



UvA-DARE (Digital Academic Repository)

The time-variation of volatility and the evolution of expectations

van der Weide, R.

[Link to publication](#)

Citation for published version (APA):

van der Weide, R. (2012). *The time-variation of volatility and the evolution of expectations*. Amsterdam: University of Amsterdam.

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

References

- Alexander, C. (1998). Volatility and correlation: Methods, models and applications. *In Risk Management and Analysis: Measuring and Modelling Financial Risk*, John Wiley, New York 125–172.
- Alexander, C. (2001). Orthogonal GARCH. *In Mastering Risk*, Financial TimesPrentice Hall, London, **2**, 21–38.
- Alexander, C. (2002). Principal component models for generating large GARCH covariance matrices. *Review of Banking, Finance and Monetary Economics*, **31** (2), 337–359.
- Alexander, C. and Chibumba, A. (1996). Multivariate orthogonal factor GARCH. *University of Sussex Discussion Papers in Mathematics*.
- Alghalith, M. (2010). The interaction between food prices and oil prices. *Energy Economics*, **32** (6), 1520–1522.
- Allen, H. and Taylor, M. (1990). Charts, noise and fundamentals in the london foreign exchange market. *The Economic Journal*, **100**, 49–59.
- Andersen, L. Benzoni T. and Lund, J. (2002). An empirical investigation of continuous-time equity return models. *Journal of Finance*, **57**, 1239–1284.
- Anderson, T. (1996). Return volatility and trading volume: An information flow interpretation of stochastic volatility. *Journal of Finance*, **51** (1), 169–204.
- Anderson, T., Bollerslev, T., Diebold, F. and Ebens, H. (2001). The distribution of realized stock return volatility. *Journal of Financial Economics*, **61** (1), 43–76.
- Anderson, T., Bollerslev, T., Diebold, F. and Labys, P. (2003). Modeling and forecasting realized volatility. *Econometrica*, **71** (2), 579–625.

- Ang, A. and Bekaert, G. (2002). International asset allocation under regime switching. *Review of Financial Studies*, **15**, 1137–1187.
- Ang, A. and Chen, J. (2002). Asymmetric correlations of equity portfolios. *Journal of Financial Economics*, **63**, 443–494.
- Arnold, L. (1998). *Random Dynamical Systems*. Berlin: Springer Verlag.
- Avery, C. and Zemsky, P. (1998). Multidimensional uncertainty and herd behavior in financial markets. *American Economic Review*, **88**, 724–748.
- Bakshi, C. Cao G. and Chen, Z. (1997). Empirical performance of alternative option pricing models. *Journal of Finance*, **94**, 277–318.
- Ball, C. and Roma, A. (1994). Stochastic volatility option pricing. *Journal of Financial and Quantitative Analysis*, **29**, 589–607.
- Barberis, N. and Thaler, R. (2002). A survey of behavioral finance. *NBER Working Paper Series*, **9222**, 1–77.
- Barndorff-Nielsen, O. and Shephard, N. (2002). Econometric analysis of realized volatility and its use in estimating stochastic volatility models. *Journal of the Royal Statistical Society - Series B*, **64**, 253–280.
- Bates, D. (2000). Post-'87 crash fears in the s&p 500 futures option market. *Journal of Econometrics*, **94** (1), 181–238.
- Bauwens, L., Laurent, S. and Rombouts, J. (2006). Multivariate garch models: A survey. *Journal of Applied Econometrics*, **21** (1), 79–109.
- Beaghen, M. (1997). *Canonical Variate Analysis and Related Methods with Longitudinal Data*. PhD Dissertation, Virginia Polytechnic Institute and State University.
- Bekaert, G., Campbell, R. and Ng, A. (2005). Market integration and contagion. *Journal of Business*, **78**, 39–69.
- Ben-Akiva, M. and Watanatada, T. (1981). Application of a continuous spatial choice logit model. In *Structural Analysis of Discrete Data and Econometric Applications* (eds C. F. Manski and D. L. McFadden), pp. 320–343. MIT Press, Cambridge, MA.

- Bernanke, B. (1983). Irreversibility, uncertainty, and cyclical investment. *Quarterly Journal of Economics*, **98** (1), 85–106.
- Bikhchandani, S., Hirschleifer, D. and Welch, I. (1992). A theory of fads, fashion, custom and cultural change as informational cascades. *Journal of Political Economy*, **100**, 992–1027.
- Black, F. and Scholes, M. (1973). The pricing of options and corporate liabilities. *Journal of Political Economy*, **81**, 637–654.
- Bollerslev, Chou R. T. and Kroner, K. (1992). Arch modeling in finance: A selective review of the theory and empirical evidence. *Journal of Econometrics*, **52**, 5–59.
- Bollerslev, Engle R. T. and Wooldridge, J. (1988). A capital asset pricing model with time varying covariances. *Journal of Political Economy*, **96**, 116–131.
- Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics*, **31** (3), 307–327.
- Bollerslev, T. (1990). Modelling the coherence in short-run nominal exchange rates: A multivariate generalized ARCH approach. *Review of Economics and Statistics*, **72**, 498–505.
- Bollerslev, T. (2008). Glossary to ARCH (GARCH). *CREATES Research Paper*, **2008-49**.
- Boswijk, H.P., Hommes, C. and Manzan, S. (2007). Behavioral heterogeneity in stock prices. *Journal of Economic Dynamics and Control*, **31** (6), 1938–1970.
- Boswijk, H.P. and van der Weide (2009). Method of moments estimation of GO-GARCH models. *UvA Econometrics Discussion Paper*, **2009/05**.
- Boswijk, H.P. and van der Weide, R. (2006). Wake me up before you GO-GARCH. *UvA-Econometrics Discussion Paper*, **2006/03**.
- Boswijk, H.P. and van der Weide, R. (2008). Testing the number of factors in GO-GARCH models. *Working Paper, University of Amsterdam*.
- Boswijk, H.P. and van der Weide, R. (2011). Method of moments estimation of GO-GARCH models. *Journal of Econometrics*, **163** (1), 118–126.

- Boussama, F. (1998). Ergodicity, mixing and estimation in GARCH models. *Ph.D. dissertation, University Paris 7*.
- Brennan, M. (1979). The pricing of contingent claims in discrete-time models. *Journal of Finance*, **34**, 53–68.
- Brock, W. and Hommes, C. (1997). A rational route to randomness. *Econometrica*, **65**, 1059–1095.
- Brock, W. and Hommes, C. (1998). Heterogeneous beliefs and routes to chaos in a simple asset pricing model. *Journal of Economic Dynamics and Control*, **22**, 1235–1274.
- Brock, W., Hommes, C. and Wagener, F. (2005). Evolutionary dynamics in markets with many trader types. *Journal of Mathematical Economics*, **41**, number 1-2, 7–42.
- Brock, W., Hommes, C. and Wagener, F. (2009). More hedging instruments may destabilize markets. *Journal of Economics Dynamics and Control*, **33**, 1912–1928.
- Brock, W. A. and Durlauf, S. N. (2001). Discrete choice with social interactions. *Review of Economic Studies*, **68**, 235–260.
- Brock, W. A. and LeBaron, B. (1996). A dynamic structural model for stock return volatility and trading volume. *Review of Economics and Statistics*, **78**, 94–110.
- Buraschi, A. and Jiltsov, A. (2006). Model uncertainty and option markets with heterogeneous beliefs. *Journal of Finance*, **61**, 2841–2898.
- Burnside, C., Eichenbaum, M. and Robelo, S. (2011). Understanding booms and busts in housing markets. *NBER Working Paper*, **16734**.
- Busch, B. Christensen T. and Nielsen, M. (2011). The role of implied volatility in forecasting future realized volatility and jumps in foreign exchange, stock, and bond markets. *Journal of Econometrics*, **160** (1), 48–57.
- Cabrales, A. and Hoshi, T. (1996). Heterogeneous beliefs, wealth accumulation, and asset price dynamics. *Journal of Economic Dynamics and Control*, **20**, 1073–1100.
- Cameron, K. and Schnusenberg, O. (2009). Oil prices, SUVs, and Iraq: An investigation of automobile manufacturer oil price sensitivity. *Energy Economics*, **31**, 375–381.

- Campbell, J. Y., Lo, A. W. and MacKinley, A. C. (1997). *The Econometrics of Financial Markets*. Princeton University Press, Princeton, NJ.
- Christoffersen, P. and Jacobs, K. (2004). The importance of the loss function in option valuation. *Journal of Financial Economics*, **72**, 291–318.
- Comte, F. and Lieberman, O. (2003). Asymptotic theory for multivariate GARCH processes. *Journal of Multivariate Analysis*, **84**, 61–84.
- Constantinides G., J. Jackwerth and Perrakis, S. (2009). Mispricing of s&p 500 index options. *The Review of Financial Studies*, **22 (3)**, 1247–1277.
- Cox, S. Ross J. and Rubinstein, M. (1979). Option pricing: A simplified approach. *Journal of Financial Economics*, **7**, 229–263.
- Cyert, R. and DeGroot, M. (1974). Rational expectations and bayesian analysis. *Journal of Political Economy*, **82 (3)**, 521–536.
- Dacorogna, M. (2002). Scaling analysis to characterize financial markets. Technical Report. Paper presented at the CeNDEF workshop, Leiden, The Netherlands, June 2002. See <http://www.fee.uva.nl/cendef>.
- Dagsvik, J. K. (1994). Discrete and continuous choice, max-stable processes, and independence from irrelevant attributes. *Econometrica*, **62**, number 5, 1179–1205.
- Dagsvik, J. K. (2002). Discrete choice in continuous time: Implications of an intertemporal version of the IIA property. *Econometrica*, **70**, 817–831.
- Das, S. and Uppal, R. (2004). Systematic risk and international portfolio choice. *Journal of Finance*, **59**, 2809–2834.
- Deaton, A. and Laroque, G. (1992). On the behaviour of commodity prices. *Review of Economic Studies*, **59 (1)**, 1–23.
- Diebold, F. and Nerlove, M. (1989). The dynamics of exchange rate volatility: A multivariate latent factor ARCH model. *Journal of Applied Econometrics*, **4**, 1–21.
- Diether, K. B., Malloy, C. J. and Scherbina, A. (2002). Differences of opinion and the cross section of stock returns. *Journal of Finance*, **57**, 2113–2141.

- Diks, C. and van der Weide, R. (2003). Heterogeneity as a natural source of randomness. *Tinbergen Discussion Paper*, **073/1**.
- Diks, C. and van der Weide, R. (2005). Herding, a-synchronous updating and heterogeneity in memory in a cbs. *Journal of Economic Dynamics and Control*, **29**, 741–763.
- Diks, C. and van der Weide, R. (2011). A role for prior beliefs in explaining price movements. *mimeo*.
- Ding, Z. (1994). *Time Series Analysis of Speculative Returns*. PhD Dissertation, University of California at San Diego.
- Dotsey, M. and Reid, M. (1992). Oil shocks, monetary policy, and economic activity. *Economic Review*, **78**, 14–27.
- Doz, C. and Renault, E. (2006). Factor stochastic volatility in mean models: A GMM approach. *Econometric Reviews*, **25**, 275–309.
- Drost, F. and Nijman, T. (1993). Temporal aggregation of GARCH processes. *Econometrica*, **61**, 909–927.
- Dufwenberg, M., Lindqvist, T. and Moore, E. (2005). Bubbles and experience: An experiment. *American Economic Review*, **95** (5), 1731–1737.
- Dumas, B., Fleming, J. and Whaley, R. (1998). Implied volatility functions: Empirical tests. *Journal of Finance*, **53** (6), 2059–2106.
- Elder, J. and Serletis, A. (2009). Oil price uncertainty in canada. *Energy Economics*, **31**, 852–856.
- Elder, J. and Serletis, A. (2010). Oil price uncertainty. *Journal of Money, Credit and Banking*, **42** (6), 1137–1159.
- Engle, Ng V. R. and Rothschild, M. (1990). Asset pricing with a factor ARCH covariance structure: Empirical estimates for treasury bills. *Journal of Econometrics*, **45**, 213–238.
- Engle, R. (1982). Autoregressive conditional heteroskedasticity with estimates of the variance of United Kingdom inflation. *Econometrica*, **50** (4), 987–1007.
- Engle, R. (2002). Dynamic conditional correlation. *Journal of Business and Economic Statistics*, **20** (3), 339–350.

- Engle, R. (2004). Risk and volatility: Econometric models and financial practice. *American Economic Review*, **94** (3), 405–420.
- Engle, R., Ghysels, E. and Sohn, B. (2009). On the economic sources of stock market volatility. *NYU Finance Working Papers*, **FIN-08-043**.
- Engle, R. and Kroner, K. (1995). Multivariate simultaneous generalized ARCH. *Econometric Theory*, **11**, 122–150.
- Engle, R. and Rangel, J. (2008). The spline GARCH model for low-frequency volatility and its global macroeconomic causes. *Review of Financial Studies*, **21** (3), 1187–1222.
- Evans, G. and Honkapohja, S. (2003). Expectations and the stability problem for optimal monetary policies. *Review of Economic Studies*, **70** (4), 807–824.
- Fan, J., Wang, M. and Yao, Q. (2008). Modelling multivariate volatilities via conditionally uncorrelated components. *Journal of the Royal Statistical Society Series B*, **70**, 679–702.
- Flood, R. and Garber, P. (1980). Market fundamentals versus price-level bubbles: The first tests. *Journal of Political Economy*, **88** (4), 745–770.
- Flury, B. (1984). Common principal components in k groups. *Journal of the American Statistical Association*, **79**, 892–898.
- Flury, B. and Gautschi, W. (1986). An algorithm for simultaneous orthogonal transformation of several positive definite matrices to nearly diagonal form. *SIAM Journal of Scientific and Statistical Computing*, **7**, 169–184.
- Frankel, J. and Froot, K. (1987). Using survey data to test standard propositions regarding exchange rate expectations. *American Economic Review*, **77** (1), 133–153.
- Frankel, J. and Froot, K. (1990). Chartists, fundamentalists, and trading in the foreign exchange market. *American Economic Review*, **80** (2), 181–185.
- Frankel, J. A. and Froot, K. A. (1988). Chartists, fundamentalists and the demand for dollars. *Greek Economic Review*, **10**, 49–102.
- Froot, K., Scharfstein, D. and Stein, J. (1992). Heard on the street: Information inefficiencies in a market with short-term speculators. *Journal of Finance*, **47**, 1461–1484.

- Gallant, A. R., Rossi, P. E. and Tauchen, G. (1992). Stock prices and volume. *Review of Financial Studies*, **5**, 199–242.
- Garber, P. (1989). Tulipmania. *Journal of Political Economy*, **97** (3), 535–560.
- Garber, P. (1990). Famous first bubbles. *Journal of Economic Perspectives*, **4** (2), 35–54.
- Garcia, E. Ghysels R. and Renault, E. (2003a). The econometrics of option pricing. *Working Paper, CIRANO, CIREQ*.
- Garcia, E. Ghysels R. and Renault, E. (2010). The econometrics of option pricing. *Handbook of Financial Econometrics, Elsevier-North Holland, Amsterdam* 479–552.
- Garcia, R. and Renault, E. (2001). Latent variable models for stochastic discount factors. *Handbooks in Mathematical Finance: Topics in Option Pricing, Interest Rates and Risk Management, Cambridge University Press*.
- Garcia, R. Luger R. and Renault, E. (2003b). Empirical assessment of an intertemporal option pricing model with latent variables. *Journal of Econometrics*, **116**, 49–83.
- Gaunersdorfer, A., Hommes, C. and Wagener, F. (2008). Bifurcation routes to volatility clustering under evolutionary learning. *Journal of Economic Behavior and Organization*, **67**, 27–47.
- Granger, C. (1980). Long memory relationships and the aggregation of dynamic models. *Journal of Econometrics*, **14**, 227–338.
- Greenwood, R. and Nagel, S. (2009). Inexperienced investors and bubbles. *Journal of Financial Economics*, **93**, 239–258.
- Guesnerie, R. (2002). Anchoring economic prediction in common knowledge. *Econometrica*, **70**, 439–480.
- Hafner, C. (2003). Fourth moment structure of multivariate GARCH models. *Journal of Financial Econometrics*, **1**, 26–54.
- Hafner, C. (2008). Temporal aggregation of multivariate GARCH processes. *Journal of Econometrics*, **142**, 467–483.
- Hamilton, J. (1983). Oil and the macroeconomy since World War II. *Journal of Political Economy*, **91** (2), 228–248.

- Hamilton, J. and Lin, G. (1996). Stock market volatility and the business cycle. *Journal of Applied Econometrics*, **11** (5), 573–593.
- Han, B. (2008). Investor sentiment and option prices. *The Review of Financial Studies*, **21** (1), 387–414.
- Hanemann, W. M. (1984). Discrete/continuous models of consumer demands. *Econometrica*, **52**, number 3, 541–561.
- Haruvy, E., Lahav, Y. and Noussair, C. (2007). Traders' expectations in asset markets: Experimental evidence. *American Economic Review*, **97** (5), 1901–1920.
- He, C. and Terasvirta, T. (1999). Properties of moments of a family of GARCH processes. *Journal of Econometrics*, **92**, 173–192.
- Heady, E. and Kaldor, D. (1954). Expectations and errors in forecasting agricultural prices. *Journal of Political Economy*, **62** (1).
- Heemeijer, P., Hommes, C., Sonnemans, J. and Tuinstra, J. (2009). Price stability and volatility in markets with positive and negative expectations feedback: An experimental investigation. *Journal of Economic Dynamics and Control*, **33** (5), 1052–1072.
- Heston, S. (1993). A closed-form solution for options with stochastic volatility with applications to bond and currency options. *Review of Financial Studies*, **6**, 327–343.
- Hommes, C. (2001). Financial markets as nonlinear adaptive evolutionary systems. *Quantitative Finance*, **1**, 149–167.
- Hommes, C. (2002). Modeling the stylized facts in finance through simple nonlinear adaptive systems. *Proceedings of the National Society of Science*, **99**, 7721–7728.
- Hommes, C. (2006). Heterogeneous agent models in economics and finance. *Handbook of Computations Economics*, **2**, 1109–1186.
- Hommes, C. and Rosser Jr, J. (2001). Consistent expectations equilibria and complex dynamics in renewable resource markets. *Macroeconomic Dynamics*, **5**, 180–203.
- Hommes, C., Sonnemans, J., Tuinstra, J. and van de Velden, H. (2005). Coordination of expectations in asset pricing experiments. *Review of Financial Studies*, **18**, 955–980.

- Hommes, C. and Sorger, G. (1998). Consistent expectations equilibria. *Macroeconomic Dynamics*, **2**, 287–321.
- Hommes, C. and Wagener, F. (2009). Complex evolutionary systems in behavioral finance. *Handbook of Financial Markets: Dynamics and Evolution*, Edited by T. Hens and K.R. Schenk-Hoppe 217–276.
- Hong, H., Kubik, J. D. and Solomon, A. (2000). Security analysts' career concerns and herding of earnings forecasts. *RAND Journal of Economics*, **31**, 121–144.
- Horn, R. and Johnson, C. (1999). *Matrix Analysis*. Cambridge: Cambridge University Press.
- Hosking, J. R. M. (1981). Fractional differencing. *Biometrika*, **68**, 165–176.
- Hull, J. and White, A. (1987). The pricing of options on assets with stochastic volatilities. *Journal of Finance*, **42**, 281–300.
- Hussam, R., Porter, D. and Smith, V. (2008). Thar she blows: Can bubbles be rekindled with experienced subjects? *American Economic Review*, **93** (3), 924–937.
- Ito, T. (1990). Foreign exchange rate expectations: Micro survey data. *American Economic Review*, **80**, 434–449.
- Jackwerth, J. and Rubinstein, M. (1996). Recovering probability distributions from option prices. *Journal of Finance*, **51** (5), 1611–1632.
- Jeantheau, T. (1998). Strong consistency of estimators for multivariate ARCH models. *Econometric Theory*, **14**, 70–86.
- Jensen, S. and Rahbek, A. (2007). On the law of large numbers for (geometrically) ergodic Markov chains. *Econometric Theory*, **23**, 761–766.
- Jones, C. and Kaul, G. (1996). Oil and the stock markets. *Journal of Finance*, **51**, 463–491.
- Jury, E. I. (1974). *Inners and Stability of Dynamical Systems*. John Wiley & Sons, New York.
- Kandel, E. and Pearson, N. D. (1995). Differential interpretation of public signals and trade in speculative markets. *Journal of Political Economy*, **4**, 831–872.

- Keane, M. P. and Wolpin, K. I. (1994). The solution and estimation of discrete choice dynamic-programming models by simulation and interpolation – Monte-Carlo evidence. *Review of Economics and Statistics*, **76**, 648–672.
- Kilian, L. and Murphy, D. (2010). The role of inventories and speculative trading in the global market for crude oil. *CEPR Discussion Paper*, **7753**.
- Kilian, L. and Taylor, M. P. (2001). Why is it so difficult to beat the random walk forecast of exchange rates? Technical Report. ECB Working paper No. 88. European Central Bank.
- Kirman, A. (1993). Ants, rationality and recruitment. *Quarterly Journal of Economics*, **108**, 137–156.
- Klaassen, F. (1999). Have exchange rates become more closely tied? Evidence from a new multivariate GARCH model. *Center Working Paper, Tilburg University*.
- Kroner, K. and Ng, V. (1998). Modeling asymmetric comovements of asset returns. *The Review of Financial Studies*, **11**, 817–844.
- Kurz, M. (2001). Endogenous uncertainty and market volatility. *Economic Theory*, **17**, 497–544.
- Lahiri, K. and Sheng, X. (2008). Evolution of forecast disagreement in a bayesian learning model. *Journal of Econometrics*, **144** (2), 325–340.
- Lanne, M. and Saikkonen, P. (2007). A multivariate generalized orthogonal factor GARCH model. *Journal of Business and Economic Statistics*, **25**, 61–75.
- LeBaron, B. (1999). Technical trading rule profitability and the foreign exchange intervention. *Journal of International Economics*, **49**, 125–143.
- LeBaron, B. (2000). Agent based computational finance: Suggested readings and early research. *Journal of Economic Dynamics and Control*, **24**, 679–702.
- LeBaron, B. (2001). Evolution and time horizons in an agent-based stock market. *Macroeconomic Dynamics*, **5**, 225–254.
- LeBaron, B., Arthur, W. and Palmer, R. (1999). The time series properties of an artificial stock market. *Journal of Economic Dynamics and Control*, **23**, 1487–1516.

- Ledoit, O. and Wolf, M. (2004). A well-conditioned estimator for large-dimensional covariance matrices. *Journal of Multivariate Analysis*, **88**, 365–411.
- Lee, R. (2004). The moment formula for implied volatility at extreme strikes. *Mathematical Finance*, **14**, 469–480.
- Lehmann, B. N. (1991). Asset pricing and intrinsic values. *Journal of Monetary Economics*, **28**, 485–500.
- Levich, R. M. and Thomas, L. R. (1993). The significance of technical trading-rule profits in the foreign exchange market: A bootstrap approach. *Journal of International Money and Finance*, **12**, 451–474.
- Linden, M. (1999). Time series properties of aggregated AR(1) processes with uniformly distributed coefficients. *Economics Letters*, **64**, 31–36.
- Ling, S. and McAleer, M. (2003). Asymptotic theory for a vector ARMA-GARCH model. *Econometric Theory*, **19**, 280–310.
- Lo, A. W. and MacKinlay, A. C. (1997). *A Non-random Walk Down Wall Street*. Princeton University Press, Princeton, NJ.
- Longin, F. and Solnik, B. (2001). Extreme correlation of international equity markets. *Journal of Finance*, **56**, 649–676.
- Lucas, R. (1972). Expectations and the neutrality of money. *Journal of Economic Theory*, **4**, 103–124.
- Lux, T. (1995). Herd behaviour, bubbles and crashes. *Economic Journal*, **105**, 881–896.
- Lux, T. and Marchesi, M. (1999). Scaling and criticality in a stochastic multi-agent model of a financial market. *Nature*, **397**, 498–500.
- Malkiel, B. (1990). *A Random Walk Down Wall Street*. Norton, New York.
- McFadden, D. (1973). Conditional logit analysis of qualitative choice behavior. In *Frontiers in Econometrics, New York* (ed. P. Zarembka), pp. 105–142. Academic Press, NY.
- Merton, R. (1973). Theory of rational option pricing. *The Bell Journal of Economics and Management Science*, **4**, 141–183.

- Michaely, R. and Vila, J.-L. (1996). Trading volume with price valuation: Evidence from the ex-dividend day. *Review of Financial Studies*, **9**, 471–509.
- Milgrom, P. and Stokey, N. (1982). Information, trade, and common knowledge. *Journal of Economic Theory*, **26**, 17–27.
- Mills, T. (1999). *The Econometric Modelling of Financial Time Series*, 2nd edn. Cambridge University Press, Cambridge, UK.
- Muller, U. A., Dacorogna, M. M., Dave, R. R., Olsen, R. B., Pictet, O. V. and Weizsacker, J. E. Von (1997). Volatilities of different time resolutions - analyzing the dynamics of market components. *Journal of Empirical Finance*, **4**, 213–239.
- Muth, J. (1961). Rational expectations and the theory of price movements. *Econometrica*, **29** (3), 315–325.
- Nelson, L. (2002). Persistence and reversal in herd behavior: Theory and application to the decision to go public. *Review of Financial Studies*, **15**, 65–95.
- Nerlove, M. (1979). The dynamics of supply: Retrospect and prospect. *American Journal of Agricultural Economics*, **61** (5), 874–888.
- O’Hara, M. (2008). Bubbles: Some perspectives (and loose talk) from history. *Review of Financial Studies*, **21** (1), 11–17.
- Peters, R. and de Vilder, R. (2006). Testing the continuous semimartingale hypothesis for the s&p 500. *Journal of Business and Economic Statistics*, **24**, 444–454.
- Peters, R. and van der Weide, R. (2011). Volatility: Expectations and realizations. *mimeo*.
- Poon, S.H. and Granger, C. (2003). Forecasting volatility in financial markets: A review. *Journal of Economic Literature*, **41** (2), 478–539.
- Renault, E. and Touzi, N. (1996). Option hedging and implied volatilities in a stochastic volatility model. *Mathematical Finance*, **6**, 279–302.
- Resnick, S. I. and Roy, R. (1994). Superextremal processes, max-stability and dynamic continuous choice. *Annals of Applied Probability*, **4**, 791–811.
- Resnick, S.I. (1998). *A Probability Path*. Birkhäuser, Boston.

- Rigobon, R. (2003). Identification through heteroskedasticity. *Review of Economics and Statistics*, **85**, 777–792.
- Rubinstein, M. (1976a). The strong case for the generalized logarithmic utility model as the premier model of financial markets. *Journal of Finance*, **31**.
- Rubinstein, M. (1976b). The valuation of uncertain income streams and the pricing of options. *Bell Journal of Economics and Management Science*, **7**, 407–425.
- Russell, B. (1947). *Am I An Atheist Or An Agnostic?*
- Sargent, T. (1993). *Bounded rationality in macroeconomics: The Arne Ryde memorial lectures*. Oxford University Press.
- Scharfstein, D. and Stein, J. (1990). Herd behavior and investment. *American Economic Review*, **80** (3), 465–479.
- Schwert, G.W. (1989). Why does stock market volatility change over time? *Journal of Finance*, **44** (5), 1115–1153.
- Sentana, E. and Fiorentini, G. (2001). Identification, estimation and testing of conditionally heteroskedastic factor models. *Journal of Econometrics*, **102**, 143–164.
- Shalen, C. T. (1993). Volume, volatility, and the dispersion of beliefs. *Review of Financial Studies*, **6**, 405–434.
- Shiller, R. (1990). *Market volatility*. MIT Press.
- Shiller, R. (2003). From efficient markets theory to behavioral finance. *Journal of Economic Perspectives*, **17** (1), 83–104.
- Shiller, R. (2005). *Irrational exuberance*. Princeton University, Princeton University Press.
- Shiller, R. J. (1981). Do stock prices move too much to be justified by subsequent changes in dividends? *American Economic Review*, **71**, 421–436.
- Silvennoinen, A. and Terasvirta, T. (2009). Multivariate GARCH models. *T.G. Andersen, R.A. Davis, J.P. Kreiss and T. Mikosch, (Eds.), Handbook of Financial Time Series*, Springer, New York 201–229.

- Simon, H. (1957). *Models of man, social and rational: Mathematical essays on rational human behavior in a social setting*. Garland Pub. (New York).
- Smith, V., Suchanek, G. and Williams, A. (1988). Bubbles, crashes, and endogenous expectations in experimental spot asset markets. *Econometrica*, **56** (5), 1119–1151.
- Sogner, L. and Mitlohner, H. (2002). Consistent expectations equilibria and learning in a stock market. *Journal of Economic Dynamics and Control*, **26** (2), 171–185.
- Sweeney, R. J. (1986). Beating the foreign exchange market. *Journal of Finance*, **41**, 163–182.
- Taylor, M. and Allen, H. (1992). The use of technical analysis in the foreign exchange market. *Journal of International Money and Finance*, **11** (3), 304–314.
- ter Ellen, S. and Zwinkels, R. (2010). Oil price dynamics: A behavioral finance approach with heterogeneous agents. *Energy Economics*, **32** (6), 1427–1434.
- Times, New York (2008). Price volatility adds to worry on U.S. farms. *The ‘Food Chain’ series*, **April 22**.
- Tirole, J. (1982). On the possibility of speculation under rational expectations. *Econometrica*, **50** (5), 1163–1181.
- Trueman, B. (1994). Analysts forecasts and herding behavior. *Review of Financial Studies*, **7**, 97–124.
- Tse, Y. (2000). A test for constant correlations in a multivariate GARCH model. *Journal of Econometrics*, **98**, 107–127.
- Tse, Y. (2002). Residual-based diagnostics for conditional heteroscedasticity models. *Econometrics Journal*, **5** (2), 358–374.
- Tse, Y. and Tsui, A. (2002). A multivariate generalized autoregressive conditional heteroscedasticity model with time-varying correlations. *Journal of Business and Economic Statistics*, **20** (3), 351–362.
- Urga, G. (2007). Common features in economics and finance: An overview of recent developments. *Journal of Business and Economic Statistics*, **25**, 2–11.

- van der Weide, R. (2002). GO-GARCH: A multivariate orthogonal GARCH model. *Journal of Applied Econometrics*, **17** (5), 549–564.
- Vilenkin, N. (1968). Special functions and the theory of group representation, translations of mathematical monographs. *American Math. Soc., Providence, Rhode Island, U.S.A.*, **22**.
- Vrontos, I., Dellaportas, P. and Politis, D. (2003). A full-factor multivariate GARCH model. *Econometrics Journal*, **6**, 312–334.
- Yoon, K.H. and Ratti, R. (2010). Energy price uncertainty, energy intensity and firm investment. *Energy Economics*, **33** (1), 67–78.
- Ziegler, A. (2002). State-price densities under heterogeneous beliefs, the smile effect, and implied risk aversion. *European Economic Review*, **46**, 1539–1557.