

CURRICULUM VITAE

Name: **Qiying WANG**

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Education

6/2001: Ph. D., University of Wollongong, Australia
5/1990: M.Sc, University of Science and Technology of China
8/1983: B.Sc, Anhui University, China

Positions held

01/2019 –	Professor,	University of Sydney
01/2012 – 12/2018	Reader (A/Professor),	University of Sydney
01/2007 – 03/2012	ARF (Senior Lecturer),	University of Sydney
02/2003 – 12/2006	Lecturer,	University of Sydney
11/2001 – 02/2003	Research Fellow,	Australian National University
12/2000 – 11/2001	Research Fellow,	Carleton University
06/1990 – 07/1998	Assi. Prof . and Assoc. Prof.,	Nanjing University

Visiting professor positions held (Since 2012)

09/2019 – 12/2019	USTC, CHINA
06/2019 – 07/2019	HKUST, HONG KONG
12/2017 – 12/2017	University of Oxford; University of Southampton, UK
12/2016 – 12/2016	University of Hong Kong, HONG KONG
04/2016 – 06/2016	Yale University, USA
03/2016 – 04/2016	HKUST, HONG KONG
11/2015 – 12/2015	Fudan University, Hsinghua University, CHINA
11/2014 – 12/2014	Tongji University, CHINA
11/2013 – 12/2013	Tongji University, CHINA
11/2012 – 11/2012	USTC and CHKU, HONG KONG
06/2012 – 06/2012	Cambridge University, UK; University of Lille, France

Research interests

Nonstationary time series econometrics, Financial Econometrics, Nonparametric statistics, Econometric Theory, Self-normalized limit theory.

External funding

ARC grants: Total of A\$1,255,171.

- 2017-22 ARC Discovery Project (\$291,471, sole CI with two international PIs.)
- 2013-16 ARC Discovery Project (\$180,000, sole CI with two international PIs.)
- 2007-12 ARC Discovery Project (\$658,700, project leader (first named CI, ARF),
with Prof. Robinson and Prof. Weber)
- 2004-06 ARC Discovery grant (\$225,000, CI with Prof. Robinson)

Honors:

ARC Research Fellow, 2007-2011; ISI selected member, 2013 -;
Econometric Theory Plura Scripsit Award, 2017.

Selected professional service (since 2012)

Associate Editor: Statistics and Probability Letters, 2016 - Present.
FoR coordinator for code 0104 (Statistics) in ERA 2015, ERA 2018.
Member of program committee in SETA 2017, Beijing, SETA 2018, Sydney.
Member of local organizing committee in ASC/IMS 2014 conference, Sydney.

Supervision and Mentoring (since 2012)

- PhD Students

Nigel Chan (Degree awarded, 2013); Sanjaya Dissanayake (Degree awarded, 2015);
Helen Wu (2015, ongoing); Chunlei Jin (2018, ongoing).

- Visiting academic program

Peng Jiangyan: A/Prof, University of Electronic Science and Technology of China,
11/2015-10/2016.

- Occupational trainee program

Renjie Lu: PhD candidate, University of Hong Kong, 07/2017 - 08/2017;
Tian Dinshi: PhD candidate, Xiamen University, 02/2017 - 05/2017;
Shen Yu: PhD candidate, Tongji University, 12/2016 - 5/2017;
Hu Cheng: PhD candidate, Shangdong University, 12/2015 - 11/2016;
Chen Yi: Exchange student, USTC, 08/2015 - 09/2015.

Invited speakers and lectures (since 2012)

- 2019: The 11th China conference on limit and large sample theory (keynote speaker), Jishou; Specially invited talk at Tsinghua University.
- 2018: A Celebration of Peter Phillips Forty Years at Yale; The 2nd International Conference on Econometrics and Statistics, Hong Kong;
- 2017: UAH Distinguished Speakers; The 13th International Symposium on Econometric Theory and Applications, (SETA 2017) in Beijing University; 11th international conference on computational and financial econometrics, London;
- 2016: Workshop on Advanced Econometrics, University of Kansas;
- 2015: (a) Short course (6 lectures) on Introduction to nonlinear cointegrating regression in School of Management, Fudan University, China; (b) Tsinghua University Statistics Colloquium (4 lectures); (c) IMS-China International Conference on Statistics and Probability, Kunming.
- 2014: Short course in School of Mathematics, Tongji University;
- 2013: (a) Short course in School of Mathematics, Tongji University, (b) IMS-China International Conference on Statistics and Probability, Chengdu;
- 2012: International Symposium on Asymptotic methods in Stochastics, Carleton University, Canada.

RESEARCH

Research interests

Nonstationary time series econometrics, Financial Econometrics, Nonparametric statistics, Econometric Theory, Self-normalized limit theory.

Main achievements

I am a mathematical statistician, an econometrician and a probabilist with well-established expertise in classical limit theory and asymptotics. In earlier stages of my research, I contributed to the development of self-normalised limit theory. I introduced a truncation technique that has been widely used in subsequent articles for self-normalised large deviations.

The overarching goal of my current research is to establish the fundamental asymptotic results that are used as necessary tools in various statistical and econometrical models. In the last 10 years, my focus in research has been in nonstationary and nonlinear time series econometrics, in particular, in exploring the limit theory for nonlinear covariance functionals under endogeneity and long memory, and the limit theory for nonlinear transformation of nonstationary time series.

The highlights of my current research are summarized as follows.

- *New martingale limit theorem*
- *Convergence to local time with applications*
- *Convergence to stochastic integrals with applications*
- *Estimation and inference theory in nonlinear cointegrating regression*
- *Monograph: Limit theorems for nonlinear cointegrating regression*

This book systematically introduces the machinery of theoretical development in nonlinear cointegrating regression. The contents include weak convergence to a local time process, weak convergence to a mixture of normal distributions, weak convergence to stochastic integrals and estimation and inference theory in nonlinear cointegrating regression. The main theorems appearing in this book come from my current researches with several collaborators in past years, but the majority of the original works has been significantly extended in line with current development in the area. Some contents in the book are new, including new framework on convergence to local time (Chapter 2.3.5), uniform approximation to local time (Chapter 2.5) and a new limit theorem for martingale (Chapter 3.3). This monograph is the first reference book in nonlinear cointegration.

Publication listing

In the majority of my joint works, I deal with the core asymptotic results that are used in various models. Count of my publications in selected journals is as follows:

<i>Econometrica</i>	1
<i>Ann. Probab.</i>	6
<i>Ann. Statist.</i>	3
<i>Econometric Theory</i>	16
<i>Journal of Econometrics</i>	4
<i>Statistica Sinica</i>	6
<i>Bernoulli</i>	4

- **Books:**

1. Wang, Q. (2015). Limit theorems for nonlinear cointegrating regression, World Scientific, Singapore.

- **Book Chapters**

2. Wang, Q. (2015). An Extended Martingale Limit Theorem with Application to Specification Test for Nonlinear Co-integrating Regression Model. In D. Dawson, R. Kulik, M. O. Haye, B. Szyszkowicz, Y. Zhao (Eds.), Asymptotic Laws and Methods in Stochastics: A Volume in Honour of Miklos Csorgo, (pp. 167–176).

- **Jornal articles** (since 2012)

3. Tu, Y., Liang, H. and Wang, Q. (2022). Nonparametric inference for quantile cointegrations with stationary covariates. *Journal of Econometrics*, Available online 25 June 2021.
4. Wang, Q. and Phillips, PCB. (2022). Optimal bandwidth selection in nonlinear cointegrating regression. *Econometric Theory*, Published online: 14 December 2020, pp. 1-13.
5. Liang, H., Sheng, Y. and Wang, Q. (2022). Functional-coefficient cointegrating regression with endogeneity, forthcoming.
6. Yang, Y., Ling, S., Wang, Q. (2022). Consistency of global LSE for MA(1) models. *Statistics and Probability Letters*, 182, 109292.
7. Wang, Q., Phillips, P., Kasparis, I. (2021). Latent variable nonparametric cointegrating regression. *Econometric Theory*, 37(1), 138–168.
8. Wang, Q. (2021). Least Squares Estimation for Nonlinear Regression Models with Heteroscedasticity. *Econometric Theory*, 37(6), 1267–1289.
9. Hu, Z., Phillips, P., Wang, Q. (2021). Nonlinear Cointegrating Power Function Regression with Endogeneity. *Econometric Theory*, 37(6), 1173–1213.

10. Sabzikar, F., Wang, Q., Phillips, P. (2020). Asymptotic theory for near integrated processes driven by tempered linear processes. *Journal of Econometrics*, 216, 192-202.
11. Wang, Q., Zhu, K. (2020). On a measure of lack of fit in nonlinear cointegrating regression with endogeneity. *Statistica Sinica*, 30(1), 371–396.
12. Tu, Y., Chan, N., Wang, Q. (2020). Testing for a unit root with nonstationary nonlinear heteroskedasticity. *Econometric Reviews*, 39(9), 904–929.
13. Wang, Q. Wu, D and Zhu, K. (2018). Model checks for nonlinear cointegrating regression, *Journal of Econometrics*, **207**, 261-284.
14. Peng, J. and Wang, Q. (2018). Weak convergence to stochastic integrals under primitive conditions in nonlinear econometric models, *Econometric Theory*, **34(5)**, 1132-1157.
15. Li, D., Liu, W., Wang, Q. and Wu, W-B. (2017). Simultaneous Confidence Bands in Nonlinear Regression Models with Nonstationarity, *Statistics Sinica*, **27**, 1385 - 1400.
16. Wang, Q. and Phillips, P.C.B. (2016). Nonparametric cointegrating regression with endogeneity and long memory, *Econometric Theory*, **32**, 359–401.
17. Linton, O. and Wang, Q. (2016). Non-parametric transformation regression with non-stationary data, *Econometric Theory*, **32**, 1–29.
18. Liang, H. Phillips, PCB, Wang, H. and Wang, Q. (2016). Weak convergence to stochastic integrals for econometric applications, *Econometric Theory*, **32**, 1349–1375.
19. Chan, N. and Wang, Q. (2015). Nonlinear cointegrating regressions with non-stationary time series, *Journal of Econometrics*, **185**, 182–195.
20. Bing-Yi Jing, Qiying Wang, Wang Zhou (2015). Cramr-Type Moderate Deviation for Studentized Compound Poisson Sum, *Journal of Theoretical Probability*, **28**, no. 4, 15561570.
21. Wang, Q. and Chan, N. (2014). Uniform convergence rates for a class of martingales with application in non-linear co-integrating regression, *Bernoulli*, **20**, 207–230.
22. Wang, Q. (2014). Martingale limit theorem revisited and nonlinear cointgerating regression, *Econometric Theory*, **30**, 509-535.
23. Chan, N. and Wang, Q. (2014). Uniform convergence for nonparametric estimators with non-stationary data, *Econometric Theory*, **30**, 1110-1133.
24. Liu, W., Shao, Q-M. and Wang, Q. (2013). Self-normalized Cramér type Moderate Deviations for the Maximum of Sums, *Bernoulli*, **19**, 1006–1027.
25. Shao, Q-M. and Wang, Q. (2013). Self-normalized Limit Theorems: A Survey, *Probability Surveys*, **10**, 69-93.

26. Gao, J. Wang, Q. and Yin, Y. (2013). Long-range Dependent Time Series Specification, *Bernoulli*, **19**, 1714-1749.
27. Wang, Q. and Wang, R. (2013). Non-parametric cointegrating regression with NNH errors, *Econometric Theory*, **29**, 1-27.
28. Wang, Q. and Phillips, PCB (2012). A Specification Test for Nonlinear Nonstationary Models *Ann. Statist.*, **40**, 727-758.
29. Hu, Z. Robinson, J and Wang, Q. (2012). Tail approximations for samples from a finite population with applications to permutation tests, *ESAIM: Probability and Statistics* , **16**, 425-435.

• **Jornal articles** (2011-2001)

30. Lai, T. L., Shao, Q. and Wang, Q. (2011). Cramér Type Moderate Deviations for Studentized U-statistics, *ESAIM: Probability and Statistics* (2011), **15**, 168-179.
31. Wang, Q. (2011). Refined self-normalized large deviations for independent random variables. *J. Theoret. Probab.*(2011), **2**, 307-329.
32. Wang, Q. and Phillips, PCB (2011). Asymptotic Theory for Zero Energy Functionals with Nonparametric Regression Applications, *Econometric Theory* (2011), **27**, 237-259.
33. Gao, J. Wang, Q. and Yin, J. (2011). Specification Testing in Nonlinear Time Series with Long-Rang Dependence, *Econometric Theory* (2011), **27**, 260-284.
34. Hall, P. and Wang, Q. (2010). Strong Approximations of level exceedences related to multiple hypothesis testing, *Bernoulli*, **16**, 418-434.
35. Jing, B.-Y. and Wang, Q. (2010). A unified approach to Edgeworth expansions for a general class of statistics, *Statistics Sinica*, **20**, 613-637.
36. Wang, Q. and Phillips, PCB. (2009). Structural nonparametric cointegration regression, *Econometrica*, **77**, 1901-1948.
37. Helmers R., Zitikis R. and Wang, Q. (2009). Confidence regions for the intensity function of a cyclic Poisson process, *Stat Infer Stoch Process*, **12**, no. 1, 21-36.
38. Hu Z., Shao Q.-M. and Wang, Q. (2009). Cramer type moderate deviations for the maximum of self-normalized sums, *Electronic Journal of Probability*, **14**, 1181-1197.
39. Wang, Q. and Phillips, PCB. (2009). Asymptotic theory for local time density estimation and nonparametric cointegrating regression, *Econometric Theory*, **25**, 710-738.
40. Wang, Q. and Hall, P. (2009). Relative errors in central limit theorems for Student's statistic, with applications, *Statistics Sinica*, **19**, 343-354.
41. Csorgo, M. Szyszkowicz, B. and Wang, Q. (2008). Asymptotics of Studentized U-type processes for changepoint problems, *Acta Math. Hungar.* , **121**, 307-332.

42. Csorgo, M. Szyszkowicz, B. and Wang, Q. (2008). On weighted approximations in $D[0, 1]$ with applications to self-normalized partial sum processes, *Acta Math. Hungar.* , **121**, 333–357.
43. Hu Z., Robinson, J. and Wang, Q. (2007). Edgeworth expansions for a sample sum from a finite set of independent random variables, *The Electronic Journal of Probability* , **12**, 1402–1417.
44. Hu Z, Robinson J and Wang, Q. (2007). Cramer Type Large Deviations for Samples from a Finite Population, *The Annals of Statistics* , **35**, 673–696.
45. Csorgo, M. Szyszkowicz, B. and Wang, Q. (2006). Change in the mean in the domain of attraction of the normal law, *Austrian Journal of Statistics* , **35**, 93–103.
46. Wang, Q. and Weber, NC. (2006). Exact convergence rate and leading term in the central limit theorem for U -statistics. *Statistica Sinica*, **16**, 1409–1422.
47. Wang, Q. (2005). Limit theorems for self-normalized large deviations. *Electronic Journal of Probability*, **10**, 1260–1285.
48. Robinson J. and Wang, Q. (2005). On the self-normalized large deviations. *J. Theoret. Probab.* **18** , 891–909.
49. Hall, P. and Wang, Q. (2004). Exact convergence rate and leading term in central limit theorem for Student’s t statistic. *Ann. Probab.*, **32**, 1497–1437.
50. Zhao, LC and Wu, C. Q. and Wang, Q. (2004). Berry-Esseen bound for a sample sum from a finite set of independent random variables, *Journal of Theoretical Probability*, **17**, 557–572.
51. Wang, Q. and Jing, B.-Y. (2004). Weighted bootstrap for U -statistics, *J. Multivariate Anal.* , **91**, 177–198.
52. Wang, Q., Lin X-Y and Chandra M. Gulati. (2003). Strong approximation for long memory processes with application, *Journal of Theoretical Probability*, **16**, 377–389.
53. Jing, B.-Y., Shao, Q.-M. and Wang, Q. (2003). Self-normalized Cramér Type Large Deviations for Independent Random Variables. *Ann. Probab.* **31**, 2167–2215.
54. Jing, B.-Y. and Wang, Q. (2003). Edgeworth expansion for U -statistics under minimal conditions. *Ann. Statist.* **31**, 1376–1391.
55. Csorgo, M. Szyszkowicz, B. and Wang, Q. (2003). Donsker’s theorem for self-normalized partial sums processes. *Ann. Probab.* **31**, 1228–1240.
56. Csorgo, M. Szyszkowicz, B. and Wang, Q. (2003). Darling-Erdős theorem for self-normalized sums. *Ann. Probab.* **31**, 676–692.
57. Wang, Q., Lin X-Y and Chandra M. Gulati. (2003). Asymptotics for general fractionally integrated processes with applications to unit root tests. *Econometric Theory*, **19**, 143–164.

58. Wang, Q. (2002). Non-uniform Berry-Esseen bound for U-statistics. *Statistica Sinica*, **12**, 1157–1169.
59. Wang, Q., Lin X-Y and Chandra M. Gulati. (2002). Asymptotics for general nonstationary fractionally integrated processes without prehistorical influence. *Journal of Applied Mathematics and Decision Sciences*, **6(4)** , 255–269.
60. Wang, Q., Lin X-Y and Chandra M. Gulati. (2002). The invariance principle for linear processes with applications. *Econometric Theory*, **18** , 119–139.
61. Wang, Q., Lin X-Y and Chandra M. Gulati. (2001). Asymptotics for moving average processes with dependent innovations. *Stat. and Probab. Letters*. **54** , 347–356.

• **Jornal articles (2000-1988)**

62. Wang, Q. Jing, B-Y. and Zhao, L.C. (2000). The Berry-Esséen bound for studentized statistics. *Ann. Probab.*, **28** , 511–535.
63. Wang, Q. and Jing, B.-Y. (1999). An exponential non-uniform Berry-Esséen bound for self-normalized sums. *Ann. Probab.*, **27**, 2068–2088.
64. Wang, Q. (1999). Kolmogorov and Erdős Test for self-normalized Sums. *Stat. and Probab. Letters*, **42** , 323–326.
65. Wang, Q. (1998). On Berry-Esseen rates for m-dependent U-statistics. *Stat. and Probab. Letters*, **41** , 123–130.
66. Wang, Q (1998). Bernstein type Inequalities for degenerate U-statistics with applications. *Chinese Annals of Math. (Series B)* **2** , 157–166.
67. Wang, Q. (1998). L_p rates of convergence for symmetric statistics. *J. of Nanjing University Math. Biquarterly*, **15** , 41–49.
68. Wang, Q. (1996). Non-uniform Rates of Convergence for Double Arrays of Independent Random Variables with Applications. *Acta Math. Appl. Sinica*, (English Series), **12** , 109–112.
69. Wang, Q. (1996). On the Maximal Inequality. *Stat. and Probab. Letters*, **31** , 85–89.
70. Wang, Q. (1996). Probabilities of large Deviations for U-statistics. *J. of Nanjing University Math. Biquarterly*, **13** , 168–172.
71. Wang, Q. (1995). The Strong Law of U-Statistics with ϕ^* -mixing Samples. *Stat. and Probab. Letters*, **23**, 151–155.
72. Wang, Q. (1995). On the Non-uniform Convergence Rates for U-statistics. *Science in China (Series A)*, **25** , 253–261.
73. Wang, Q. (1994). Bootstrapping for L-Statistics with unbounded score functions. *Chinese Annals of Math. (Series A)*, **15** , 281–286.

74. Wang, Q. (1994). The Strong Stability of Partial sums of Independent Random Variables. *J. Sys.Sci.& Math. Sci.* (Chinese Series), **14**, 139-145.
75. Wang, Q. (1994). Convergence Rate of L.I.L. for Functional Statistics. *J.of Mathematics (PRC)*, **14**, 363–368.
76. Wang, Q. (1994). On the Convergence Rates of Moderate Deviation. *J. of Nanjing University Math. Biquarterly*, **11** 77-89.
77. Wang, Q. (1993). Bootstraping Approximation Rates for L-Statistics. *Acta Math. Sinica* (Chinese Series), **36** , 223–232.
78. Wang, Q. (1993). On the Marcinkiewicz's Theorem of U-Statistics. *Chinese Science Bulletin*, **38**, 1672.
79. Wang, Q. (1993). Further Research for Complete convergence of Subsequence of Sums of I.I.D.Random Variables. *Acta Math. Scientia* (Chinese Series), **13** , 37–49.
80. Wang, Q. (1993). On the L_p ($1 \leq p \leq \infty$) Metric Property of Estimates of Error Variance in Linear Models. *Acta Math. Appl. Sinica* (Chinese Series), **16** , 10–22.
81. Wang, Q. (1993). Non-uniform Berry-Essen distance for Summability Methods with Applications. *Acta Math. Appl. Sinica* (Chinese Series), **16**, 338–395.
82. Wang, Q. (1992). Two-sided Bounds on the Rate of Convergence to the Normal Distribution of U-statistics. *J.Sys.Sci. and Math. Sci.* (Chinese Series), **12**, 35–40.
83. Wang, Q. (1992). Two-sided Bounds on the Rate of Convergence to the Normal Distribution of the Estimation of Error Variances. *Chinese J. of Applied Probability and Statistics*, **8** , 365–373.
84. Wang, Q. (1992). Estimates of the Convergence Rates for the Sums of sequences of Double Arrays. *J. of Mathematics (PRC)*, **12** , 334–341.
85. Wang, Q. and Gafurov, M.V. (1992). Further Research for Convergence Rates of the L.I.L.and the question of Small Parameter. *J. of China University of Science and Technology*, **21**, 217–226.
86. Wang, Q. (1991). Strong Invariance Principle for Sample Quantile of Order P. *Math. Stat. and Appl. Prob.* (Chinese), **5** , 53–58.
87. Wang, Q. (1991). Complete Convergence of Subsequence of the Sums of I.I.D. Random Variables. *J. of Mathematics (PRC)*, **11** , 161–171.
88. Wang, Q. (1991). The Almost Sure Bound of Two-sample Rank Statistics *Chinese J. of Applied Probability and Statistics*, **5**, 33–44.
89. Wang, Q. (1989). Strong Approximation for Linear Function of Order Statistics, *J. of Mathematics (PRC)*. **9**, 181–186.
90. Wang, Q. (1988) Strong Approximation for Jacknifing Function of U-Statistics and Von-Mises Statistics. *J.Sys. Sci. & Math. Sci.*(Chinese Series), **8** , 315–323.

91. Wang, Q. (1988). The Consistency of Ridge Regression. *Math. Stat. and Appl. Prob.* (Chinese), **3** , 43-52.

• **Refereed conference articles**

92. Csorgo, M. Szyszkowicz, B. and Wang, Q. (2004). On weighted approxiamtions and strong limit theorems for self-normalized partial sums processes. In *Asymptotics Methods in Stochastics: Festschrift for M. Csörgö*, Edited by L. Horváth and B. Szyszkowicz. Fields institute communications (Vol. 44), 489-521, (with Csörgö, M. and Szyszkowicz, B.)

93. Wang, Q. (2004). On Darling Erdos type theorems for self-nornmalized sums. In *Asymptotics Methods in Stochastics: Festschrift for M. Csörgö*, Edited by L. Horváth and B. Szyszkowicz. Fields institute communications (Vol. 44), 523-530.