

Income Volatility and Portfolio Choices*

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Abstract

Using a detailed household-level financial and labor-market panel data from the Statistics Norway, we examine the effect of structural breaks in the labor market on household's portfolio decisions. Individual structural breaks are identified by sharp changes in the volatility of labor income. We find a clear *negative* relationship between the volatility in the labor market and household's risky share. According to our estimates, a worker who experiences a 33% increase in income volatility decreases the risky share by 4.4 percentage point.

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1 Introduction

During the last two decades there has been significant progress in understanding households' financial behavior. Numerous studies have emphasized the importance of labor-income risk for understanding portfolio choices. To name a few, [Cocco et al. \(2005\)](#) study the effects of income risk to stock market participation in a life-cycle model. Other studies such as [Benzoni et al. \(2011\)](#), [Huggett and Kaplan \(2016\)](#), and ? [Should be AEJ 2018 version?] explore the properties of labor income risk with more details—e.g., its covariance with stock-market returns or its age-dependent unemployment and mobility.

Despite the large progress made in the literature, there are only a few studies that establishes an empirical link between the labor-market risk and households' portfolio decisions based on a individual panel data. Even the well-known studies (e.g., [Campbell et al. \(2001\)](#) and [Angerer and Lam \(2009\)](#))) rely on the cross-sectional variation of income risk (by occupations or industries). This is due to the lack of coherent panel data that have both detailed information on the financial portfolio and labor market status at the household level.

In this paper, we overcome this shortcoming by analyzing the effect of labor-market risk on the portfolio choice using high-quality household-level *panel* from the Statistics Norway. Our dataset includes *all* Norwegian residents from 1993 to 2014. Households in Norway are obliged to report their complete income and wealth holdings to the tax authority every year. Also, employers, banks, brokers, insurance companies and any other financial intermediaries are obliged to send the information on the value of the assets owned by the individual to the tax authority. The tax authority combines the information from companies' report on net worth with individuals', and adjust if necessary. We merge this household finance data with a matched Employer-Employee Register which includes detailed labor market information for every worker each year such as a worker ID, an employers ID, job starting date with each employer, job ending date with each employer, total payments to workers from each employer, industry, occupation, actual and expected working hours, total number of days worked and information about full-time/part-time employment.

Equipped with long histories of workers' income and portfolio choices, we analyze the effects of changes in individual labor-market volatility on portfolio choice (risky shares in asset holdings). We first identify the individual structural breaks in the labor market risk. The structural break in the labor-market is defined as a large change in the volatility (i.e., the standard deviation) of labor income growth. For example, if a worker experienced a 33% increase (which corresponds to the 90 percentile in our benchmark sample of 48,768 workers) in the standard deviation of labor income growth between the two sub-periods, that year is

identified as a structural break (of the increased income volatility) for the worker.¹

We find a clear *negative* relationship between the income volatility in the labor market and household's risky share. For example, workers who experience a large increase in the labor market volatility (e.g., more than 33% increase in the standard deviation of income growth rates) decreases their risky share by 4.4 percentage point in the years to follow. We also find an interesting pattern in the timing of portfolio adjustments. First, workers starts adjusting their risky shares a couple of years prior to the structural break, suggesting that workers might have been able to foresee the structural break. Second, workers continue to adjust their portfolio choice several years after the structural break, which may suggest an adjustment cost in financial portfolio or a gradual progression of structural break itself.

We would like to use these evidences from our panel data to further discipline a structural model of household's portfolio choice. We construct a life-cycle model where households choose between a risk-free and a risky asset for savings. In the model, households are subject to age-dependent income shocks (unemployment and/or switching jobs) along with a typical life-cycle profile of income process. In addition, our model will feature imperfect information and (gradual) Bayesian learning about the income profile. We wish to match the estimated dynamic relationships between portfolio choice and structural breaks in the labor market from our panel data.

¹According to our benchmark sample (explained below in details) of 48,768 workers, the average annual growth rate of labor income (after controlling for demographic characteristics) is 0.6%. The labor market uncertainty (the standard deviation of income growth) is 37%. When we split the sample into two sub-periods at the midpoint (year 2004), the standard deviation of the *change* in income volatility is 39%. For example, when the labor-market volatility increases by 33% in a year, that year is identified as a structural break (of labor-market risk) for the worker. Vice versa, when the labor-market volatility decreases by 45% in a year, that year is identified as a structural break for the decrease in the labor market risk.

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