COMPLETE CONVERGENCE AND COMPLETE MOMENT CONVERGENCE FOR WEIGHTED SUMS OF *m*-EXTENDED NEGATIVELY DEPENDENT RANDOM VARIABLES

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Abstract. The authors study the complete convergence and complete moment convergence for weighted sums of *m*-extended negatively dependent (*m*-END) random variables. The results obtained in this paper extend and improve the corresponding results of Wu, Zhai and Peng [Y. F. Wu, M. Q. Zhai and J. Y. Peng, On the complete convergence for weighted sums of extended negatively dependent random variables, Journal of Mathematical Inequalities, 13 (1) (2019), 251–260] and Zarei and Jabbari [H. Zarei and H. Jabbari, Complete convergence of weighted sums under negative dependence, Statistical Papers, 52 (2011), 413–418].

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REFERENCES

- K. JOAG-DEV AND F. PROSCHAN, Negative association of random variables with applications, The Annals of Statistics 11 (1) (1983), 286–295.
- [2] N. EBRAHIMI AND M. GHOSH, Multivariate negative dependence, Communication in Statistics-Theory and Methods 10 (1981), 307–337.
- [3] L. LIU, Precise large deviations for dependent random variables with heavy tails, Statistics and Probability Letters 79 (2009), 1290–1298.
- [4] Y. Q. CHEN, A. Y. CHEN AND K. W. NG, The strong law of large numbers for extended negatively dependent random variables, Journal of Applied Probability 47 (4) (2010), 908–922.
- [5] A. T. SHEN, Probability inequalities for END sequence and their applications, Journal of Inequalities and Applications 98 (2011), 12 pages.
- [6] Y. F. WU AND M. GUAN, Convergence properties of the partial sums for sequences of END random variables, Journal of the Korean Mathematical Society 49 (6) (2012), 1097–1110.
- [7] S. J. WANG AND X. J. WANG, Precise large deviations for random sums of END real-valued random variables with consistent variation, Journal of Mathematical Analysis and Applications 402 (2013), 660–667.
- [8] X. J. WANG, L. L. ZHENG, C. XU AND S. H. HU, Complete consistency for the estimator of nonparametric regression models based on extended negatively dependent errors, Statistics: A Journal of Theoretical and Applied Statistics 49 (2) (2015), 396–407.
- [9] A. T. SHEN AND A. VOLODIN, Weak and strong laws of large numbers for arrays of rowwise END random variables and their applications, Metrika 80 (2017), 605–625.
- [10] Y. C. YI, D. H. QIU AND P. Y. CHEN, Complete moment convergence for weighted sums of extended negatively dependent random variables, Communication in Statistics-Theory and Methods 46 (20) (2017), 10189–10202.
- [11] X. J. WANG, Y. WU, R. WANG AND S. H. HU, On consistency of wavelet estimator in nonparametric regression models, Statistical Papers 62 (2) (2021), 935–962.
- [12] X. J. WANG, Y. WU AND S. H. HU, Exponential probability inequality for m-END random variables and its applications, Metrika 79 (2) (2016), 127–147.



- [13] W. F. XU, Y. WU, R. ZHANG, H. L. JIANG AND X. J. WANG, The mean consistency of the weighted estimator in the fixed design regression models based on m-END errors, Journal of Mathematical Inequalities 12 (3) (2018), 765–775.
- [14] Z. J. WANG, Y. WU, M. G. WANG AND X. J. WANG, Complete and complete moment convergence with applications to the EV regression models, Statistics: A Journal of Theoretical and Applied Statistics 53 (2) (2019), 261–282.
- [15] Y. WU AND X. J. WANG, Strong laws for weighted sums of m-extended negatively dependent random variables and its applications, Journal of Mathematical Analysis and Applications 494 (2021), 124566.
- [16] P. L. HSU AND H. ROBBINS, Complete convergence and the law of large numbers, Proceedings of the National Academy of Sciences 33 (1947), 25–31.
- [17] Y. S. CHOW, *On the rate of moment complete convergence of sample sums and extremes*, Bulletin of the Institute of Mathematics Academia Sinica **16** (3) (1988), 177–201.
- [18] H. ZAREI AND H. JABBARI, Complete convergence of weighted sums under negative dependence, Statistical Papers 52 (2011), 413–418.
- [19] Y. F. WU, M. Q. ZHAI AND J. Y. PENG, On the complete convergence for weighted sums of extended negatively dependent random variables, Journal of Mathematical Inequalities 13 (1) (2019), 251–260.
- [20] S. H. SUNG, Moment inequalities and complete moment convergence, Journal of Inequalities and Applications 2009 (2009), 271265, 14 pages.