



# A labor news hedge portfolio and the cross-section of expected stock returns<sup>☆</sup>

Olaf Stotz

Frankfurt School of Finance and Management, Adickesallee 32-34, D-60322 Frankfurt am Main, Germany



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## ABSTRACT

Using the relation between the surprise component in labor statistics and an asset's return on labor news announcement days, we derive a labor beta. By adding a labor news hedge portfolio which is long in high labor beta assets and short in low labor beta assets to the market portfolio, we obtain a labor news model. This model describes the cross-section of expected stock returns just as well as or even better than alternative multifactor models. The estimated premium for bearing labor income risk varies between three and five percentage points per annum.

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## 1. Introduction

For many households, labor income dominates income from financial assets as a source of consumption.<sup>1</sup> Unlike financial assets, however, labor income cannot be capitalized and is therefore not traded in capital markets. If households use financial assets to insure risks stemming from labor income (e.g. they want to smooth consumption), their hedging demand should be reflected in their allocation to financial assets and in prices of such (e.g. Heaton and Lucas, 2000; Viceira, 2001; Cocco et al., 2005). The cross-section of expected stock returns should then be related to a labor income risk (e.g. Mayers, 1972). Although on an individual household level, such a labor hedging demand can be empirically observed (e.g. Angerer and Lam, 2009; Betermier et al., 2012), the impact of hedging labor income risks on the cross-section of average stock returns is less clear. Early studies have used a stock's sensitivity with the growth rate of (per capita) labor income as a proxy for labor beta. Such approaches, however, have provided at best a mixed picture of the relation between an asset's labor beta and the expected return of the asset.<sup>2</sup>

We present a new approach to analyzing the role of labor income risk in the cross-section of expected stock returns. The central idea is to focus on announcement days of important labor statistics in order to characterize a stock's labor beta. We thereby analyze the impact of the surprise component in the labor statistics on the marginal utility of the average investor. Good labor news tends to decrease the marginal utility of consumption, while bad news tends to increase it. Then, we link the surprise component conditional on its effect on marginal utility to a stock's return. Bad labor news (i.e. increasing marginal utility) and good stock returns imply a good hedging characteristic, and vice versa. Thus, a stock's reaction to surprises in labor news helps to discriminate between stocks with good and bad hedging characteristics and to rank stocks on their labor beta.

For illustrative purposes, consider the US economy. A major source of information about the labor market is the monthly release of the labor statistics by the Bureau of Labor Statistics (BLS). Investors regard the labor statistics to be one of the most important

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E-mail address: [o.stotz@fs.de](mailto:o.stotz@fs.de).

<sup>1</sup> For example, Palacios (2015) documents that the wages-to-consumption ratio in the US has been averaged to about 85% for the period of 1947 to 2007.

<sup>2</sup> In most studies, the growth rate of labor income is interpreted as the return on human capital. Then, for example, Fama and Schwert (1977) and Campbell (1996) find no positive relation between the labor beta and average stock returns. Jagannathan and Wang (1996), Jagannathan et al. (1998), and Eiling (2013), however, document a positive relation.

macroeconomic indicators for the US economy. Aggregate labor income is most likely to decrease unexpectedly if people earn less than anticipated and fewer people than expected are employed, since fewer people will receive paychecks. Accordingly, the state of the economy reflects a lower level of consumption and a higher marginal utility of consumption. Assets with a high (low) return on a negative labor news day can be characterized as good (bad) hedging instruments with a low (high) labor beta. If investors dislike economic states with low labor income, holding stocks with a particular low return after hearing bad news should be compensated with a high risk premium on average.

Using the link between an asset's return, labor news, and corresponding changes in the marginal utility, we rank assets on their labor beta. This ranking is used subsequently to form a zero-investment portfolio called a labor news hedge (LNH) portfolio. This hedge portfolio is long in high labor beta assets and short in low labor beta assets. The formation of the LNH thereby follows the intuition of [Merton's \(1973\)](#) hedge portfolios, since the LNH is related to unexpected changes in the marginal utility of consumption. Adding it to the market portfolio in a consumption-based asset pricing context, we obtain a factor model (called "labor news model"). In cross-section asset pricing tests, we demonstrate that betas to the LNH portfolio are significantly priced. It should be noted that the formation of the LNH portfolio does not require a point estimate of the labor beta (which is usually used in asset pricing tests, e.g. [Fama and Schwert, 1977](#)) but only the ranking of all assets according to their respective labor beta. This makes the formation of the LNH robust to specification errors associated with a point estimator for a labor beta. Such a ranking approach is widely used to derive hedge portfolios in general, such as size (small minus big—SMB) and value (high book-to-market minus low book-to-market—HML) portfolios of [Fama and French \(1993\)](#). The formation of the LNH portfolio, however, differs from common factors such as SMB and HML, since these use *company specific metrics*, such as market capitalization and book-to-market ratio, whereas we directly use an asset's *hedging characteristic*.

We analyze the return characteristics of the LNH portfolio in the time series and its asset pricing implications in the cross-section of average stock returns. Over time, the LNH portfolio earns a positive premium, which is consistent with an aggregate demand to insure labor income risk. The size of the premium is about 4.7% per annum. Using 25 portfolios sorted on size and book-to-market and other test assets, cross-sectional asset pricing tests imply a risk premium of about 3.6%. Thus, time series and cross-section analyses deliver a labor risk premium of the same order. Thereby, the labor news model explains average stock returns just as well as the three-factor model of [Fama and French \(1993\)](#), the four-factor model of [Carhart \(1997\)](#), or the five-factor model of [Fama and French \(2015\)](#). We find that the pricing errors of the labor news model cannot be explained either by size, value, and momentum factors or by size, value, and momentum characteristics. Also, risk prices for size and value are significantly attenuated if sensitivities to the LNH portfolio are considered. Several robustness checks confirm these conclusions. These robustness exercises include, among others, alternative base assets for forming the LNH, alternative test assets, and alternative approaches to estimating a labor beta. In sum, using information surprises on announcement days of labor statistics seems to be a robust approach to forming a labor news hedging portfolio.

We also compare the labor news model to asset pricing models derived in a production-based economy. In these models, labor is treated as a friction, since it is associated with search costs or adjustment costs (e.g. [Belo et al., 2014](#); [Kuehn et al., 2017](#)). These frictions then produce a risk premium. For example, a tight labor market (e.g. [Kuehn et al., 2017](#)) is associated with higher adjustment costs and higher labor income: What is good for workers (labor income) in a consumption economy is bad for companies' profits in a production economy. We find that the risk premiums associated with labor market tightness ([Kuehn et al., 2017](#)) and labor income news are empirically related.

The paper proceeds as follows. In Section 2 we provide a short summary of the labor news model and describe the approach to forming the LNH portfolio. The labor news model is tested in Section 3. Several robustness checks in Section 4 analyze whether the labor news model is robust to alternative specifications of the LNH. Section 5 provides the conclusion.

## 2. Methodology

This section is divided into four parts. The first part provides a short summary of the theoretical relationship between the expected return of an asset and its labor beta. We use this relation to derive an empirical approach in order to rank assets on their labor beta and to form an LNH. The second section describes the empirical approach of forming an LNH. In the third part, we compare the new approach with existing ones that mimic the news component of labor income risk. The last part considers the frictional aspect of labor and discusses several models and how they relate to the labor news model.

### 2.1. A labor news model and a labor news hedge portfolio

The labor news model relates asset  $i$ 's expected excess return  $E_t(r_{i,t+1}) - r_{f,t+1}$  to two risk premiums: a premium for bearing market risk ( $\lambda_{t+1}^m$ ) and a premium for bearing labor income risk ( $\lambda_{t+1}^l$ ):

$$E_t(r_{i,t+1}) - r_{f,t+1} = \beta_{i,t}^m \cdot \lambda_{t+1}^m + \beta_{i,t}^l \cdot \lambda_{t+1}^l, \quad (1)$$

where  $\beta_{i,t}^m$  (market beta) is the sensitivity of asset  $i$ 's return  $r_{i,t}$  to the return of the market portfolio  $r_{m,t}$ , and  $\beta_{i,t}^l$  (labor beta) is the sensitivity of asset  $i$ 's return to the labor income. In particular, the labor beta is proportional to the covariance at time  $t$  of the unexpected return of asset  $i$ , denoted by  $\eta[r_{i,t}]$ , and of the unexpected news in labor income, denoted by  $\eta[l_t]$ :

$$\beta_{i,t}^l \sim \text{cov}_t(\eta[r_{i,t}], \eta[l_t]). \quad (2)$$

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