Gross Labor Market Flows and Entrepreneurship

Online Appendix

For Online Publication

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1 Empirical Appendix

1.1 Full details on the CPS sample

1.1.1 Sample construction

Throughout the paper, we use the IPUMS-CPS to compute both the masses in each occupation and the corresponding flows between them. We retain a sample from 1994 to 2015 and consider only the 20-65 years old population. We build a quarterly panel of around 10 million matched individuals for the empirical section of the paper.

To control for false matches, we construct a specific individual identifier that controls for age, sex, ethnicity, and US state. Probabilities are multiplied by the first-month respondent weight to generate a numeric value for the fraction of individuals in a specific occupation leaving to another occupation. In our empirical analysis, we use the longitudinal CPS weights: PANLWT.[1] We use only quarterly transitions for which we observe that individuals switched for at least two consecutive months to another occupation. For instance, U – – E – U transitions (from unemployment to entrepreneurship and back over the quarter) are recoded as U – – – U. We do a similar adjustment if we observe U – – U – E. As such, only U – – E – E observations are coded as U – – – E. This restriction aims to reduce the mismeasurement due to possible misreporting as highlighted in Farber et al. (2015). Results are robust without this restriction.

1.1.2 Occupation definition

Worker We classify as a worker an individual who currently work in a paid job or who declares being temporarily absent from a paid job (EMPSTAT = $1, 10, 12$, and CLASSWKR = $20 : 28$).

[1]Notice that the results of the paper hold with alternative weights, such as the cross-sectional CPS weight and with an unweighted sample. Those additional results are available upon request.

Unemployed individuals Agents are classified as unemployed if they did not work for pay or profit and did not have a job from which they were briefly absent. The variable EMPSTAT = 20 : 22 identifies unemployed individuals. We distinguish layoff unemployed persons when WHYUNEMP = 1,2 which records job loser/ on layoff and other job losers. All other unemployed individuals are considered not eligible for unemployment insurance. We further condition the *layoff* category with DURUNEMP, which allows us to further select groups of eligible UI claimants with respect to their unemployment duration. When studying the effect of regular UI benefits (Panel A), we define layoff individuals eligible for UI as those with less than 30 weeks of unemployment duration, which is the maximum regular US state UI duration. When considering UI extensions, we define a laid off unemployed agents as unemployed individuals with less than 99 weeks in unemployment. In a robustness check, we further restrict a *layoff* unemployed to declare having worked in the last twelve months (WNFTLOOK to be either 0 or 11). Results are quite similar.

Entrepreneur and self-employed In the core of the paper, we define an entrepreneur as a self-employed worker (CLASSWKR = $10, 13, 14$), who currently work (EMPSTAT = $1, 10, 12$). We additionally control in a robustness check for self-employed individuals who own their business (HHBUS = 1).[2] The share of entrepreneurs varies between 8.5% to 12% (relative to the population of workers, entrepreneurs, and unemployed) depending on the assumption considered (self-employment or self-employed business owners) and the period. With the restriction on business ownership, we might bias upward the actual number of entrepreneurs since HHBUS controls for business ownership within the family, as such we can not identify whether the individual is the owner of the family business or whether it is owned by another member of the family. As our estimated share of entrepreneurs defined as self-employed individuals or self-employed business owners are close to their counterparts in the SCF, respectively 8-9% and 10.5-12%, we believe that our CPS estimates are consistent.

1.1.3 Summary statistics

Table A1 present the (unweighted) summary statistics of the sample of unemployed individuals from 1994 to 2015 and the main variables used throughout the empirical part.

[2]We control business ownership by creating a specific variable that indicates whether or not the individual owned his firm from 1994 to 2015, allowing us to control for measurement errors arising in the survey. If we do not construct this additional variable, the flow from entrepreneurship to employment during a quarter jump to 16%, which is inconsistent with yearly flows. Therefore, our definition captures a part of self-employment that is not business ownership, but this is more consistent with resulting flows.

Table. A1. Descriptive statistics

Statistic	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Age	39.3	12.4	20	28	49	65
Average weekly wage	541.5	440.0	0.01	264.0	673.1	2,884.6
CPI adjusted weekly max benefits	424.9	114.2	212.8	346.9	492.2	963.4
Duration	38.9	31.9	0.0	16.0	53.0	119.0
Layoff dummy	0.5	0.5	0	0	1	1
Layoff dummy (duration < 31 weeks)	0.4	0.5	0	0	1	1
State unemployment rate	6.5	2.2	2.1	4.9	7.9	14.6
$Max\ Regular_{weeks}$	25.9	1.4	12	26	26	30
$Max\ EB\ EUC_{weeks} + Max\ Regular_{weeks}$	46.3	26.8	14	26	70.5	99
Hpi index	178.4	49.2	81.9	147.4	203.7	476.5
Log real GDP	10.8	0.2	10.3	10.7	10.9	12.1
Log per capita income	10.5	0.3	9.9	10.3	10.7	11.3

Note: this table shows the main statistics of a sample of unemployed individuals from 1994 to 2015.

1.2 Exogeneity of regular UI benefit changes

We verify whether UI laws are correlated with determinants of the flows from unemployment to self-employment and entrepreneurship that could confound our estimates. Table A2 evaluate the determinants of state UI benefits with various state macroeconomic variables and union coverage, conditional on state and year fixed effects. We employ a similar set of determinants as in Hsu et al. (2018) and find no evidence of a relation over the period from 1994 to 2007. The estimated correlations are small and not statistically significant for the state unemployment rate, union coverage, housing HPI index, log real GDP per capita, average wage, log per capita income, and the UI trust fund reserves.

1.2.1 UI weekly benefit amount and maximum duration

We obtain data for regular UI duration and the maximum weekly benefit amount at the state level from the US department of labor's "significant provisions of state unemployment insurance laws". Data for UI extensions comes from Farber et al. (2015) complemented with the EUC91 extensions. Figure A1 displays the maximum duration ($Max\ Regular\ Weeks_{st} + Max\ EB\ EUC\ Weeks_{st}$), the maximum weekly benefit amount ($Max\ WBA_{st}$), and maximum claimable extended benefits ($Max\ Extended\ UI_{st}$), both as the US average and for selected states.

1.2.2 SIPP transitions

The SIPP data (1996:2008) are detailed in the core of the paper. We just describe here the corresponding quarterly flows between occupations in Table A3. As mentioned in Krusell et al. (2017) there are large discrepancy between SIPP and CPS flows, most notably concerning flows from entrepreneurship to unemployment and from employment to unemployment. Moreover, there is a lower share of unemployed individuals in the SIPP relative to the CPS. All other flows are close to the CPS estimate, as shown in Table 1 (core paper).

Table. A2. Regular UI benefits and aggregate economic variables

	Total Max Regular$_{benefit}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment Rate (%)	0.016							0.015
	(0.016)							(0.032)
log(Housing HPI index)		0.000						0.001
		(0.000)						(0.000)
log(real GDP per capita)			0.112					−0.038
			(0.250)					(0.243)
log(per capita income)				2.704				5.254
				(2.173)				(2.984)
Average wage					−0.002			−0.006
					(0.007)			(0.006)
Union Coverage						0.001		0.000
						(0.005)		(0.004)
UI trust fund reserves							0.012	−0.006
(% of covered wages)							(0.016)	(0.014)
State and year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.95
Observations	714	714	714	714	714	714	714	714

Notes: *p<0.1; **p<0.05; ***p<0.01. Standard deviation clustered by state in parentheses. The measure of Total Max Regular$_{benefit}$ is in thousand of dollars.

Table. A3. Aggregate quarterly occupational gross flows rate in the SIPP.

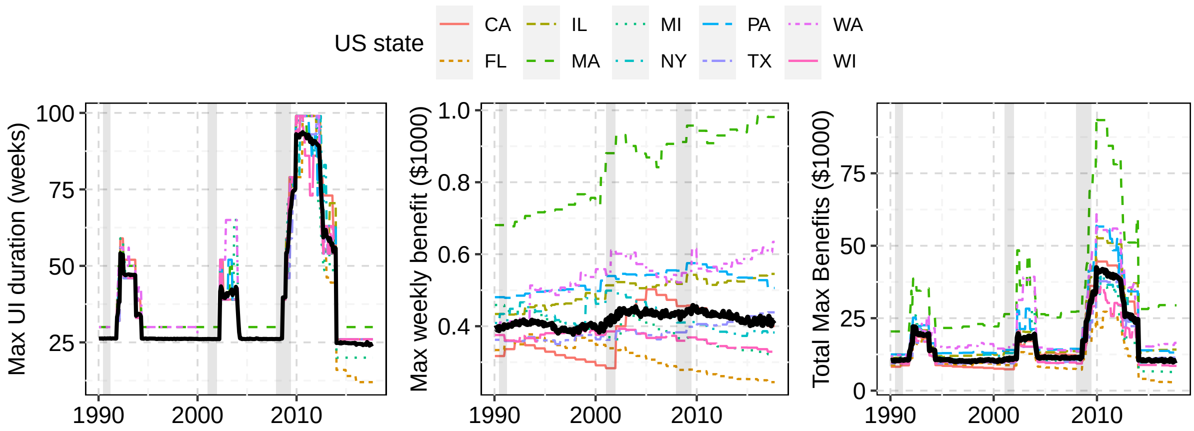
	Gross flow (%) to			**Masses** (%)
From	*Employment*	*Entrepreneurship*	*Unemployment*	
Employment	98.37	0.67	0.96	84.8
Entrepreneurship	6.48	93.16	0.36	10.6
Unemployment	43.37	2.23	54.40	4.6

Source: authors' computations using SIPP data from 1996:2008. We restrict our sample to individuals between the ages 20 to 65 years old.

1.3 Empirical Robustness and Further Evidence

Table A4 provides robustness regarding the responsiveness of flows out of unemployment with respect to UI variations in the CPS. Alternative measures using incorporated and unincorporated self-employment (1st and 2nd rows) or self-employed business owners (3rd row) using the HUBUS CPS variable indicate that all groups react to UI extensions with especially high elasticity. We then distinguish the effects of an increase in the UI duration (4th row) and one in the weekly benefit amount (5th row). We find that change in benefit amount (WBA) has a much larger impact, a result that our model is able to rationalize: using WBA and UI duration as proxy for UI generosity gives respectively elasticities $\varepsilon_{U\to E} = -0.458$ and $\varepsilon_{U\to E} = -0.261$.

Figure A1. Maximum UI benefits duration and amount: US average and selected states



Left panel: maximum duration (*Max Regular Weeks*$_{st}$ + *Max EB EUC Weeks*$_{st}$). Middle panel: maximum weekly benefit (*Max WBA*$_{st}$), CPI adjusted. Right panel: total claimable benefits (*Max Extended UI*$_{st}$), CPI adjusted. The black line is the US average. Grey areas reports NBER recessions.
Sources: US Department of Labor, significant provisions of state unemployment insurance laws biannual reports.

Table. A4. Sensitivity analysis: main regression. [a]

	EB/EUC	U → E	U → W	E → W	W → E	S-YM FE	Period
Alternative measures & controls							
1. E Uncorporated	Yes	-0.29^{***}	–			Yes	1994-2015
2. E Incorporated	Yes	-0.40^{*}	–			Yes	1994-2015
3. Self-employed + bus. owners	Yes	-0.22^{***}	–			–	1994-2015
4. log(UI weeks)	Yes	-0.12^{**}	-0.12^{***}			Yes	1994-2015
5. log(UI WBA)	No	-0.59^{***}	-0.001			Yes	1994-2015
Additional specification and further evidence							
6. Selection E/W	No			0.33^{***}	-0.30^{**}	Yes	1994:2010
7. Selection E/W (WBA)	No			0.19^{*}	-0.28^{***}	Yes	1994:2010

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviations. SE clustered by US states. FE stands for fixed effects and YM stands for Year-Month and S for state. Experiments using no UI extensions use a definition of laid off unemployed individuals with less than 26 weeks in unemployment. The estimation methods are OLS. Results are robust using mLogit.

2 Model Appendix

2.1 Robustness and alternative specifications

In this section, we investigate alternative assumptions and specifications that potentially affect the conclusion of our main quantitative exercise.

2.1.1 Long-run elasticities of flows

We first provide the model estimates of the specification in equation (18) in the core of the paper when we use the resulting steady-state flows when computing the elasticity $\varepsilon_{X,Y}$. The resulting elasticity of flows from insured unemployment to entrepreneurship is -0.25 while from insured unemployment to employment it is -0.05. This means that there are not substantial composition effects among the insured unemployment population after having implemented the policy change.

2.2 Additional Robustness

We run two additional robustness checks that we believe might influence the main message of the paper that the UI has important effects on the selection into entrepreneurship. We first verify if including a form of learning changes the results. Indeed, learning can be an important part of the business prospect that can not be well captured by our endogenous business search s_e. Second, we check whether our results hold with tighter labor market frictions.

2.2.1 Business Maturity and Learning

In this alternative specification, we assume that upon entry, entrepreneurs face a higher probability to start with a low shock z. This aims to capture a form of learning about the demand, the time needed to accumulate goodwill, client lists, or customer base. We assume that new entrants draw their productivity from the distribution $z \sim \mathcal{H}(z)$ with $Q(z) \leq \mathcal{H}(z)$, $(\forall z)$ where $Q(z)$ defines the probability distribution of z of new entrants in the baseline model. This condition states that new entrants start with, on average, a lower business productivity, and then evolve over time according to the AR(1) described in the baseline model.[3] For the sake of parsimony, we assume $\mathcal{H}(z)$ shifts the mean of the $Q(z)$ distribution over the possible discretized values of z by 10%. This 10% shift is consistent with the average productivity of new firms in Clementi and Palazzo (2016) relative to well established businesses. Under this new specification, we calibrate again the model to match targeted moments. Table A5 shows that our results remain valid under this specification, with an increase in the adverse effect of UI on the propensity to start a business due to the additional risk generated by the learning profile.

Table. A5. Elasticity of insured unemployment to UI generosity with/without learning

	Elasticity to UI			
	$U_I \to E$	$U_N \to E$	$U_I \to W$	$U_N \to W$
1. Benchmark	-0.287***	-0.015***	-0.167***	0.002***
2. With learning [a]	-0.331***	-0.015***	-0.171***	0.002***

Note: *p<0.1; **p<0.05; ***p<0.01. [a] recalibrated to match key moments.

2.2.2 Higher labor market frictions

The last experiment we perform is to check the sensitivity of our results with a relatively more frictional labor market. To this end, we increase the worker firing rate by 1 percentage point for

[3] A similar learning/maturity process is used in Clementi and Palazzo (2016) to give a role to the age of the firm.

each ability level and decrease the job and business finding rate by 3 percentage points. The corresponding new stationary equilibrium displays a higher unemployment rate of 6.8%. Under this new calibration, the main results of the paper are qualitatively similar: higher insurance significantly dampens the propensity of unemployed agents to select into entrepreneurship, and reallocate the labor force to employment activities. The elasticity of the flow from unemployment to entrepreneurship, at about -0.312, is close to that in the benchmark economy. The slight increase is due to higher frictions in the labor market: when employment is riskier, increasing unemployment insurance leads unemployed individuals to search for employment and decreases the search to start a self-employed business.

3 Model Implications Appendix

3.1 *On-the-business* Unemployment Insurance

3.1.1 Policy implementation

In most of the US, as in the baseline model, there is no UI provided to entrepreneurs upon business failure. Conversely, UI rights earned during employment can not be used to start an entrepreneurial activity. The last decades, a number of countries have adopted labor market policies with a somewhat larger meaning of UI rights. Namely, once an individual has earned UI rights while in employment, the idea is to let her use UI benefits – under some conditions – even when starting and running a business activity and until the UI rights expire normally.[4] A small number of US states have also been experimenting a similar idea under the Self-Employment Assistance Program (SEAP).[5] But otherwise, current UI laws in the US are, for the most part, restrictive in the sense that benefits are distributed conditional on maintaining a job search activity or not engaging in any sort of other activities.[6] It can be argued that this situation creates a distortion in favor of job search at the expense of entrepreneurial

[4]European countries such as the UK, Germany, or France have widely implemented similar policies. Caliendo and Künn (2011) find a significant increase in entrepreneurial entry in Germany, following the implementation of *bridging allowance* (BA) program. Hombert et al. (2020) estimates that a similar policy in France increased the startup rate by about 20%.

[5]SEAP waives regular UI beneficiaries from active job search and dispenses an allowance of the same amount and duration as regular benefits, provided they engage in the establishment of a business. The policy is often limited by quotas. For instance, in Maine, *"The aggregate number of individuals receiving a self-employment assistance allowance at any time may not exceed 5% of the number of individuals receiving regular benefits at that time"*, Maine Legislature, Title 26, Chapter 13.

[6]For instance, in Pennsylvania, section 402(h) of the Pennsylvania Unemployment Compensation Law states that "*a claimant is ineligible for any week in which he/she is engaged in self-employment. When a claimant is starting a new business, the claimant becomes self-employed with the first positive step toward starting the business.*". Other states have rules regarding self-employment income and UI benefits: many states put a bound on the number of hours worked in a self-employed activity and most deduct the self-employment income from UI benefits. Examples of such rules follows: https://www.vec.virginia.gov/unemployed/benefits-information/benefits-eligibility or here https://www.uimn.org/applicants/affectsbenefits/self-employment/index.jsp.

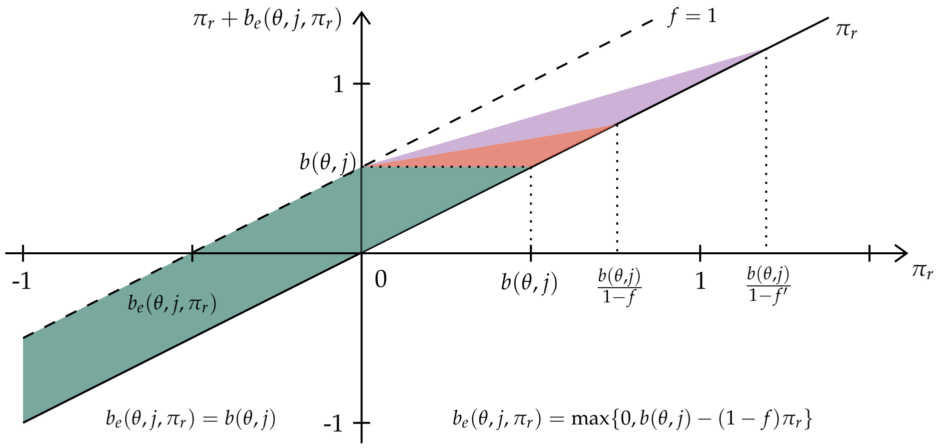


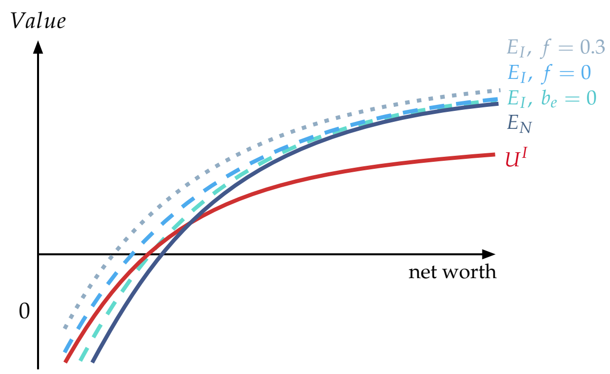
Figure A2. On-the-business UI reform. The green (darkest) region corresponds to a minimal case where $f = 0$ (entrepreneur gets at least $b(\theta, j)$ when $b(\theta, j) > \pi_r > 0$). The red (lighter) zone refers to a case where $f = 0.3$.The purple (lightest) zone is a case where $f = 0.45$. Finally, the white zone between the purple zone and the upper dashed line is the case where $f \to 1$ (entrepreneur always gets $b(\theta, j)$).

activities. The option of maintaining UI during the early stages of business creation could be a way to mitigate this distortion, especially when the UI generosity changes.

Figure A2 provides an illustration of the key thresholds in the *On-the-business* UI policy introduced in the core of the paper. The higher the f and the higher is the amount of insurance provided in case of a positive but low π_r and the lower is the deduction of entrepreneurial profit. Moreover, the higher the f, the higher is the fraction of entrepreneurs insured. Indeed, $\frac{b(\theta,j)}{1-f}$ is the maximum level of entrepreneurial income π_r for which $b_e(\theta, j, \pi_r) > 0$. Technically, as UI benefits might be only partially claimed by an entrepreneur within a period, we assume that there is a probability $p_b(\pi_r, j, \theta) = b_e(\theta, j, \pi_r)/b(\theta, j)$ that the entrepreneur with remaining UI duration j switches to the next state $j - 1$. An additional but key element is that the policy lets insured entrepreneurs return to the unemployment pool and keep claiming their outstanding UI rights upon business failure. In the model, negative profits trigger business failure, compelling entrepreneurs to return to the unemployment pool.

To better understand the impact of the above alternative policies, Figure A3 provides an illustration of the ordering of the value functions of insured unemployed and entrepreneurial agents with *on-the-business* UI policies. In the baseline case, only after a specific wealth threshold does the value of entrepreneurship (E) dominate the insured unemployment value (U^I). With the alternative policies, this threshold persists only in the $b_e = 0$ case. In the $f = 0$ and $f = 0.3$ cases, when entrepreneurs are guaranteed at least the UI benefits as business income, then $E > U^I$ at any level of wealth. The disappearance of the threshold is a key effect. Indeed, it turns the scope of the policy from a small number of insured unemployed individuals above the threshold to the whole population of insured unemployed, especially wealth poor agents. The $f = 0$ and $f = 0.3$ policies therefore favor the entry of very small businesses with low levels of entrepreneurial capital. When UI generosity increases, all values functions are shifted up but the ordering is preserved.

Figure A3. Illustration of value functions ordering in the case of *on-the-business* UI policies.



3.1.2 Effect on occupational masses

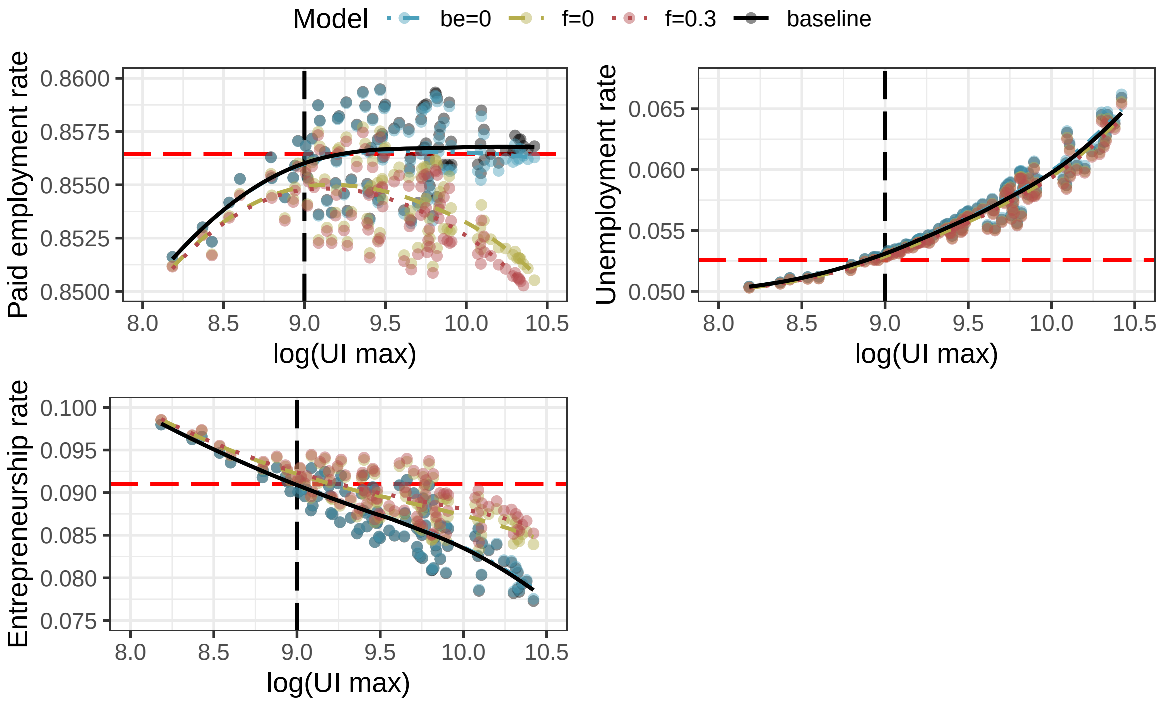
Figure A4 displays the resulting steady-state masses of occupation. The general pattern of the entrepreneurship rate is similar to the baseline case for all policy alternatives: it decreases with UI generosity. However, for the $f = 0$ and $f = 0.3$ policies, it is clear that the fraction of entrepreneurs decreases less while in the $b_e = 0$ case there is no substantial difference with the baseline. Contrastingly, the paid-employment rate is hump-shaped with respect to the UI generosity in the $f = 0$ and $f = 0.3$ cases. On the increasing section of the hump shape, UI duration is specially short and insured unemployed individuals are likely to have exhausted a portion of their UI benefits before being able to enter entrepreneurship. Thus in that section of the hump shape, the scope of the *on-the-business* policy is limited. On the decreasing section, entrepreneurship is a more attractive alternative for insured unemployed individuals when UI generosity increases: low or negative entrepreneurial income π_r are covered for a longer period and with higher benefits, while paid-employment only benefits from better insurance coverage with no direct benefits.

Interestingly, while a primary goal of such a policy could be the reduction of the unemployment rate, we find that its implementation would only reallocate individuals between entrepreneurship and paid-employment. However, the implemented value of the deduction parameter f is of some importance: a higher value of f implies a higher entrepreneurship rate that leads to a slight decrease in unemployment which leads to a slight increase in aggregate output. Nevertheless, this type of policies lead to a surge in the number of small firms as wealth-poor individuals are now willing to start businesses.

3.2 UI extensions during the Great Recession

In this section, we provide additional details about our Great Recession experiment. We investigate the role of the successive UI extensions during the Great Recession. we highlight

Figure A4. UI generosity and occupational masses in alternative economies.



Note: the vertical dashed black line corresponds to the current average regular UI system in the US, with $\mu = 0.45$ and $\bar{J} = 6$ months (26 weeks). The dashed red line is the benchmark mass of occupation. The maximum UI generosity in this figure corresponds to $\mu = 0.498$ and $\bar{J} = 23.75$ months. Dots correspond to the benchmark results.

large changes in gross flows together with special UI extensions: starting in late 2008, the UI extensions (the EB and EUC programs) were activated for about 5 years.

Our GR experiment is based on the transitional dynamics of our model. The separation rate, the job-finding rate, and the process of the business shock z are changed over time in addition to the duration of UI. All these changes are revealed at time $t = 1$ leading to a perfect-foresight transition path.[7] We adjust the set of parameters $\{\eta(\vartheta), \kappa_w, p_{z0}, \bar{J}\}$ to consistently account for the data. First, we implement in mid-2008 until the end of 2013 an UI extension replicating the average EB and EUC08 extensions: the UI duration $\bar{J}$ is increased to 76 weeks during this period. The job separation shock $\eta(\vartheta)$ and the job finding elasticity κ_w are adjusted to replicate the job separation and finding rate in the CPS during the GR. We make the simplifying assumption that the job finding rate is not responding to UI change. In reality, this may occur because firms may adjust the number of vacancies in function of UI payments. While this is interesting *per se*, we leave it for future research and keep things deliberately simple here. Finally, we adjust p_{z_0} to fit the increasing gross flows from entrepreneurship toward unemployment during this period. Figure A5 shows the change in the parameters of interest. Figure A6 shows the flows across occupations during the GR. The model dynamics (in black) are broadly consistent with

[7] Although conceptually more satisfactory, it is computationally more challenging to consider model expectations over shocks and gradually reveal policy changes. We acknowledge it is a limit of our experiment but we are not at odds with the literature on this point,

the data patterns (in grey) with one caveat. There is a reduction in the early transition from employment to entrepreneurship which seems to be observed in the data only in mid-2012. This is the case because, in the model, the business failure rate increases such that it becomes much less attractive from the perspective of an employed individual to switch to an entrepreneurial situation. Apart from this flow and the three targeted flows ($f_{U\to W}$, $f_{E\to U}$ and $f_{W\to W}$), the adjustments of $f_{E\to W}$ and $f_{U\to E}$ are consistent with what is observed in the CPS. Notice that the setting without UI extensions (dashed red) generates a much higher response of $f_{U\to E}$ relative to what was actually observed. This will in turn have non-negligible effects on occupational masses.

Figure A5. Parameter change during the GR experiment.

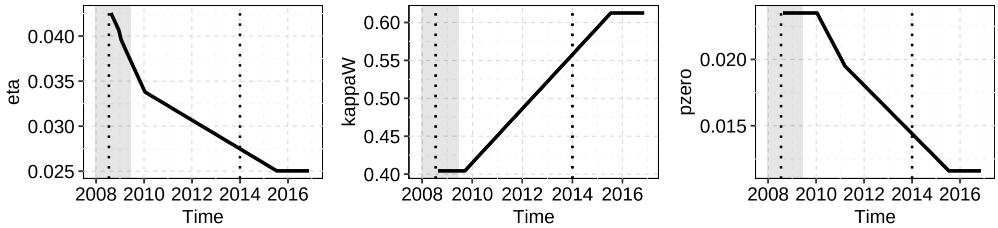
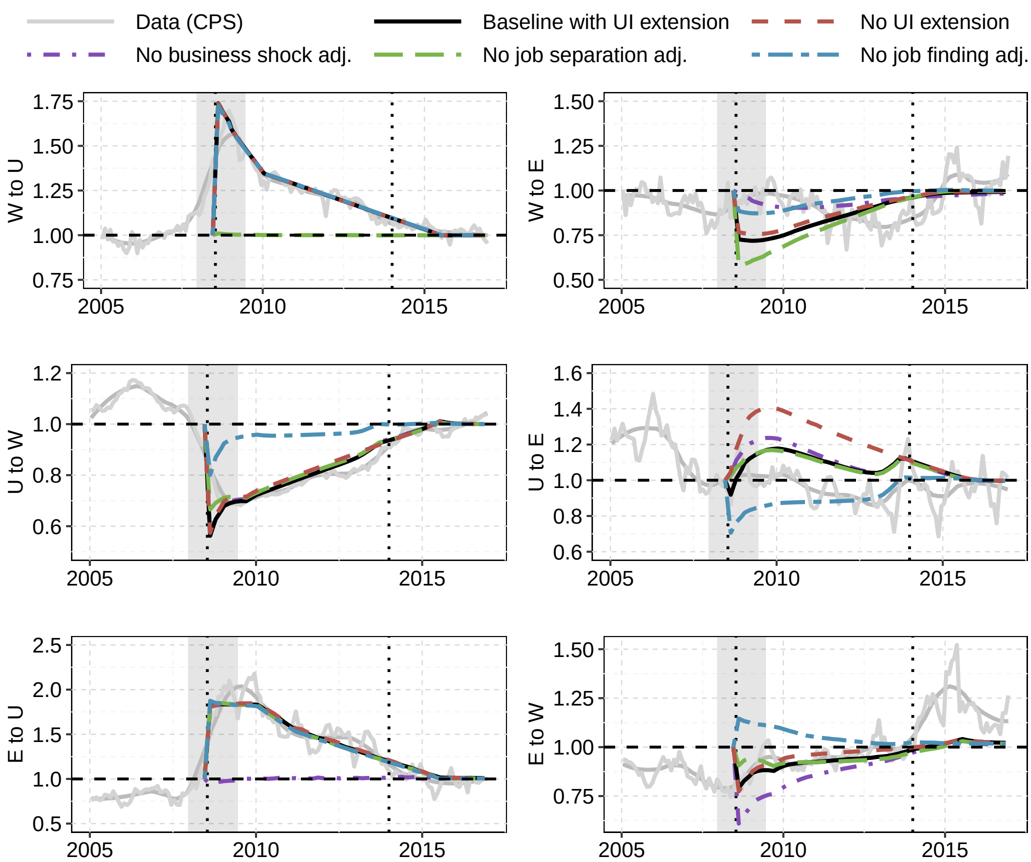


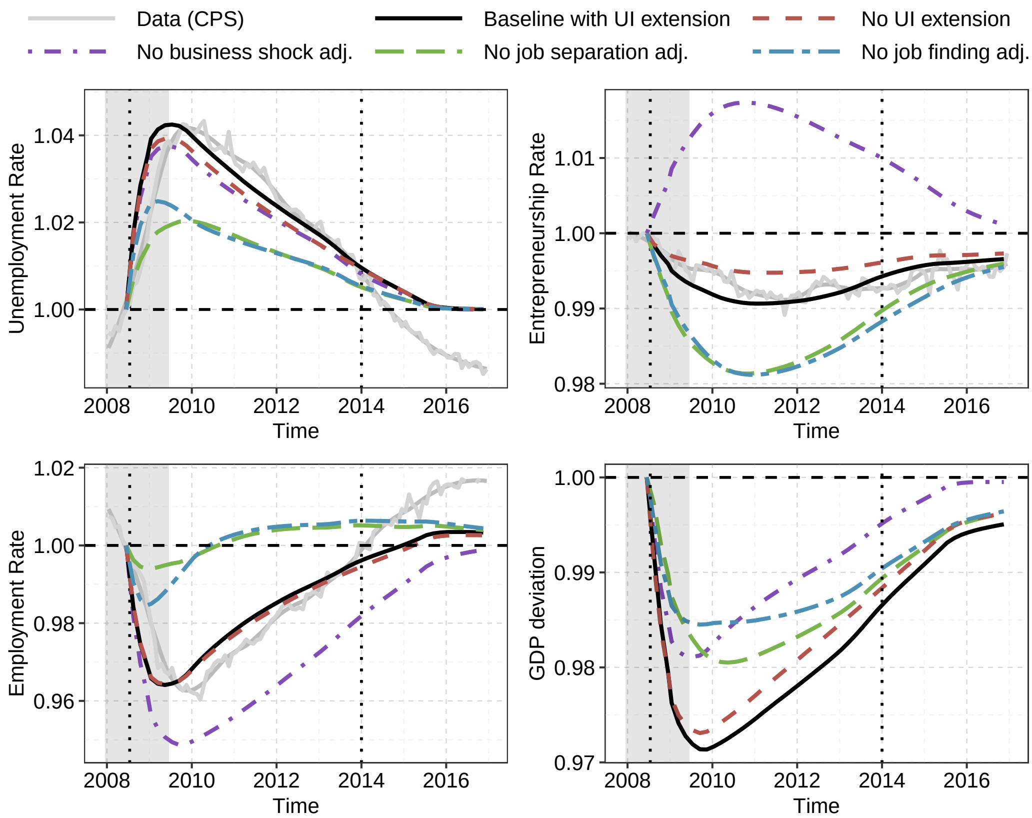
Figure A6. Transitions between occupations during the Great Recession.



Notes: Grey area: NBER definition of the GR. Vertical dotted line: EUC and EB implementation dates, from mid-2008 to end-2013. The solid grey line is the smoothed CPS data.

To provide a tractable quantification of the contribution of each component, including UI extensions, on the gross labor markets flows, we run a counterfactual experiment in which, *ceteris paribus*, we fix one of the four components in $\{\eta(\vartheta), \kappa_w, p_{z0}, \bar{J}\}$ to their benchmark value. Figure A7 displays the resulting occupational masses and the entrepreneurial sector GDP.

Figure A7. UI change during the Great Recession.



Notes: Grey area: NBER definition of the GR. Vertical dotted line: EUC and EB implementation from mid-2008 to end-2013. The occupational rates are computed using the CPS and are detrended. The solid grey line is the smoothed CPS data. We normalize the rates by their starting value in December 2007 such that the occupational rates are in deviations from their starting values.

As the entrepreneurship rate is known to be decreasing since the 80s, we detrend all the series linearly. We find that each component has a significant effect on the resulting occupational stocks. It is interesting to note that without the change in p_{z_0}, the entrepreneurship rate is increasing during the GR. First, employment is riskier because of the increased job separation rate, changing the relative riskiness of entrepreneurship and leading to a surge in the flow into entrepreneurship. Second, as unemployed individuals are more likely to switch to entrepreneurship (see Table 1 in the main paper), there is a mechanical effect that pushes toward higher flows towards that occupation. Together, those two effects contribute to a higher entrepreneurship rate and a lower entrepreneurial exit rate such that p_{z_0} is needed to counterbalance them. The adjustments of the job separation and the job-finding rates work in the same direction: they contribute to the overall increase in the unemployment rate and to the decrease in the employment rate. Without those two adjustments, the unemployment rate would have been larger (again, due to a composition effect), which would have decreased the selection into entrepreneurship, and, thus, the drop in the entrepreneurship rate would have been even larger. Finally, notice that the decrease in the entrepreneurship rate is quite persistent as finding a business to run is a slow process. Even after all shocks have vanished, and consistent with the CPS data, the entrepreneurship rate is below its long run steady-state value. Evidently, those results are derived in a perfect-foresight transition dynamics setting. In reality, individuals may not perfectly anticipate policy adjustments. In such a case, they would only adjust their search efforts once the policy is revealed, which may generate a slight jump in the observed transition flows and occupational masses at the time of the UI reform.

4 Numerical implementation

State space and grid definition In our model, an household is fully characterized by a state vector $\mathbf{x} = (o, y, \theta, z, j, a)$ with $a \in A$, $y \in \mathcal{Y}$, $z \in \mathcal{Z}$, $\theta \in \Theta$, $o \in \{w, e, u\}$ and $j = J$. We compute the household problem using a grid of asset **a** of 350 points (adding more points only very marginally increase our accuracy), spaced according to an exponential rule. We discretize the process z, y and θ with respectively 7, 5 and 3 grid points.

4.1 Algorithm

We organize the algorithm as follows.

1. Initialize a full dimension grid space composed of all different possible asset values (a), productivity level (y), innate ability (θ) and entrepreneurial state (z). The maximum asset level is chosen sufficiently large to place the policy functions in an ergodic set.

2. Guess initial tax rate τ_w and prices $\{w, r\}$.

3. Given prices, solve the consumption-saving-search (CSS) problem, productive capital k, and search efforts of an agent. We use the DC-EGM algorithm of Iskhakov et al. (2017) for the CSS problem.

4. Construct the transition matrix $\mathbf{M}$ generated by Π_y, Π_z and Π_θ, $a'(\mathbf{x})$, $s_w(\mathbf{x})$, $s_e(\mathbf{x})$. Compute the associated stationary measure of individuals $\Gamma(\mathbf{x})$, by first guessing an initial mass of one of households with zero asset and then by iterating on $\Gamma'(\mathbf{x}) = \mathbf{M}\Gamma(\mathbf{x})$ until $|\Gamma'(\mathbf{x}) - \Gamma(\mathbf{x})| < \mu$, with μ very small.

5. Compute the resulting total asset level, total labor supplied and total investment in the entrepreneurial sector. Total capital invested in the corporate sector is given as the difference between total savings and total capital invested in the entrepreneurial sector. Total labor used in the corporate sector is given by total labor supplied by workers.

6. Update prices $\{r, w\}$ using the marginal productivities in the corporate sector and tax rate τ_w to close the government budget up to a relaxation. Back to step 2 until convergence of labor income tax rate and prices.

4.2 Transitional dynamics

To solve the transition, we compute the solutions of the household problem backward, starting at the new steady-state. We then find prices that are consistent with the implied policies and we iterate until convergence. We assume that the economy is in the initial steady-state in period 0 and the reform is announced and implemented in period 1. Agents did not anticipate the policy before its implementation. The economy makes a transition to reach the final steady-state in period T. We choose T large enough so that the resulting stationary distribution in period T is close enough to the final steady-state equilibrium. The algorithm for the transition dynamics is:

1. Guess a path for $\{\mathcal{L}_1, ..., \mathcal{L}_{T-1}\}$ with $\mathcal{L}_t = \{r_t, w_t, \tau_{w,t}\}$. $\mathcal{L}_0$ and $\mathcal{L}_T$ are given by initial and final steady-states.

2. Use value functions of the final steady-state (period T) to solve the households' problem backward starting from $T-1$ until period 1.

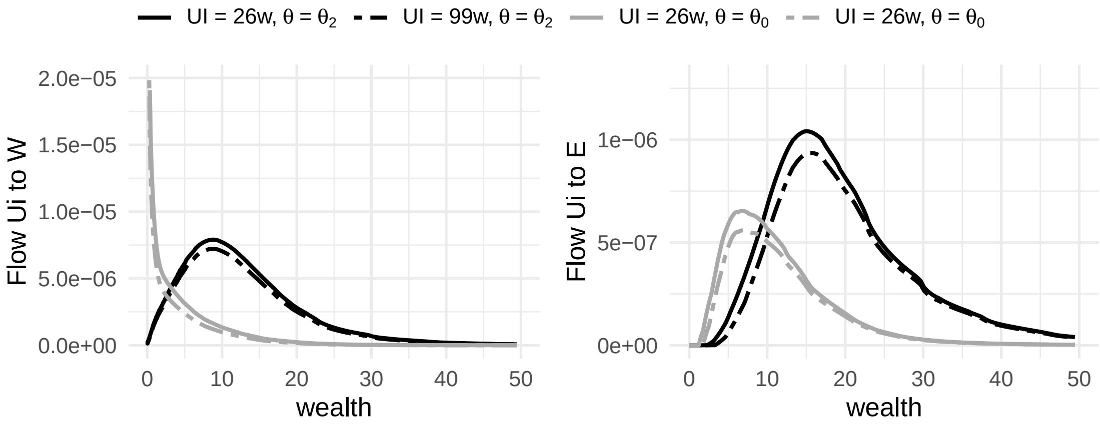
3. Use the distribution of the initial steady-state and the resulting policy functions to compute the path of the distribution of household $\{\hat{\Gamma}(\mathbf{x})_1, ..., \hat{\Gamma}(\mathbf{x})_T\}$.

4. Given these distributions, compute new path $\{\mathcal{L}_1, ..., \mathcal{L}_{T-1}\}$. Iterate from step 2 until the difference between the initial path is close enough to the resulting path.

5. When convergence is achieved, check if the resulting final distribution $\hat{\Gamma}(\mathbf{x})_T$ is close enough to the steady-state distribution $\Gamma(\mathbf{x})_T$ up to a relaxation. If the two distributions are identical, then stop, else, increase the number of periods T.

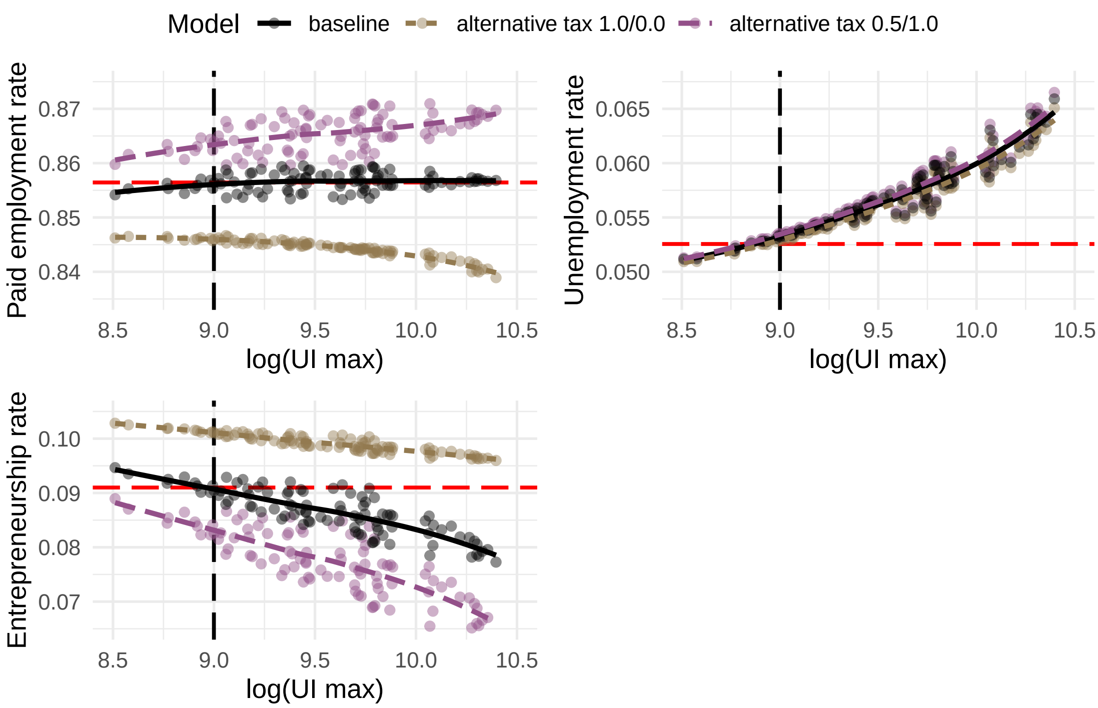
4.3 Additional figures

Figure A8. Model flows from insured unemployment to entrepreneurship.



Note: we display the flows out of insured unemployment with $j = \bar{J}$ for two models with the same benchmark initial distribution: the baseline with $\bar{J}$ = 26 weeks (solid line) and an alternative with $\bar{J}$ = 99 weeks (dashed line).

Figure A9. Effect of alternative tax scheme on occupation masses.



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