherent difficulty (impossibility) in arriving at a calibrated price result in early-stage valuations being underpriced. With limited venture capital to go around (relative to number of early-stage tinkerers), the oversupply of call options will tend to push prices downwards. And with the massive uncertainty around "fair" valuations, the transaction will usually favor the VC.

Another factor that allows VCs to negotiate from a position of strength is the lack of liquidity that would prevent accurate price discovery even if the options were priceable.

Note that both these effects (unpricable and oversupply) become more pronounced as one gets more and more speculative and goes deeper out-of-the-money. The more speculative the venture, the more underpriced these options will tend to be.

3.4 Salience

There are some instances where these options can tend to become overpriced.

First, options written in really-late stage funding cycles run the risk of being overpriced. The VCs begin to lose their edge as the funding cycle progresses. The final set of investors, stock market participants, can overpay for an IPO by large amounts.

Second, if a fad is running through the VC community or if there is a "sure thing" that is up for funding, investors will almost certainly overpay for the options. Options on salient rewards are usually overpriced. Often, with a "sure thing," there is an oversupply of VCs instead of entrepreneurs. The edge moves towards the entrepreneurs.

"Sure things" in the movie and publishing world result in massive advance payments to actors and writers. These are almost always overpriced payouts. This practice reduces the return on investment for the bigger movie studios to a measly 4% - not at all commensurate with the risk levels they are exposed to.

4. Diversification & Conclusion

The presence of power-law tails in entrepreneurship makes diversification a crucial, nay, necessary ingredient for success and risk management. In fact, from a technical perspective, results become more linear with the number of investments as opposed to the amount invested in each bet. This has to do with the tail-exponent falling below unity for a portfolio of deep out-of-the money options, thus exposing the portfolio owner to an unstable and growing sample mean. This is discussed in another essay.

The underpricing of deep out-of-the-money options results from a combination of

oversupply of covered call writers and the inherent uncertainty in pricing tail options in modern environments. This is a persistent human bias that emerges from our inability to draw inferences from skewed non-gaussian distributions of success and implies that massively diversified, speculative out-of-the-money investments can be used to make asymmetric bets while being protected against large draw-downs.