

**2<sup>nd</sup> PBSS Colloquium**  
**21-23 May 2007**  
**Helsinki, Finland**

**Topic C. Actuarial Valuation Methods and Assumptions**

**Modelling and predicting individual salaries**

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This paper models wages by exploiting a unique Finnish dataset. For both genders the data is divided into four income quartiles. A panel data model is estimated with the three degree polynomials of age, the duration of employment, and GDP growth as explanatory variables. Individual variation within a wage quartile is shown to be large and an important risk factor. The model provides predictors also for individual wages. Note that common salary models permit analysis only of average levels. The estimation period is 1975-1985. Genuine out-of-sample predictions are made first assuming a normal growth in 1986-1990, then a deep recession in 1991-1994.

According to the models, the wage formation seems to be essentially different in different wage quartiles. GDP is statistically significant only for one wage group, but still the prediction accuracy is remarkably worse during the recession period when GDP drops. The prediction errors for the middle-wage quarters seem to be considerably smaller than for the low and high-wage groups. There is some indication that the middle quarters can be predicted quite accurately several years ahead. The results show that individual aspects and the wage group play a significant role in modeling and prediction. This is potentially useful information when designing and developing pension schemes.

**Keywords:** Macroeconomic Risk, Mixture Model, Planning Schemes, Projection Method, Salary Risk.