Uncertainty, Redistribution, and the Labor Market

February 2013
Uncertainty and the Labor Market: Mechanisms

• “Labor demand”: uncertainty pushes real wages lower
  – v1. Reduced investment → people who make investment goods have fewer jobs
  – v1 liberal BOE: attribute entire investment drop – $2k per capita = 4% of GDP – to heightened uncertainty. But 4% drop in labor demand only reduces labor by about 1%, while actual labor fell almost 10%
  – v2. employers perceive a new cost of employment in addition to employee compensation (e.g., probability of new employer tax)
  – v3. uncertainty affects markup behavior

• “Labor supply”
  – precautionary savings motive: pushes real wages lower
  – increased demand for social insurance:
    • reduces after-tax wages and
    • (in the short term) raises pre-tax wages
After-tax Real Wages Fell Sharply, and Remain Low

pre-tax real wage

real wage after taxes and benefits
Principal-Agent Model

- Worker’s output = \( y = n + \nu + \varepsilon \)
  - \( n \) = effort
  - \( \nu \) = random factor, public information
  - \( \varepsilon \) = random factor, private information
- \( \nu \) and \( \varepsilon \) are idiosyncratic risks but their relative importance may change over time
- After full-information insurance, workers are left with \( y - \nu = n + \varepsilon \)
- Social insurance at rate \( (1-\mu) \), so disposable income is
  \[ c = \mu \varepsilon + \mu n + b \]
- \( b \) is the guaranteed minimum income. \( \mu \) is “self-reliance rate”
- Social insurance budget constraint
  \[ b = (1-\mu)N \]
- where \( N \) is average effort
Principal-Agent Model (cont’d)

• Equilibrium defined for given $\mu$:
  – Individual effort $n$ maximizes expected utility, taking $N$ and $\mu$ as given
    \[
    \int u \left( \mu n + \mu \epsilon + (1 - \mu)N - \gamma \frac{n}{\eta + 1} n^{(\eta+1)/\eta} \right) dG(\epsilon)
    \]
    where the constant $\eta > 0$ is the wage elasticity of effort. $\gamma, u' > 0, u'' < 0$,
  – Average effort $N$ coincides with optimal individual effort
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- Efficient effort $n^* = (1/\gamma)^\eta$
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- Efficient effort $n^* = (1 / \gamma)^\eta$
- Safety $S$ defined as a monotone decreasing function of the variance of disposable income $c$
  \[ S \equiv \frac{1}{1 + s_c} = \frac{1}{1 + s_\varepsilon \left( \frac{N}{n^*} \right)^{1/\eta}} \]
- Safety-efficiency tradeoff is the locus of equilibria in the [efficiency, safety] plane: one for each degree of social insurance
Safety = \( (1 + s_\epsilon)^{-1} \)

Figure 1. The Equity-Efficiency Frontier

Labor efficiency = \( \frac{N}{n^*} \)
Optimal Social Insurance

- Equilibrium expected utility, for given $\mu$:
  \[
  \int u\left(\mu \varepsilon + \left(\frac{\mu}{\gamma}\right)^\eta - \gamma \frac{\eta}{\eta + 1} \left(\frac{\mu}{\gamma}\right)^{\eta+1}\right)dG(\varepsilon)
  \]
  - Optimal social insurance is the $\mu$ that maximizes this

- Optimal degree of social insurance ($1-\mu$) depends on
  - shape of $u()$: more risk aversion $\rightarrow$ more social ins. (move along frontier)
  - shape of $G$: more variance $\rightarrow$ more social ins (frontier twists)

- Changing the composition of information between public and private
  - amounts to changing the distribution of $G$
  - e.g., aggregate shock makes it harder to disentangle effort from luck
Figure 2. Changes in the Equity-Efficiency Frontier

Labor efficiency $N_n = \frac{N}{n^*}$

2009, actual
2009, if social insurance had been constant
2007
Figure 4. Statutory Marginal Labor Income Tax Rates
for non-elderly heads or spouses
Optimal Social Insurance: Quantitative

- Holstrom-Milgrom example
  - ARRA (coefficient denoted $r$)
  - Normal distribution $G$
  - No stigma cost
  - Wage elasticity $\eta = 1$

- Comparative statics for the optimal $\mu$

$$d \ln \mu = -(1 - \mu)2(d \ln s_\varepsilon) - (1 - \mu)(d \ln r)$$

- Evaluated at $\mu = 0.44$ and $d \ln \mu = -0.15$

$$-0.15 = -0.88(d \ln s_\varepsilon) - 0.44(d \ln r)$$

- 0.17 added to the log standard deviation would be enough by itself
- 0.34 added to the log ARRA would be enough by itself
Figure 3. The CBOE Volatility Index, monthly 2006-2010
Figure 11.2. Decomposition of 2007-Q4 to 2009-Q4 real safety net generosity changes, person characteristics held constant

- interactions among UI and related provisions (13%)
- modernize UI eligibility criteria (4%)
- exempt part of UI benefits from federal income tax (5%)
- means-tested mortgage modification (6%)
- federal additional UI (9%)
- subsidize COBRA payments (11%)
- SNAP (benefits and eligibility) (16%)
- increase UI duration (36%)

Source: *The Redistribution Recession*, 2012
Labor Market Wedges

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• Employer wedge between productivity and market wages
  – has tax rate units
  – e.g., ACA employer penalty creates an employer wedge
  – uncertainty can create an employer wedge if it makes employers less willing to hire at a given wage and productivity. E.g., increase in the optimal markup of price over marginal cost
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    - uncertainty can create an employer wedge if it makes employers less willing to hire at a given wage and productivity. E.g., increase in the optimal markup of price over marginal cost.
  - Employee wedge between market wages and household marginal rate of substitution between consumption and leisure
    - has same tax rate units as employer wedge
    - e.g., payroll tax on employee creates an employee wedge

\[
\frac{d \ln(\text{labor productivity})}{d} = \frac{d \ln(\text{employer wedge})}{d} + \frac{d \ln(\text{real wage})}{d}
\]

\[
\frac{d \ln(\text{real wage})}{d} = \frac{d \ln(\text{employee wedge})}{d} + d \ln MRS
\]

- Both are non-trivial, but employee wedge widens much more.
Figure 5. Labor Market Wedges and Marginal Tax Rates

Source: The Redistribution Recession, 2012
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- employee wedge
- after-tax share

Source: The Redistribution Recession, 2012
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**Have the Laws of Economics Been Suspended?**

- Claim: these days, extra transfers for the poor and unemployed actually *reduce* the number of people eligible for such help

- Empirical study breaking non-elderly adult population into 10 groups
  - 5 skill groups (based on demographics like schooling, age, etc.)
  - Married and unmarried

- Look at program rules to determine marginal tax rates, and their changes 2007-10, for each group
  - forthcoming in *Tax Policy and the Economy*

- Measure 2007-10 changes in hours worked per capita (including zeros for those not working) from CPS data
Figure 9. 2007-10 Work Hours Change and Work Incentive Changes
for non-elderly household heads as spouses, as a function of potential monthly earnings and marital status
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Conclusions

• Uncertainty, fear, and risk aversion affect the demand for social insurance
  – the optimal degree of social insurance is sensitive to these variables
  – absent the Keynesian free lunch, more social insurance depresses the labor market
  – social insurance creates a labor wedge, especially on the employee side
    → “The only thing we have to fear is fear itself”

• Uncertainty could affect the quantity of labor (and investment!) more through social insurance than through other mechanisms

• The actual amount of social insurance changed significantly after 2007
  – Largest change in 50+ years
  – Enough to depress the labor at least 5 percent, and investment at least 10 percent