Job Seekers' Perceptions and Employment Prospects: Heterogeneity, Duration Dependence and Bias

Andreas I. Mueller
UT Austin

Johannes Spinnewijn
LSE

Giorgio Topa
New York Fed

May, 2019

Introduction

- Long-term unemployment is a key concern:
  - long 'history' in Europe, more recent in US
  - cost to workers + inefficiency of labor market
- Long literature on sources of LT unemployment:
  - central finding: *observed* negative duration-dependence in job finding
  - major challenge: separate *true* duration-dependence from heterogeneity in job finding
- Disentangling different sources is essential for design of unemployment policy

This Paper

In this paper, we:

1. Document novel facts about job seekers' *perceptions*
2. Use perceptions to separate heterogeneity in job finding from true duration dependence
3. Study how biased beliefs contribute to incidence of LT unemployment

This Paper: Main Ideas

In this paper, we:

1. Document novel facts about job seekers' *perceptions*
2. Use perceptions to separate heterogeneity in job finding from true duration dependence
   - **Infer heterogeneity from relation between ex ante beliefs and ex post job finding outcomes**
   - **Build on Hendren ('13,'17), but allow for biases in beliefs**
3. Study how biased beliefs contribute to incidence of LT unemployment

This Paper: Main Ideas

In this paper, we:

1. Document novel facts about job seekers' *perceptions*
2. Use perceptions to separate heterogeneity in job finding from true duration dependence
3. Study how biased beliefs contribute to incidence of LT unemployment
   - **This part requires assumptions on how beliefs affect job search**
   - **Under-reaction in beliefs to Δ in employment prospects magnifies Δ in job finding**

This Paper: Preview of Results

In this paper, we:

1. Document novel facts about job seekers' *perceptions*
   - **Perceptions have strong predictive power**
   - **Job seekers are over-optimistic, especially LT unemployed**
   - **Job seekers do not revise beliefs downward over the spell**
2. Use perceptions to separate heterogeneity in job finding from true duration dependence
3. Study how much biased beliefs contribute to incidence of LT unemployment

This Paper: Preview of Results

In this paper, we:

1. Document novel facts about job seekers' *perceptions*
2. Use perceptions to separate heterogeneity in job finding from true duration dependence
   - **Heterogeneity explains almost all of the decline in job finding**
   - **Beliefs under-react to variation in job finding rates**
3. Study how much biased beliefs contribute to incidence of LT unemployment

This Paper: Preview of Results

In this paper, we:

1. Document novel facts about job seekers' *perceptions*
2. Use perceptions to separate heterogeneity in job finding from true duration dependence
3. Study how much biased beliefs contribute to incidence of LT unemployment
   - **Biases increase share of LT unemployed by** ~ 10 **percent**

Related literature

- Incidence of LT unemployment
  - *Machin-Manning (1999), Kroft et al. (2016)*
- Separating *true* duration-dependence vs. heterogeneity
  - Unobserved Heterogeneity: *Heckman-Singer (1984ab),...*
  - Audit studies: *Kroft et al (2013), Farber et al (2018), Jarosch-Pilossoph (2018)*
  - Repeated spells: *Honoré (1993), Alvarez et al (2016)*
- Behavioral biases / frictions in job search
  - Information frictions: *Spinnewijn (2015), Altmann et al. (2018), Belot et al. (2018), Conlon et al. (2018)*
  - Hyperbolic discounting: *DellaVigna-Paserman (2005)*
  - Reference-dependence: *DellaVigna et al. (2017)*
  - Persistent reservation wages: *Krueger-Mueller (2016)*
- Use of survey elicitations in models of job search
  - Beliefs on wage offers: *Conlon et al (2018)*
  - Elicited reservation wages: *Hall-Mueller (2018)*

Data I

- NY Fed's Survey of Consumer Expectations (SCE)
  - Started in 2013, after extensive testing phase
  - Nationally representative, internet-based survey of a 12-month rotating panel of about 1,300 household heads
  - Core monthly survey on expectations about macro and household level variables

Data I

- NY Fed's Survey of Consumer Expectations (SCE)
  - Started in 2013, after extensive testing phase
  - Nationally representative, internet-based survey of a 12-month rotating panel of about 1,300 household heads
  - Core monthly survey on expectations about macro and household level variables
- Job finding expectations (asked of unemployed job seekers):
  - *"[...] what do you think is the percent chance that within the coming 3 months, you will find a job that you will accept, considering the pay and type of work?"*

Data I

- NY Fed's Survey of Consumer Expectations (SCE)
  - Started in 2013, after extensive testing phase
  - Nationally representative, internet-based survey of a 12-month rotating panel of about 1,300 household heads
  - Core monthly survey on expectations about macro and household level variables
- Job finding expectations (asked of unemployed job seekers):
  - *"[...] what do you think is the percent chance that within the coming 3 months, you will find a job that you will accept, considering the pay and type of work?"*
- Panel data allows to link perceived job finding to actual job finding (with limited attrition)

▸ Summary Stats ▸ Distributions

Data II

- Survey of Unemployed Workers in New Jersey (KM)
  - Panel of about 6,000 unemployed job seekers (UI recipients in October 2009)
  - Interviewed weekly for 12 weeks
  - Long term unemployed surveyed for additional 12 weeks

Data II

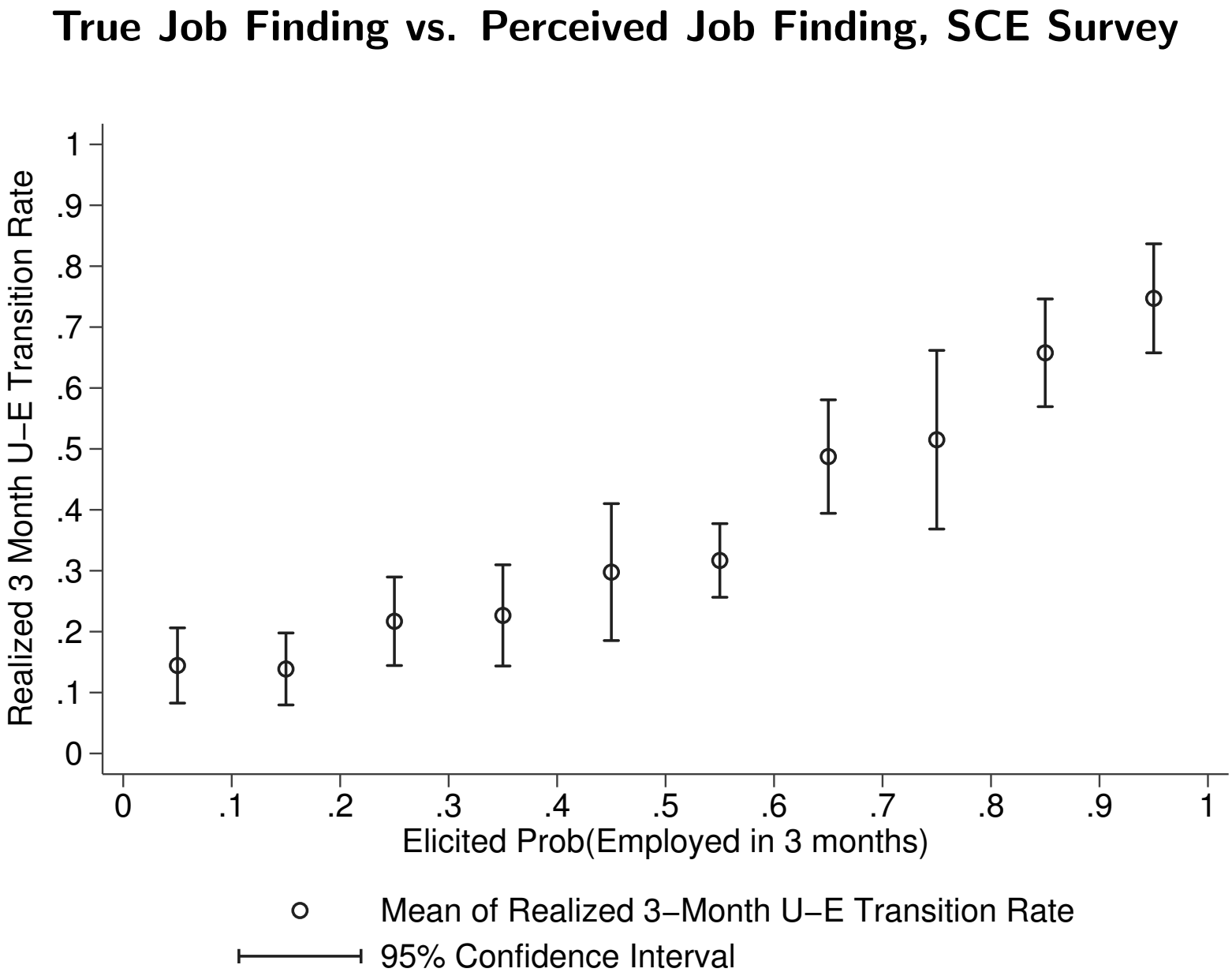
- Survey of Unemployed Workers in New Jersey (KM)
  - Panel of about 6,000 unemployed job seekers (UI recipients in October 2009)
  - Interviewed weekly for 12 weeks
  - Long term unemployed surveyed for additional 12 weeks
- Job finding expectations:
  - *"What do you think is the percent chance that you will be employed again within the next 4 weeks?"*

Data II

- Survey of Unemployed Workers in New Jersey (KM)
  - Panel of about 6,000 unemployed job seekers (UI recipients in October 2009)
  - Interviewed weekly for 12 weeks
  - Long term unemployed surveyed for additional 12 weeks
- Job finding expectations:
  - *"What do you think is the percent chance that you will be employed again within the next 4 weeks?"*
  - *"How many weeks do you estimate it will actually take before you will be employed again?"*

▸ Summary Stats ▸ Distributions

Fact 1: Predictive Value of Beliefs



Fact 1: Predictive Value of Beliefs [cont'd]

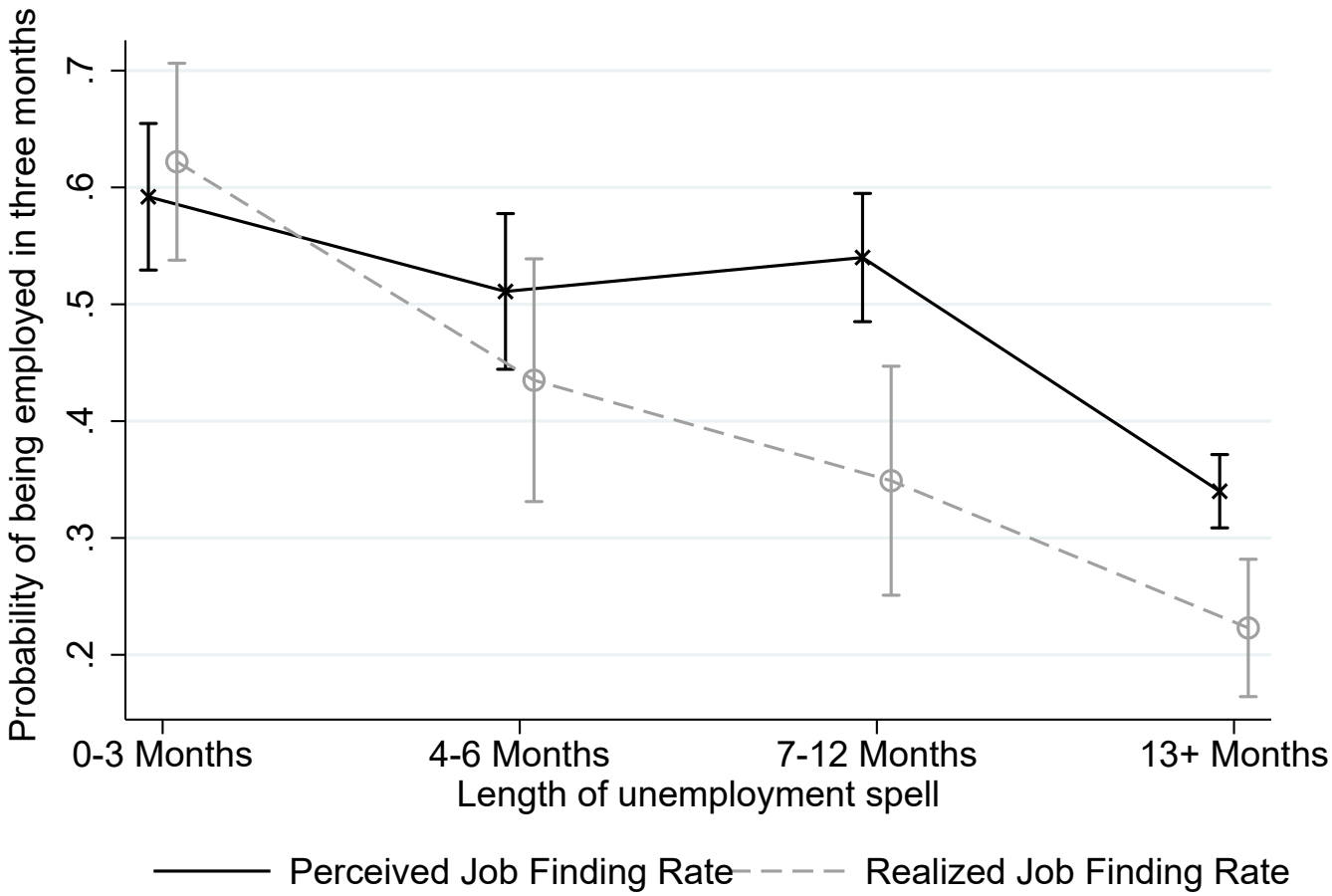
SCE: 3-month UE Transition Rate

	(1)	(2)	(3)	(4)	(5)
Elicited 3-month Probability	0.618***		0.624***		0.565***
	(0.0654)		(0.0886)		(0.0952)
Lagged Elicited 3-m Prob		0.314***			
		(.0684)			
Elicited 3-m Prob x LT Unempl.			-0.216*		-0.274**
			(0.125)		(0.123)
LT Unemployed			-0.111		-0.0291
			(0.0695)		(0.0738)
Controls				X	X
N	983	392	983	983	983
R2	0.142	0.0454	0.190	0.152	0.252

▸ Full Table

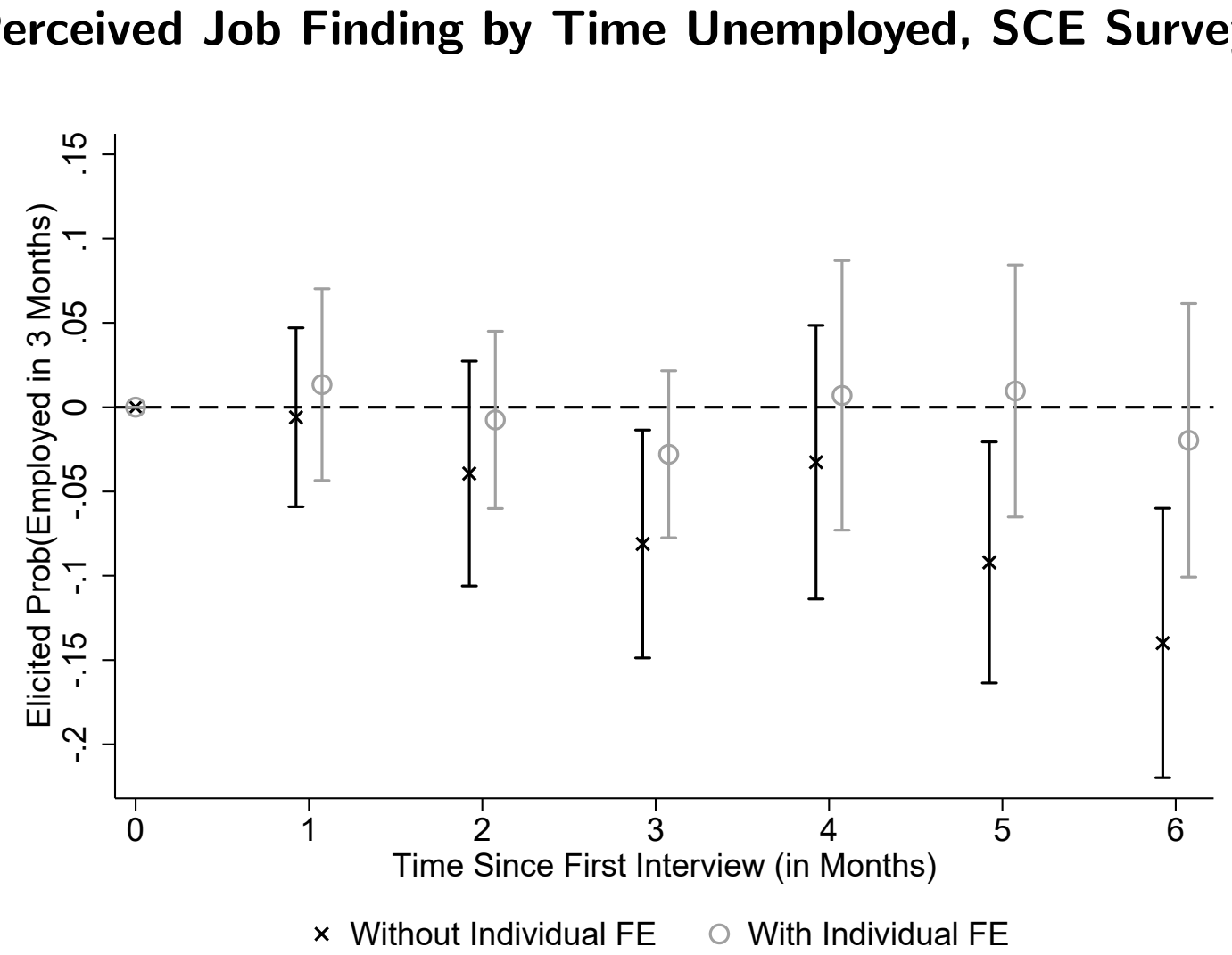
Fact 2: Optimistic Bias (for LT unemployed)

Perceived vs. True Job Finding by Time Unemployed, SCE Survey



▸ Table

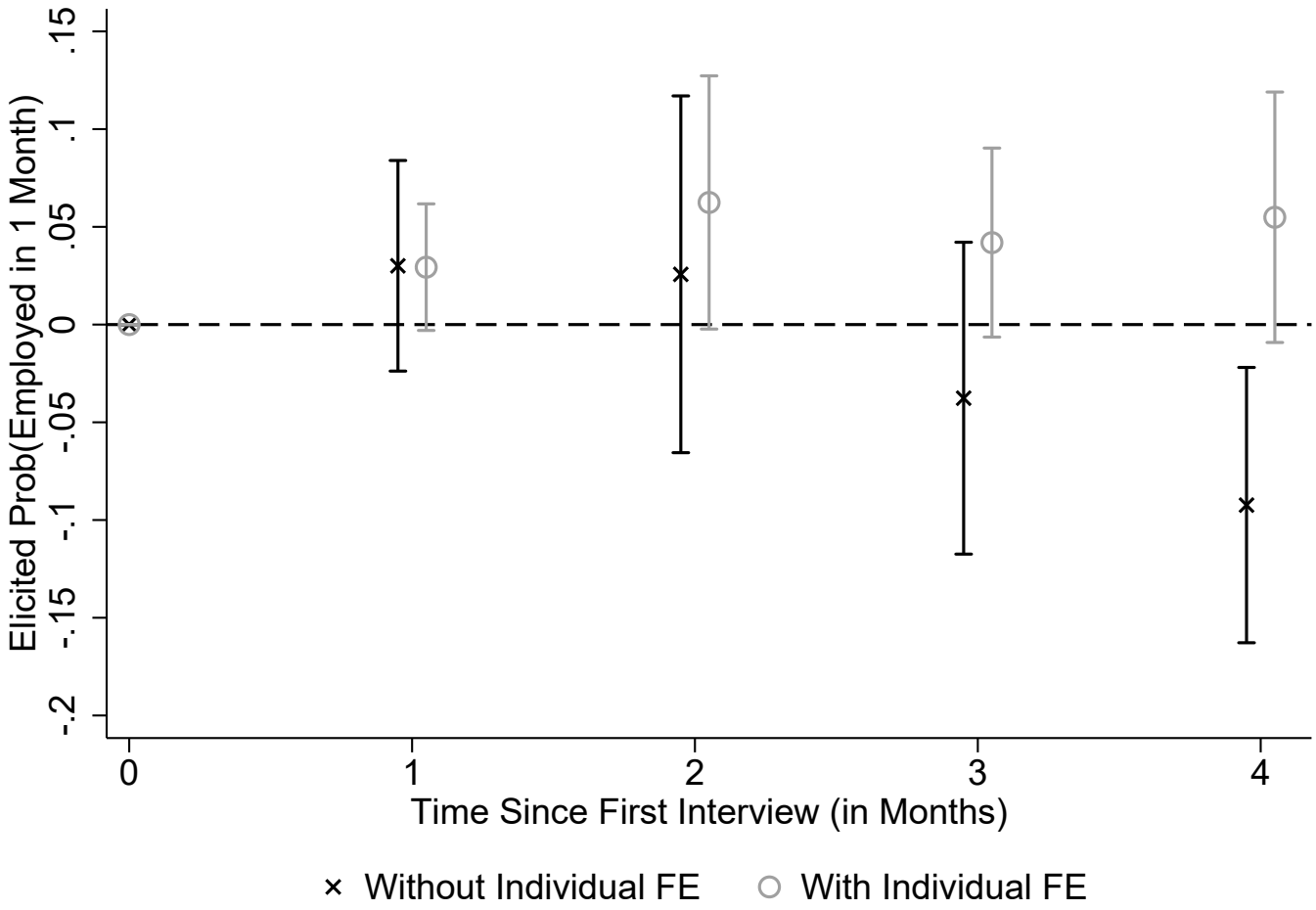
Fact 3: No Downward Revising of Beliefs



▸ Table

Fact 3: No Downward Revising of Beliefs

Perceived Job Finding by Time Unemployed, KM Survey



▸ Table

Further Discussion

- Lack of negative updating seems puzzling:
  - is true duration-dependence not perceived? no learning from unsuccessful job search?
  - There could be behavioral explanations (e.g., gambler's fallacy, motivated beliefs)
  - ... BUT is there true duration dependence? something to be learned?
- Other related evidence
  - reservation wages hardly decrease over the spell (Krueger, Mueller 2016)
  - similar under-reaction of perceptions to aggregate indicators, but only for the unemployed ▸ Table

Part II: Statistical Analysis of Job Finding

- Develop a statistical framework to separate:
  1. Heterogeneity in job finding
  2. True duration-dependence in job finding
  3. Biases in beliefs, both across job seekers and over spell
  4. Random elicitation errors

Statistical Framework - Assumptions

- (**Latent**) true job finding probability:

$$T_{id} = [1 - \theta]^d (T_i + \tau_{id})$$

- (**Elicited**) perceived job finding rate:

$$Z_{id} = b_0 + b_1 \tilde{T}_{id} + \varepsilon_{id}$$

- (**Observed**) job finding realization:

$$F_{id} = \begin{cases} 1 \text{ with prob. } T_{id} \\ 0 \text{ with prob. } 1 - T_{id} \end{cases}$$

Statistical Framework - Assumptions

- (**Latent**) true job finding probability:

$$T_{id} = [1 - \theta]^d (T_i + \tau_{id})$$

  - θ is the depreciation rate $\Rightarrow$ *true duration-dependence*
  - T_i is a persistent component $\Rightarrow$ *dynamic selection*
  - τ_{id} is a transitory component $\not\Rightarrow$ *dynamic selection*

Statistical Framework - Assumptions

- (**Latent**) true job finding probability:

$$T_{id} = [1 - \theta]^d (T_i + \tau_{id})$$

- (**Elicited**) perceived job finding rate:

$$Z_{id} = b_0 + b_1 \tilde{T}_{id} + \varepsilon_{id}$$

  - b_0 and b_1 capture systematic 'biases'
    (*rational exp, perfect info* $\Rightarrow b_0 = 0, b_1 = 1$)
  - ε_{id} is random error in elicitations or perceptions

$$\tilde{T}_{id} = [1 - \hat{\theta}]^d (T_i + \tau_{id})$$

  - $\hat{\theta} \neq \theta$ allows for different cross-sectional and longitudinal 'bias'
    (*learning from unsuccessful job search* $\Rightarrow \hat{\theta} > \theta$)

Statistical Framework - Assumptions

- (**Latent**) true job finding probability:

$$T_{id} = [1 - \theta]^d (T_i + \tau_{id})$$

- (**Elicited**) perceived job finding rate:

$$Z_{id} = b_0 + b_1 \tilde{T}_{id} + \varepsilon_{id}$$

- (**Observed**) job finding realization:

$$F_{id} = \begin{cases} 1 \text{ with prob. } T_{id} \\ 0 \text{ with prob. } 1 - T_{id} \end{cases}$$

Identification: Heterogeneity vs. Depreciation

- Identification challenge:
  - what drives observed duration dependence?

$$\frac{E_{d+1}(T_{i,d+1})}{E_d(T_{i,d})} = (1-\theta)\left[1 - \frac{Var_d(T_i)}{E_d(T_{i,d})(1-E_d(T_{i,d}))}\right]$$

- Our approach:
  - infer heterogeneity from relation between *ex-ante* elicitations and *ex-post* realizations (cfr Hendren '13)
  - non-parametric implementation: any predictable variation in job finding indicates ex ante heterogeneity

$$Var(T_{id}) \geq Var(E(T_{id}|X_{id}))$$

  - parametric implementation using model of beliefs:
    - noisy elicitation: $Z_{id} = T_{id} + \varepsilon_{id}$ (with $E(\varepsilon_{id}|T_{id}) = 0$)
    - binary realization: $F_{id} = 1$ with prob T_{id}
    - Hence, $Cov(Z_{id}, F_{id}) = Var(T_{id})$

Identification: Challenges

- Challenge 1: only persistent heterogeneity drives selection
  - elicitation depends on both persistent component T_i and transitory shock τ_{id}
  - separate the two using $Cov(Z_{i,d-x}, F_{i,d})$ vs. $Cov(Z_{i,d}, F_{i,d})$
- Challenge 2: beliefs are biased
  - biased beliefs: $Z_{id} = b_0 + b_1 T_{id} + \varepsilon_{id}$ (with $E(\varepsilon_{id}|T_{id}) = 0$)
  - Hence, $Cov(Z_{id}, F_{id}) = b_1 Var(T_{id})$

$\Rightarrow$ To what extent is variation in job finding perceived?

Identification: Biases in Beliefs

- Use variation in job finding T across spell durations to estimate bias
  - identify b_1 from $\frac{E_{LT}(Z_{id}) - E_{ST}(Z_{id})}{E_{LT}(T_{id}) - E_{ST}(T_{id})}$
  - e.g., LTU: lower job finding, more optimistic $\Rightarrow b_1 < 1$
- Allow for different cross-sectional and longitudinal bias
  - identify $\hat{\theta} \neq \theta$ using $Cov(Z_{i,d+x}, F_{i,d+x})$ vs. $Cov(Z_{i,d}, F_{i,d})$
  - intuition: covariance between Z and F for LT unemployed depends also on longitudinal bias
- In principle, we can use other observable variation $T|X$, but we would need the bias not to change with X, i.e., $E(\varepsilon|X) = 0$

Statistical Model: Estimation + Results

- Estimation using method of simulated moments
- RESULT 1: **heterogeneity >> depreciation in job finding**
- RESULT 2: **beliefs under-react to Δ in job finding**

▸ Estimates/Robustness/Sensitivity

Statistical Model: Estimation + Results

- Estimation using method of simulated moments
  - minimize weighted SSR using inverse of covariance matrix
  - check non-param. identification arguments in full model
  - gauge sensitivity to functional forms / distrib. assumps
- RESULT 1: **heterogeneity >> depreciation in job finding**
- RESULT 2: **beliefs under-react to Δ in job finding**

▸ Estimates/Robustness/Sensitivity

Statistical Model: Estimation + Results

- Estimation using method of simulated moments
- RESULT 1: **heterogeneity >> depreciation in job finding**
  - substantial heterogeneity in job finding; 23 percent driven by transitory shocks
    - dynamic selection explains 98 (35.5) percent of the decline in job finding rates
    - dynamic selection on 'observables' explains only 28 percent of the decline ▸ Table
  - non-parametric lower bound: $Var(T_{id}) \geq Var(E(T_{id}|X_{id}))$
    - using beliefs: LB = 32% of estimated variance
    - using beliefs + observables : LB = 53% of estimated variance
  - other robustness:
    - similar results when estimating statistical model on residualized moments
    - model fit is worse without heterogeneity
- RESULT 2: **beliefs under-react to Δ in job finding**

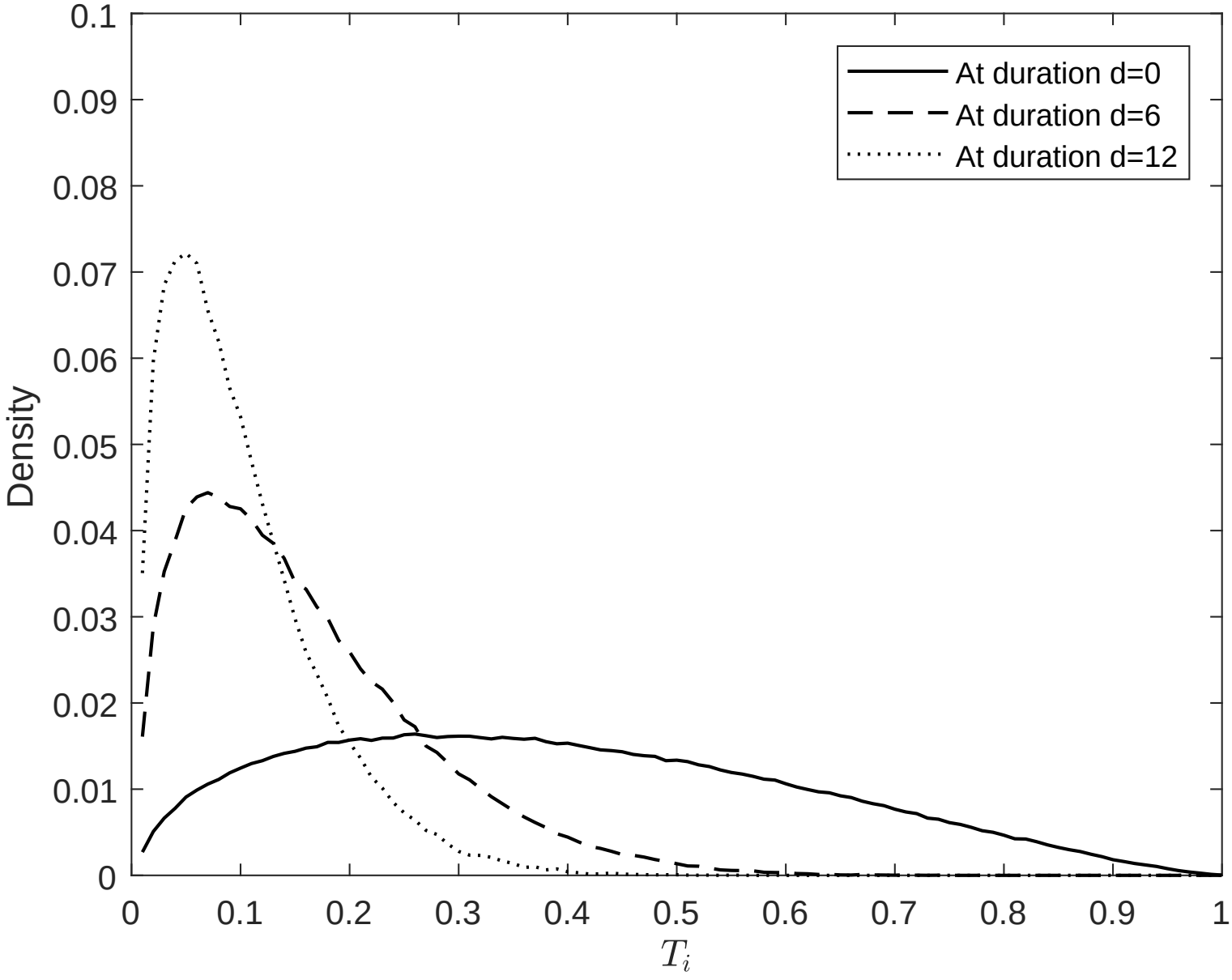
▸ Estimates/Robustness/Sensitivity

Statistical Model: Estimation + Results

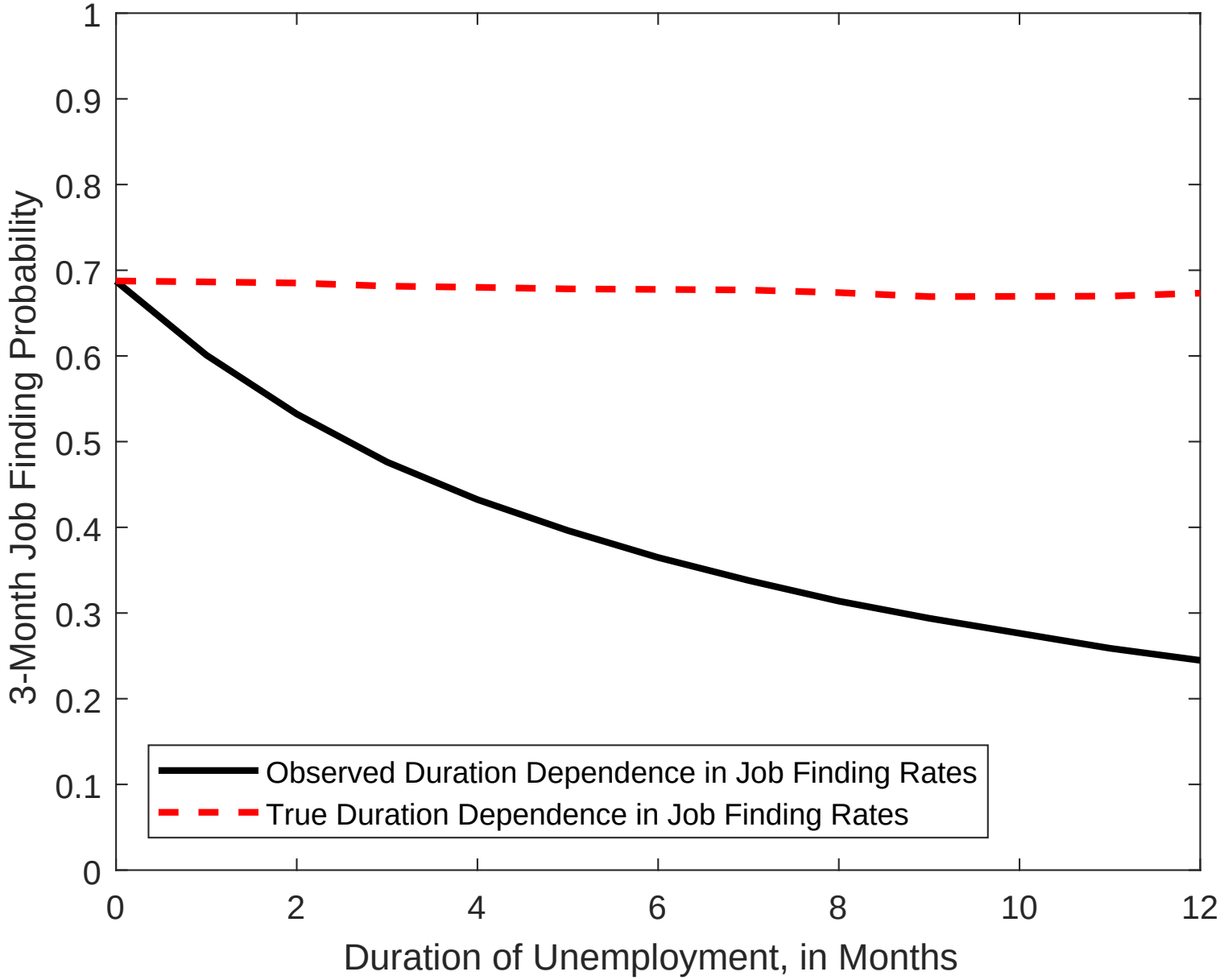
- Estimation using method of simulated moments
- RESULT 1: **heterogeneity >> depreciation in job finding**
- RESULT 2: **beliefs under-react to Δ in job finding**
  - only half of the heterogeneity in job finding is perceived
    - slope parameter: $b_1 = .54\ (.12) < 1$
    - no extra longitudinal response: $\hat{\theta} \approx \theta$
    - model fit is worse for $b_1 = 1$, not for $\hat{\theta} = \theta$
  - optimistic bias for LTU is driven by dynamic selection
    - job seekers with low job finding are optimistic and do not revise their beliefs downward

▸ Estimates/Robustness/Sensitivity

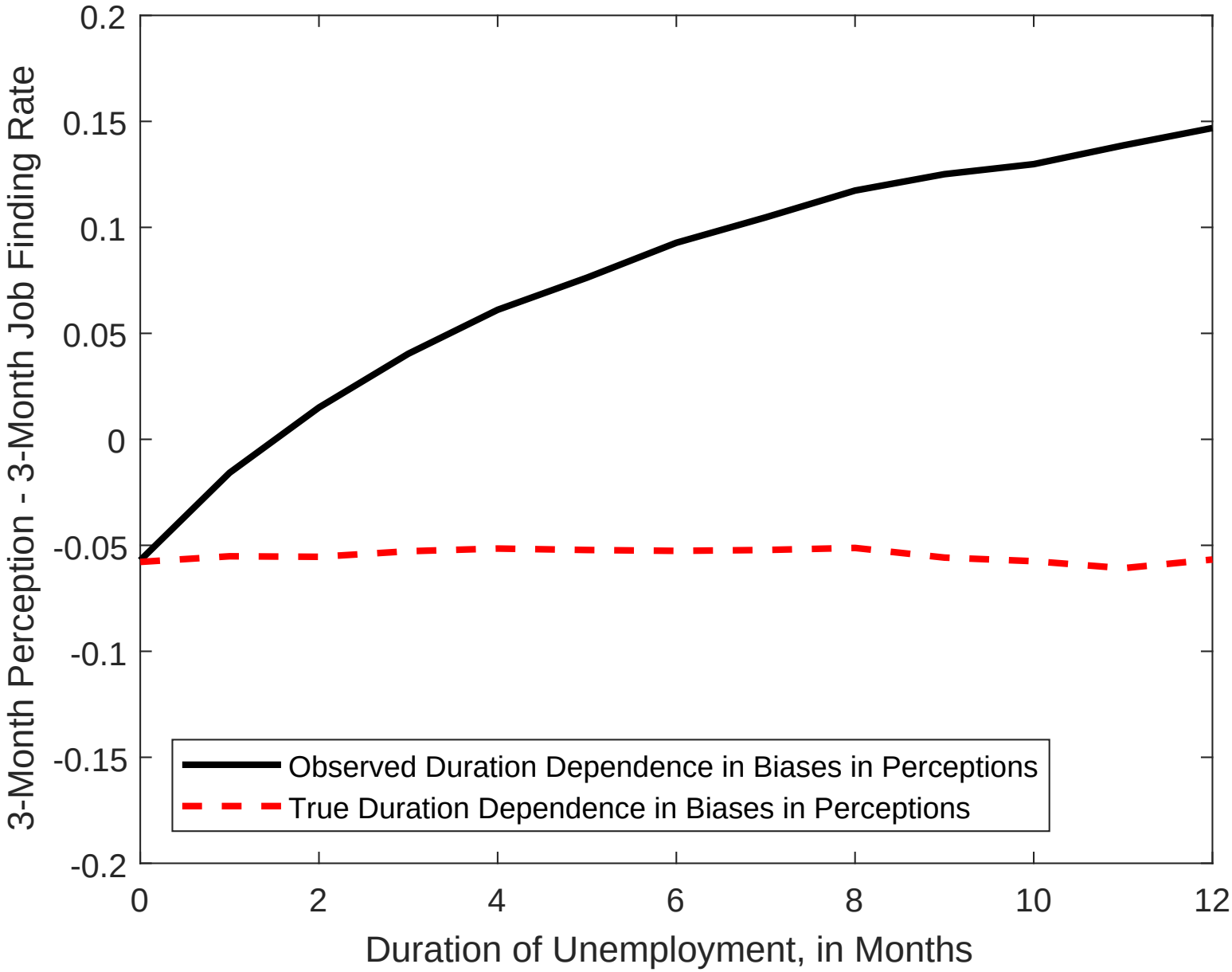
The Distribution of T_i among Survivors



Duration Dependence in Job Finding Rates



Duration Dependence in Biases in Perceptions



Part III: Structural Model with Biased Beliefs

- Statistical model abstracts from job seekers' behavior
- Questions:
  - how do beliefs affect job seekers' behavior?
  - how much do beliefs affect incidence of LT unemployment?
- Setup McCall search model Details
  - allow for heterogeneity, duration-dependence and bias
  - introduce action through arrival rate of job offers
  - target true and perceived job finding rates
  - target estimates from statistical model directly

True vs. Perceived Arrival Rate

- Key mechanism:
  - as arrival rate increases, behavioral response mitigates increase in exit rate, but only if perceived

$$T = \underbrace{(1 - F(R))}_{\text{Acceptance Rate}} \times \underbrace{\lambda}_{\text{Arrival Rate}}$$

$$dT = \underbrace{[1 - F(R)] \times d\lambda}_{\text{Mechanical Effect}} - \underbrace{[\lambda f(R)\, \partial R/\partial \hat{\lambda}] \times d\hat{\lambda}}_{\text{Behavioral Effect}}.$$

- Pass-through elasticity: $\varepsilon_{T,\lambda} = 1 - \beta \times \kappa$
  - With $d\hat{\lambda} = \beta d\lambda$; $\kappa = \frac{f(R)}{1-F(R)} E_{w \geq R}(w - R)$
- Behavioral response is consistent with larger optimism for LT unemployed
  - lower arrival rate $\Rightarrow$ optimistic bias in job finding (for $\beta < 1$)
  - optimistic bias in arrival rate $\Rightarrow$ lower job finding (as $R \uparrow$)

Heterogeneity

- Consider heterogeneity in true and perceived arrival rates:

$$\hat{\lambda}_i = \beta_0 + \beta_1 \lambda_i + \nu_i \text{ with } \sigma_\lambda, \sigma_\nu \text{ and } E(\nu_i|\lambda_i) = 0$$

Proposition

Negative duration-dependence in exit rates T is:

1. *increasing in heterogeneity in arrival rates (σ_λ)*
2. *and more so if heterogeneity is under-estimated ($\beta_1 < 1$)*

Heterogeneity

- Consider heterogeneity in true and perceived arrival rates:

$$\hat{\lambda}_i = \beta_0 + \beta_1 \lambda_i + \nu_i \text{ with } \sigma_\lambda, \sigma_\nu \text{ and } E(\nu_i | \lambda_i) = 0$$

Proposition

Negative duration-dependence in exit rates T is:

1. *increasing in heterogeneity in arrival rates (σ_λ)*
2. *and more so if heterogeneity is under-estimated ($\beta_1 < 1$)*

- 'Proof':
  - Duration-dependence depends on variance in job finding
  - Variance can be approximated for 'small' heterogeneity by

$$var_0(T) \propto [1 - \beta_1 \kappa]^2 \sigma_\lambda^2 + \kappa^2 \sigma_\nu$$

Depreciation

- Consider depreciation of true and perceived arrival rates:

$$\lambda_{d+1} = (1-\theta)\,\lambda_d \;;\; \hat{\lambda}_{d+1} = (1-\beta_\theta\theta)\,\hat{\lambda}_d$$

Proposition

Negative duration-dependence in exit rates T is:

1. *increasing in depreciation of arrival rates (θ)*
2. *and more so if depreciation is under-estimated ($\beta_\theta < 1$)*

Depreciation

- Consider depreciation of true and perceived arrival rates:

$$\lambda_{d+1} = (1-\theta)\,\lambda_d \;;\; \hat{\lambda}_{d+1} = (1-\beta_\theta\theta)\,\hat{\lambda}_d$$

Proposition

Negative duration-dependence in exit rates T is:

1. *increasing in depreciation of arrival rates (θ)*
2. *and more so if depreciation is under-estimated ($\beta_\theta < 1$)*

- 'Proof':
  - Duration-dependence depends on updating of reservation wage
  - Workers lower reservation wages over the unemployment spell to offset the (perceived) decrease in arrival rates

$$\frac{d\left[\frac{T_{d+1}}{T_d}\right]}{d\theta} = -[1-\beta_\theta\frac{\kappa}{\lambda}]$$

Structural Model: Calibration + Results

- Calibration using method of simulated moments
  - target true and perceived job finding means
  - directly target depreciation from statistical analysis
  - add moments/parameters for search model ▸ Targets/Estimates
- Main results / counterfactuals
  - behavioral effect is sizeable, so quantitative impact of beliefs can be substantial ▸ Comparative Stats
  - biases jointly explain $12 - 14$ percent of the incidence of LT unemployment
- Robustness of contribution to LT incidence
  - result is driven by under-reaction in beliefs, not by exact role of depreciation vs. heterogeneity
  - calibration ignores random error in perceptions, which would further increase beliefs-driven variance in job finding

Counterfactual Analysis: Elimination of Biases

	Calibrated Model	Eliminating Biases			
		$B_0 = 0$	$B_1 = 1$	$B_\theta = 1$	$B_0 = 0$ $B_1 = 1$ $B_\theta = 1$
A. Baseline Model					
Unemployment duration	4.24	4.24	4.21	4.24	4.21
Share of LT unemployed	0.32	0.32	0.29	0.32	0.29
B. Alternative spec: high depreciation					
Average unemployment duration	4.3	4.56	4.27	3.99	4.08
Share of LT unemployed	0.32	0.33	0.31	0.30	0.29

Concluding Remarks

- Elicitation of job seekers' perceptions can be used to learn about 'real' environment
- Biases in job seekers' perception by themselves pose a 'real' challenge for unemployment policy
- Understanding the source of these biases will be important when hoping to target biases directly

SCE: Summary Statistics / Representativeness

	SCE 2012-17 All	CPS 2012-17 All	SCE 2012-17 Unemployed	CPS 2012-17 Unemployed
Demographic data (in percent)				
High-School Degree or Less	31.9	35.3	42.8	45.0
Some College Education	18.7	18.9	21.0	21.3
College Degree or More	49.0	45.8	35.3	33.6
Female	49.5	48.2	55.7	49.2
Ages 20-34	26.4	26.6	24.8	35.2
Ages 35-49	37.4	34.0	32.7	33.3
Ages 50-65	36.2	39.4	42.4	31.6
Black	11.4	14.3	16.5	23.6
Hispanic	9.8	15.2	11.4	18.1
Survey outcomes				
Avg. monthly job finding rate (%)	n.a.	n.a.	17.6	22.7
# of respondents	8,396	n.a.	777	n.a.
# of survey responses	53,089	2,427,795	2117	86,761

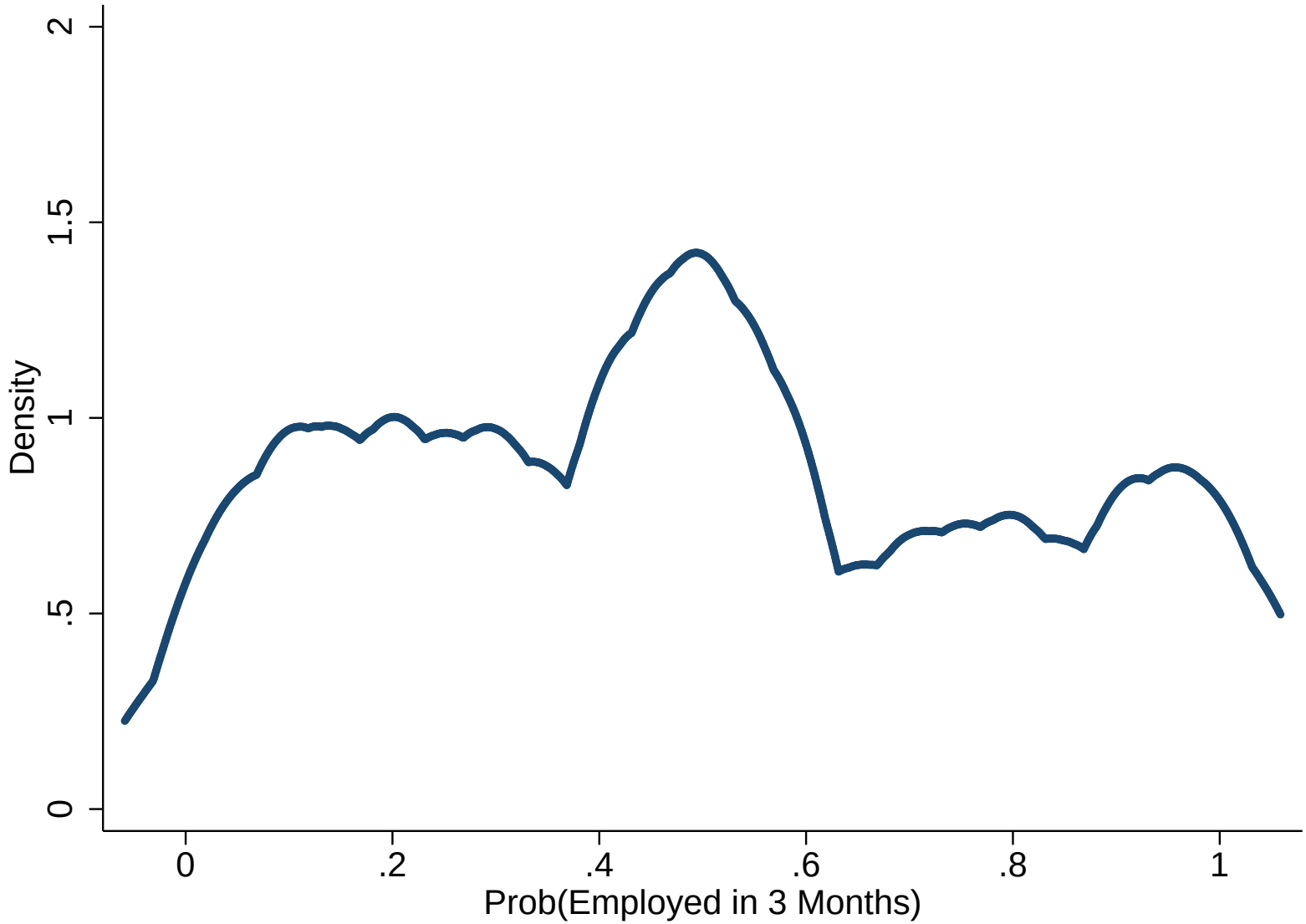
Back

SCE vs. KM: Summary Statistics

	SCE 2012-17	KM Survey 2009-10
Demographic data (in percent)		
High-School Degree or Less	42.8	32.5
Some College Education	21.0	37.4
College Degree or More	35.3	30.1
Female	55.7	48.6
Ages 20-34	24.8	38.1
Ages 35-49	32.7	35.4
Ages 50-65	42.4	26.5
Black	16.5	19.8
Hispanic	11.4	25.6
Survey outcomes		
Avg. monthly job finding rate (in percent)	17.6	13.6
# of respondents	777	2,384
# of respondents w/ at least 2 unemployed surveys	437	1,422
# of unemployed survey responses	2,117	4,803

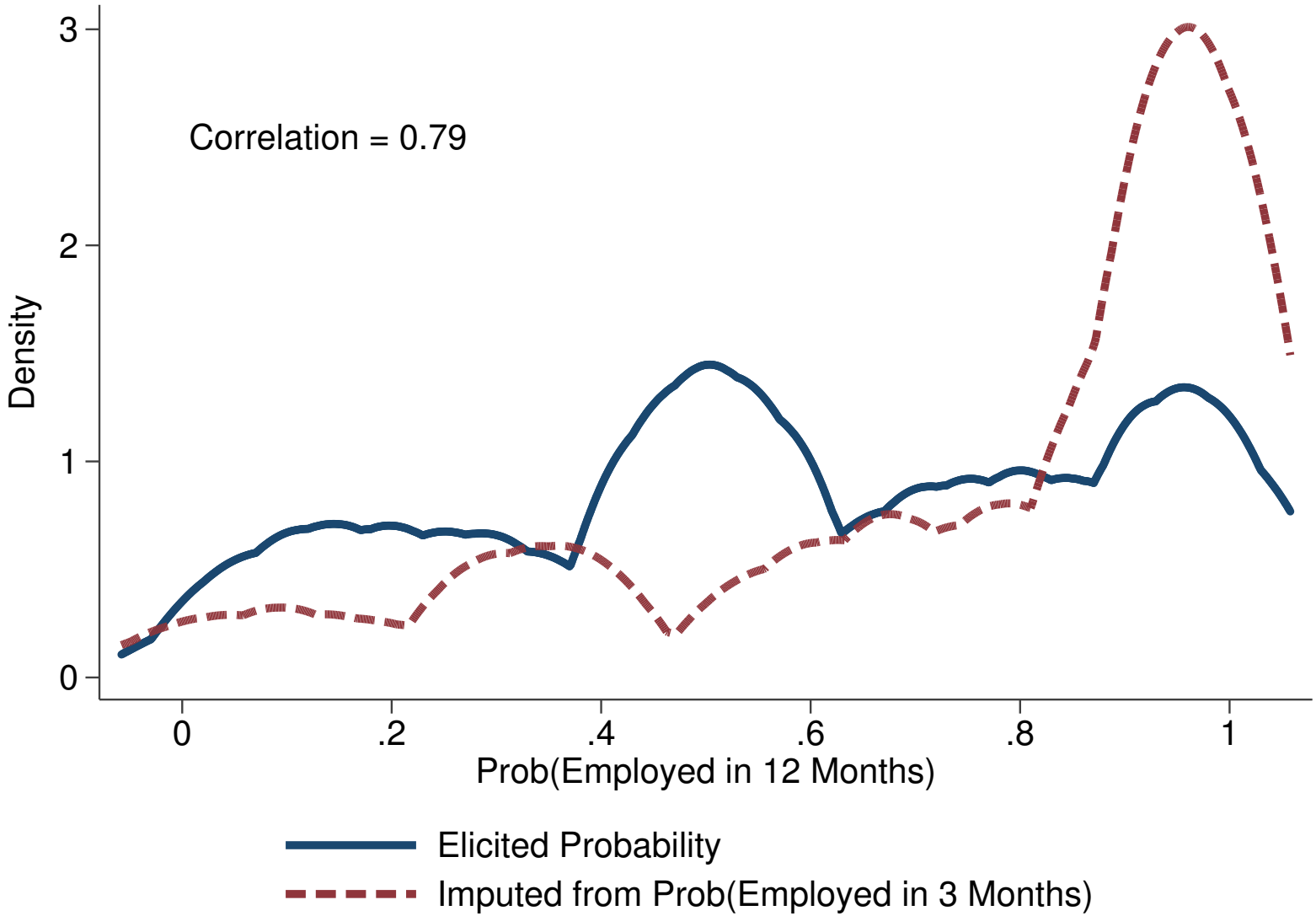
Back

Kernel Density Estimates of 3-Month Elicitation (SCE)



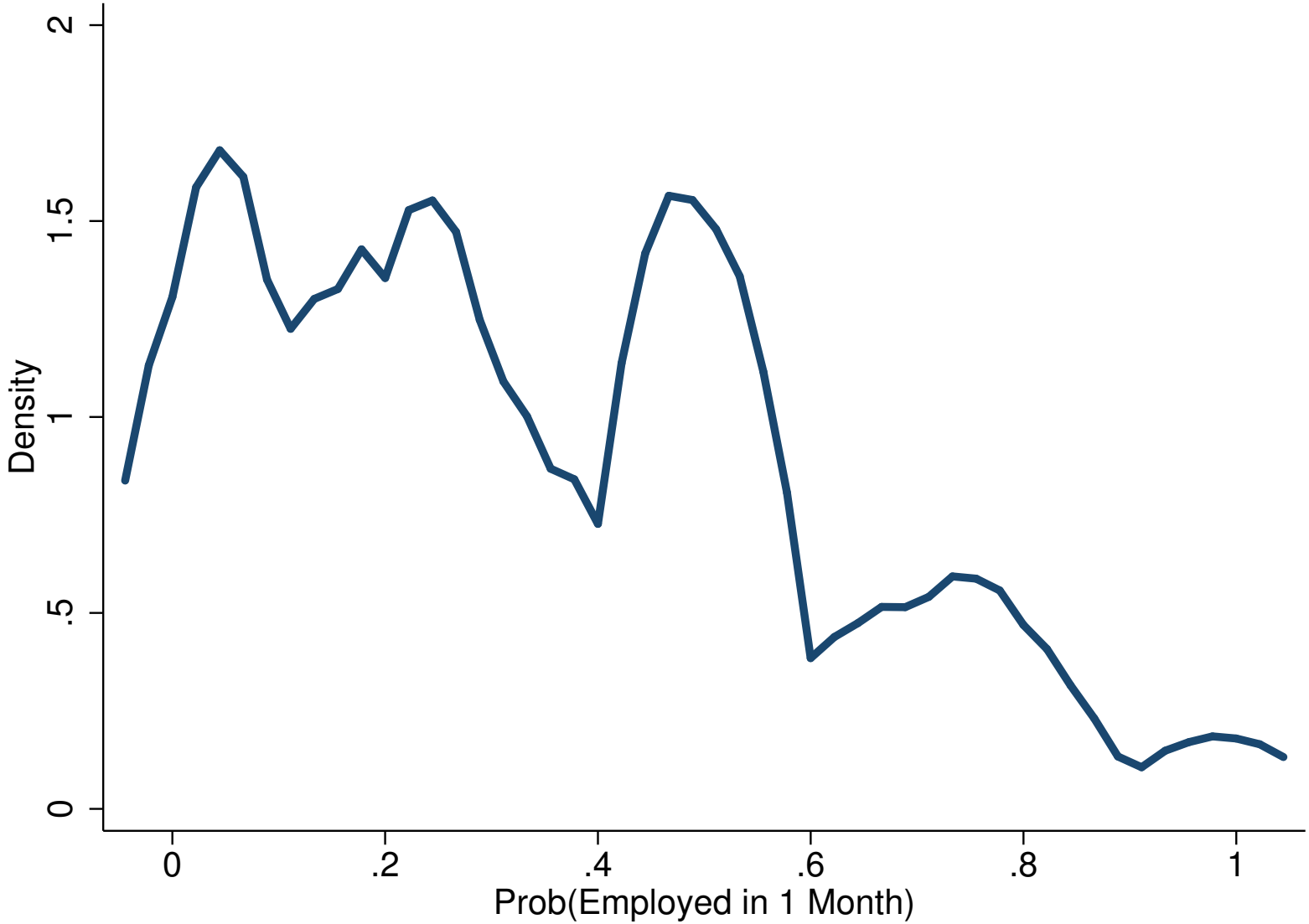
Back

Comparison with Alternative Form of Elicitation (SCE)



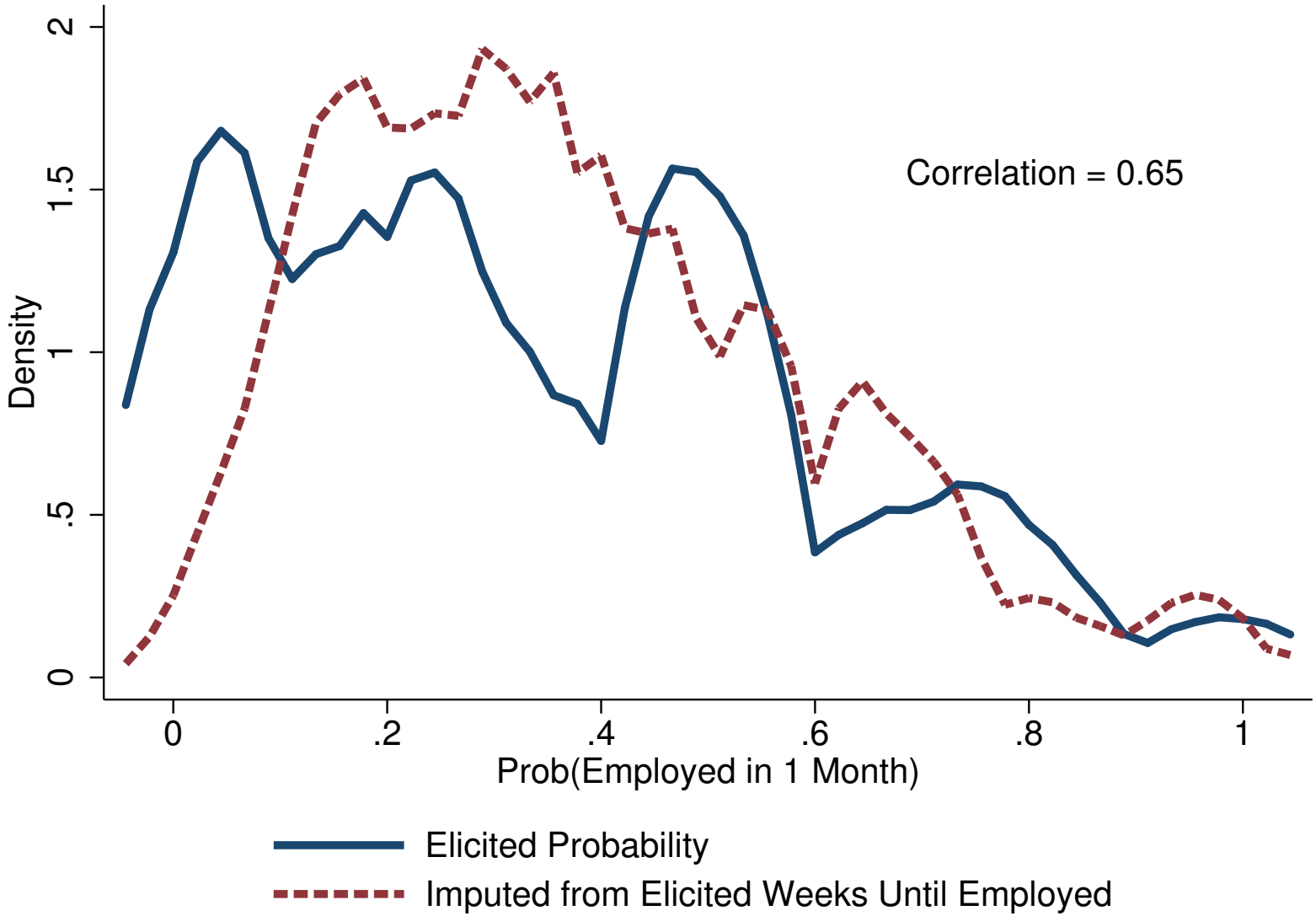
Back

Kernel Density Estimates of 1-Month Elicitation (KM)



Back

Comparison with Alternative Form of Elicitation (KM)



Back

Bias in Job Finding Beliefs (1/3)

SCE (3-month horizon)

	Realized Job-Finding Rate	**Perceived** Job-Finding Probability	Sample Size
Full sample	0.396 (0.024)	0.474 (0.016)	983
Duration 0-3 months	0.622 (0.043)	0.592 (0.032)	302
Duration 4-6 months	0.435 (0.053)	0.511 (0.034)	160
Duration 7-12 months	0.349 (0.050)	0.540 (0.028)	164
Duration 13+ months	0.223 (0.030)	0.340 (0.016)	357

Back

Bias in Job Finding Beliefs (1/3)

KM (1-month horizon)

	Realized Job-Finding Rate	**Perceived** Job-Finding Probability	Sample Size
Full sample	0.105 (0.022)	0.256 (0.019)	734
Duration 0-6 months	0.135 (0.043)	0.256 (0.042)	79
Duration 7-12 months	0.116 (0.048)	0.283 (0.031)	158
Duration 13+ months	0.076 (0.022)	0.232 (0.028)	497

Back

Predictive Value of Beliefs (2/3)

Dependent Variable: 3-Month UE Transition Rate	(1)	(2)	(3)	(4)
Prob(Find Job in 3 Months)	0.618***	0.624***		0.565***
	(0.0654)	(0.0886)		(0.0952)
Prob(Find Job in 3 Months)		-0.216*		-0.274**
x LT Unemployed		(0.125)		(0.123)
LT Unemployed		-0.111		-0.0291
		(0.0695)		(0.0738)
Female			-0.143***	-0.0730**
			(0.0424)	(0.0371)
Race: African-American			0.218***	0.129*
			(0.0641)	(0.0664)
Race: Hispanic			-0.0458	-0.0940*
			(0.0577)	(0.0565)
Race: Asian			0.0785	0.167*
			(0.0983)	(0.0886)
Race: Other			-0.0971	-0.0839
			(0.0656)	(0.0602)
Age			0.0158	0.0206*
			(0.0146)	(0.0111)
Age*Age			-0.000280*	-0.000283**
			(0.000157)	(0.000123)

Predictive Value of Beliefs [cont'd] (2/3)

Dependent Variable: 3-Month UE Transition Rate	(1)	(2)	(3)	(4)
HH income: 30,000-59,999			0.0921*	0.0753*
			(0.0513)	(0.0430)
HH income: 60,000-100,000			0.163**	0.130**
			(0.0633)	(0.0641)
HH income: 100,000+			0.135**	0.122*
			(0.0604)	(0.0689)
High-School Degree			0.333***	0.201***
			(0.0778)	(0.0703)
Some College			0.256***	0.167***
			(0.0661)	(0.0633)
College Degree			0.252***	0.133**
			(0.0640)	(0.0634)
Post-Graduate Education			0.264***	0.143**
			(0.0696)	(0.0690)
Other Education			0.602***	0.416***
			(0.176)	(0.147)
Constant	0.103***	0.207***	0.0600	-0.258
	(0.0328)	(0.0583)	(0.323)	(0.252)
N	983	983	983	983
R2	0.142	0.190	0.152	0.252

Persistence in Predictive Value of Beliefs (2/3)

Dependent Variable: 3-Period Forward UE Transition Rate	(1)	(2)	(3)	(4)
Elicited 3-Month Probability	0.314***	0.486***		0.425***
	(0.0864)	(0.125)		(0.121)
Elicited 3-M Prob x LT unemployed		-0.368**		-0.319**
		(0.157)		(0.143)
LT Unemployed		0.0472		0.0344
		(0.0704)		(0.0681)
Controls			X	X
N	392	392	392	392
R2	0.0454	0.0778	0.153	0.207

Back

Updating in Beliefs among Unemployed (3/3)

Panel A. SCE, Dependent Variable: Elicited 3-Month Probability	(1)	(2)	(3)	(4)
Unempl. Duration (Ms)	-0.00544***	-0.00473***	-0.00395***	0.00395
	(0.000767)	(0.000524)	(0.000490)	(0.00761)
Demographics			X	
Spell FE				X
Observations	673	1845	1845	1845
R^2	0.107	0.079	0.164	0.822

Panel B. KM Survey, Dependent Variable: Elicited 1-Month Probability	(1)	(2)	(3)	(4)
Unempl. Duration (Ms)	-0.0009	-0.0020	-0.0025	0.0216
	(0.0021)	(0.0016)	(0.0014)*	(0.0077)**
Demographics			X	
Individual Fixed Effects				X
Observations	2,088	4,435	4,318	4,435
R-Squared	0.000	0.003	0.119	0.902

▸ Back

Dynamic Selection on Observables

Dependent Variable: 3-Month UE Transition Rate	(1)	(2)	(3)	(4)
Unemployment Duration, in Months	-0.0090***	-0.0071***		
	(0.0009)	(0.0009)		
Unemployment Duration: 4-6 Months			-0.187***	-0.152**
			(0.069)	(0.064)
Unemployment Duration: 7-12 Months			-0.274***	-0.239***
			(0.066)	(0.060)
Unemployment Duration: 13+ Months			-0.400***	-0.287***
			(0.053)	(0.052)
Demographics		X		X
HH income (3 Bins)		X		X
Education levels		X		X
Observations	983	983	983	983
R^2	0.119	0.213	0.116	0.205

Back

Dynamic Selection on Beliefs

Dependent Variable: 3-Month UE Transition Rate	(1)	(2)	(3)	(4)
Unemployment Duration, in Months	-0.0064***	-0.0053***		
	(0.0009)	(0.0010)		
Unemployment Duration: 4-6 Months			-0.145**	-0.127**
			(0.060)	(0.059)
Unemployment Duration: 7-12 Months			-0.240***	-0.214***
			(0.061)	(0.058)
Unemployment Duration: 13+ Months			-0.274***	-0.200***
			(0.050)	(0.052)
Demographics		X		X
HH income (3 Bins)		X		X
Education levels		X		X
Belief Controls (10 Bins)	X	X	X	X
Observations	983	983	983	983
R^2	0.200	0.262	0.199	0.261

Back

Beliefs vs. Behavior

Dependent variable:	Prob(Find Job in 1 Month)		Expected Duration (Inverted)	
	(1)	(2)	(3)	(4)
Time Spent on Job Search (Hours per Week)	0.0013	-0.0013	0.0009	0.0007
	(0.0006)**	(0.0010)	(0.0005)	(0.0013)
Log(Hourly Reservation Wage)	-0.0387	-0.0099	-0.0586	0.1374
	(0.0360)	(0.0758)	(0.0316)*	(0.0828)*
Reservation Commuting Distance (in min)	-0.0000	-0.0010	-0.0006	-0.0003
	(0.0006)	(0.0013)	(0.0005)	(0.0013)
Controls	X		X	
Individual F.E.		X		X
N	3,992	4,087	3,911	3,990
R^2	0.129	0.915	0.097	0.891

Response to Aggregate Indicators for Unemployed

Panel A. Unemployed Individuals: Elicited 3-Month Probability	(1)	(2)	(3)	(4)
National Unemployment Rate	2.059			
	(1.946)			
National Job Openings Rate	3.535			
	(4.792)			
State Unemployment Rate		0.534	-0.150	
		(0.729)	(0.727)	
Elicited Prob(rise in US stock prices)				0.170***
				(0.0399)
Elicited Prob(rise in US unempl.)				-0.0905**
				(0.0373)
Demographics	X	X	X	X
State FE			X	X
Observations	1826	1832	1832	1821
R^2	0.116	0.115	0.183	0.195

Response to Aggregate Indicators for Employed

Panel B. Employed Individuals: (Conditional) Elicitation	(1)	(2)	(3)	(4)
National Unemployment Rate	-1.407***			
	(0.426)			
National Job Openings	4.984***			
	(1.094)			
State Unemployment Rate		-2.812***	-3.120***	
		(0.147)	(0.177)	
Elicited Prob(rise in US stock prices)				0.223***
				(0.00920)
Elicited Prob(rise in US unempl.)				-0.109***
				(0.00924)
Demographics	X	X	X	X
State FE			X	X
Observations	44309	44380	44380	44494
R^2	0.056	0.058	0.073	0.086

Back

Functional Form and Distributional Assumptions

- Permanent job finding rates, T_i, follows Beta distribution
- Transitory component of the job finding rate, τ_{id}, with $T_{id} \in [0, 1]$
  - uniform distribution on the interval $[-\sigma_\tau, \sigma_\tau]$
  - masspoint(s) at the bounds such that $E(\tau | T_i) = 0$
- Perceptions/elicitations errors, ε_{id}, with $Z_{id} \in [0, 1]$
  - uniform distribution on the interval $[-\sigma_\varepsilon, \sigma_\varepsilon]$
  - masspoint(s) at the bounds such that $E(\varepsilon | \tilde{T}_{id}^3) = 0$
- Geometric depreciation in baseline specification. Alternative specification with piecewise linear depreciation:

$$\theta_d = \begin{cases} \theta d \text{ if } d \leq 12 \\ \theta 12 \text{ if } d > 12 \end{cases} \quad \text{and } \hat{\theta}_d = \begin{cases} \hat{\theta} d \text{ if } d \leq 12 \\ \hat{\theta} 12 \text{ if } d > 12 \end{cases}$$

Targeted Moments

Moment	Symbol	Value in SCE	Value in Model
Mean of 3-Month Job Finding Rates:			
... at 0-3 Months of Unemployment	$m_{F_{03}}$	0.623	0.626
... at 4-6 Months of Unemployment	$m_{F_{46}}$	0.435	0.441
... at 7+ Months of Unemployment	$m_{F_{7+}}$	0.260	0.261
Mean of 3-Month Elicitations (Deviation from Actual):			
... at 0-3 Months of Unemployment	$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.029
... at 4-6 Months of Unemployment	$m_{Z_{46}} - m_{F_{46}}$	0.076	0.057
... at 7+ Months of Unemployment	$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.141
Mean of Monthly Innovations in Elicitations	m_{dZ}	0.009	0.008
Var. of Elicitations	s_Z^2	0.089	0.089
Cov. with Job Finding	$c_{Z,F}$	0.055	0.057
Cov. wtih Job Finding in 3 Months	$c_{Z_d,F_{d+3}}$	0.023	0.023

Back

Estimation Results

A. Parameter Estimates

Parameter/ Moment	Explanation	Estimate	(S.e.)
$E(T_i)$	Mean of distribution of T_i	0.389	(0.066)
$Var(T_i)$	Variance of distribution of T_i	0.048	(0.022)
σ_τ	Dispersion in transitory component τ_{id}	0.325	(0.250)
θ	Depreciation in job finding	0.003	(0.049)
b_0	Intercept bias	0.262	(0.053)
b_1	Slope bias	0.537	(0.112)
σ_ε	Dispersion in elicitation errors, ε_{id}	0.438	(0.024)

Back

Estimation Results

B. Additional Moments w.r.t. Job Finding			
Moment	Explanation	Estimate	(S.e.)
$Var(T^3_{i0})$	Var. in job finding at $d = 0$	0.084	(0.017)
$Var(T^3_i)$	Var. in permanent component at $d = 0$	0.065	(0.022)
$Var(dT^3_{id})$	Var. in changes job finding	0.017	(0.010)
$E(T^3_{i0} - T^3_{i12})$	12-month decline (longitudinal)	0.010	(0.159)
$E(T^3_{i0}) - E(T^3_{i12})$	12-month decline (cross-sectional)	0.442	(0.077)
$\frac{E(T^3_{i0} - T^3_{i12})}{E(T^3_{i0}) - E(T^3_{i12})}$	Ratio of longitud. to cross-sect. decline	0.022	(0.356)
C. Additional Moments w.r.t. Job Finding			
$Var(Z^3_{i0})$	Var. in elicitations at $d = 0$	0.080	(0.005)
$Var(Z^3_{i0} - \varepsilon_{i0})$	Var. in elicitations at $d = 0$ (net of err.)	0.024	(0.008)
$Var(dZ^3_{id})$	Var. in changes in elicitations	0.124	(0.013)
$Var(dZ^3_{id} - d\varepsilon_{id})$	Var. in changes in elicit. (net of err.)	0.005	(0.003)
$E(Z^3_{i0} - Z^3_{i12})$	12-month decline (longitudinal)	0.006	(0.083)
$E(Z^3_{i0}) - E(Z^3_{i12})$	12-month decline (cross-sectional)	0.238	(0.046)
$\frac{E(Z^3_{i0} - Z^3_{i12})}{E(Z^3_{i0}) - E(Z^3_{i12})}$	Ratio of longitud. to cross-sect. decline	0.026	(0.347)

Back

Restricted Model Results

A. Parameter Estimates:	(1) Baseline
$E(T_i)$	0.388
$Var(T_i)$	0.048
σ_τ	0.325
θ	0.003
b_0	0.262
b_1	0.537
σ_ε	0.438

B. Model Fit:	Data	(1)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.029
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.057
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.141
$m_{F_{03}}$	0.623	0.626
$m_{F_{46}}$	0.435	0.441
$m_{F_{7+}}$	0.260	0.261
s_Z^2	0.089	0.089
$c_{Z,F}$	0.055	0.057
$c_{Z_d,F_{d+3}}$	0.023	0.023
m_{dZ}	0.009	0.008
Weighted SSR		0.3347

Back

Restricted Model Results

A. Parameter Estimates:		(1) Baseline	(2) $\theta = 0$
$E(T_i)$		0.388	0.386
$Var(T_i)$		0.048	0.048
σ_τ		0.325	0.316
θ		0.003	0
b_0		0.262	0.260
b_1		0.537	0.541
σ_ε		0.438	0.438
B. Model Fit:	Data	(1)	(2)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.029	-0.027
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.057	0.057
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.141	0.14
$m_{F_{03}}$	0.623	0.626	0.624
$m_{F_{46}}$	0.435	0.441	0.440
$m_{F_{7+}}$	0.260	0.261	0.263
s_Z^2	0.089	0.089	0.09
$c_{Z,F}$	0.055	0.057	0.057
$c_{Z_d,F_{d+3}}$	0.023	0.023	0.024
m_{dZ}	0.009	0.008	0.009
Weighted SSR		0.3347	0.3374

Back

Restricted Model Results

A. Parameter Estimates:	(1) Baseline	(2) $\theta = 0$	(3) No heterog. in T_{id}
$E(T_i)$	0.388	0.386	0.286
$Var(T_i)$	0.048	0.048	0
σ_τ	0.325	0.316	0
θ	0.003	0	0.097
b_0	0.262	0.260	0.340
b_1	0.537	0.541	0.295
σ_ε	0.438	0.438	0.423

B. Model Fit:	Data	(1)	(2)	(3)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.029	-0.027	-0.055
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.057	0.057	0.03
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.141	0.14	0.184
$m_{F_{03}}$	0.623	0.626	0.624	0.56
$m_{F_{46}}$	0.435	0.441	0.440	0.440
$m_{F_{7+}}$	0.260	0.261	0.263	0.222
s_Z^2	0.089	0.089	0.09	0.062
$c_{Z,F}$	0.055	0.057	0.057	0.008
$c_{Z_d,F_{d+3}}$	0.023	0.023	0.024	0.007
m_{dZ}	0.009	0.008	0.009	-0.010
Weighted SSR		0.3347	0.3374	45.663

Back

Restricted Model Results

A. Parameter Estimates:	(1) Baseline	(2) $\theta = 0$	(3) No heterog. in T_{id}	(4) $\sigma_\tau = 0$
$E(T_i)$	0.388	0.386	0.286	0.412
$Var(T_i)$	0.048	0.048	0	0.076
σ_τ	0.325	0.316	0	0
θ	0.003	0	0.097	-0.069
b_0	0.262	0.260	0.340	0.264
b_1	0.537	0.541	0.295	0.525
σ_ε	0.438	0.438	0.423	0.440

B. Model Fit:	Data	(1)	(2)	(3)	(4)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.029	-0.027	-0.055	-0.025
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.057	0.057	0.03	0.073
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.141	0.14	0.184	0.141
$m_{F_{03}}$	0.623	0.626	0.624	0.56	0.612
$m_{F_{46}}$	0.435	0.441	0.440	0.440	0.401
$m_{F_{7+}}$	0.260	0.261	0.263	0.222	0.261
s_Z^2	0.089	0.089	0.09	0.062	0.088
$c_{Z,F}$	0.055	0.057	0.057	0.008	0.054
$c_{Z_d,F_{d+3}}$	0.023	0.023	0.024	0.007	0.029
m_{dZ}	0.009	0.008	0.009	-0.010	0.008
Weighted SSR		0.3347	0.3374	45.663	1.9952

Back

Restricted Model Results

A. Parameter Estimates:	(1) Baseline	(2) $\theta = 0$	(3) No heterog. in T_{id}	(4) $\sigma_\tau = 0$	(5) $b_1 = 1$
$E(T_i)$	0.388	0.386	0.286	0.412	0.269
$Var(T_i)$	0.048	0.048	0	0.076	0.017
σ_τ	0.325	0.316	0	0	0.201
θ	0.003	0	0.097	-0.069	0.001
b_0	0.262	0.260	0.340	0.264	0.057
b_1	0.537	0.541	0.295	0.525	1
σ_ε	0.438	0.438	0.423	0.440	0.350

B. Model Fit:	Data	(1)	(2)	(3)	(4)	(5)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.029	-0.027	-0.055	-0.025	0.056
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.057	0.057	0.03	0.073	0.057
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.141	0.14	0.184	0.141	0.057
$m_{F_{03}}$	0.623	0.626	0.624	0.56	0.612	0.543
$m_{F_{46}}$	0.435	0.441	0.440	0.440	0.401	0.453
$m_{F_{7+}}$	0.260	0.261	0.263	0.222	0.261	0.330
s_Z^2	0.089	0.089	0.09	0.062	0.088	0.093
$c_{Z,F}$	0.055	0.057	0.057	0.008	0.054	0.058
$c_{Z_d,F_{d+3}}$	0.023	0.023	0.024	0.007	0.029	0.033
m_{dZ}	0.009	0.008	0.009	-0.010	0.008	0.008
Weighted SSR		0.3347	0.3374	45.663	1.9952	10.141

Back

Restricted Model Results

A. Parameter Estimates:	(1) Baseline	(2) $\theta = 0$	(3) No heterog. in T_{id}	(4) $\sigma_\tau = 0$	(5) $b_1 = 1$	(6) $b_0 = 0$ $b_1 = 1$
$E(T_i)$	0.388	0.386	0.286	0.412	0.269	0.298
$Var(T_i)$	0.048	0.048	0	0.076	0.017	0.017
σ_τ	0.325	0.316	0	0	0.201	0.210
θ	0.003	0	0.097	-0.069	0.001	0.001
b_0	0.262	0.260	0.340	0.264	0.057	0
b_1	0.537	0.541	0.295	0.525	1	1
σ_ε	0.438	0.438	0.423	0.440	0.350	0.358

B. Model Fit:	Data	(1)	(2)	(3)	(4)	(5)	(6)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.029	-0.027	-0.055	-0.025	0.056	0
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.057	0.057	0.03	0.073	0.057	0
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.141	0.14	0.184	0.141	0.057	0.001
$m_{F_{03}}$	0.623	0.626	0.624	0.56	0.612	0.543	0.589
$m_{F_{46}}$	0.435	0.441	0.440	0.440	0.401	0.453	0.498
$m_{F_{7+}}$	0.260	0.261	0.263	0.222	0.261	0.330	0.375
s_Z^2	0.089	0.089	0.09	0.062	0.088	0.093	0.093
$c_{Z,F}$	0.055	0.057	0.057	0.008	0.054	0.058	0.056
$c_{Z_d,F_{d+3}}$	0.023	0.023	0.024	0.007	0.029	0.033	0.033
m_{dZ}	0.009	0.008	0.009	-0.010	0.008	0.008	0.009
Weighted SSR		0.3347	0.3374	45.663	1.9952	10.141	14.983

Back

Restricted Model Results

A. Parameter Estimates:	(1) Baseline	(2) $\theta = 0$	(3) No heterog. in T_{id}	(4) $\sigma_\tau = 0$	(5) $b_1 = 1$	(6) $b_0 = 0$ $b_1 = 1$	(7) $\theta \neq \hat{\theta}$ $b_1 = 1$
$E(T_i)$	0.388	0.386	0.286	0.412	0.269	0.298	0.345
$Var(T_i)$	0.048	0.048	0	0.076	0.017	0.017	0.016
σ_τ	0.325	0.316	0	0	0.201	0.210	0.306
θ	0.003	0	0.097	-0.069	0.001	0.001	0.067
b_0	0.262	0.260	0.340	0.264	0.057	0	-0.062
b_1	0.537	0.541	0.295	0.525	1	1	1
σ_ε	0.438	0.438	0.423	0.440	0.350	0.358	0.343

B. Model Fit:	Data	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.029	-0.027	-0.055	-0.025	0.056	0	-0.023
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.057	0.057	0.03	0.073	0.057	0	0.042
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.141	0.14	0.184	0.141	0.057	0.001	0.141
$m_{F_{03}}$	0.623	0.626	0.624	0.56	0.612	0.543	0.589	0.618
$m_{F_{46}}$	0.435	0.441	0.440	0.440	0.401	0.453	0.498	0.470
$m_{F_{7+}}$	0.260	0.261	0.263	0.222	0.261	0.330	0.375	0.257
s_Z^2	0.089	0.089	0.09	0.062	0.088	0.093	0.093	0.089
$c_{Z,F}$	0.055	0.057	0.057	0.008	0.054	0.058	0.056	0.055
$c_{Z_d,F_{d+3}}$	0.023	0.023	0.024	0.007	0.029	0.033	0.033	0.024
m_{dZ}	0.009	0.008	0.009	-0.010	0.008	0.008	0.009	0.009
Weighted SSR		0.3347	0.3374	45.663	1.9952	10.141	14.983	0.4761

Back

Extended Model Results

A. Parameter Estimates:	(1) $\theta \neq \hat{\theta}$ $b_1 \neq 1$
$E(T_i)$	0.397
$Var(T_i)$	0.044
σ_τ	0.448
θ	0.021
$\hat{\theta}$	0.021
b_0	0.271
b_1	0.528
σ_ε	0.431

B. Model Fit:	Data	(1)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.030
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.060
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.153
$m_{F_{03}}$	0.623	0.636
$m_{F_{46}}$	0.435	0.444
$m_{F_{7+}}$	0.260	0.249
s_Z^2	0.089	0.089
$c_{Z_{06},F_{06}}$	0.058	0.055
$c_{Z_{7+},F_{7+}}$	0.030	0.032
$c_{Z_d,F_{d+3}}$	0.023	0.021
m_{dZ}	0.009	0.010
Weighted SSR		0.7739

Back

Extended Model Results

A. Parameter Estimates:	(1) $\theta \neq \hat{\theta}$ $b_1 \neq 1$	(2) $\theta \neq \hat{\theta}$ $b_1 = 1$
$E(T_i)$	0.397	0.342
$Var(T_i)$	0.044	0.014
σ_τ	0.448	0.519
θ	0.021	0.077
$\hat{\theta}$	0.021	0.049
b_0	0.271	0.070
b_1	0.528	1
σ_ε	0.431	0.000

B. Model Fit:	Data	(1)	(2)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.030	-0.025
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.060	0.105
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.153	0.154
$m_{F_{03}}$	0.623	0.636	0.610
$m_{F_{46}}$	0.435	0.444	0.457
$m_{F_{7+}}$	0.260	0.249	0.236
s_Z^2	0.089	0.089	0.087
$c_{Z_{06},F_{06}}$	0.058	0.055	0.041
$c_{Z_{7+},F_{7+}}$	0.030	0.032	0.040
$c_{Z_d,F_{d+3}}$	0.023	0.021	0.022
m_{dZ}	0.009	0.010	0.009
Weighted SSR		0.7739	4.8157

Back

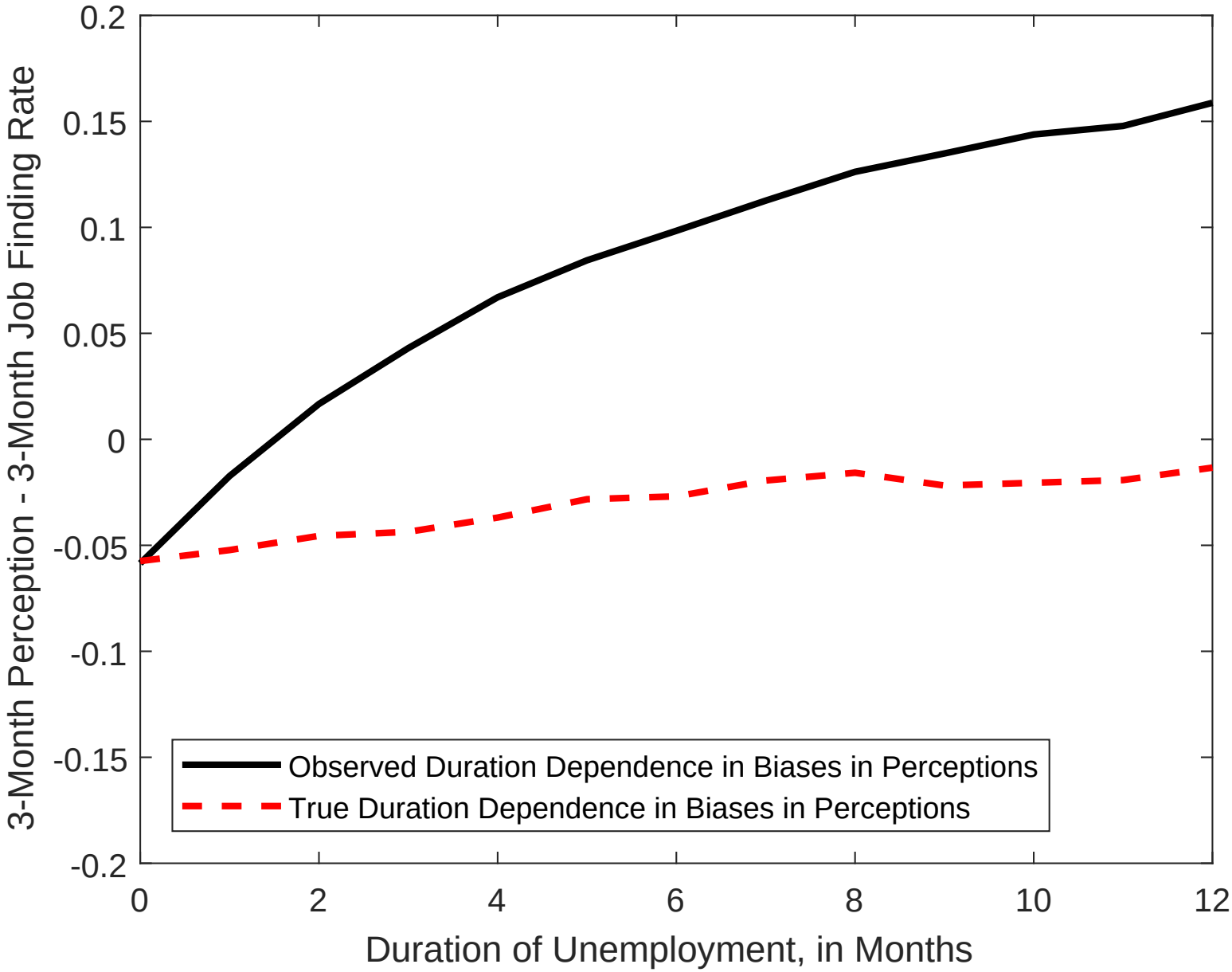
Extended Model Results

A. Parameter Estimates:		(1) $\theta \neq \hat{\theta}$ $b_1 \neq 1$	(2) $\theta \neq \hat{\theta}$ $b_1 = 1$	(3) $\theta = \hat{\theta}$ $b_1 \neq 1$
$E(T_i)$		0.397	0.342	0.395
$Var(T_i)$		0.044	0.014	0.044
σ_τ		0.448	0.519	0.448
θ		0.021	0.077	0.022
$\hat{\theta}$		0.021	0.049	0.022
b_0		0.271	0.070	0.270
b_1		0.528	1	0.529
σ_ε		0.431	0.000	0.432
B. Model Fit:	Data	(1)	(2)	(3)
$m_{Z_{03}} - m_{F_{03}}$	-0.031	-0.030	-0.025	-0.030
$m_{Z_{46}} - m_{F_{46}}$	0.076	0.060	0.105	0.059
$m_{Z_{7+}} - m_{F_{7+}}$	0.139	0.153	0.154	0.153
$m_{F_{03}}$	0.623	0.636	0.610	0.635
$m_{F_{46}}$	0.435	0.444	0.457	0.445
$m_{F_{7+}}$	0.260	0.249	0.236	0.250
s_Z^2	0.089	0.089	0.087	0.089
$c_{Z_{06},F_{06}}$	0.058	0.055	0.041	0.055
$c_{Z_{7+},F_{7+}}$	0.030	0.032	0.040	0.032
$c_{Z_d,F_{d+3}}$	0.023	0.021	0.022	0.021
m_{dZ}	0.009	0.010	0.009	0.010
Weighted SSR		0.7739	4.8157	0.7739

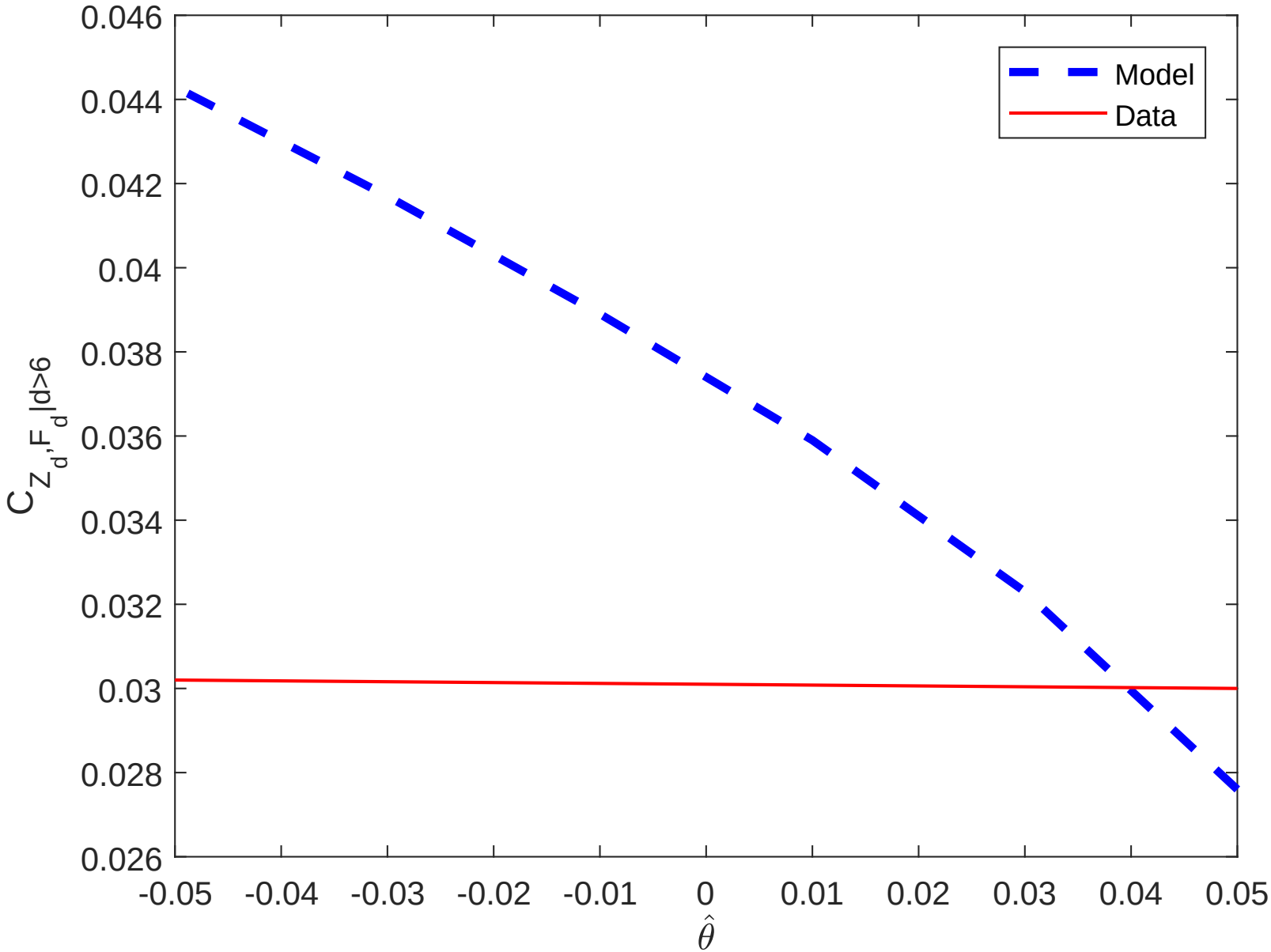
Back

Dur. Dep. in Job Finding (Extended Model)

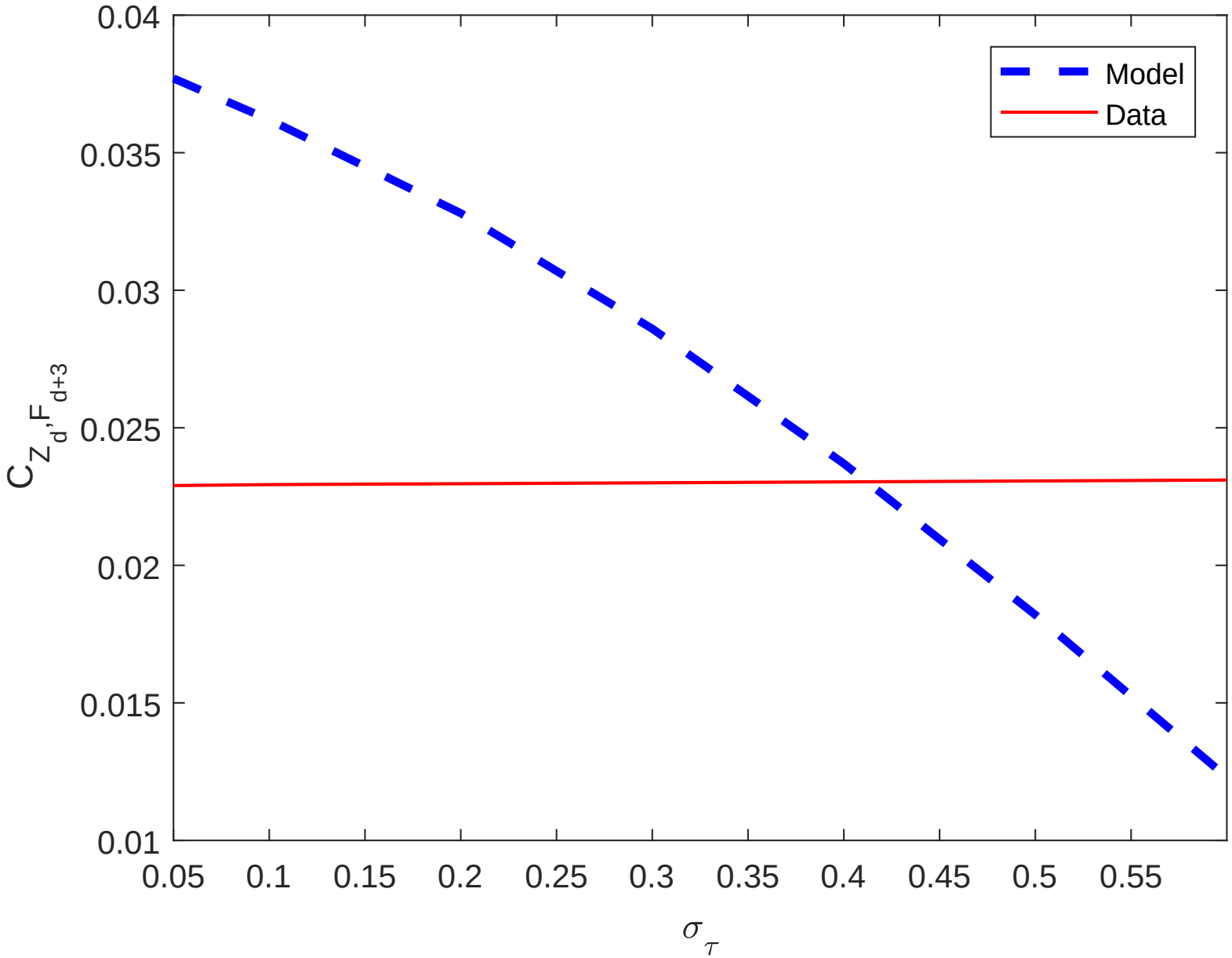
Dur. Dep. in Biases in Perceptions (Extended Model)



Identification of the Parameter $\hat{\theta}$



Identification of the Parameter σ_τ



Robustness

Parameter Estimates:	(1) Baseline	(2) Gamma (T_i)	(3) Weibull (T_i)	(4) Normal (ε)	(5) Linear Depreciation
$E(T_i)$	0.389	0.387	0.37	0.388	0.388
$Var(T_i)$	0.048	0.047	0.038	0.048	0.049
σ_τ	0.325	0.326	0.343	0.337	0.316
θ	0.003	0.003	0.006	0.003	0
b_0	0.262	0.261	0.262	0.235	0.262
b_1	0.537	0.539	0.538	0.597	0.537
σ_ε	0.438	0.438	0.438	0.276	0.438
Weighted SSR	0.3347	0.3325	0.3031	0.3353	0.3372

Back

Robustness (continued)

Parameter Estimates:	(1) Baseline	(6) Horizon=5y	(7) Horizon=5y Lin. Depr.	(8) Persistent Errors	(9) Bunching
$E(T_i)$	0.389	0.366	0.361	0.385	0.387
$Var(T_i)$	0.048	0.043	0.038	0.046	0.047
σ_τ	0.325	0.282	0.324	0.346	0.323
θ	0.003	-0.012	-0.001	0.006	0.003
b_0	0.262	0.262	0.26	0.257	0.268
b_1	0.537	0.534	0.54	0.543	0.523
σ_ε	0.438	0.44	0.439	0.449	0.425
Weighted SSR	0.3347	0.3306	0.3848	0.281	0.2932

Robustness (continued)

Parameter Estimates:	(1) Baseline	(10) Resid. Moments	(11) Excl. Recall	(12) Exactly Identified	(13) Diagonal W
$E(T_i)$	0.389	0.322	0.388	0.365	0.387
$Var(T_i)$	0.048	0.02	0.047	0.042	0.051
σ_τ	0.325	0.244	0.325	0.323	0.301
θ	0.003	-0.001	0.004	0.008	-0.008
b_0	0.262	0.238	0.26	0.255	0.272
b_1	0.537	0.581	0.541	0.555	0.514
σ_ε	0.438	0.392	0.438	0.436	0.443
Weighted SSR	0.3347	0.9067	0.3284	0	0.1059

Back

Setup Model

- Unemployed worker i:
  - receives job offer with probability λ
  - wage w is drawn from distribution $F(\mu_w, \sigma_w)$
  - set reservation wage R
- Introduce all relevant action in arrival rates:
  - Heterogeneity: $\lambda_i \in \lambda^h, \lambda^l$
  - Depreciation: $\lambda_{i,d} = (1-\theta)\,\lambda_{i,d-1}$
  - Biases in beliefs:
    - uniform bias: $\hat{\lambda}^j = \lambda^j + B_0$
    - cross-sectional bias: $Prob(\hat{\lambda}_{i,0} = \hat{\lambda}^j | \lambda_{i,0} = \lambda^j) = B_1$
    - longitudinal bias: $B_\theta = 0$
- Unemployed workers solve dynamic problem depending on their beliefs

Setup Model

- Unemployed worker i:
  - receives job offer with probability λ
  - wage w is drawn from distribution $F(\mu_w, \sigma_w)$
  - set reservation wage R

- Introduce all relevant action in arrival rates:
  - Heterogeneity: $\lambda_i \in \lambda^h, \lambda^l$
  - Depreciation: $\lambda_{i,d} = (1-\theta)\lambda_{i,d-1}$
  - Biases in beliefs:
    - uniform bias: $\hat{\lambda}^j = \lambda^j + B_0$
    - cross-sectional bias: $Prob(\hat{\lambda}_{i,0} = \hat{\lambda}^j | \lambda_{i,0} = \lambda^j) = B_1$
    - longitudinal bias: $B_\theta = 0$

- Unemployed workers solve dynamic problem depending on their beliefs

$$U_{id} = u_d + \frac{1}{1+\delta} \max_R \{ U_{i,d+1} + \hat{\lambda}_{i,d} \int_R [V_i(w) - U_{i,d+1})] \, dF(w) \}$$

Back

Calibration Targets

Moments	Data	Baseline Model	High Depreciation
Mean of 3-Month Job Finding Rates:			
... at 0-3 Months of Unemployment	0.623	0.622	0.613
... at 4-6 Months of Unemployment	0.435	0.436	0.455
... at 7 Months of Unemployment or more	0.26	0.259	0.244
Mean of 3-Month Elicitations:			
... at 0-3 Months of Unemployment	0.592	0.592	0.594
... at 4-6 Months of Unemployment	0.511	0.510	0.511
... at 7 Months of Unemployment or more	0.399	0.400	0.399
Acceptance Rate:	0.71	0.710	0.716
True Duration Dependence:			
... Baseline	0.991	0.982	-
... High Depreciation	0.650	-	0.654

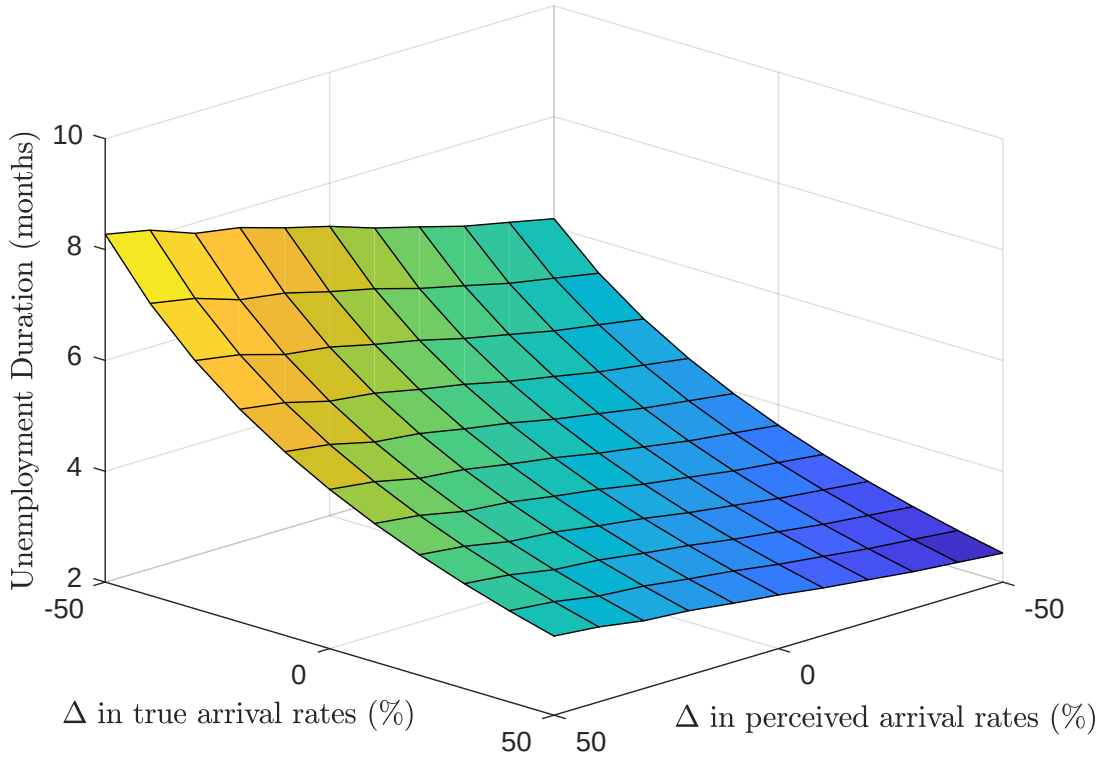
Back

Calibration Estimates

Parameters	Symbol	Baseline Model	High Depreciation
A. Set Parameters			
Median of wage offer distribution	μ_w	1	1
Std. dev. of logged wage offer distribution	σ_w	0.24	0.24
Exogeneous job loss probability	σ	0.02	0.02
Arrival rate when employed	λ^e	0.15	0.15
Discount rate	δ	0.004	0.004
Coefficient of relative risk aversion	γ	2	2
Longitudinal bias	B_θ	0	0
B. Estimated Parameters			
Uniform bias	B_0	-0.001	-0.068
Cross-sectional bias	B_1	0.81	0.93
Low-type arrival rate	λ_l	0.10	0.19
High-type arrival rate	λ_h	0.64	0.72
Share of high-types	φ	0.74	0.65
Depreciation in arrival rate	θ	1.1E-05	0.060
Unemployed consumption (b_u)	b	0.51	0.52

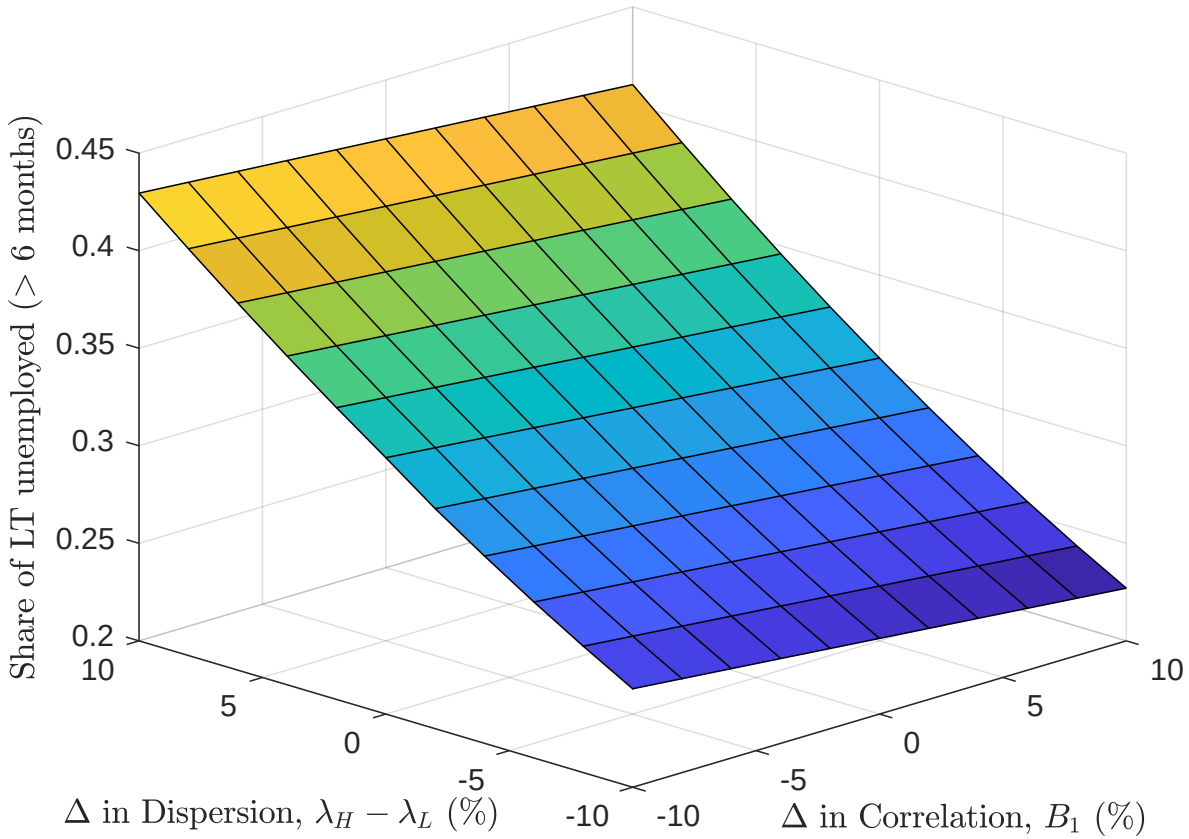
Back

True vs. Perceived Arrival Rate ⇒ Duration



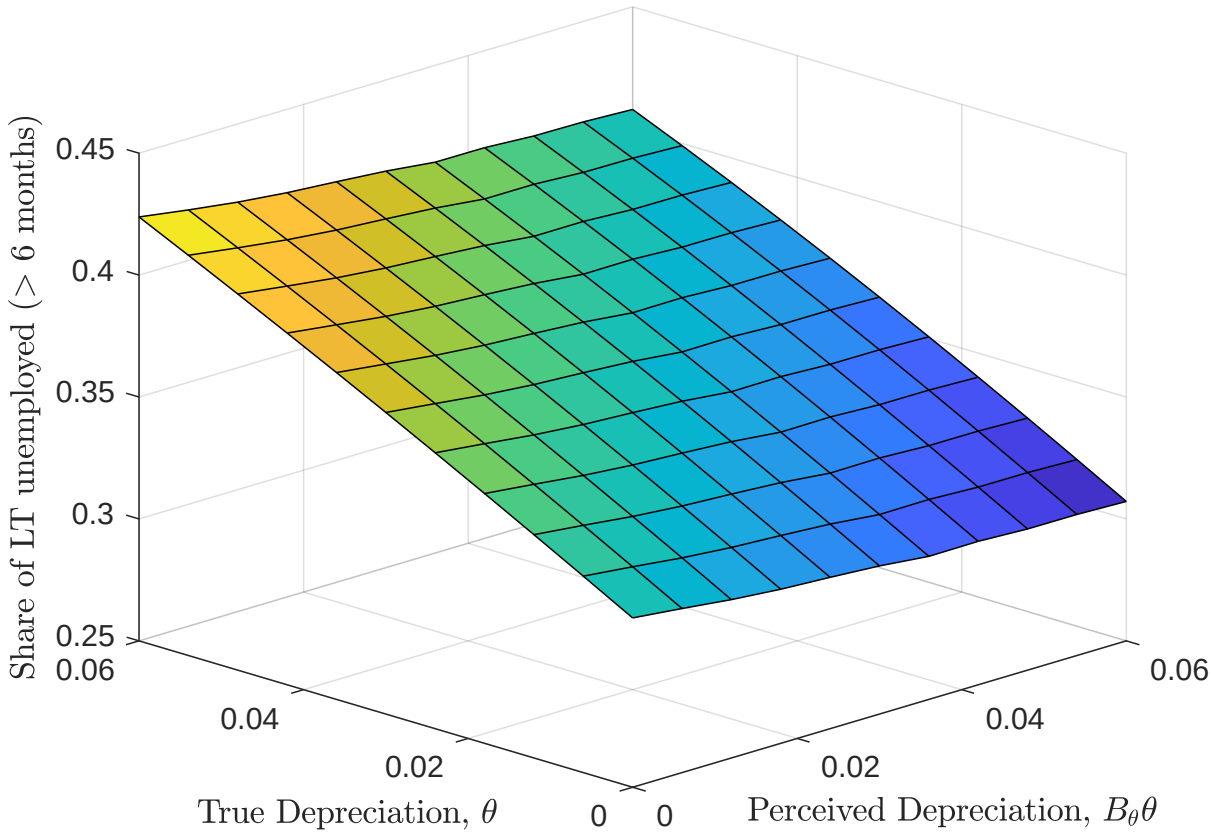
▸ Back

True vs. Perceived Heterogeneity ⇒ LT Incidence



Back

True vs. Perceived Depreciation ⇒ LT Incidence



Back