

Spousal Insurance and the Amplification of Business Cycles

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^aThe views expressed are my own and do not necessarily reflect those of the Board of Governors of the Federal Reserve System.

Motivation & research question

- Households face large **income uncertainty** that **varies with the business cycle**.
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 3. **family labor supply**

Q: Does family labor supply shapes the business cycle and its impact on households?

Contribution to literature

1. Spousal labor supply response to job loss (added worker effect): Lundberg 1985; Mankart and Oikonomou 2017; Ellieroth 2019; Birinci 2021; Pruitt and Turner 2020; Busch et al. 2020; Guner et al. 2020; Andersen et al. 2021
 - heterogeneity: AWE is low on average but highly selected
 - general equilibrium: spillovers to other households, multiplier effect
2. Women's employment and the business cycle: Doepke and Tertilt 2016; Albanesi and Şahin 2018; Albanesi 2019; Fukui, Nakamura and Steinsson 2018
 - microfounded gender differences
3. Idiosyncratic risk and business cycles: McKay and Reis 2016; Den Haan et al. 2018; Bayer et al. 2019; Patterson 2021; Graves 2020; Gornemann et al. 2021
 - relevance of ex-ante heterogeneity (gender & family size) on top of MPCs
 - fast & robust solution method for models with discrete-continuous choices

1. **Surveying the evidence:** a spousal insurance puzzle?
2. **Micro:** spousal insurance & consequences of job loss
3. **Macro:** spousal insurance & aggregate dynamics

Surveying the evidence

- Is spousal labor supply effective insurance against cyclical income risk?
 - Administrative data on household income (US). [Pruitt and Turner 2020]
 - household income is less volatile than individual income
 - women's income is less cyclical than men's income
 - non-employed women are more likely to enter when husband's income falls
 - employed women's income declines more when husband's income rises
- **spousal labor supply is effective insurance against cyclical risk facing primary earners**

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 - employed women's income declines more when husband's income rises→ **spousal labor supply is effective insurance against cyclical risk facing primary earners**
 - Event studies of job loss (US, Denmark). [Birinci 2021; Andersen et al. 2021]
 - average job loser suffers large and persistent income loss
 - spouse of average job loser raises her earnings only by a small amount
 - presence of secondary earner mitigates the impact on household income→ **spousal labor supply is weak insurance against job loss of primary earner**
- ← active
← passive

A spousal insurance puzzle?

- Administrative earnings data show clear signs of spousal insurance.
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- Is that a **contradiction**?
 1. **passive insurance** should not be ignored, joint job loss is very rare
 2. observing small response on average does not imply that **active channel** is weak
- **Next:** demonstrate 2. in a structural model.

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Micro model overview

- Unitary household with 2 members—called male and female.
- Standard incomplete markets model with labor search.
 - save in risk-free asset $a \geq 0$ (no borrowing)
 - individual productivity $e \in \{e_1, \dots, e_m\}$ follows Markov process
 - individual job-finding rate f and separation rate σ
- Two special features.
 - male job loss can lead to **persistent decline in earnings**
 - female makes non-trivial **participation decision**
- Quarterly frequency (building block of estimated HANK model)

$$s_m \in \{E, E_l, U\}$$

$$s_f \in \{E, U, N\}$$

Stages: shocks and decisions

0. Household enters the period. (s_f, s_m, e_f, e_m, a)
1. Productivity shocks are realized. $(s_f, s_m, e'_f, e'_m, a)$
2. If employed, lose job with probability σ_f, σ_m . $(s'_f, s'_m, e'_f, e'_m, a)$
3. **Female participation decision** (male always participates). $(s''_f, s'_m, e'_f, e'_m, a)$
 - $\underbrace{\text{stay employed}}_{\text{utility cost } \varphi}$, $\underbrace{\text{search for job}}_{\text{utility cost } \chi}$, $\underbrace{\text{be out of labor force}}_{\text{utility cost } 0}$
4. If searching, find job with probability f_f, f_m . $(s'''_f, s''_m, e'_f, e'_m, a)$
5. **Consumption-savings decision.** $(s'''_f, s''_m, e'_f, e'_m, a')$

Consumption-savings decision

- Bellman equation:

$$V^{(5)}(s_f, s_m, e_f, e_m, a) = \max_{c, a' \geq 0} u(c) + \beta V^{(0)}(s_f, s_m, e_f, e_m, a')$$
$$\text{s.t. } c + a' = \underbrace{(1 - \tau_t) [y_f + y_m]}_{\text{post-tax household income}}^{1-\lambda} + (1 + r)a$$

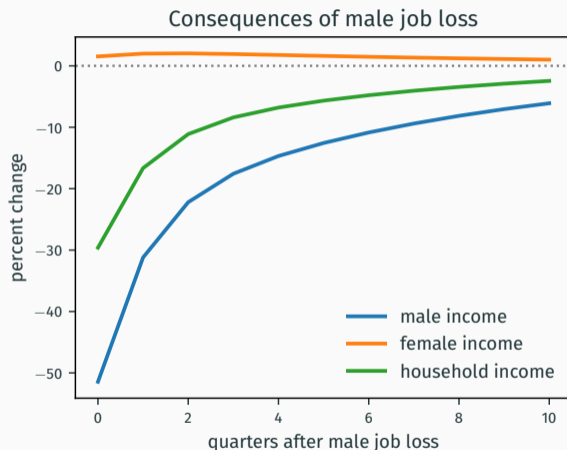
- Pre-tax individual income:

$$y_f = \begin{cases} w_f e_f & \text{for } s_f = E \\ 0 & \text{for } s_f = N \end{cases} \quad y_m = \begin{cases} w_m e_m & \text{for } s_m = E \\ w_m e_m (1 - \varrho) & \text{for } s_f = E_l \\ b e_m & \text{for } s_m = U \end{cases}$$

Quantitative exercise

- Calibrate the model to contemporary US economy
 - **gross flows** between E and U for married men and women aged 25–55
 - average **gender wage gap** of 19%
 - average quarterly **MPC** of 25%
 - process of **male earnings loss** follows Gornemann et al. (2021)
- Conduct an event study of job loss in the model.
 - **sample**: male starts period 0 in a good job
 - **treatment group**: male loses his job in stage 2 of period 0
 - **control group**: male does not lose his job in stage 2 of period 0
- Construct **treatment effects** from law of motion without simulation.

Spousal insurance and the consequences of job loss (part 1)



Male income falls persistently (targeted).

- may find new job in quarter 0
- but it is likely to be a bad job

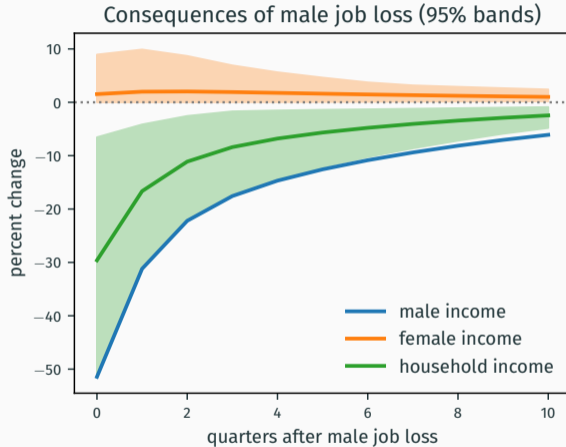
Female labor supply increases very little.

Household income still falls much less.

- passive insurance

Average responses are in line with empirical event studies.

Spousal insurance and the consequences of job loss (part 2)



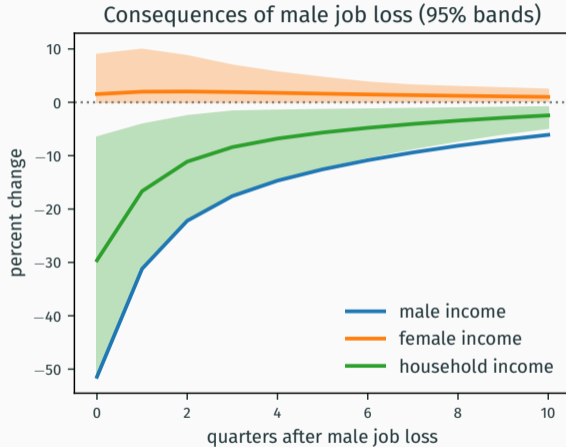
Male income is purely exogenous.

→ uniform responses

Female (household) income reflects **uncorrelated shocks & optimal choice.**

→ heterogeneous responses

Spousal insurance and the consequences of job loss (part 2)



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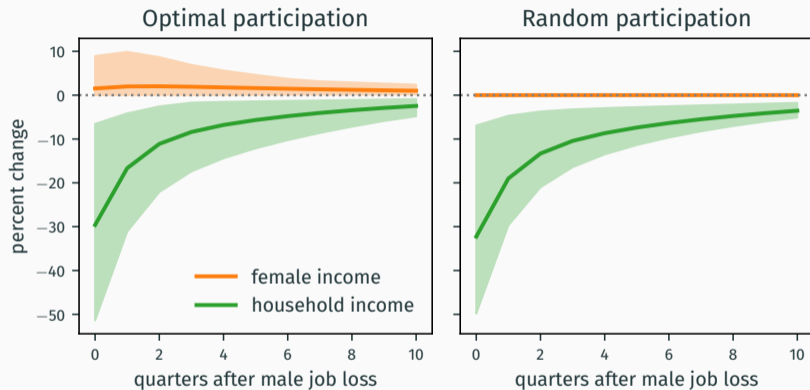
Female (household) income reflects **uncorrelated shocks & optimal choice.**

→ heterogeneous responses

Next: what if female participation decision was random?

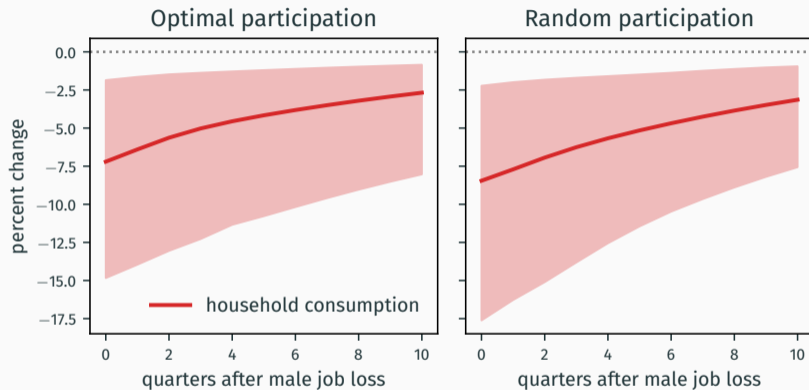
- fix choice probabilities at their mean

Shutting down active insurance (part 1)



Random participation: dispersion in HH income is fully exogenous (no role of optimal choice)

Shutting down active insurance (part 2)



Random participation: average cumulative consumption loss is 21% larger

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- We saw that spousal labor supply mitigates the consequences of job loss.
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 1. precautionary behavior of every household ▶ Jacobians
 2. aggregate demand spillovers
 3. labor market congestion
 4. income tax spillovers

} general equilibrium

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} general equilibrium
- In progress: characterize 2.-4. in **estimated HANK model**.
 - **Sequence-Space Jacobian framework**: heterogeneity presents zero conceptual or practical difficulty for time-series estimation [Auclert, Bardóczy, Rognlie and Straub 2021]

Takeaways

- Spousal labor supply substantially mitigates individual unemployment risk.
 - **passive:** married women have stable jobs & joint job loss is very rare
 - **active:** low average can mask large non-random heterogeneity
- Standard practice in HANK literature is to model households as individuals with an income process estimated on male data. These choices lead to
 - **overstating income risk** facing households
 - **ignoring a class of precautionary behavior** with unique GE spillovers

Thank you!

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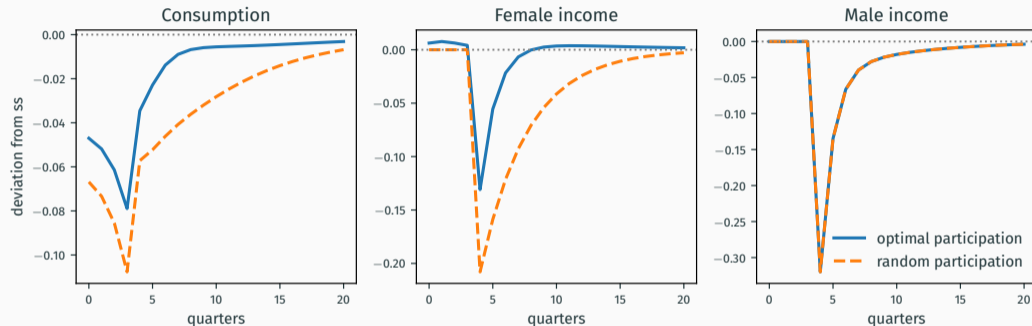
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Aggregate responses to anticipated increase in separation rate



Optimal participation: lean against separation rate, consumption falls much less

One-time increase in male and female separation rates 4 periods ahead

Whose income risk?

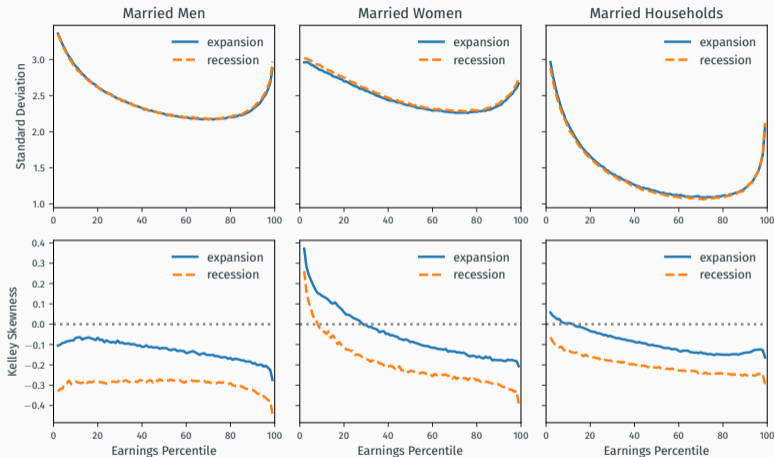


Figure 1: Distribution of One-Year Labor Income Growth from Pruitt & Turner (2020)