



**COMPARISON OF PREMIUM CALCULATION WITH
MORTALITY TABLE AND MODIFIED DE MOIVRE
METHOD ON N YEAR TERM LIFE INSURANCE**

UNDERGRADUATE THESIS

Submitted as one of the requirements to obtain

Sarjana Aktuaria

By

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**FACULTY OF BUSINESS
ACTUARIAL SCIENCE STUDY PROGRAM
CIKARANG
AUGUST, 2023**

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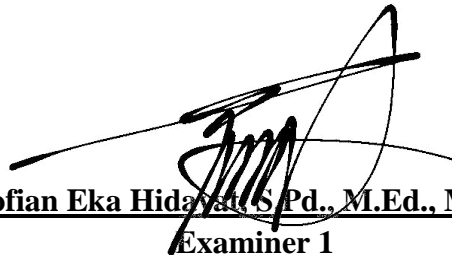
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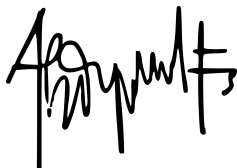
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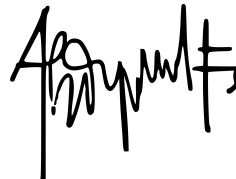
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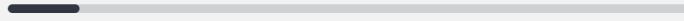
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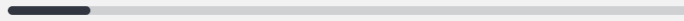
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ABSTRACT

In Indonesia, the insurance firm usually calculate the premiums by Indonesia Mortality Table. But, there are several method to calculate the premiums like De Moivre Method. De Moivre Method is a method to calculate the probability of survival and dies from an uniform distribution. This method is simpler method than others but the result is very far with Indonesia Mortality Table. The author wanted the De Moivre Method can run in Indonesia by equalizing the probability values by Modified De Moivre Method. This method is almost same with De Moivre Method but there is an alpha value as a parameter. The author compared and equalied the probability of survival between the Indonesia Mortality Table 2019 and Modified De Moivre Method by adjusting the alpha values. Therefore, Modified De Moivre can run in Indonesia. The author used the median and harmonic mean to find the alpha value. Median is a measure to find the central point from increasing order of size sample and harmonic mean is a measure to find the average where it is sensitive with small value. This study used term life insurance because this type has a low premium. From this study, it can be concluded that the cheaper premium is the Modified De Moivre Harmonic Alpha Value Method and the most expensive is the Modified De Moivre Median Alpha Value Method because the harmonic alpha value is smaller than others. The smaller of alpha value, then the survival probability will increase, the dies probability will decrease, and the premium will decrease.

Keywords: *Harmonic Mean, Indonesia Mortality Table, Median, Modified De Moivre, Premium, Term Life Insurance*

ABSTRAK

Di Indonesia, perusahaan asuransi biasanya menghitung premi berdasarkan Tabel Mortalitas Indonesia. Namun ada beberapa metode untuk menghitung premi seperti Metode De Moivre. Metode De Moivre merupakan metode untuk menghitung peluang bertahan hidup dan mati dari *uniform distribution*. Cara ini lebih sederhana dibandingkan cara lain namun hasilnya sangat jauh dengan Tabel Mortalitas Indonesia. Penulis ingin Metode De Moivre dapat berjalan di Indonesia dengan menyamakan nilai probabilitas dengan Metode Modified De Moivre. Cara ini hampir sama dengan Metode De Moivre namun terdapat nilai α sebagai parameternya. Penulis membandingkan dan menyamakan probabilitas kelangsungan hidup antara Tabel Mortalitas Indonesia 2019 dan Metode Modified De Moivre dengan menyesuaikan nilai α . Maka, Modified De Moivre dapat berjalan di Indonesia. Penulis menggunakan median dan rata-rata harmonik untuk mencari nilai α . Median adalah ukuran untuk mencari titik pusat dari penambahan ukuran sampel dan rata-rata harmonik adalah ukuran untuk mencari rata-rata yang sensitif dengan nilai yang kecil. Penelitian ini menggunakan asuransi jiwa berjangka karena jenis ini memiliki premi yang rendah. Dari penelitian ini dapat disimpulkan bahwa premi yang lebih murah adalah Metode Modified De Moivre dengan nilai α rata-rata harmonik dan yang paling mahal adalah Metode Modified De Moivre dengan nilai median α karena nilai α harmoniknya lebih kecil dibandingkan yang lain. Semakin kecil nilai α maka probabilitas kelangsungan hidup akan meningkat, probabilitas kematian akan menurun, dan premi akan menurun.

Kata Kunci: Asuransi Jiwa Berjangka, Median, Modified De Moivre, Premi, Rata-rata Harmonic, Tabel Mortalitas Indonesia.

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