The Work-Leisure Tradeoff: Identifying the Heterogeneity *

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Abstract

Labor force participation is a key determinant of important aggregates in the economy, such as employment and hours worked. Understanding and predicting the behavior of participation in the macroeconomy requires identifying individuals' tradeoff for work and leisure correctly, and the underlying heterogeneity. However, since observed work-leisure choices are influenced by various other determinants such as year, age, and cohort effects, it is difficult to identify the underlying heterogeneity in these preference parameters using standard data without imposing some additional assumptions. In addition, observational data suffer from issues such as labor market frictions and unobservables, which may lead to biased inference.

In this paper, we revisit this important issue by designing a novel survey that was fielded as a special module of the NY Fed's Survey of Consumer Expectations (SCE) in December 2017. SCE is a monthly, online survey of a representative sample of US household heads. The survey has three main stages. In the first stage, we ask the respondents about their current labor market status, work hours, earnings, family composition, household wealth. In the second stage, we ask the survey participants to consider a *hypothetical* situation where everything about them is the same as their current situation except that they are currently not working. We then elicit information about their search behavior, subjective probability of receiving job offers and reservation wages. The information we gather in the first two stages helps us design individual-specific scenarios that are anchored around respondents' current or most recent wages. In the third and final stage, we present the respondents with multiple scenarios, in each of which they are asked to choose between two different job offers. The scenarios vary work hours, wage offers, and the outside option of non-work. These scenarios are individual-specific, and take into account the individual's household income, consumption, and current and past labor market history. In particular, each individual is offered ten scenarios based on the types of job they are willing to search for. Each scenario includes two job offers and the option of remaining unemployed and vary both wages and hours.

Using the rich variation that our survey provides us, we estimate a canonical labor supply model to recover the *unique* preference parameters separately for each demographic group (such as gender, education, and income) without imposing any parametric assumptions on the underlying distribution of the heterogeneity

*The opinions expressed herein are those of the author and not necessarily those of the Federal Reserve Bank of New York or the Federal Reserve System.

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in preferences. The key ingredient of our framework is the optimization problem of an individual who maximizes her instantaneous utility with respect to consumption and hours of work, given her observable and unobservable characteristics and the choice of job type in a given period. The job types we consider are only part-time, only full-time, and both part-time and full-time jobs. We do not model the individual's search decisions and wages, rather we take that as given. We assume that at the start of the period each individual is unemployed and each of them receive two job offers defined by wage-hours pairs and are identical in all other aspects. The individual has the option of choosing one of the jobs, or rejecting both and staying unemployed. We take into account the tax and transfer system as well as spousal earnings (if married), non-labor income, the number of kids, and state or residence when constructing individual budget constraints. We model fixed, work-related costs as being specific to the demographic group the individual belongs to, and assume that they reflect the actual costs an individual has to pay to get to work. These fixed costs are also modeled as being specific to the types of jobs the individuals search for; such as only full-time, only part-time, or both part-time and full-time jobs.

We estimate our model using Method of Simulated Moments, which minimizes a weighted squared sum of the differences between the moments generated by the model and their data equivalents. After estimating the preference parameters for different demographic groups, we simulate our model to compute Marshallian and Hicksian elasticities at the group level. The elasticities implied by the estimated parameters vary systematically across demographic groups.There is also substantial heterogeneity in estimated elasticities *within* each of the demographic groups. In order to highlight the importance of this heterogeneity, we assess the impact of policy changes in the tax policy and childcare subsidies on labor supply in a labor supply model with and without this heterogeneity.

We use our estimated model to perform counterfactual experiments to evaluate the importance of incorporating the underlying heterogeneity in preferences. We simulate the effect of a marginal income tax change on work hours, using the distribution of elasticities we estimate and compare it with the response in hours computed using a single aggregate elasticity. Our preliminary results show that both the average hours response and the distributional impact to a change in the marginal tax rate are substantially biased if the underlying heterogeneity in preferences is not taken into account.

KEYWORDS: labor supply; gender; household survey.

Motivation

- Labor supply elasticities are of great interest to both macro and microeconomists.
  - Policy responses
  - Business cycle responses
  - Optimal design of tax and transfer systems
- They are hard to measure!

Measurement Challenges

1. Need exogenous variation either in the incentive structure or wages:
   - We mostly use
     - ★ quasi-experimental
     - ★ cross-country variation
   - Results don't allow us to make consistent comparisons across population groups.

Measurement Challenges

2. In order to calculate labor supply elasticities using observational data, we need to make strong assumptions on:
    - the choice set
    - labor market frictions such as offer arrival probabilities and job separation rates
    - unobserved heterogeneity across jobs

- Inference will be based on the validity of these assumptions.

- These confounding factors might be interacting non-trivially with the underlying heterogeneity in preferences.

This Paper

We design a novel survey in which respondents are presented with hypothetical job scenarios to estimate preferences over consumption and leisure.

- individual-specific scenarios that vary work hours and wage offers

Use these variation in the data to estimate labor supply models for different demographic groups

- Use the hypotheticals to discipline the heterogeneity.
- Recover group-specific preference parameters without making any parametric assumptions on the underlying heterogeneity.
- Analyze the elasticities implied by these "pure" preference estimates.

This Paper

Advantages of this stated-preference (hypothetical methodology) approach:

- Variation is exogenous and covers the whole sample
- Fully observe the offer distribution and the choice set
- No need to make any assumptions on labor market frictions or on the unobserved components of the jobs
- The preferences are identified from the "labor supply" side.

This Paper

How well do stated choices compare with actual choices?

- Stated-choice approach yields meaningful responses when the hypothetical scenarios presented to respondents are **realistic** and **relevant** for them.
- Several papers show that there is **strong correspondence between stated and actual choices** for
  - alternative work arrangements: Mas & Pallais (2018)
  - workplace amenities: Wiswall & Zafar (2018)
  - household financial decisions: Parker & Souleles (2017)

Overview of Results

- There is a lot of variation in the preference parameters across different demographic groups.
- Implication for behavior: There is no "one value" of elasticity in a given economy.
  - There is substantial heterogeneity in hours elasticities across demographic groups.
  - Within-group variation is also sizable.
- Using broad group parameter estimates to generate elasticities leads to biased policy evaluation.
  - Distributional impact
  - Aggregate impact

Outline

1. Related Literature
2. Data
3. Model
4. Estimation & Results

Related Literature

Vast literature on labor supply elasticities:

- Heckman and MaCurdy (1980); MaCurdy (1983); Altonji (1986); Blundell, Duncan, and Meghir (1998); Blundell, MaCurdy, and Meghir (2007); Meghir and Phillips (2008); Blundell, Bozio, and Larqoue (2011); Keane (2011); Keane and Rogerson (2012); Guner, Kaygusuz, and Ventura (2012); **Attanasio, Low, Levell, and Sanchez-Marcos (2018)**.

Hypothetical-choice methodology:

- Blass, Lach, and Manski (2008); **Ameriks, Briggs, Caplin, Shapiro, and Tonetti (2015)**; Mas and Pallais (2017); Parker and Souleles (2017); Fuster, Kaplan, and Zafar (2018); Wiswall and Zafar (2018); Kosar, Ransom, and van der Klaauw (2019).

Data

We designed a special module added to the NY Fed's Survey of Consumer Expectations in December 2017.

- SCE is a monthly, online survey to elicit expectations about economic variables.
- Rotating panel of around 1,000 household heads.
- Respondents participate for up to 12 months.
- Geographically representative.
- Sample is more highly educated (college degree or higher).

Survey Design

3 parts:

1. Ask about current labor market status, work hours, earnings, family composition, household wealth.
    - Rich information on the underlying heterogeneity.
    - Use **the current or most recent job's wage** as an **anchor** for the scenario wages.

Sample Characteristics

	SCE	CPS	p-value
Male	0.49	0.52	0.11
White	0.81	0.77	0.00
Age	45.38	45.67	0.50
	(11.85)	(11.70)	
Bachelor's Degree or higher	0.57	0.37	0.00
Married	0.64	0.61	0.12
Number of Children	0.70	0.90	0.00
Employed	0.82	0.75	0.00
Unemployed	0.04	0.02	0.08
Working PT	0.13	0.13	0.94
Hourly wage — college	36.51	37.50	0.43
	(21.58)	(18.88)	
Hourly wage — no college	23.44	22.25	0.20
	(12.74)	(12.73)	
Observations	784	36,185	

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▸ SCEw ▸ CPSw

Survey Design

3 parts:

2. **Consider the "hypothetical" situation where everything about you is the same as your current situation EXCEPT your labor market status**
    a. Define what search entails, and elicit search behavior.
        - ★ Both full-time and part-time jobs
        - ★ Only full-time jobs
        - ★ Only part-time jobs
        - ★ No search



Survey Design - Search Behavior

Group	PT only	PT and FT	FT only	Would not search
Full sample	0.11	0.45	0.32	0.12
Female	0.10	0.49	0.28	0.12
Male	0.12	0.40	0.35	0.13
Working full-time	0.03	0.51	0.44	0.02
Working part-time	0.28	0.56	0.08	0.08
Female, with kids	0.09	0.52	0.26	0.13
Male, with kids	0.03	0.51	0.42	0.04

- Most commonly chosen option: search for both PT & FT jobs.
- Group-level differences: men more likely to search for only full-time compared to women.
- Current labor market status is meaningfully related to the stated job search behavior.

Survey Design

3 parts:

2. **Consider the "hypothetical" situation where everything about you is the same as your current situation EXCEPT your labor market status**

    a. Elicit search behavior.

    b. Elicit the expected offer wage distribution.

Survey Design - Expected offer wage distribution

Example: For an individual who earns $40/hour:

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Consider the case where you are searching for jobs and receive at least one job offer. Think about the job offers that you may receive within the next three months. Of the job offers that you might receive, what percent of them do you think will offer an hourly wage of...

*(Please note: The numbers need to add up to **100**.)*

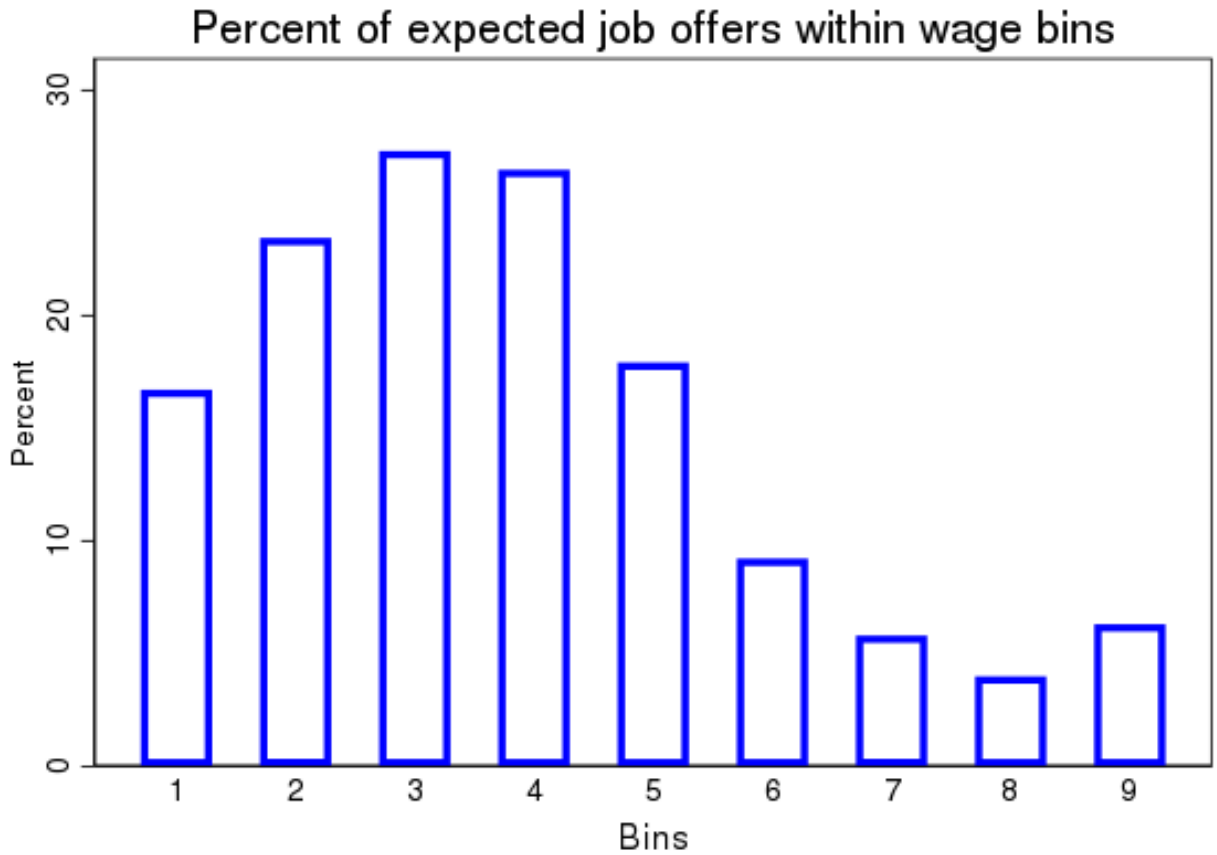
Less than $20.00		percent
Between $20.00 and $30.00		percent
Between $30.00 and $38.00		percent
Between $38.00 and $42.00		percent
Between $42.00 and $50.00		percent
Between $50.00 and $60.00		percent
Between $60.00 and $70.00		percent
Between $70.00 and $78.00		percent
More than $78.00		percent
TOTAL	0	

BACK | NEXT

0% 25% 50% 75% 100%

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Survey Design - Expected offer wage distribution



- Higher average likelihood for bins with wages equal to or lower than current or most recent wage.

▸ By gender

Survey Design

3 parts:

2. **Consider the "hypothetical" situation where everything about you is the same as your current situation EXCEPT your labor market status**

    a. Elicit search behavior.

    b. Elicit the expected offer wage distribution

        - ★ Get Z_{1i}: the lower end of the lowest job offer wage bin for which a person puts a non-zero probability of receiving.
        - ★ Get Z_{2i}: the higher end of the highest job offer wage bin for which a person puts a non-zero probability of receiving.

Survey Design - Subjective probability of receiving job offers

Example: For an individual who earns $40/hour:

Consider the case where you are searching for jobs and receive at least one job offer. Think about the job offers that you may receive within the next three months. Of the job offers that you might receive, what percent of them do you think will offer an hourly wage of...

*(Please note: The numbers need to add up to **100**.)*

Less than $20.00		percent	
Between $20.00 and $30.00		percent	
Between $30.00 and $38.00	15	percent	→ Z1 = $30.0
Between $38.00 and $42.00	35	percent	
Between $42.00 and $50.00	20	percent	
Between $50.00 and $60.00	20	percent	
Between $60.00 and $70.00	10	percent	→ Z2 = $70.0
Between $70.00 and $78.00		percent	
More than $78.00		percent	
TOTAL	100		

Survey Design

3 parts:

1. Ask about current labor market status, work hours, earnings, family composition, household wealth.

2. **Consider the "hypothetical" situation where everything about you is the same as your current situation EXCEPT your labor market status**

    a. Elicit search behavior.

    b. Elicit subjective probability of receiving job offers

        ⋆ Get Z_{1i}: the lower end of the lowest job offer wage bin for which a person puts a non-zero probability of receiving.

        ⋆ Get Z_{2i}: the higher end of the highest job offer wage bin for which a person puts a non-zero probability of receiving.

3. Hypothetical job scenarios
    - Anchor the wage offers to Z_{1i} and Z_{2i}.

Survey Design - Scenarios

- Hypothetical job scenarios:
  - Each individual gets 10 scenarios based on the types of job they are willing to search for.
  - Each scenario includes 2 job offers and the option of remaining unemployed. A job is defined by a wage-hours pair.
  - Scenarios vary both wages and hours. Wages are determined based on Z_{1i}, and Z_{2i}.
  - The continuation values for each job and staying unemployed is specified.

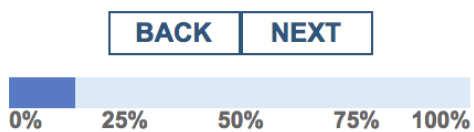
Survey Design-Scenarios



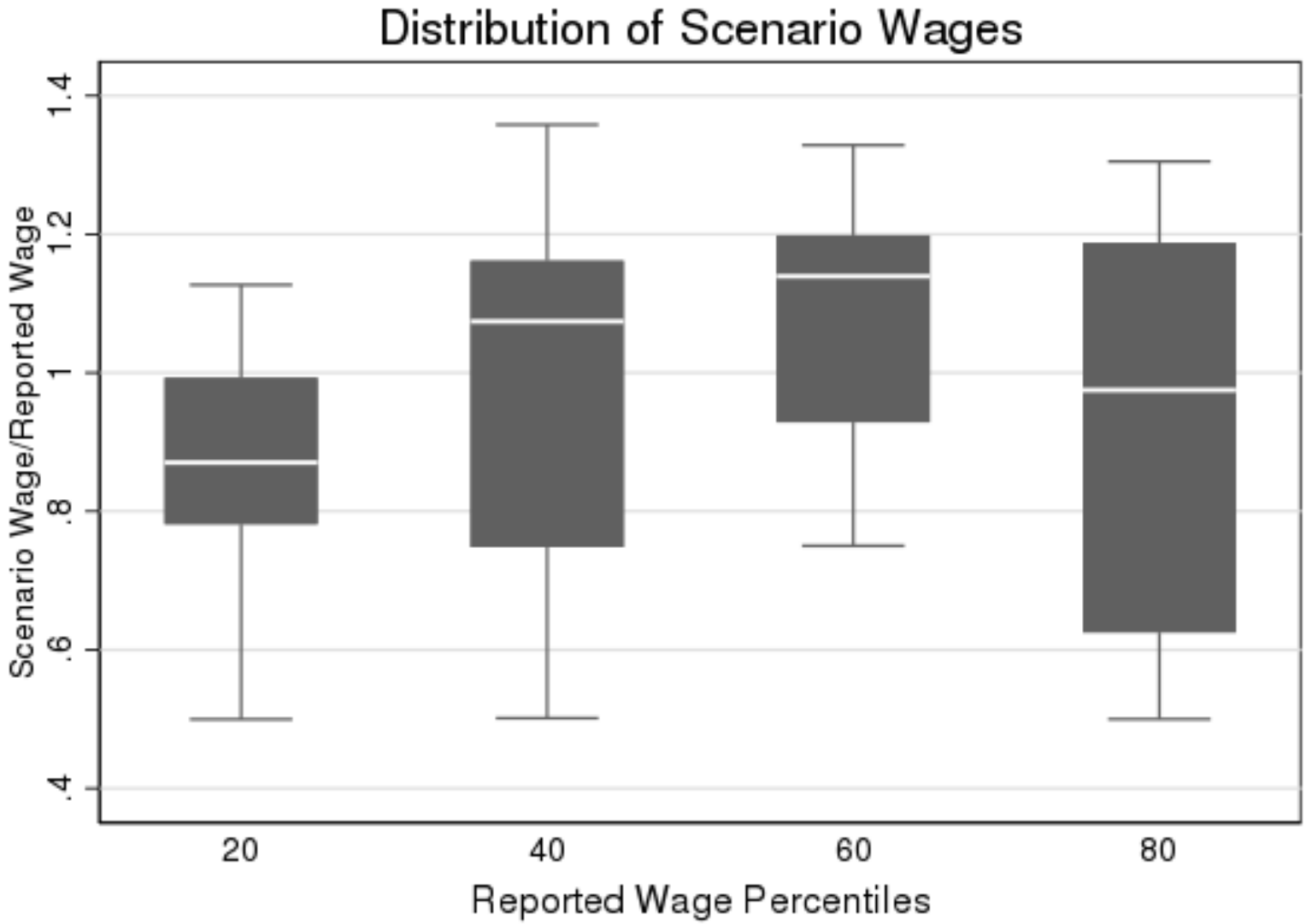
You will next be presented with 10 different scenarios where you will be asked to choose between various work options. Put yourself in the situation where everything about you is the SAME as your current situation. Now assume that you are NOT working.

In each of these scenarios you will be presented with 2 potential jobs. Each job will be characterized by an hourly wage rate and the weekly required work hours. These 2 jobs will **otherwise be identical** in all other aspects (including the likelihood of being laid off, and the wage growth at the job).

You will have the choice of accepting either one of the jobs or rejecting both. If you reject both jobs, you will have access to your household assets and other savings, and you may also get certain government benefits. You will also have the choice of continuing to search for jobs, in which case you may get *additional* government benefits, such as the unemployment insurance.



Survey Design - Variation in Scenario Wages



Choices - Key Descriptives

	All	Employed	Female	Male
Always stay unemployed	0.00	0.00	0.00	0.00
Always choose one of the jobs	0.61	0.63	0.59	0.63
Always choose highest hours	0.00	0.00	0.00	0.00
Always choose highest earnings	0.08	0.07	0.07	0.09
Choose longer job	0.57	0.58	0.56	0.58
(conditional on choosing to work)				
Choose higher earnings	0.66	0.66	0.65	0.67
(conditional on choosing to work)				

- The choices are highly reasonable with **very few extreme choices** of always choosing unemployment or always choosing the highest hours.
- Rich variation as a result of the **individually-relevant scenario design**.

Details on Choices

	All			Female			Male		
Hours	Mean wage	Mean earn.	Frac. choosing	Mean wage	Mean earn.	Frac. choosing	Mean wage	Mean earn.	Frac choosing
Scenario 2									
20	18.72	374.3	0.03	16.04	320.7	0.01	22.2	444.1	0.05
35	22.25	778.8	0.79	19.54	684.1	0.80	25.77	902	0.78
0	-	-	0.18	-	-	0.19	-	-	0.17
Scenario 9									
40	30.39	1215	0.49	25.35	1014	0.52	36.95	1478	0.45
55	33.6	1848	0.47	28.48	1567	0.43	40.28	2215	0.52
0	-	-	0.05	-	-	0.06	-	-	0.03

- Significant **gender gap** in offer wages.
- Data reflects the **difference in preferences**.

A Static Labor Supply Model

- Modeling within-period preferences over consumption and leisure.
- Especially useful for generating preferences for intensive-margin allocations.
- Relevant for generating steady-state elasticities.

A Static Labor Supply Model

We define the within-period utility for an individual i in group g_i over consumption and leisure:

$$U(c_i, \ell_i) = \frac{c_i^{1-\phi_{g_i}} - 1}{1-\phi_{g_i}} + \alpha_{g_i} \frac{(H-h_i)^{1-\theta_{g_i}} - 1}{1-\theta_{g_i}}$$

$$\alpha_{g_i} = \exp(\alpha_{0g_i} + \epsilon_{hi}) \qquad \epsilon_{hi} \sim N(0, \sigma^2_{ug_i})$$

- ϕ_{g_i} and θ_{g_i} will determine
  - the curvature of the utility function with respect to consumption and leisure
  - marginal utilities from consumption and leisure
  - the Marshallian and Hicksian elasticities
- $\epsilon_{hi} \sim N(0, \sigma^2_{ug_i})$ is a choice-specific preference shock.
  - captures any unobservable preference an individual might have for a specific wage-hours pair

The Choice Set

Consumption:

- determined by the budget constraint for each wage-hours pair
- $c_i \in \mathbb{R}^+$
- $c_i = w_i h_i + N_i + y_i^s - T(w_i h_i, N_i, sr_i, m_i, k_i) - cc_i h_i \mathbb{1}\{k_i > 0\} - f_{g_i}$
  - N_i: non-labor income
  - y_i^s: spousal income
  - sr_i: state of residence
  - k_i: number of kids
  - m_i: marital status
  - cc_i: hourly childcare costs
  - f_{g_i}: fixed cost of work
- Tax and transfer system, $T(.)$, is approximated using NBER's TAXSIM.

The Choice Set

Hours:

- If the individual searches for
  - only full-time jobs:

$$h_i \in \{0, 35, 37, 40, 45, 50, 55, 65\}$$

  - only part-time jobs:

$$h_i \in \{0, 15, 17, 18, 20, 22, 25, 30\}$$

  - both full-time and part-time jobs:

$$h_i \in \{0, 15, 18, 20, 25, 30, 35, 40, 50, 55, 65\}$$

The Choice Set

Jobs come in pairs:

- only full-time jobs:

$$h_i \in \{0, 35, 37, 40, 45, 50, 55, 65\}$$

$$\begin{aligned}\text{scenarios} = \{&(35, 45, 0), (35, 37, 0), (35, 45, 0), (40, 50, 0), (40, 50, 0),\\ &(40, 55, 0), (40, 55, 0), (55, 65, 0), (55, 65, 0), (55, 65, 0)\}\end{aligned}$$

- only part-time jobs:

$$h_i \in \{0, 15, 17, 18, 20, 22, 25, 30\}$$

$$\begin{aligned}\text{scenarios} = \{&(15, 22, 0), (15, 17, 0), (15, 22, 0), (18, 25, 0), (18, 25, 0),\\ &(15, 30, 0), (15, 30, 0), (20, 30, 0), (20, 30, 0), (20, 30, 0)\}\end{aligned}$$

- both full-time and part-time jobs:

$$h_i \in \{0, 15, 18, 20, 25, 30, 35, 40, 50, 55, 65\}$$

$$\begin{aligned}\text{scenarios} = \{&(20, 35, 0), (20, 35, 0), (25, 35, 0), (25, 40, 0), (18, 20, 0),\\ &(15, 30, 0), (40, 50, 0), (55, 65, 0), (40, 55, 0), (40, 50, 0)\}\end{aligned}$$

Estimation

For a demographic group g

- Model Parameters:

$$\Theta = \{\phi_g, \theta_g, \alpha_{0g}, \sigma_g, f_g\}$$

- Likelihood function:

$$\mathcal{L}(\Theta; \text{data}) = \prod_{i=1}^{N_g} \mathcal{L}_i(\Theta; data)$$

$$\mathcal{L}_i(\Theta; data) = \Pr\left(d^m_{i,s1} = d_{i,s1}, \ldots, d^m_{i,s10} = d^m_{i,s10} | \Theta\right)$$

- Standard errors are calculated using re-estimating the model on 200 block bootstrap replicates of the data (where the block corresponds to the individual).

▸ LF

Estimation

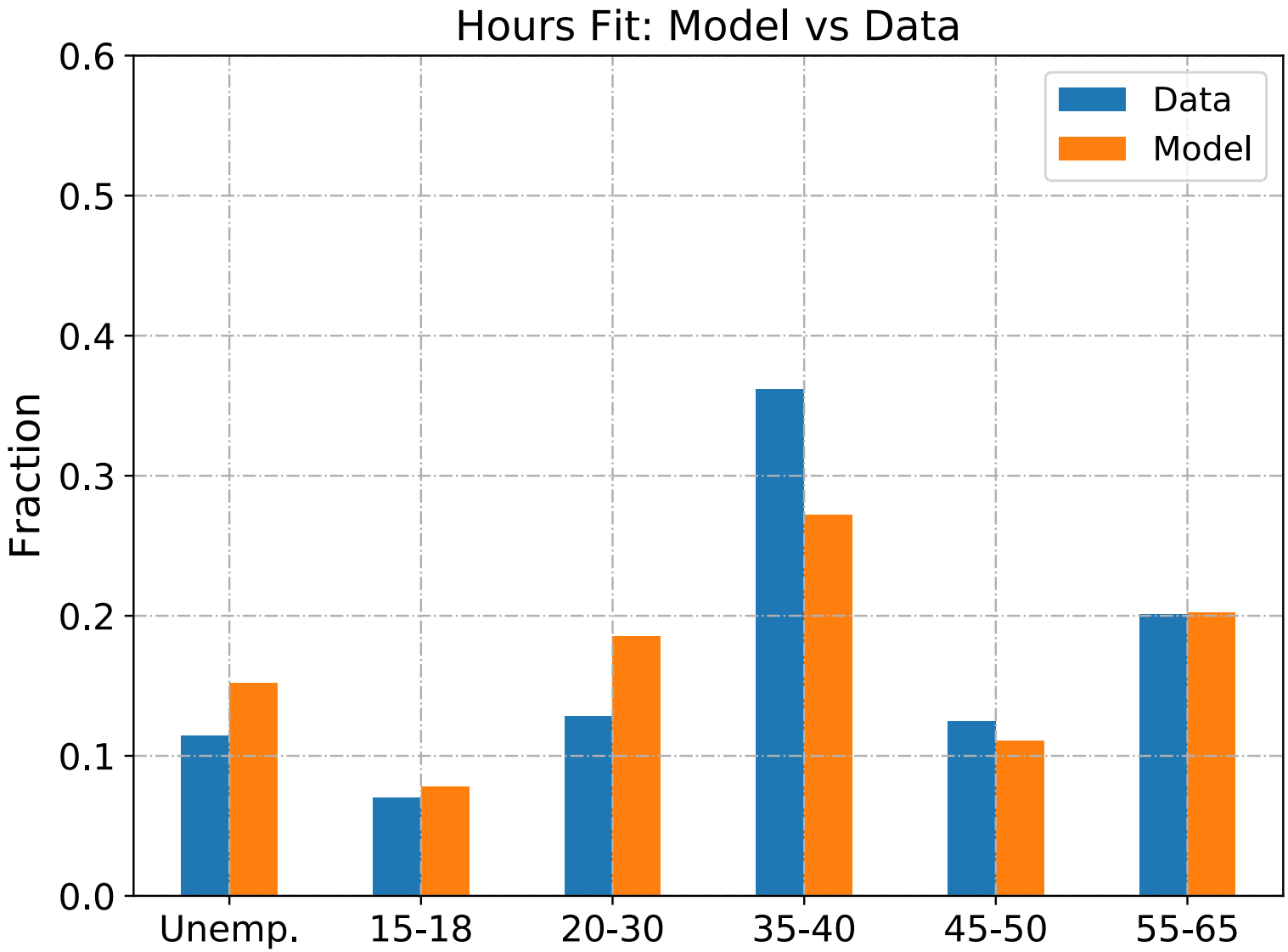
Demographic groups:

Full sample
By gender (2)
By education (2)
By age (6)
By marital status (2)
gender X kids (4)
gender X education (4)
⋮

= 91 groups

Most detailed groups: by gender $\times$ education $\times$ marital status $\times$ kids

Sample Fit - No Heterogeneity

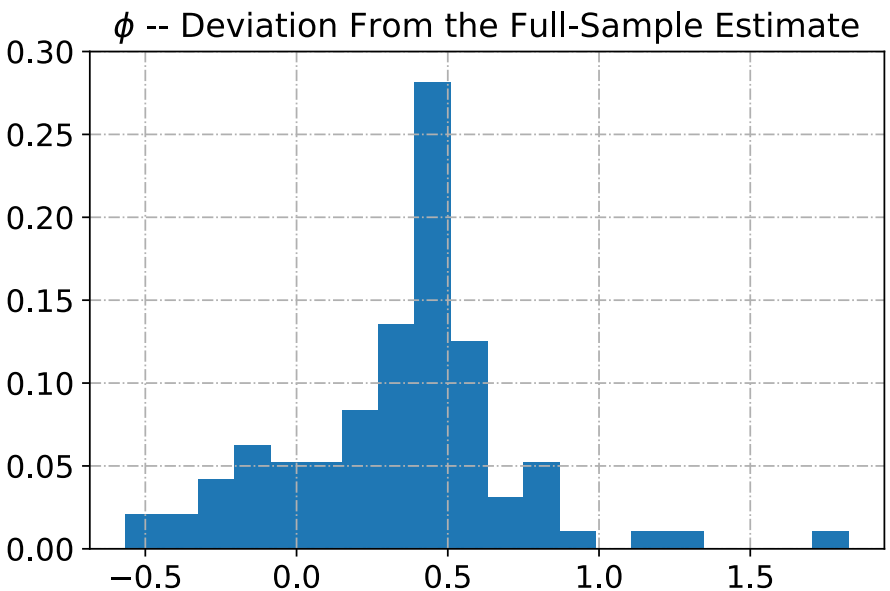


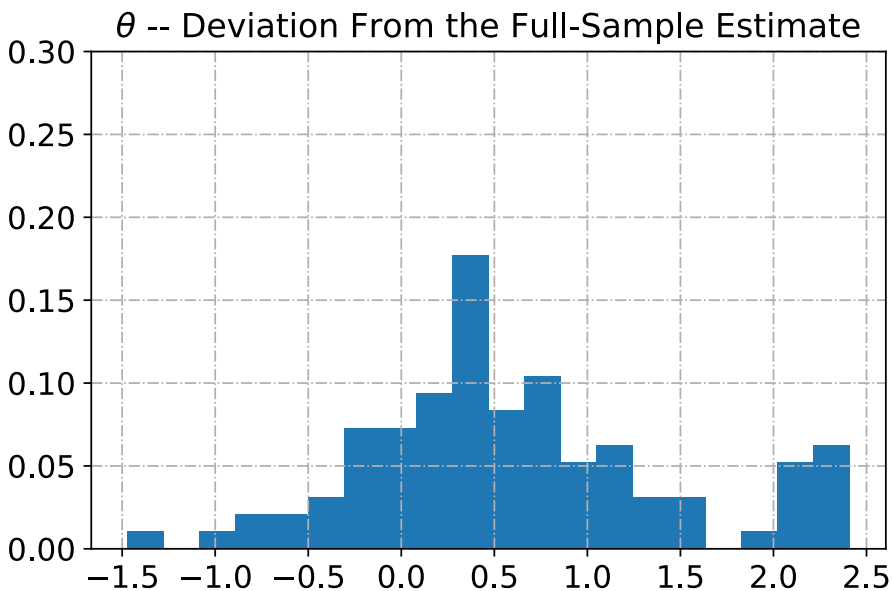
Results - Parameter Estimates

	ϕ	θ	α_0	σ_u	f
Full Sample	0.607	1.543	3.270	0.973	6.609
	(0.192)	(0.474)	(0.923)	(0.807)	(4.33)
Females	1.090	2.297	3.623	0.047	127.328
	(0.112)	(0.697)	(0.262)	(0.015)	(15.053)
Males	0.437	1.334	4.117	0.791	12.74
	(0.162)	(0.494)	(0.925)	(0.949)	(10.356)
College degree	0.573	1.485	3.344	1.199	2.83
	(0.113)	(0.370)	(0.502)	(0.317)	(59.895)
No college degree	0.983	2.409	3.448	0.091	126.639
	(0.311)	(0.319)	(2.172)	(1.598)	(49.358)
Age $<$ 45	1.069	2.190	3.165	0.053	121.060
	(0.142)	(0.553)	(0.916)	(0.660)	(24.286)
Age $\geq$ 45	0.574	1.442	3.234	1.355	141.732
	(0.136)	(0.462)	(0.641)	(0.914)	(14.93)

Bootstrapped standard errors are reported in brackets.

Results - Heterogeneity in the Parameter Estimates





Mapping Preferences to Behavior

- **What does this heterogeneity in preferences imply for behavior?**
- Measure: Hours elasticity with respect to wages.
- Simulate responses to a wage increase by 1%.
- Focus on two different elasticities:
  - Marshallian (uncompensated)
  - Hicksian (compensated)

Definition of Labor Supply Elasticities

Hicksian (compensated):

- How hours within a period change in response to a wage change, holding the utility constant?
- Change in labor supply as a result of a tax change, if the tax change is compensated with a lump-sum transfer to keep the utility constant.
- Includes only the substitution effect.

Definition of Labor Supply Elasticities

Marshallian (uncompensated):

- How hours within a period change in response to a wage change?
- Change in labor supply as a result of a tax change, if the tax change is not compensated.
- Includes both the substitution and income effects.
- Using the Slutsky equation:

$$\text{Marshallian elasticity} = \text{Hicksian elasticity} + \text{Income effect}$$

Hicksian Hours Elasticities

	Full sample	Female	Male	College	No College
Overall	0.391	0.479	0.313	0.339	0.583
h=20	0.775	0.894	0.695	0.722	1.082
h=30	0.436	0.541	0.398	0.408	0.590
h=40	0.454	0.598	0.340	0.380	0.771
h=50	0.145	0.173	0.114	0.126	0.210

- Group-level elasticities are calculated using the coefficients estimated using data for each group.
- Heterogeneity across groups:
  - Females are more elastic than males at all hours.
  - Lower-educated individuals respond more to incentives.

Hicksian Hours Elasticities

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h=50	0.145	0.173	0.114	0.126	0.210

- Elasticities are slightly higher than those in the literature:
  - Evidence that some people are restricted in responding to incentives in real life!
- Elasticities change based on hours of work:
  - Evidence that elasticites are not policy-invariant.
  - They can change considerably when the distribution of hours in the population changes
    - ★ Business cycles!

Hicksian Hours Elasticities - Household Composition

How do kids enter the picture?

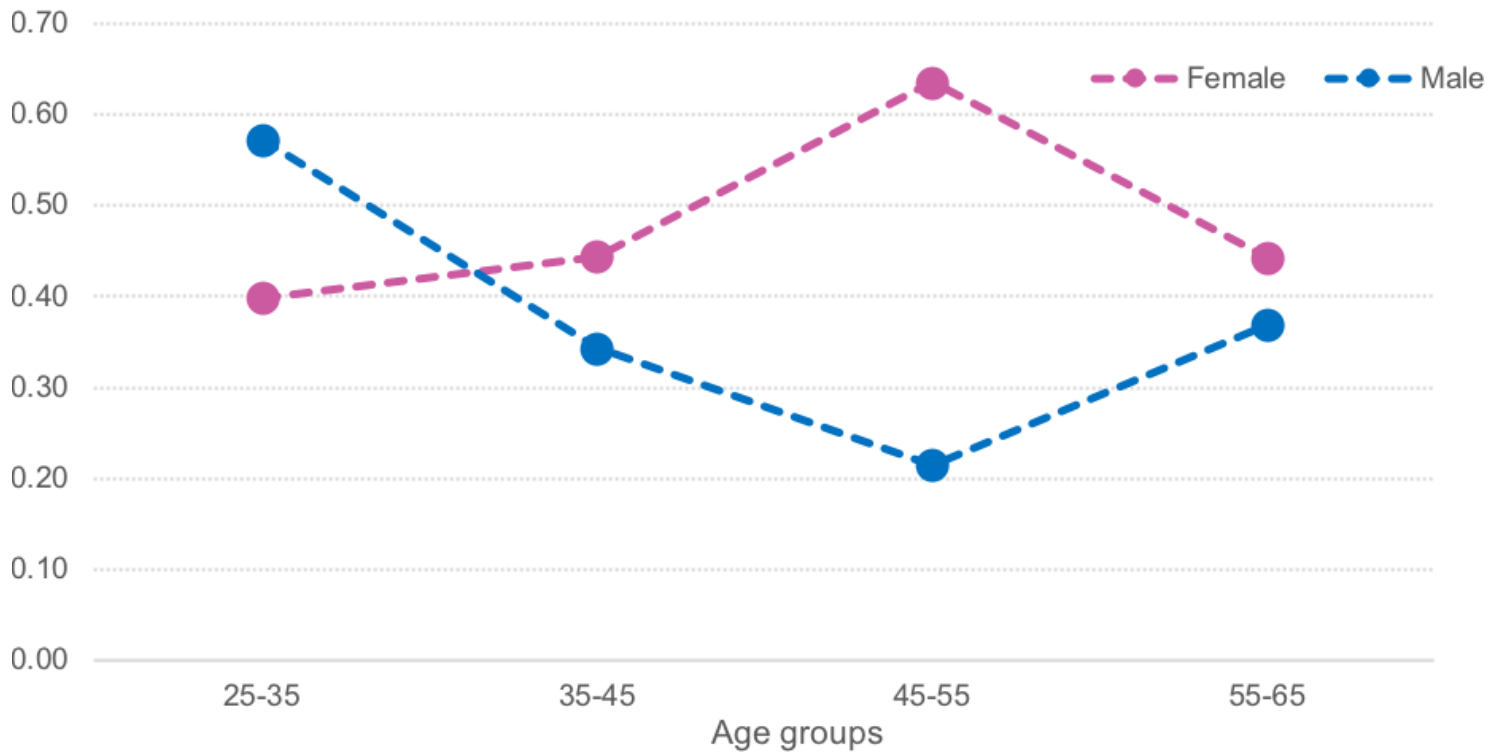
	Female with kids	Female without kids
Overall	0.459	0.494
h=20	0.884	0.940
h=30	0.554	0.523
h=40	0.527	0.630
h=50	0.170	0.180

No meaningful effect?! Let's look again:

	Married Female with kids	Married Female without kids	Single Female with kids	Single Female without kids
Overall	0.403	0.501	0.662	0.510
h=20	0.885	0.789	1.223	0.990
h=30	0.502	0.467	0.684	0.639
h=40	0.457	0.765	0.842	0.585
h=50	0.140	0.178	0.253	0.189

Broad groups may mask important underlying heterogeneity!

Hicksian Hours Elasticities - Age



- Married women become more responsive as their kids get older.
- Married men are less elastic compared to single men, but their elasticities don't change much with kids.

Marshallian Hours Elasticities

	Full sample	Female	Male	College	No College
Overall	0.260	0.310	0.208	0.224	0.375
h=20	0.760	0.859	0.676	0.714	1.008
h=30	0.291	0.375	0.241	0.272	0.383
h=40	0.338	0.419	0.256	0.280	0.545
h=50	0.068	0.081	0.053	0.060	0.100

- Overall, same patterns as in Hicksian.
- Non-monotonicity based on hours:
  - Lower elasticity at long part-time hours and long full-time hours.
- Income effect?

Marshallian vs Hicksian Elasticities: Income Effect

Using the Slutsky equation:

$$\text{Marshallian elasticity} = \text{Hicksian elasticity} + \text{Income effect}$$

	Full sample	Female	Male	College	No College
Overall	0.131	0.201	0.127	0.137	0.247
h=20	0.015	0.094	0.065	0.056	0.146
h=30	0.145	0.202	0.183	0.164	0.247
h=40	0.117	0.219	0.106	0.125	0.277
h=50	0.077	0.104	0.068	0.074	0.124

- Income effect is highest for females and those without a college degree.
  - 1% wage increase is a higher proportion of their non-labor income compared to other groups.

Within-group Heterogeneity in Elasticites

The rich variation in our data allows us to:

- Estimate this model at narrowly defined groups.
  - gender $\times$ education $\times$ marital status $\times$ existence of kids
- Simulate elasticities using the parameter estimates from these "disaggregrated" groups.

This enables us to take into account the within-group heterogeneity and have and idea on distribution of elasticities for broader groups.

We also get a sense of the bias in policy evaluation due to ignoring the underlying heterogeneity.

Marshallian Elasticities - Within-group Heterogeneity

	Full sample	Female	Male	College	No College
Overall	0.465	0.555	0.371	0.402	0.671
	[1.670]	[1.821]	[1.503]	[1.509]	[1.825]
h=20	1.081	1.222	0.962	1.016	1.435
	[1.925]	[2.164]	[1.856]	[1.899]	[1.943]
h=30	0.339	0.489	0.250	0.304	0.503
	[1.647]	[1.920]	[1.334]	[1.412]	[1.865]
h=40	0.604	0.749	0.458	0.501	0.975
	[1.780]	[1.622]	[2.01]	[1.925]	[1.588]
h=50	0.122	0.145	0.096	0.107	0.179
	[0.993]	[0.964]	[1.008]	[1.047]	[0.921]

Means are reported. The 90-10 range is in brackets.

- Substantial heterogeneity within groups!!!
- Less dispersion at higher hours.

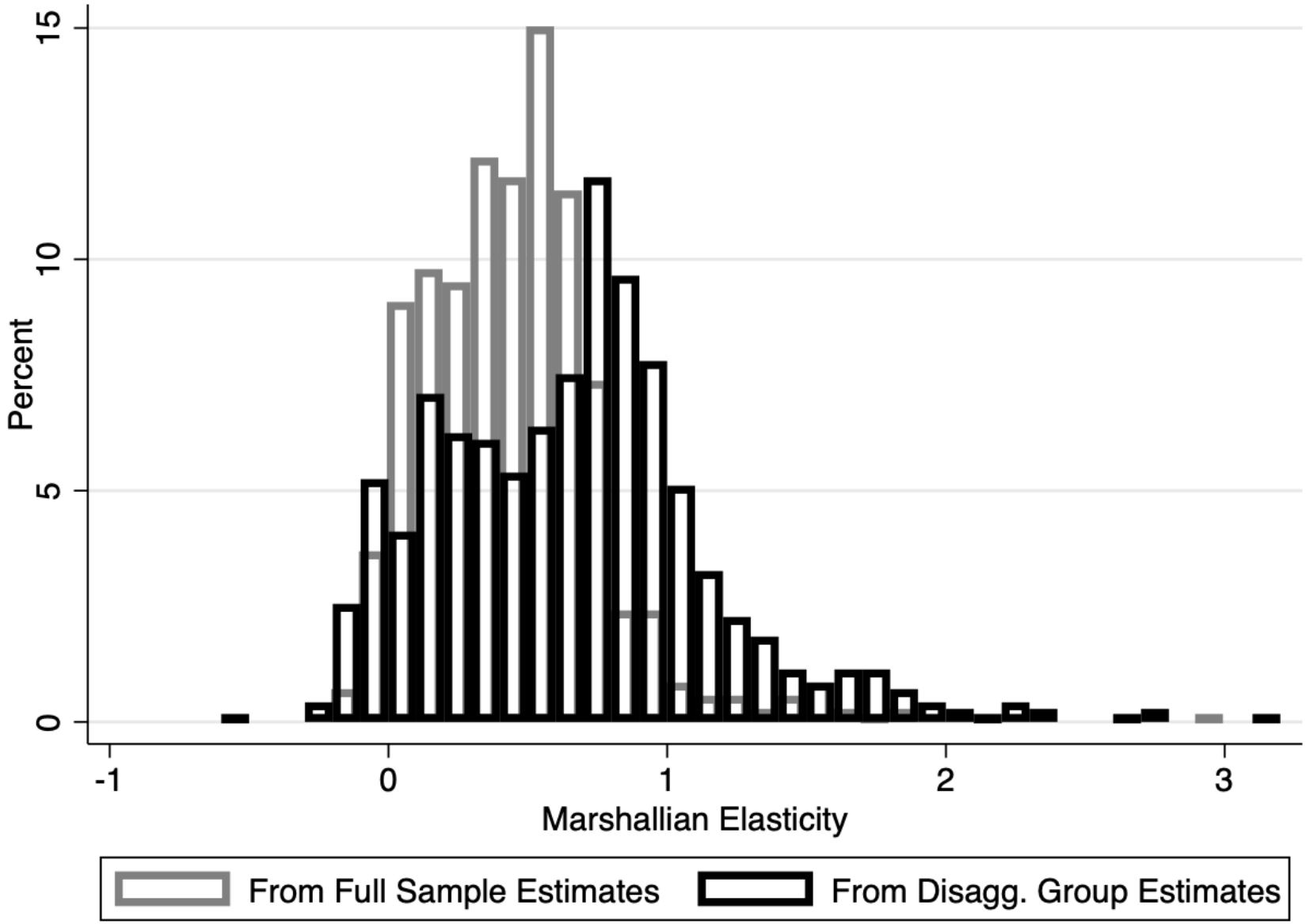
Marshallian Elasticities - Within-group Heterogeneity

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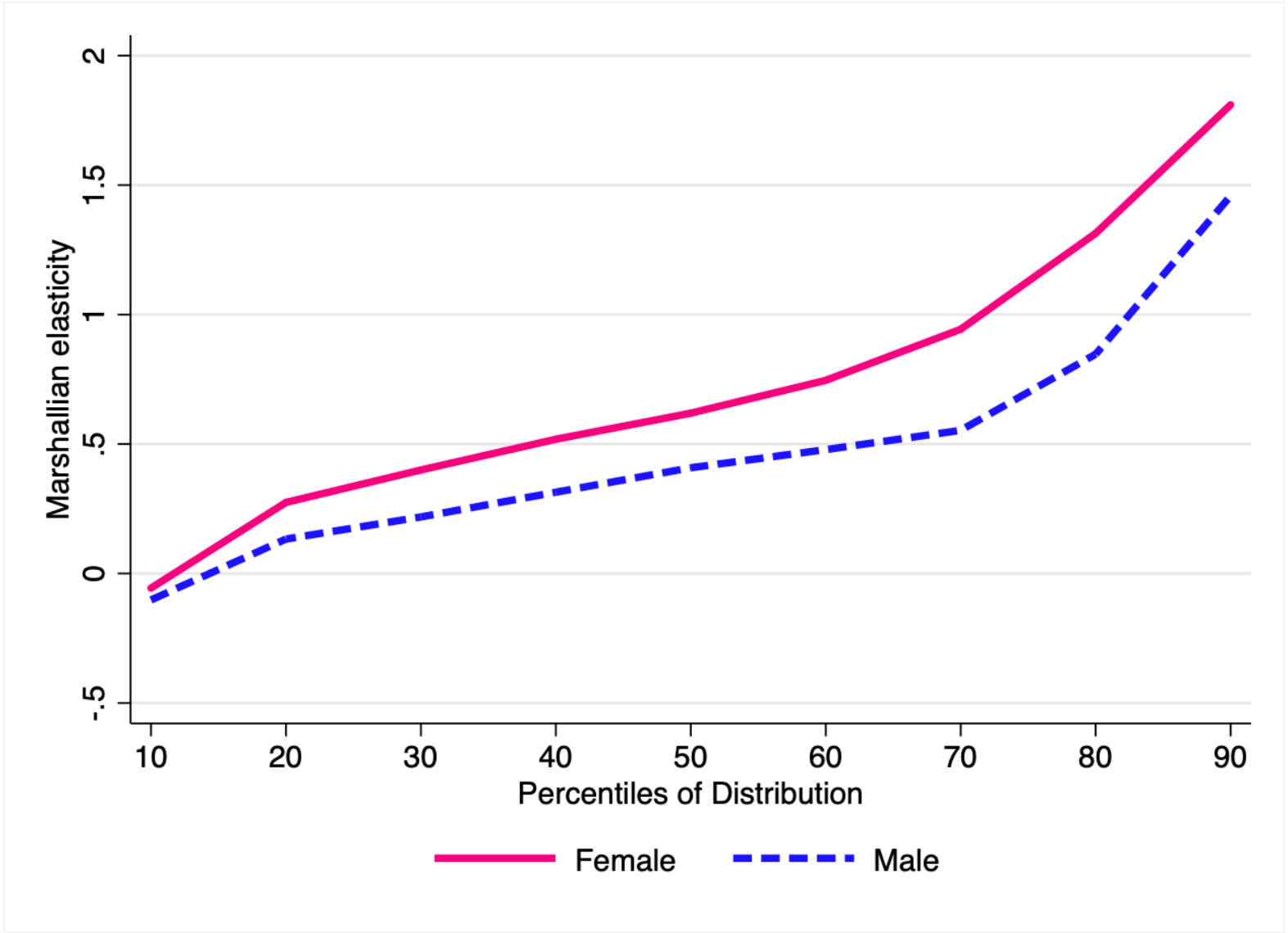
Means are reported. The 90-10 range is in brackets.

- Average elasticities get larger when more variation in the data is taken into account.
- Differences across groups get more pronounced once underlying heterogeneity is taken into account.

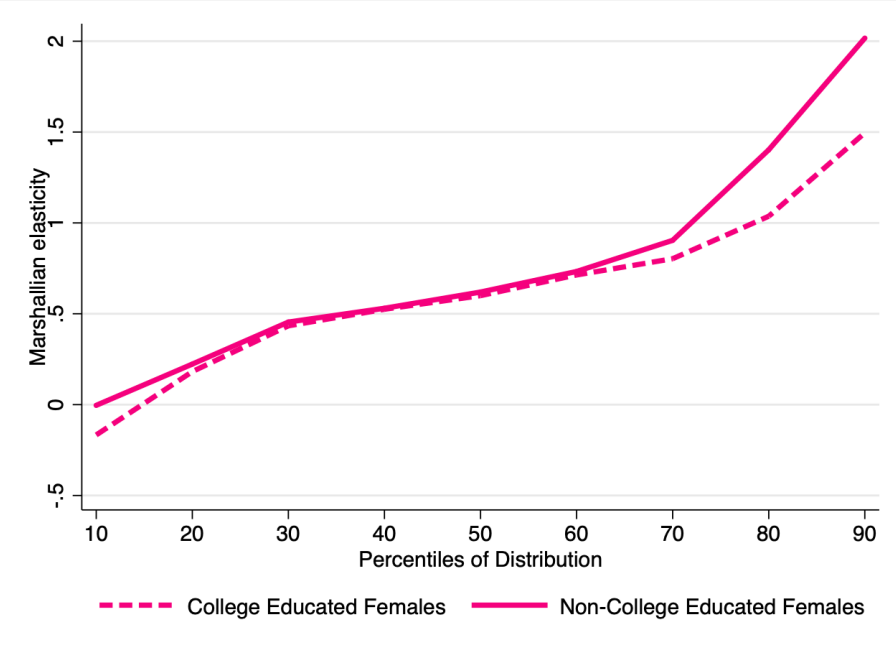
Marshallian Elasticities - Within-group Heterogeneity

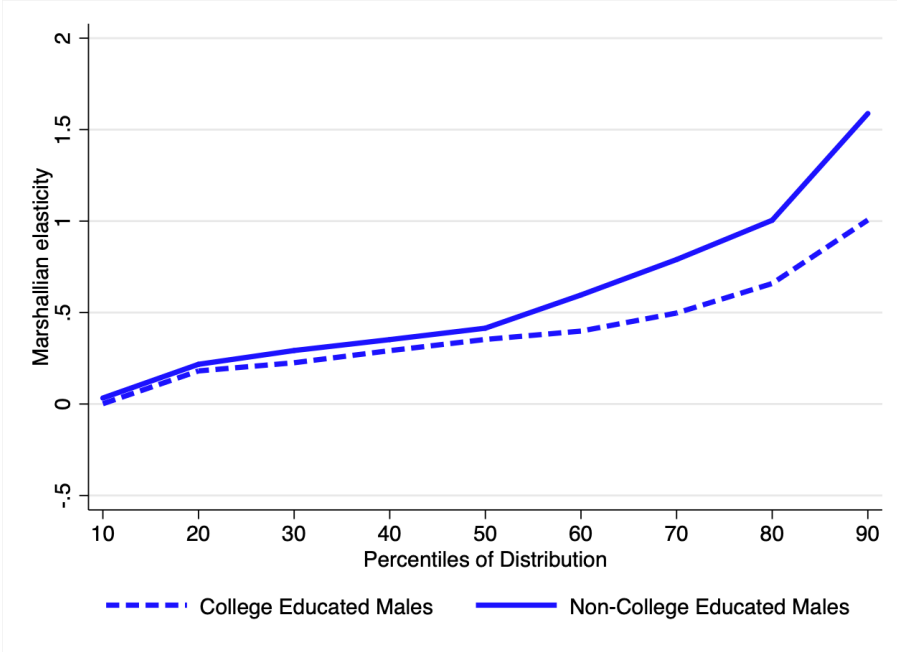


Marshallian Elasticities - Women vs Men



Marshallian Elasticities - By Education





- For policy analysis:
  - Depending on the target group for the policy of interest, we need to take certain observable characteristics in our analysis.
  - Observable characteristics may not be enough to capture the full heterogeneity in behavior.

Does Heterogeneity Matter?

A simple exercise:

- Consider a case where the government increases the marginal tax rate on labor income by 10 percentage points:

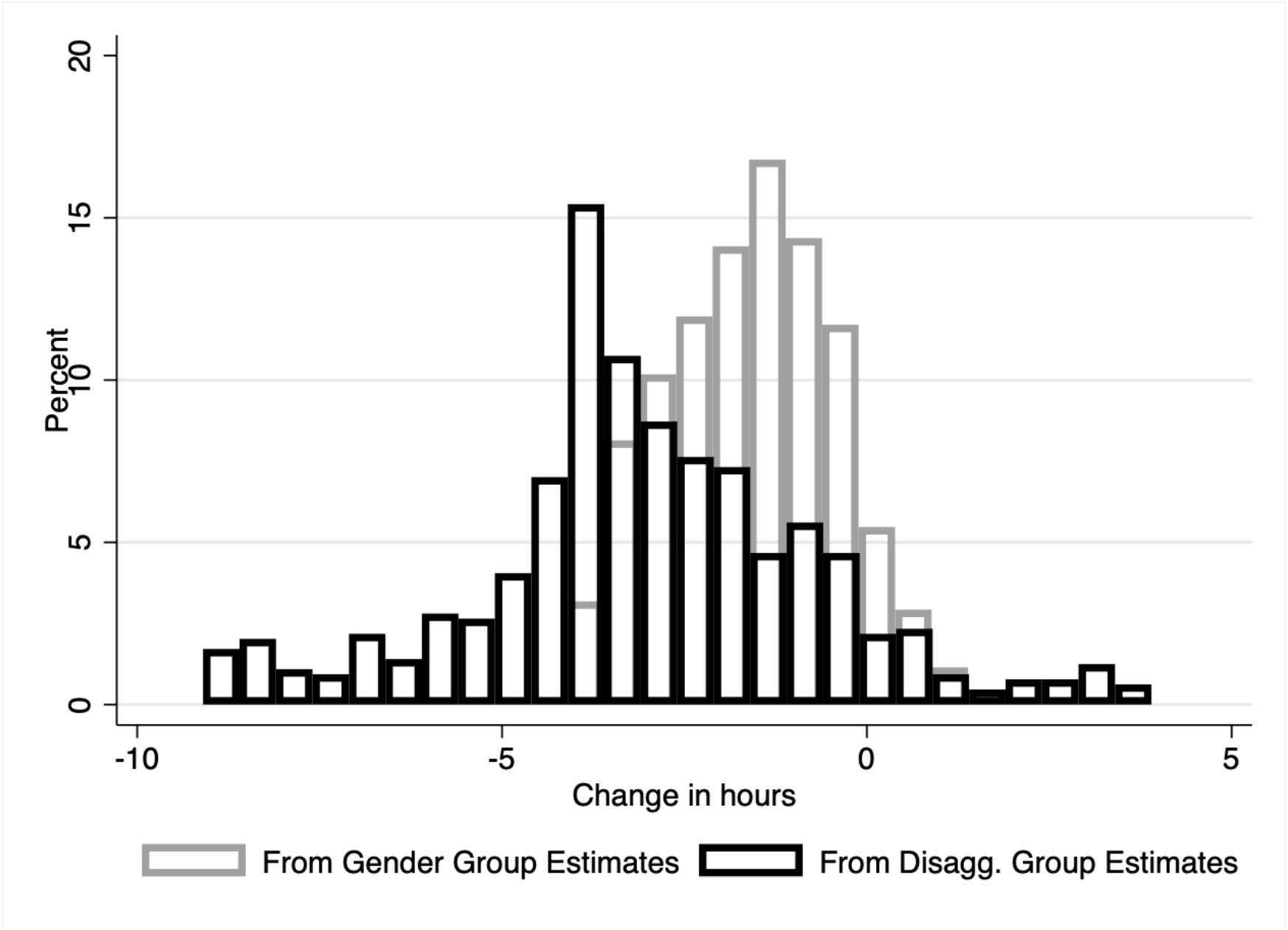
$$\text{earnings} = wh(1-t) \rightarrow w[1-(t+0.10)]h$$

1. Simulate responses using the group-level parameter estimates by gender.

2. Simulate responses using the group-level parameter estimates by $\times$ education $\times$ marital status $\times$ existence of kids.

3. Compare
   - the distribution of responses
   - aggregate response

Does Heterogeneity Matter? - The Distributional Impact



Does Heterogeneity Matter? - The Aggregate Impact

A simple exercise:

- Consider a case where the government increases the marginal tax rate on labor income by 10 percentage points:

$$\text{earnings} = wh(1-t) \rightarrow w[1-(t+0.10)]h$$

1. Simulate responses using the group-level parameter estimates by gender:
   - **Total hours worked in the economy declines by 3.9%.**

2. Simulate responses using the group-level parameter estimates by gender $\times$ education $\times$ marital status $\times$ existence of kids:
   - **Total hours worked in the economy declines by 7.1%.**

The response of hours is significantly larger if the within-group heterogeneity is taken into account.

Which observables to take into account?

MARSHALLIAN ELASTICITIES

	Full sample	Female	Male
Female	0.244***	–	–
	(0.0207)		
Married	−0.169***	0.0112	−0.443***
	(0.0342)	(0.0164)	(0.0712)
College	−0.262***	0.0106	−0.295***
	(0.0210)	(0.00869)	(0.0423)
Kid(s)	0.129***	0.320***	−0.074***
	(0.0258)	(0.0523)	(0.0110)
Kid(s) under 5	0.0343	−0.179*	0.0854
	(0.0333)	(0.0160)	(0.0591)
Married, spouse works	0.0570*	−0.116***	0.0788
	(0.0310)	(0.0164)	(0.0590)
Constant	0.316***	0.242***	0.482***
	(0.0262)	(0.00857)	(0.0451)
R-squared	0.284	0.370	0.225

*($p < 0.1$), **($p < 0.05$), ***($p < 0.01$)

Take-aways on the Intensive-Margin Elasticities

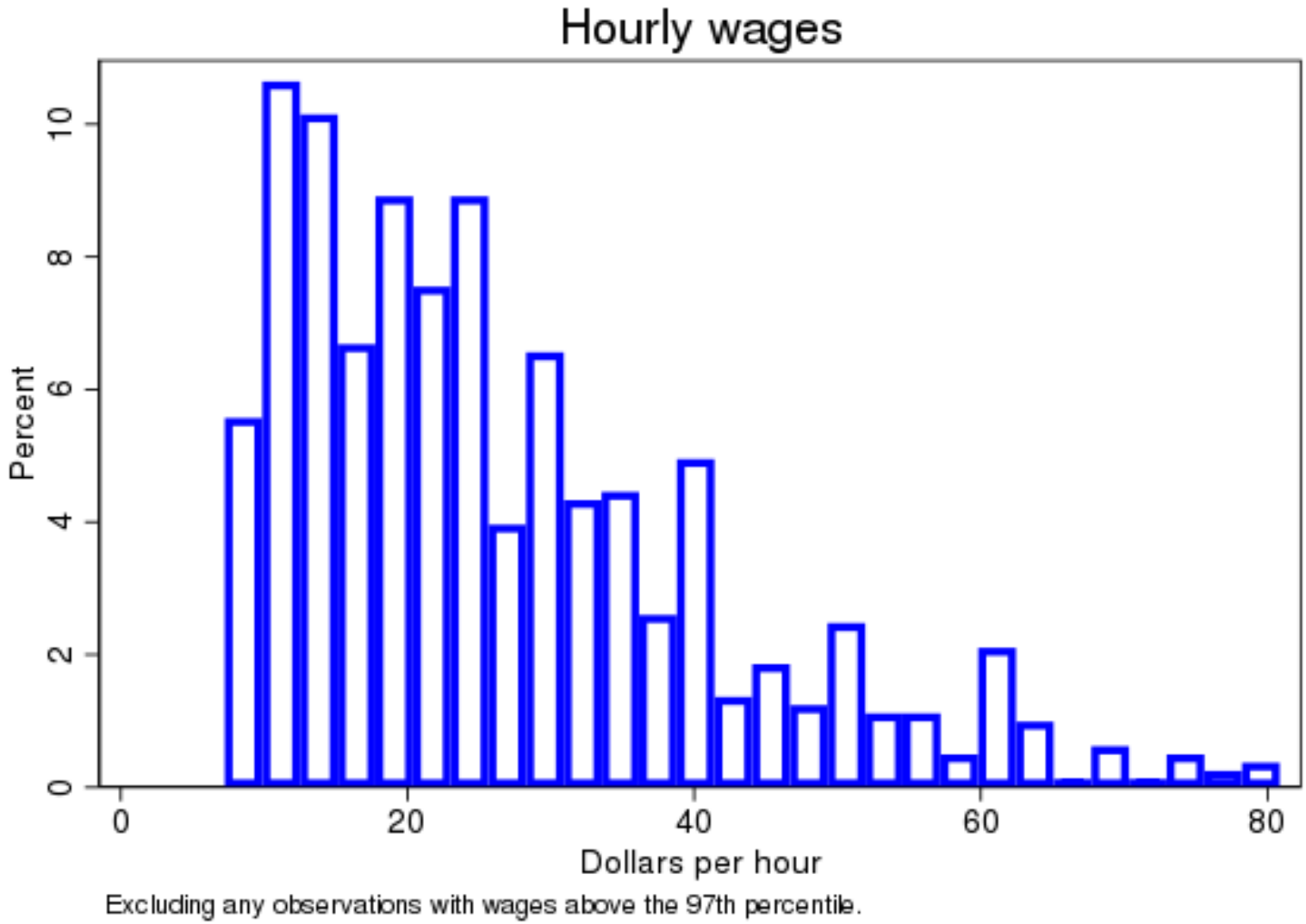
- Average group-level elasticities generated by not taking into account the full variation in the data mask great dispersion and potentially higher responses to policy change.
  - Biased policy evaluation.
- Substantial heterogeneity *across* demographic groups:
  - Comparison of demographic groups using broad definitions are misleading.
- Substantial heterogeneity *within* demographic groups:
  - More dispersion at lower hours.
- Labor supply elasticities are not policy-invariant.
  - No "one" value of elasticity in a given economy!

Roadmap

- Decomposing the heterogeneity in elasticities:
  - For averages?
  - For the distribution?
- Extensive-margin elasticities

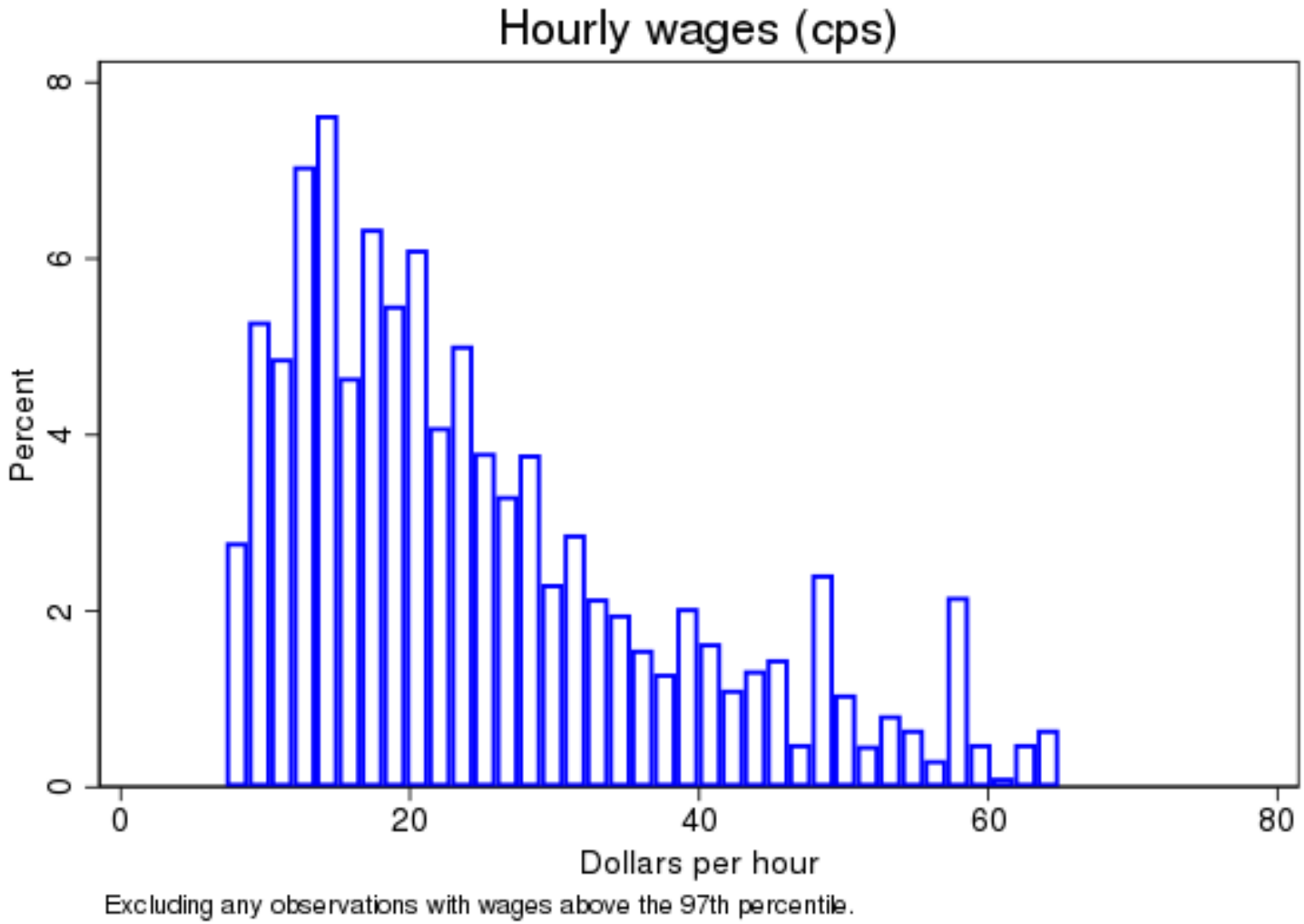
APPENDIX

Current or Most Recent Hourly Wage



Back to Sample Ch.

Current or Most Recent Hourly Wage



▸ Back to Sample Ch.

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For the questions below consider the "hypothetical" situation where everything about you is the same as your current situation EXCEPT that you are currently not working.

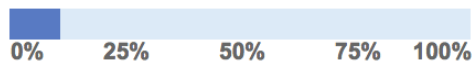
You are deciding whether to search for a job or not. Searching for a job involves activities such as spending time looking at job postings, applying to jobs, doing interviews, waiting to hear back for results etc. If you do not search, you will have access to your savings and other household assets and potentially other government benefits (such as Medicaid, SNAP, etc.). If you search, you might receive additional government benefits (such as the Unemployment Insurance).

Consider your current personal situation and assume you are currently NOT working. Would you search for a job?

Please select only one.

- ○ Yes, I would search for BOTH full-time and part-time jobs
- ○ Yes, I would search for full-time jobs only (Note: full-time means working at least 35 hours per week)
- ○ Yes, I would search for part-time jobs only (Note: part-time means working less than 35 hours per week)
- ○ No, I would not search

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Survey Design - Expected offer wage distribution





Estimation

$$u_1 = \underbrace{\frac{(c_1 - f)^{1-\phi} - 1}{1-\phi}}_{\mathbf{A}_1} + (\alpha + \epsilon_{h1}) \underbrace{\frac{(H - h_1)^{1-\theta} - 1}{1-\theta}}_{\mathbf{B}_1},$$

$$u_2 = \underbrace{\frac{(c_2 - f)^{1-\phi} - 1}{1-\phi}}_{\mathbf{A}_2} + (\alpha + \epsilon_{h2}) \underbrace{\frac{(H - h_2)^{1-\theta} - 1}{1-\theta}}_{\mathbf{B}_2},$$

$$u_3 = \underbrace{\frac{c_3^{1-\phi} - 1}{1-\phi}}_{\mathbf{A}_3} + \alpha \underbrace{\frac{(H)^{1-\theta} - 1}{1-\theta}}_{\mathbf{B}_3},$$

where $\epsilon_{h1}, \epsilon_{h2} \sim N(0, \sigma_u^2)$.

Estimation

Then,

$$
\begin{aligned}
\Pr(d_{is} = 1|\Theta) &= \Pr\left(u_1 > max\{u_2, u_3\}\right) \\
&= \Pr\left((\alpha + \epsilon_{h1})B_1 > \max\{A_2 + (\alpha + \epsilon_{h2})B_2, A_3 + \alpha B_3\} - A_1\right) \\
&= \Pr\left(\epsilon_{h1} > \underbrace{\max\left\{\frac{A_2 + (\alpha + \epsilon_{h2})B_2}{B_1}, \frac{A_3 + \alpha B_3}{B_1}\right\} - \frac{A_1}{B_1} - \alpha}_{\epsilon^*}\right) \\
&= \int_{\epsilon^*}^{\infty} \int_{-\infty}^{\infty} F(\max\left\{\frac{A_2 + (\alpha + \epsilon_{h2})B_2}{B_1}, \frac{A_3 + \alpha B_3}{B_1}\right\} - \frac{A_1}{B_1} - \alpha)\, dF(\epsilon_{h2})\, dF(\epsilon_{h2})
\end{aligned}
$$

Survey Design - Scenarios

This is scenario 9 of 10. Now consider the case where you have received the following 2 job offers:

Options	Hourly Wage Rate	Weekly Work Hours	Weekly Earnings
Job 1	**$51.10**	**40**	**$2,044**
Job 2	**$54.70**	**50**	**$2,735**

As before, these two jobs are **otherwise identical** in all other aspects.

You have the option of choosing one of the jobs, or rejecting both. If you accept either one of the jobs, there is a 2% chance of being laid off from that job in three months, in which case you would start over and decide whether to look for a job or not. If you decide to look for a job (after being laid off from one of the jobs or after choosing to stay unemployed), the likelihood of you receiving at least one offer in the next 3 months will be 43%, and the offers you receive will be picked at random from the set of twenty jobs shown to you earlier. If you are not laid off, you will continue to work at the job at the specified wage rate, with the wage growing at a rate of 0.5% over a 3-month period. Your assets will also grow at a rate of 0.5% over a 3-month period.

When answering these questions, please ignore the effects of price inflation on earnings. That is, assume that one dollar today is worth the same as one dollar in the future.

Which option would you choose?

Please select only one.

- ○ Job 1
- ○ Job 2
- ○ I will stay unemployed, and continue to search.
- ○ I will stay unemployed, and will not search for a job.

BACK | NEXT

0% 25% 50% 75% 100%