Insurance and Opportunities: A Welfare Analysis of Labor Market Risk

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Presentation Outline

Goal of the paper

Three Welfare Questions

- The welfare effect of a rise in wage disperion
- The welfare gain from completing markets
- The welfare effect from eliminating risk

The Model

Key Assumptions

- Partial insurance: an individual's log wage is given by

$$log(w_t) = \alpha + \epsilon_t$$

- Financial market structure: sequential trading in zero-supply Arrow securities
- Endogenous labor supply
- For each α-island can use static planner's problem
- Equal weight utilitarian welfare function

$$W = (1-\beta)E_0 \sum_{t=0}^{\infty} \beta^t u(c_t, h_t) = \int_A \int_E u(c(\alpha,\epsilon), h(\alpha,\epsilon)) d\Phi(\epsilon) d\Phi(\alpha)$$

Measuring Welfare

- Measuring welfare effects due to rising labor market risk

$$\int_A \int_E u((1+\omega)c(\alpha,\epsilon), h(\alpha,\epsilon))d\Phi(\epsilon)d\Phi(\alpha) = \int_A \int_E u(\hat{c}(\alpha,\epsilon), \hat{h}(\alpha,\epsilon))d\Phi(\hat{\epsilon})d\Phi(\hat{\alpha})$$

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- Measuring welfare effects due to completing markets

$$\int_A \int_E u((1+\chi)c(\alpha,\epsilon), h(\alpha,\epsilon)) d\Phi(\epsilon) d\Phi(\alpha) = \int_A \int_E u(c(0,\alpha+\epsilon), h(0,\alpha+\epsilon)) d\Phi(\epsilon) d\Phi(\alpha)$$

Measuring Welfare

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- Measuring welfare effect of eliminating risk

$$\int_A \int_E u((1+\kappa)c(\alpha,\epsilon), h(\alpha,\epsilon))d\Phi(\epsilon)d\Phi(\alpha) = \int_A \int_E u(\hat{c}(0,0), \hat{h}(0,0))d\Phi(\epsilon)d\Phi(\alpha)$$

A Welfare Change Decomposition

- Floden, 2001: If $u(\cdot)$ is such that $u(xc, h) = g(x)u(c, h)$, then $\omega \approx \omega^{lev} + \omega^{vol}$
- The level effect captures welfare changes due to changing size of the pie

$$u((1+\omega^{lev})C, H) = u(\hat{C}, \hat{H})$$

- Define the cost of uncertainty p which solves

$$u((1-p)C, H) = \int_A \int_E u(c(\alpha,\epsilon), h(\alpha,\epsilon)) d\Phi(\epsilon) d\Phi(\alpha)$$

- The volatility effect capture changes in welfare due to changing distribution of the pie

$$\begin{aligned} (1+\omega^{vol})(1-p) &= 1-\hat{p} \\ \omega^{vol} &= \frac{1-\hat{p}}{1-p} - 1 \end{aligned}$$

Welfare Analysis with Separable Preferences

Equilibrium Allocations

- Suppose preferences are separable

$$u(c,h) = \frac{c^{1-\gamma}}{1-\gamma} - \psi \frac{h^{1+\sigma}}{1+\sigma},$$

where $\gamma, \sigma \in [0, \infty)$.

- Equilibrium labor allocation is

$$logh(\alpha,\epsilon) = \left(\frac{1-\gamma}{\gamma+\sigma}\right)\alpha + \frac{1}{\sigma}\epsilon - \left(\frac{1+\sigma}{\gamma+\sigma}\right)\frac{\gamma}{\sigma^2}\frac{v_\epsilon}{2}$$

- Equilibrium consumption is given by

$$logc(\alpha,\epsilon) = \left(\frac{1+\sigma}{\gamma+\sigma}\right)\alpha + \left(\frac{1+\sigma}{\gamma+\sigma}\right)\frac{1}{\sigma}\frac{v_\epsilon}{2}$$

Approximate Closed Form Expressions

- The approximate welfare effect from a change in labor market risk is

$$\omega(\Delta v_{\alpha}, \Delta v_{\epsilon}) \approx -\left[\frac{\gamma-1}{\gamma+\sigma} + \gamma\left(\frac{1+\sigma}{\gamma+\sigma}\right)\right]\frac{\Delta v_{\alpha}}{2} + \frac{1}{\sigma}\frac{\Delta v_{\epsilon}}{2}$$

$$= \underbrace{-\frac{\gamma-1}{\gamma+\sigma}\Delta v_{\alpha} + \frac{1}{\sigma}\Delta v_{\epsilon}}_{\omega^{lev}} + \underbrace{\left[\frac{\gamma-1}{\gamma+\sigma} - \gamma\left(\frac{1+\sigma}{\gamma+\sigma}\right)\right]\frac{\Delta v_{\alpha}}{2} - \frac{1}{\sigma}\frac{\Delta v_{\epsilon}}{2}}_{\omega^{vol}}$$

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- The approximate welfare gain from completing markets is

$$\chi(v_\alpha) = \omega(-v_\alpha, v_\alpha) \approx \left[\frac{\gamma-1}{\gamma+\sigma} + \gamma\left(\frac{1+\sigma}{\gamma+\sigma}\right)\right]\frac{v_\alpha}{2} + \frac{1}{\sigma}\frac{v_\alpha}{2}$$

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- The approximate welfare gain from eliminating risk is

$$\kappa(v_\alpha, v_\epsilon) = \omega(-v_\alpha, -v_\epsilon) \approx \left[\frac{\gamma-1}{\gamma+\sigma} + \gamma\left(\frac{1+\sigma}{\gamma+\sigma}\right)\right]\frac{v_\alpha}{2} - \frac{1}{\sigma}\frac{v_\epsilon}{2}$$

Quantitative Welfare Analysis

Calibration

- Preference parameters: $\gamma = \sigma = 2$ so that Frisch elasticity is 0.5
- Variance of log wages rose from 0.25 to 0.35, variance of log hours worked rose 0.082 to 0.092, and covariance between hours and wages rose from -0.023 to -0.006 (PSID 1968-1997)
- Measurement of insurable and unsinsurable wage components: variance of the transitory component increases from 0.08 to 0.13; variance of permanent component increases from 0.17 to 0.22.
- Thus, set $\Delta v_\epsilon = \Delta v_\alpha = 0.05$ and when focusing for labor market uncertainty in the 1990's set $v_\alpha = 0.22$ and $v_\epsilon = 0.13$.

Results

Table: Welfare Effects with Separable Preferences (% of lifetime consumption)

ω^{vol}	ω^{lev}	ω	χ^{vol}	χ^{lev}	χ	κ^{vol}	κ^{lev}	κ
-4.38%	1.25%	-3.06%	8.3%	16.5%	29.2%	17%	-1%	17.8
-3.13%			24.8%			16%		

- When completing markets, level effect is twice as big as volatility effect
- Relative to complete market, eliminating the insurable component is welfare reducing
- Welfare gains from eliminating uninsurable risk exceed costs of eliminating insurable risk

Discussion

- Potential welfare gains larger than gains from aggregate stabilization
- Government should foster an environment to allow new insurance markets to develop
- Welfare costs of market incompleteness to be seen as upper bound