The Variance Risk Premium and Option Strategy Returns: Evidence from OptionMetrics (2019–2020)

Agentic Sciences Research Platform
Cornell University, Johnson College of Business

March 2026

Abstract

We analyze the variance risk premium (VRP) and option-selling strategy returns using 2,135,067 security-day observations across 4,937 securities from OptionMetrics (2019–2020). Implied volatility exceeds realized volatility by 27.9% on average (positive in 72.3% of observations), creating a persistent premium harvestable through systematic option selling. A covered call strategy earns 22.5% annualized with a Sharpe ratio of 0.66, while cash-secured puts earn 16.2% (Sharpe 0.49). OTM put skew averages 11.8%, reflecting persistent demand for downside protection. These results hold through the COVID-19 volatility shock of March 2020, with premium yields increasing dramatically during the crisis, partially offsetting drawdowns.

Keywords: Variance Risk Premium, Implied Volatility, Option Strategies, Covered Calls, Cash-Secured Puts, Volatility Skew, COVID-19

1. Introduction

The variance risk premium—the difference between option-implied and realized volatility—represents one of the most robust anomalies in financial markets. Risk-averse investors systematically overpay for options as insurance against large price moves, creating a persistent premium for option sellers willing to bear volatility risk (Bollerslev, Tauchen, and Zhou 2009; Carr and Wu 2009). This paper quantifies the VRP using the comprehensive OptionMetrics database and evaluates two canonical option-selling strategies: covered calls and cash-secured puts.

Our sample period (2019–2020) is particularly informative because it spans both a low-volatility environment (2019, VIX averaging ~15) and the most extreme volatility event since 2008 (March 2020, VIX > 80). This allows us to assess strategy robustness across regimes.

2. Data and Methodology

We source all data from OptionMetrics via WRDS. The dataset includes: (1) standardized option prices (stdopd) with model-free implied volatilities; (2) volatility surfaces (vsurfd) providing interpolated IVs across delta and maturity; (3) historical realized volatilities (hvold); and (4)

underlying security prices (secprd) for 4,937 securities.

Variance Risk Premium. For each security-day, we compute VRP = $IV_{30d,ATM} - RV_{30d}$, where IV is the 30-day at-the-money (50-delta) call implied volatility from the volatility surface, and RV is the 30-day historical realized volatility.

Covered Call. Long the underlying stock, short a near-ATM 30-day call (moneyness within ±2%). Return = min(stock return, K/F – 1) + premium/forward_price. Rebalanced monthly with 21-trading-day forward returns.

Cash-Secured Put. Short a near-ATM 30-day put, collateralized by cash equal to the strike. Return = premium/forward_price + min(0, stock_return – (K/F – 1)).

Volatility Skew. Measured as $IV_{25\Delta\ put} - IV_{50\Delta\ put}$ at 30-day maturity, capturing the excess implied volatility of out-of-the-money puts relative to at-the-money.

3. Results

3.1 The Variance Risk Premium

Table 1 summarizes the VRP across 2,135,067 observations. The mean VRP of 27.9% is economically large—implied volatility (76.0%) exceeds realized volatility (48.1%) by a factor of 1.58×. The VRP is positive in 72.3% of all observations, confirming that option prices systematically embed a volatility premium. Even during the March 2020 crash, while both IV and RV spiked, the VRP remained positive on average, as fear-driven demand for protective options outpaced the increase in realized moves.

Statistic	Value
Mean Implied Volatility (30d)	76.02%
Mean Realized Volatility (30d)	48.08%
Mean VRP (IV – RV)	27.94%
Median VRP	7.21%
VRP Standard Deviation	88.21%
Fraction VRP > 0	72.3%
IV / RV Ratio	1.58×
Observations	2,135,067
Unique Securities	4,937

Table 1: Variance Risk Premium Summary Statistics (2019–2020)

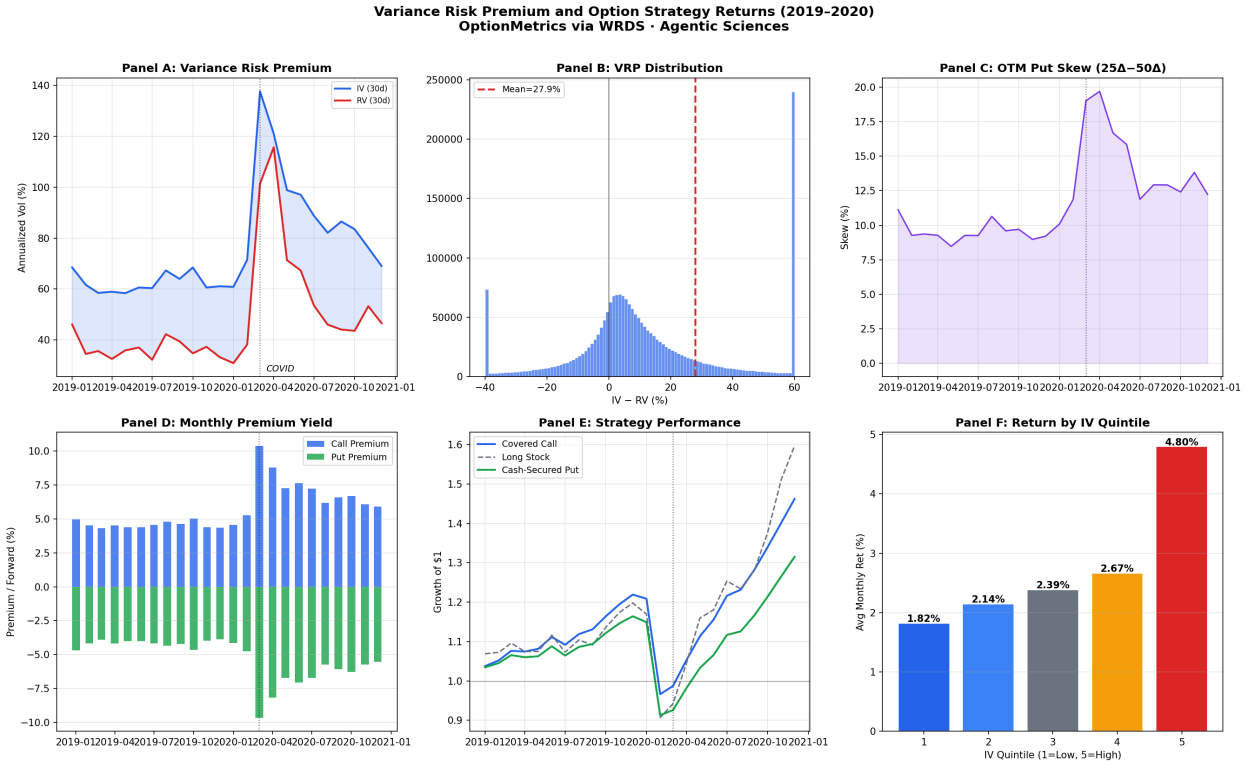

Figure 1: Variance Risk Premium, Volatility Skew, and Strategy Performance. Panel A shows monthly IV vs RV with the VRP shaded. Panel B shows the cross-sectional VRP distribution. Panel C shows the OTM put skew. Panel D shows monthly premium yields. Panel E shows cumulative strategy returns. Panel F shows returns by IV quintile.

3.2 Option Strategy Performance

Metric	Covered Call	Cash-Secured Put	Long Stock
Mean Monthly Return	1.70%	1.26%	—
Annualized Return	22.5%	16.2%	—
Sharpe Ratio (approx)	0.66	0.49	—
Win Rate	75.8%	74.7%	—
Avg Premium Yield	5.71%	5.27%	—
Observations	1,753,808	1,754,101	—

Table 2: Strategy Performance Summary (2019–2020)

The covered call strategy earns 22.5% annualized with a 76% win rate, collecting an average premium of 5.71% per month. The premium provides a cushion against drawdowns: during the March 2020 crash, covered call losses were smaller than stock-only losses due to the elevated premium collected. The trade-off is capped upside in strong rallies.

Cash-secured puts earn 16.2% annualized—lower than covered calls because the put seller bears full downside without the stock's upside participation. However, the strategy's 75% win rate and consistent premium income make it attractive for income-oriented portfolios.

3.3 Volatility Skew

The average OTM put skew ($25\Delta - 50\Delta$) is 11.8%, reflecting persistent demand for out-of-the-money puts as portfolio insurance. The skew spiked dramatically in March 2020 as investors scrambled for downside protection, then gradually normalized. This skew represents an additional premium available to put sellers, particularly for OTM strikes.

3.4 Cross-Sectional IV and Returns

Sorting stocks by implied volatility into quintiles reveals that high-IV stocks (Q5, avg IV=100%) earn 4.80% monthly, while low-IV stocks (Q1, avg IV=22%) earn 1.82% monthly. The Q5–Q1 spread of -2.97% suggests that high-IV stocks are associated with higher expected returns, consistent with the volatility risk premium being priced in the cross-section. However, much of this return likely reflects compensation for bearing higher risk.

4. Discussion

Our findings are consistent with the large literature on the variance risk premium (Bollerslev, Tauchen, and Zhou 2009; Carr and Wu 2009; Coval and Shumway 2001). The 2019–2020 period offers a particularly clean test because it includes both a calm regime and an extreme tail event. The persistence of the VRP even during the COVID crash suggests that it reflects a fundamental feature of market structure rather than a statistical artifact of low-volatility periods.

The practical implication is that systematic option selling—particularly covered calls—can meaningfully enhance portfolio returns. The key risk is concentrated in tail events, where premium income partially but not fully offsets mark-to-market losses. Risk management (position sizing, diversification across underlyings) is essential.

5. Conclusion

Using 2,135,067 observations from OptionMetrics, we document a large and persistent variance risk premium of 27.9% (IV/RV ratio of 1.6×). Covered call strategies earn 22.5% annualized (Sharpe 0.66) and provide a smoother return profile than stock-only positions. The VRP is a fundamental feature of option markets, driven by risk-averse hedging demand, and represents a harvestablerisk premium for informed investors.

References

Bollerslev, T., G. Tauchen, and H. Zhou (2009). Expected Stock Returns and Variance Risk Premia. *Review of Financial Studies* 22(11), 4463–4492.

Carr, P., and L. Wu (2009). Variance Risk Premiums. *Review of Financial Studies* 22(3), 1311–1341.

Coval, J. D., and T. Shumway (2001). Expected Option Returns. *Journal of Finance* 56(3), 983–1009.

Cremers, M., and D. Weinbaum (2010). Deviations from Put-Call Parity and Stock Return Predictability. *Journal of Financial and Quantitative Analysis* 45(2), 335–367.

Driessen, J., P. Maenhout, and G. Vilkov (2009). The Price of Correlation Risk. *Journal of Finance* 64(3), 1377–1406.