

On the exit value of a forward contract

Gabriel J. Power✉, Calum G. Turvey

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Abstract

Default risk associated with forward contracts can be substantial, yet these financial instruments are widely used to hedge price risk. An objectively priced exit option on the forward contract would help reduce the likelihood of litigation associated with contract default. A method is proposed to compute the exit option's value for an arbitrary forward contract, using Black's (1976) model and option premium data. The time series dynamics of the exit option value are confirmed to be, like its underlying, well described by a martingale with heavy-tailed (Student) GARCH residuals. © 2008 Wiley Periodicals, Inc. *Jrl Fut Mark* 29: 179–196, 2009

BIBLIOGRAPHY

Asplund, N. M., Forster, D. L., & Stout, T. T. (1989). Farmers' use of forward contracting and hedging. *Review of Futures Markets*, 8, 24–37.

[Google Scholar](#)

Baillie, R. T., & Myers, R. J. (1991). Bivariate GARCH estimation of the optimal commodity futures hedge. *Journal of Applied Econometrics*, 6, 109–124.

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Black, F. (1976). The pricing of commodity contracts. *Journal of Financial Economics*, 3, 167–179.

[Web of Science®](#) | [Google Scholar](#)

Black, F., & Scholes, M. (1973). The pricing of options and corporate liabilities. *Journal of Political Economy*, 81, 637–654.

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Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics*, 31, 307–327.

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Bollerslev, T. (1987). A conditionally heteroskedastic time series model for speculative prices and rates of return. *The Review of Economics and Statistics*, 69, 542–547.

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Bollerslev, T., & Wooldridge, J. M. (1992). Quasi-maximum likelihood estimation and inference in dynamic models with time varying covariances. *Econometric Reviews*, 11, 143–172.

 | [Google Scholar](#) |

Bunch, D. S., & Johnson, H. (2000). The American put option and its critical stock price. *The Journal of Finance*, 55, 2333–2356.

 | [Web of Science®](#) | [Google Scholar](#) |

Campbell, J. C., Lo, A., & MacKinlay, C. (1997). *The econometrics of financial markets*. Princeton, NJ: Princeton University Press.

 | [Google Scholar](#) |

Carr, P., Jarrow, R., & Myneni, R. (1992). Alternative characterizations of American put options. *Mathematical Finance*, 2, 87–106.

 | [Google Scholar](#) |

Carter, C. A. (1996). Government rail car regulation and the price of canola. *American Journal of Agricultural Economics*, 78, 677–686.

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Covey, T., & Bessler, D. A. (1995). Asset storability and the informational content of inter-temporal prices. *Journal of Empirical Finance*, 2, 103–115.

 | [Google Scholar](#) |

Danthine, J. P. (1977). Martingales, market efficiency and commodity prices. *European Economic Review*, 10, 1–17.

 | [Web of Science®](#) | [Google Scholar](#) |

Davis, T. D., Patrick, G. F., Coble, K. H., Knight, T. O., & Baquet, A. E. (2005). Forward pricing behavior of corn and soybean producers. *Journal of Agricultural and Applied Economics*, 37, 145–160.

[Google Scholar](#)

Diebold, F. X., & Nerlove, M. (1989). The dynamics of exchange rate volatility: A mul-tivariate latent factor ARCH model. *Journal of Applied Econometrics*, 4, 1–21.

[Web of Science®](#) | [Google Scholar](#)

Engle, R. F. (1982). Autoregressive conditional heteroskedasticity with estimates of the variance of U.K. inflation. *Econometrica*, 50, 987–1008.

[Web of Science®](#) | [Google Scholar](#)

Faust, J. (1992). When are variance ratio tests for serial dependence optimal? *Econometrica*, 60, 1215–1226.

[Web of Science®](#) | [Google Scholar](#)

Goncalves, S., & Kilian, L. (2004). Bootstrapping autoregressions with conditional het-eroskedasticity of unknown form. *Journal of Econometrics*, 123, 83–120.

[Web of Science®](#) | [Google Scholar](#)

Hanson, D. K., & Pederson, G. (1998). Price risk management by Minnesota farmers. The Agricultural Economist, No. 691, Winter 1998. University of Minnesota Extension Service.

[Google Scholar](#)

Ingersoll, J. E. (1987). *Theory of Financial Decision Making*. Totowa, NJ: Rowman & Littlefield.

[Google Scholar](#)

Jacka, S. (1991). Optimal stopping and the American put. *Mathematical Finance*, 1, 1–14.

[Google Scholar](#)

Kim, I. J. (1990). The analytic valuation of American options. *Review of Financial Studies*, 3, 547–572.

[Web of Science®](#) | [Google Scholar](#)

Kim, J. H. (2006). Wild bootstrapping variance ratio tests. *Economics Letters*, 92, 38–43.

[Web of Science®](#) | [Google Scholar](#)

Lo, A., & MacKinlay, C. (1988). Stock market prices do not follow random walks: Evidence from a simple specification test. *Review of Financial Studies*, 1, 41–66.

[Web of Science®](#) | [Google Scholar](#) |

Lo, A., & MacKinlay, C. (1989). The size and power of the variance ratio test in finite samples: A Monte Carlo investigation. *Journal of Econometrics*, 40, 203–238.

[Web of Science®](#) | [Google Scholar](#) |

Lunde, A., & Hansen, P. R. (2005). A forecast comparison of volatility models: Does anything beat a GARCH(1,1)? *Journal of Applied Econometrics*, 20, 873–889.

[Web of Science®](#) | [Google Scholar](#) |

Merton, R. C. (1973). The theory of rational option pricing. *Bell Journal of Economics and Management Science*, 4, 141–183.

[Web of Science®](#) | [Google Scholar](#) |

Michigan Farm Bureau. (2005). Legislative issues [last accessed 7/1/2007]. <http://www.michiganfarmbureau.com/legislative>.

[Google Scholar](#) |

Moschini, G., & Myers, R. J. (2002). Testing for constant hedge ratios in commodity markets: A multivariate GARCH approach. *Journal of Empirical Finance*, 9, 589–603.

[Google Scholar](#) |

Myers, R. J., & Hanson, S. D. (1993). Pricing commodity options when the underlying futures price exhibits time-varying volatility. *American Journal of Agricultural Economics*, 75, 121–130.

[Web of Science®](#) | [Google Scholar](#) |

National Agricultural Law Center. (2005). Research articles [last accessed 7/1/2007]. <http://www.nationalaglawcenter.org/research>.

[Google Scholar](#) |

Rausser, G. C., & Carter, C. (1983). Futures market efficiency in the soybean complex. *The Review of Economics and Statistics*, 65, 469–478.

[Web of Science®](#) | [Google Scholar](#) |

Roberts, M. C. (2000). Homogenizing heterogeneous data: Inducing ARCH effects in futures data. Selected paper presented at the annual meetings of the American Agricultural Economics Association, Tampa, FL.

[Google Scholar](#)

Sephton, P. (1992). Modeling the link between commodity prices and exchange rates: The tale of daily data. *Canadian Journal of Economics*, 25, 156–171.

[Web of Science®](#) | [Google Scholar](#)

Sephton, P. (1993a). Hedging wheat and canola at the Winnipeg Commodity Exchange. *Applied Financial Economics*, 3, 67–72.

[Google Scholar](#)

Sephton, P. (1993b). Optimal hedge ratios at the Winnipeg Commodity Exchange. *Canadian Journal of Economics*, 26, 175–193.

[Web of Science®](#) | [Google Scholar](#)

Shapiro, B. I., & Brorsen, B. W. (1988). Factors affecting farmers'hedging decisions. *North Central Journal of Agricultural Economics*, 10, 145–153.

[Google Scholar](#)

Sternberg, J. S. (1994). A reexamination of put–call parity on index futures. *The Journal of Futures Markets*, 44, 79–101.

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Stoll, H. R. (1969). The relationship between put and call option prices. *The Journal of Finance*, 23, 801–824.

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Tomek, W. G., & Peterson, H. H. (2005). Implications of commodity price behavior for marketing strategies. *American Journal of Agricultural Economics*, 87, 1258–1264.

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Townsend, J. P., & Brorsen, B. W. (2000). The Cost of forward contracting hard red winter wheat. *Journal of Agricultural and Applied Economics*, 32, 89–94.

[Google Scholar](#)

Turvey, C. G. (2007). A note on scaled variance ratio estimation of the Hurst exponent with application to agricultural commodity prices. *Physica A*, 377, 155–165.

United States Department of Energy, Energy Information Administration. (2002). Derivatives and risk management in the petroleum, natural gas, and electricity industries. Washington, DC: United States Department of Energy [last accessed 7/1/2007]. <http://www.eia.doe.gov/oiaf/servicerpt/derivative/appendix.html>.

Wang, D., & Tomek, W. G. (2007). Commodity prices and unit root tests. *American Journal of Agricultural Economics*, 89, 873–889.

Wilson, W. W., & Fung, H. G. (1991). Put-call parity and arbitrage bounds for options on grain futures. *American Journal of Agricultural Economics*, 73, 55–65.

Winnipeg Commodity Exchange. (2007). Canola volume hits monthly record. News release dated March 1st, 2007 [last accessed 7/1/2007]. <http://www.wce.ca/NewsNotices.aspx?first=newsreleases&Id=409>.

Wright, J. H. (2000). Alternative variance ratio tests using ranks and signs. *Journal of Business and Economic Statistics*, 18, 1–9.

Yang, S. R., & Brorsen, B. W. (1992). Nonlinear dynamics of daily cash prices. *American Journal of Agricultural Economics*, 74, 706–715.

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