

WELFARE EFFECTS OF INDIVIDUALIZED LIFE-CYCLE
PENSION INVESTMENTS TO HOUSEHOLDS IN TURKEY

RAVSHANBEK KHODZHIMATOV

BOĞAZIÇI UNIVERSITY

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Ravshanbek Khodzhimatov

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CHAPTER 1

INTRODUCTION

- 1.1 Turkish Pension System
- 1.2 Theory and Heuristics of Life-cycle Investments
- 1.3 Focus of this Thesis

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CHOLSKY DECOMPOSED ERRORS

In order to create K random series which are correlated exactly like K deterministic series we have in mind, we can multiply independent random variables with the Cholesky decomposed part of the deterministic series. To illustrate this, let Σ be a correlation matrix of matrix X consisting of variables x_1, x_2, \dots, x_K . Obviously the matrix is symmetric and the diagonal consists of 1s. Let $\Sigma = LL'$ be a Cholesky decomposition of this matrix. Now, let Ω be a vector of K independent random variables $\epsilon_1, \epsilon_2, \dots, \epsilon_K$ with variance 1. Consequently, the variance-covariance matrix of Ω is an identity matrix. Then we claim that the product $L\Omega$ has the same correlation structure as X . The proof is below:

$$\begin{aligned} cov(L\Omega) &= E[(L\Omega)(L\Omega)'] = E[L\Omega\Omega'L'], \\ cov(L\Omega) &= L \cdot E[\Omega\Omega'] \cdot L' = L \cdot var(\Omega) \cdot L', \\ cov(L\Omega) &= L \cdot I \cdot L' = LL' = \Sigma \end{aligned}$$