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NONGLAK SAWATDIRUKSA : THE REVISION OF ESTIMATES OF MORTALITY PROBABILITY BY WHITTAKER GRADUATION, BAYESIAN GRADUATION AND INCREASING BAYESIAN GRADUATION. THESIS ADVISOR : ASST. PROF. CAPT. MANOP VARAPHAKDI, M.S. 469 pp. ISBN 974-636-002-7.

The objective of this study is to compare revision methods of estimation of mortality probability. The estimation method of this study is Maximum Likelihood Estimation and three revision methods are Whittaker Graduation Method, Bayesian Graduation Method, and Increasing Bayesian Method. The probability that a person whose age  $x$  will die within one year are estimated ( $q'_x$ ) and then these estimates are revised between age 16 and 95 by these three methods. The sample size are 50, 100, 300, 500, 700, and 1,000 respectively. The percent withdrawn are 10%, 20%, 30%, and 40% respectively. The distribution of future life time for this study is Exponential, and distributions of withdrawal time are Uniform, and Gamma. The estimation of  $q'_x$ 's for each case is repeated 200 times using the Monte Carlo simulation method, and the value of  $q'_x$  are revised by the three revision methods. To compare the error of the revision the mean absolute percentage errors (MAPE) are evaluated for the comparison.

The results of this study are as follows :

For each distribution, for each sample size and for each percent withdrawal, the increasing Bayesian Method has the lowest MAPE, and the Bayesian Graduation Method has the highest MAPE. However, in case of very large sample size ( $m=1000$ ) or high age (between 56-95 years), the MAPE's of all three revision methods are not much different.

When the sample size increases, the MAPE of each revision method decreases and when the percent whitdraw decreases, the MAPE of each revision method also decreases.

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