Journal of
Mathematical
Inequalities
Volume 19, Number 1 (2025), 211–221
doi:10.7153/jmi-2025-19-14

COMPLETE MOMENT CONVERGENCE FOR WEIGHTED SUMS OF NEGATIVELY DEPENDENT RANDOM VARIABLES UNDER SUB–LINEAR EXPECTATIONS

MINGZHOU XU AND ZHENYU XIE

Abstract. By Rosenthal's inequality for negatively dependent random variables under sub-linear expectations, we study complete convergence and complete moment convergence for weighted sums of negatively dependent random variables. The results complement that of Li and Shen [9] in some extent.

Mathematics subject classification (2020): 60F15, 60F05.

Keywords and phrases: Negatively dependent random variables, complete convergence, complete moment convergence, sub-linear expectations.

REFERENCES

[1] X. C. CHEN AND Q. Y. WU, *Complete convergence theorems for moving average process generated by independent random variables under sub-linear expectations*, Communications in Statistics-Theory and Methods, **53**, 15 (2024), 5378–5404.

[2] Z. J. CHEN, *Strong laws of large numbers for sub-linear expectations*, Sci. China Math., **59**, 5 (2016), 945–954.

[3] Z. J. CHEN, P. Y. WU AND B. M. LI, *A strong law of large numbers for non-additive probabilities*, International Journal of Approximate Reasoning, **54** (2013), 365–377.

[4] F. Q. GAO AND M. Z. XU, *Large deviations and moderate deviations for independent random variables under sublinear expectations*, Sci. China Math., **41**, 4 (2011), 337–352.

[5] S. M. HOSSEINI AND A. NEZAKATI, *Complete moment convergence for the dependent linear processes with random coefficients*, Acta Math. Sin., Engl. Ser., **35** (2019), 1321–1333.

[6] F. HU, Z. J. CHEN AND D. F. ZHANG, *How big are the increments of G-Brownian motion*, Sci. China Math., **57**, 8 (2014), 1687–1700.

[7] M. H. KO, *Complete moment convergence of moving average process generated by a class of random variables*, J. Inequal. Appl., **2015**, article number 225 (2015).

[8] A. KUCZMASZEWSKA, *Complete convergence for widely acceptable random variables under the sublinear expectations*, J. Math. Anal. Appl., **484**, article number 123662 (2020).

[9] X. LI AND A. T. SHEN, *Complete moment convergence for weighted sums of extended negatively dependent random variables*, Journal of University of Science and Technology of China, **50**, 2 (2020), 156–162.

[10] Q. LIN, *Jensen inequality for superlinear expectations*, Stat. Probab. Lett., **151** (2019), 79–83.

[11] B. MENG, D. C. WANG AND Q. Y. WU, *Convergence of asymptotically almost negatively associated random variables with random coefficients*, Communications in Statistics-Theory and Methods, **52**, 9 (2023), 2931–2945.

[12] S. G. PENG, *G-expectation, G-Brownian motion and related stochastic calculus of Itô type*, Sto. Anal. Appl., **2**, 4 (2007), 541–561.

[13] S. G. PENG, *Nonlinear expectations and stochastic calculus under uncertainty*, 1 Eds., Springer, Berlin, 2019.

[14] M. Z. XU, *Complete convergence and complete moment convergence for maximal weighted sums of extended negatively dependent random variables under sub-linear expectations*, AIMS Mathematics, **8**, 8 (2023), 19442–19460.

Paper JMI-19-14

[15] M. Z. XU, *Complete convergence of moving average processes produced by negatively dependent random variables under sub-linear expectations*, AIMS Mathematics, **8**, 7 (2023), 17067–17080.

[16] M. Z. XU, *On the complete moment convergence of moving average processes generated by negatively dependent random variables under sub-linear expectations*, AIMS Mathematics, **9**, 2 (2024), 3369–3385.

[17] M. Z. XU AND K. CHENG, *Convergence for sums of iid random variables under sublinear expectations*, J. Inequal. Appl., **2021**, article number 157 (2021).

[18] M. Z. XU AND K. CHENG, *How small are the increments of G-Brownian motion*, Stat. Probab. Lett., **186**, article number 109464 (2022).

[19] M. Z. XU AND K. CHENG, *Note on precise asymptotics in the law of the iterated logarithm under sublinear expectations*, Mathematical Problems in Engineering, **2022**, article number 6058563 (2022).

[20] M. Z. XU, K. CHENG AND W. K. YU, *Complete convergence for weighted sums of negatively dependent random variables under sub-linear expectations*, AIMS Mathematics, **7**, 11 (2022), 19998–20019.

[21] M. Z. XU, K. CHENG AND W. K. YU, *Convergence of linear processes generated by negatively dependent random variables under sub-linear expectations*, J. Inequal. Appl., **2023**, article number 77 (2023).

[22] M. Z. XU AND X. H. KONG, *Complete qth moment convergence of moving average processes for m-widely acceptable random variables under sub-linear expectations*, Stat. Probab. Lett., **214**, article number 110203 (2024).

[23] M. Z. XU AND X. H. KONG, *Note on complete convergence and complete moment convergence for negatively dependent random variables under sub-linear expectations*, AIMS Mathematics, **8**, 4 (2023), 8504–8521.

[24] J. P. XU AND L. X. ZHANG, *The law of logarithm for arrays of random variables under sub-linear expectations*, Acta Math. Appl. Sin. Engl. Ser., **36**, 3, (2020), 670–688.

[25] J. P. XU AND L. X. ZHANG, *Three series theorem for independent random variables under sub-linear expectations with applications*, Acta Mathematicae Applicatae Sinica, English Series, **35**, 2 (2019), 172–184.

[26] L. X. ZHANG, *Donsker's invariance principle under the sub-linear expectation with an application to Chung's law of the iterated logarithm*, Commun. Math. Stat., **3**, 2 (2015), 187–214.

[27] L. X. ZHANG, *Exponential inequalities under the sub-linear expectations with applications to laws of the iterated logarithm*, Sci. China Math., **59**, 12 (2016), 2503–2526.

[28] L. X. ZHANG, *Rosenthal's inequalities for independent and negatively dependent random variables under sub-linear expectations with applications*, Sci. China Math., **59**, 4 (2016), 751–768.

[29] L. X. ZHANG, *Strong limit theorems for extended independent random variables and extended negatively dependent random variables under sub-linear expectations*, Acta Mathematica Scientia, **42**, 2 (2022), 467–490.

[30] L. X. ZHANG AND J. H. LIN, *Marcinkiewicz's strong law of large numbers for nonlinear expectations*, Stat. Probab. Lett., **137**, (2018), 269–276.

[31] H. Y. ZHONG AND Q. Y. WU, *Complete convergence and complete moment convergence for weighted sums of extended negatively dependent random variables under sub-linear expectation*, J. Inequal. Appl., **2017**, article number 261 (2017).

[32] X. C. ZHOU, *Complete moment convergence of moving average processes under φ-mixing assumptions*, Stat. Probab. Lett., **80** (2010), 285–292.