Administrative Costs and Optimal Unemployment Insurance

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Abstract

To operate the UI system, state workforce agencies incur roughly $3 billion in administrative costs each year. Yet models of optimal unemployment insurance (UI) implicitly assume no administrative costs, i.e., one dollar of additional tax revenue translates to one dollar of additional benefit payments. This paper examines the impact of UI these administrative costs on optimal UI policy. First, I add administrative costs to the standard Baily-Chetty framework. Next, using accounting data from state workforce agencies, I use two separate approaches to estimate the administrative costs associated with an additional dollar of UI benefit expenditure. Each dollar of benefit payments generates administrative costs of around five cents. Lastly, I evaluate the optimal policy and welfare implications. Administrative costs reduce the optimal UI replacement rate from 28% to 21%, with larger reductions in alternative specifications.

[1] Thanks

1 Introduction

Each year, states' unemployment insurance (UI) workforce agencies spend around \$3 billion on administrative expenses needed to operate the UI system.[1] These expenses include the labor and capital needed to, among other things, screen applicants, make payments, handle appeals, track wages, and tax employers. In a typical year, these administrative costs total more than 10% of the payments made to UI recipients. However, current optimal UI evaluations implicitly assume that administrative costs are zero; an additional dollar of UI tax revenue translates into another dollar of UI benefit payments (see Le Barbanchon et al. (2024) for a recent review). The goal of this paper is to examine the impact of administrative expenses on optimal UI policy.

First, I update the standard Baily-Chetty framework to include administrative expenses. I assume that each dollar of benefit payments requires $1+a$ dollars of tax revenue, where a represents the variable administrative costs of making an additional dollar of UI payments. Higher benefit levels or longer potential durations increase administrative expenses by lengthening unemployment spells and raising the number of continued claims processed. More generous benefits may also increase appeals, fraud, and take-up by those with marginal eligibility, thereby increasing costs of verifying eligibility and maintaining UI program integrity. In the typical framework, with $a = 0$, the optimal UI benefit level or potential benefit duration (PBD) weighs the consumption-smoothing benefits of additional UI against the mechanical and behavioral fiscal costs. These costs reflect the direct cost of the policy change (holding behavioral constant) and the additional costs from increased unemployment durations. When administrative costs are not negligible, i.e., $a > 0$, the resulting Baily-Chetty formula includes an additional term reflecting the fiscal costs of the administrative expenses.

Second, I use annual, state-level accounting records to estimate the administrative costs, a,

[1] Between 2002 and 2019, total administrative expenses reported to the US Department of Labor averaged \$3.06 billion. The average ratio of annual UI administrative costs to UI payments during this period was 0.116.

using two separate empirical approaches. In the primary approach, I estimate the response of per-recipient administrative expenses to changes in average per-recipient benefit expenditures. The specifications include state and year fixed effects and thus identify variable costs from comparisons of within-state changes. The identification challenge is that these changes in benefit expenditure may be correlated with other factors that influence administrative expenses, such as changes in labor market conditions or the number of unemployed. In addition to controlling for relevant labor market characteristics, I address this concern by instrumenting for per-recipient benefit expenditure using state-level policy variation in maximum UI benefit levels and potential benefit duration. As a complementary approach, I use the Department of Labor's (DOL's) accounting classification of variable workload-related UI administrative expenses to calculate the variable administrative costs per dollar of benefit expenditure. Both approaches indicate that a dollar of additional benefit payments leads to around five cents of additional administrative costs.

Lastly, I evaluate the optimal level and the fiscal costs of UI using these estimates. In addition to an estimate of administrative costs, evaluating the formula also requires estimates of changes in consumption and elasticities of unemployment duration. For the Baily-Chetty optimal replacement rate, I use estimates from the recent meta-analysis of Cohen and Ganong (2024), which improves on existing elasticity estimates by correcting for publication bias and allowing the elasticity to vary with the replacement rate. Incorporating administrative costs into their preferred analysis reduces the optimal UI replacement rate from 28% to 21%, with larger effects in other specifications. I also incorporate administrative expenses into the MVPF framework of Hendren and Sprung-Keyser (2020), evaluating both changes in the benefit level and the potential benefit duration. Administrative expenses increase the fiscal costs by 5-12 cents per dollar of additional UI benefit expenditure. These estimates imply that administrative expenses alone offset 30-50% of what individuals are willing to pay for the consumption-smoothing benefit of additional UI protection.

These evaluations examine the welfare impact of UI during typical labor market conditions. The empirical analysis, however, suggests that per-recipient administrative expenses exhibit economies of scale, falling when unemployment is high. These administrative economies of scale provide another justification for expanding UI during recessions, complementing Kroft and Notowidigdo (2016), which shows that the behavioral costs of UI are also lower when unemployment is high.

This paper adds to the large literature using sufficient statistics to evaluate the welfare effects of UI programs.[2] In particular, by incorporating administrative expenses, it contributes to the subset of papers that examine additional fiscal costs of UI beyond the impact of unemployment durations. Lawson (2017) incorporates additional (exogenous) government spending into the Baily-Chetty formula and shows that this leads to large increases in the fiscal costs of UI. Lindner (2016) and Mueller et al. (2016) find that UI policy changes generate spillover effects on applications for disability insurance, and Hendren and Sprung-Keyser (2020) shows that these spillovers reduce the fiscal costs of UI benefit increases.

In addition, this paper adds to the literature that examines institutional details of UI funding and administration. Several papers examine the role of UI's experience-rated employer taxation, especially on hiring and separations (e.g., Ratner (2013); Guo and Johnston (2021); Guo (2023); Duggan et al. (2023)). Lachowska et al. (2020) examines the impact of different methods of experience rating on states' UI trust funds. Lachowska et al. (forthcoming) examine the impact of another administrative procedure, employer appeals, in explaining heterogeneity in the take-up of UI. Other papers focus on shortcomings in the current system of financing administrative expenses. Lachowska et al. (2022) examines the promptness of UI payments as a function of the UI workload, then considers the principal-agent problem between the federal government and state workforce agencies when allocating administrative funding and suggests reforms to better align

[2] See Schmieder and Von Wachter (2016) and Le Barbanchon et al. (2024) for recent reviews.

their incentives. Similarly, Davidson and Martin (1998) suggests more efficient allocation mechanisms to address the principal-agent problems in administrative funding. Rather than focusing on improving the allocation of administrative expenses, this paper contributes by evaluating the welfare and policy impact of the current levels of administrative expenses.

2 Baily-Chetty Formula with Administrative Expenses

The welfare impact of increasing UI generosity is commonly evaluated using the Baily-Chetty framework (Baily, 1978; Chetty, 2006). Existing evaluations implicitly assume that the UI program operates without administrative expenses; one dollar of additional tax revenue translates to one dollar of additional benefit payments (holding behavior constant). In this section, I relax this assumption to incorporate administrative expenses.

I begin with the dynamic Baily-Chetty framework, following the specific setup of Schmieder and Von Wachter (2016) and Le Barbanchon et al. (2024). The continuous-time model focuses on an agent who becomes employed at time $t = 0$ and the time horizon lasts until time T. While unemployed (the low state l), the agent consumes $c_{l,t} = b_t + y$, where b_t is the unemployment benefit and y is exogenous income, and derives utility $u(c_{l,t})$. Once the agent finds a job (the high state h), the agent consumes $c_h = w - \tau + y$, where w is the wage and τ is a lump-sum tax, and derives utility $v(c_h)$ until time T. To find a job, the agent must search. At each instant, the worker chooses search effort s_t, and the units of effort are normalized to the arrival rate of jobs. All job offers are accepted, after which the agent remains permanently employed. Thus, the probability of remaining unemployed at time t is $S_t = e^{-\int_0^t s_t \, dt}$. Search effort leads to a utility cost of $\psi_t(s_t)$, which is differentiable, increasing, and convex. The resulting lifetime expected utility is therefore

$$W = \int_0^T \{S_t u(c_{l,t}) + [1 - S_t] v(c_h) - S_t \, \psi_t(s_t)\} \, dt. \tag{1}$$

The government sets the two policy parameters: the benefit level b_t and the potential benefit duration (PBD) P. The UI benefits are $b_t = b$ for $t \leq P$, and $b_t = 0$ for $t > P$. Consumption while unemployed is $c_{l,t\leq P} = b + y$ for $t \leq P$, and $c_{l,t>P} = y$ for $t > P$.

When setting the policy parameters, the government must adjust the tax τ to meet a balanced budget constraint, where expected tax revenues equal expected expenditures. Let $D = \int_0^T S_t dt$ be the expected unemployment duration and $B = \int_0^P S_t dt$ be the expected UI-covered unemployment duration. Let E be exogenous (per capita) government expenditures, which can include fixed costs of the UI program. The only deviation from the standard model is that I add variable administrative expenses to the government budget constraint. I assume each dollar of UI benefit payments generates a dollars of administrative expenses, so the balanced budget constraint is

$$(T - D)\tau = Bb(1 + a) + E. \tag{2}$$

I model administrative costs a as applying to benefit expenditure, but they can equally capture administrative costs from administering the UI tax on employers.[3]

There are several channels through which changes in benefit levels or benefit duration may increase administrative expenses. First, increases in both lead to longer average unemployment durations and there are administrative expenses associated with processing ongoing payments.[4] Indeed, the total UI weeks claimed are one of the primary measures of administrative workload that the DOL uses to allocate administrative funding. Second, more generous UI policies may lead to more appeals, UI fraud, violations of eligibility policies (work refusal or failure to be available

[3]For example, consider the model without exogenous government expenditure ($E = 0$). If the budget constraint is $(T - D)\tau(1 - \tilde{a}) = Bb$, it can be rewritten as $(T - D)\tau = Bb(1 + a)$ with $a = \frac{\tilde{a}}{1-\tilde{a}}$. If $E > 0$ (and retaining the focus on UI), one would need to distinguish between the UI taxes that fund benefit payments and the broader labor taxes that fund exogenous government expenditure.

[4]For example, each ongoing UI recipient files weekly or biweekly continued claims with information on job search activities, earnings, and job offers. These claims require administrative processing to verify eligibility and ensure compliance with program requirements.

for work). UI overpayments are nontrivial, amounting to 8.8% to 12.6% of annual UI payments between 2004 and 2019, and the rate tends to increase during recessions when UI payments are more generous (e.g., during the Great Recession and COVID-19 pandemic) (U.S. Department of Labor, Employment and Training Administration, 2025). These claims may increase expenses associated with screening and efforts to improve the integrity of the UI system. Third, more generous UI benefits increase program take-up (Anderson and Meyer, 1997). These marginal claimants may require more administrative effort to process and verify eligibility. For simplicity, the model assumes that all additional benefit payments, whether from higher benefit levels b or longer durations B, lead to the same increase in administrative expenses. In Section 4, however, I provide a test of this assumption.

Incorporating administrative expenses raises the fiscal costs of increasing UI generosity. Consider a marginal increase in the benefit level b. Differentiating the balanced budget, we get

$$(T - D)\frac{d\tau}{db} = B(1 + a) + \frac{dB}{db}b(1 + a) + \frac{dD}{db}\tau.$$

The first term $B(1 + a)$ on the right-hand side represents the mechanical costs of raising benefit payments. Raising benefits b by one dollar mechanically (i.e., holding behavior constant) leads to an additional B dollars of payments in expectation. Administrative expenses scale these mechanical costs by $(1+a)$, operating as a loading factor that reflects the non-zero costs of providing additional insurance.[5] Administrative expenses also increase the behavioral costs. The central behavioral distortion created by unemployment insurance is moral hazard: average unemployment durations endogenously respond to changes in benefit levels (or the PBD) through the individual's choice of search effort s_t. Equation (2) shows that behavioral distortions to UI-covered unemployment ($\frac{dB}{db}b$)

[5] Similarly, in private insurance markets, including long-term care insurance, health insurance, and automobile insurance, research has found non-trivial loading factors, though unlike UI, these could reflect markups from market power in addition to the costs of producing insurance (Chetty and Finkelstein, 2013).

are also scaled by $(1+a)$.

The welfare impact of changes in UI policy parameters b and P comes from the change to expected utility (equation (1)) subject to the balanced budget constraint (equation (2)).[6] For the benefit level b, the Baily-Chetty welfare impact is

$$\frac{dW}{db}\frac{1}{v'(c_h)B} = \underbrace{\left(\frac{u'(c_{l,t\leq P}) - v'(c_h)}{v'(c_h)}\right)}_{\text{WTP Markup}} - \underbrace{\left(\eta_{B,b} + \eta_{D,b}\frac{\tau}{b}\frac{D}{B}\right)}_{\text{Behav. Cost}} - \underbrace{a\left(1+\eta_{B,b}\right)}_{\text{Admin. Cost}}. \tag{3}$$

The units of welfare are normalized by $v'(c_h)B$, and so represent the change in utility from one dollar of additional (mechanical) benefit payments relative to an additional dollar while employed. The dynamic model also yields a formula for the welfare effects of an additional dollar of spending caused by extending the PBD P. Increasing P mechanically increases transfers to the S_P share of individuals who remain unemployed at benefit exhaustion. Let $\tilde{u}'(c_U, t > P) = \frac{1}{b}\int_{y_u}^{y_u+b} u'(c)dc$ be the average marginal utility caused by the change in consumption from y_u to $y_u + b$. The welfare effect of a one-dollar mechanical transfer from a PBD increase (i.e., raising P by $\frac{1}{S_P b}$) equals

$$\frac{dW}{dP}\frac{1}{v'(c_h)S_P b} = \underbrace{\left(\frac{\tilde{u}'(c_{l,t>P}) - v'(c_h)}{v'(c_h)}\right)}_{\text{WTP Markup}} - \underbrace{\frac{1}{S_P}\left(\int_0^P \frac{dS_t}{dP}dt + \frac{dD}{dP}\frac{\tau}{b}\right)}_{\text{Behav. Cost}} - \underbrace{a\left(1 + \frac{\int_0^P \frac{dS_t}{dP}dt}{S_P}\right)}_{\text{Admin. Cost}}. \tag{4}$$

In both formulas, the first two terms are standard and reflect the markup individuals are willing to pay for additional insurance (over the actuarially fair rate) and the behavioral costs of the policy change. The new terms are the Administrative Costs, which reflect the additional fiscal costs over the actuarially fair rate due to administrative expenses.

There are a few caveats that may alter the welfare impact of UI policy changes. First, the model only considers administrative expenses associated with benefit payments in the UI system.

[6] See Online Appendix B for the derivation.

Labor income taxation used to fund the exogenous government expenditure, E, may have separate administrative expenses, which would introduce an additional term. Second, I treat administrative expenses solely as a cost of operating UI. This is consistent with evaluations for job training in Hendren (2016) and Hendren and Sprung-Keyser (2020), which treat the operating expenses of job training as a fiscal cost of the program. It is possible, however, that increased administrative expenses create additional fiscal externalities, e.g., higher wages and tax payments for state workforce agency employees. Third, I ignore spillovers from UI benefit extensions on other social insurance programs, such as disability insurance. Finally, in line with most of the literature, I assume changes to UI do not affect wages or job separations. The existing literature suggests these effects are modest and, if anything, further increase the fiscal costs of UI generosity increases (Le Barbanchon et al., 2024). Jäger et al. (2023), however, provides some evidence of increased job separations among older workers when UI benefits are increased.

3 Data

The three main data inputs are state-year level information on UI administrative expenses, UI benefit payments, and UI policies on benefit levels and potential benefit duration (PBD). I focus on UI program expenditures between 2002-2019, stopping just before the Covid-19 pandemic. Table 1 reports the summary statistics for these variables during this period. All dollar values are deflated to 2010 dollars.

The data on administrative expenses are from the US Department of Labor's (DOL's) Resource Justification Model (RJM). The RJM is a data collection system that collects administrative UI expenditures from state agencies and is used to allocate federal administrative funding. Annually, each state submits its administrative expenditures for the previous fiscal year.[7] Total adminis-

[7]Specifically, I use total administrative expenditures from the RJM Main Workbook ACCT SUM sheet for each state and fiscal year.

trative expenses for the state workforce agencies include expenditure on personal services (e.g., salary and wages), personnel benefits (e.g., retirement, insurance), and non-personal services (e.g., information technology, facilities, equipment). In some analyses, I focus on a subset of "workload" administrative expenditures that reflect variable administrative costs: labor expenses for processing initial claims, handling ongoing claims, eligibility determination, dealing with appeals, and managing taxation and wage records. Online Appendix Table A.1 provides more information on all administrative activities included in the cost estimates and that are considered workload activities. When allocating funding, the DOL treats workload expenses as variable and scales them by projected workload, which is primarily measured by the projected number of average weekly insured unemployment (U.S. Department of Labor, 2012).

The data on UI benefit expenditure of each state and year are from the DOL's quarterly UI data summaries. When measuring state benefit expenditure, I include both regular benefits paid from the state UI program and extended benefits paid during specified high-unemployment periods. These data also contain the average unemployment rate and the number of first UI payments paid in a benefit year. Following the DOL, I use the number of first UI payments to measure the number of UI beneficiaries and calculate per-recipient administrative expenses and benefit payments.[8] Per UI recipient, the average state spends \$470.9 in administrative expenses and pays out \$4,467.5 in benefit payments. These administrative expenditures sum to \$60 million per year in the average state, and nearly half (\$28.5 million) of this is due to expenditures in workload categories.

Finally, the empirical strategy requires changes in states' UI policy parameters to generate variation in UI benefit payment. From the US DOL's Significant Provisions of State Unemployment Insurance Laws, I gather the regular UI program's potential benefit duration (PBD) and the maximum weekly benefit amount (WBA) for each state and year. Across states and years, the PBD

[8]The data documentation for the UI data summaries states that first payments "is used as a proxy for the 'beneficiaries' under a specific program," and this proxy is used when calculating average benefit amounts per beneficiary and average covered unemployment duration per beneficiary.

varies from 12 weeks to 30 weeks, and the maximum WBA varies from \$200 to \$677. The product of the maximum WBA and PBD equals the maximum benefit amount, i.e., the maximum amount that a UI recipient could receive from the state's regular UI program, which varies from less than \$3,000 to more than \$20,000.

4 Empirical Strategy and Results

The goal is to estimate a in the government's balanced-budget equation for a representative agent from Section 2, repeated here:

$$(T - D)\tau = Bb(1 + a) + E.$$

There are two important comments. First, a reflects only the *variable* administrative expenses, i.e., those that scale with increased per-recipient benefit payments Bb, which is the product of the average benefit duration B and average benefit level b. Fixed administrative costs are included in exogenous government expenditure E. Second, which expenses are fixed or variable depends on the duration of the proposed change to UI policy. I focus on variable expenses in response to annual changes in benefit payments. For a permanent policy change, however, more costs may be variable. I use two complementary approaches to estimate a.

4.1 Within-State Policy Variation Approach

Empirical Strategy

The primary approach uses annual, state-level data to examine the impact of average per-recipient benefit payments, $(Bb)_{st}$, on average per-recipient administrative expenses, A_{st}. Specifically, I estimate the following specification:

$$A_{st} = a(Bb)_{st} + E_s + \tau_t + X_{st} + \varepsilon_{st}, \tag{5}$$

where A_{st} is the average per-recipient administrative expenses in state s in year t, $(Bb)_{st}$ is the average per-recipient benefits paid in state s in year t. The notation Bb follows the Baily-Chetty setup of Section 2, where B represents the average unemployment duration and b represents the average weekly benefit level. To form per-recipient measures, I divide the total administrative expenses and benefit payments by the number of first UI payments (see 3). State fixed effects E_s capture fixed per-recipient administrative costs of state s. Year fixed effects are included as τ_t. The controls X_{st} represent observable factors that may affect per-recipient administrative expenses, namely the unemployment rate and the log number of insured unemployed (first payments). These are intended to capture economies of scale in administrative expenses. The error term ε_{st} reflects unobservable factors that create variation in administrative expenses. The parameter of interest, a, captures how administrative costs per recipient scale with within-state changes in annual per-recipient average benefit payments.

Focusing on administrative costs and benefits *per recipient*, as opposed to total expenditures, has two advantages. First, equation (5) aligns with the balanced budget equation in the Baily-Chetty model, which considers average or expected expenditures per person. In particular, with job separations assumed to be exogenous, the Baily-Chetty approach focuses on UI expenditure changes due only to variation in benefit levels b and benefit durations B. The per-recipient formulation above maps directly to these two sources of variation. In contrast, analyzing total benefit payments would also be affected by changes in the number (or probability) of unemployed. Second, the policy instruments (discussed below) generate variation in the maximum UI payments per recipient and so are best used with the per-recipient specification in equation (5).

The primary identification concern is that variation in per-recipient benefit payments $(Bb)_{st}$ may be correlated with other factors that affect per-recipient administrative expenses A_{st}. A particular concern is economies of scale in administrative expenditures. In particular, both average benefit payments (Bb) and the number of insured unemployed increase during recessions. If increases in the number of unemployed create economies of scale in administrative costs, the positive correlation between the number of unemployed and average benefit payments would bias the estimator of a downward. I partly address this by including controls for the unemployment rate and the log of the number of UI recipients (measured by first payments) in each year.

My preferred specification also addresses potential endogeneity by instrumenting for changes in average benefit payments $(Bb)_{st}$ using within-state policy changes in UI parameters. Specifically, for state s in year t, I take the product of the maximum allowed (regular) UI potential benefit duration (PBD), Z_{st}, and the maximum allowed weekly benefit amount (WBA), z_{st}, to form the instrumental variable $Z_{st}z_{st}$, which is the maximum allowed total (regular) UI benefit payments. Within-state changes in the UI PBD or WBA have been widely used to examine the impact of UI policy on unemployment durations and other outcomes.[9]

The primary concern with policy variation in the PBD or WBA is that benefit generosity tends to increase during economic downturns. For the PBD, federally funded Extended Benefits are triggered when the state's total or insured unemployment rate exceeds certain thresholds, combined with the rate of the unemployment increase over a specified "lookback" period Valletta (2014). Similarly, the WBA tends to increase during downturns and these increases respond, in part, to local labor market conditions. The standard strategy in this literature, which I follow,

[9] Papers exploiting within-state changes in the UI PBD include Moffitt (1985), Katz and Meyer (1990), Valletta (2014), Farber and Valletta (2015), and Barr and Turner (2015). Papers exploiting within-state changes in benefit levels (WBA) include Moffitt (1985), Katz and Meyer (1990), Chetty (2008), Kroft and Notowidigdo (2016), and Hsu et al. (2018).

is to control for local labor market conditions (the unemployment rate), and therefore identify changes from the residual variation in UI policies. For the PBD, differences in states' trigger thresholds, the "lookback" period, and state employment trends. These differences create variation in the PBD even for states with nearly identical unemployment levels Valletta (2014); Farber and Valletta (2015). For the WBA, state unemployment conditions play a role, but many other factors influence changes in UI benefit policies, including officials' reelection concerns, state political party preferences, and lobbying. Hsu et al. (2018) show that within-state changes in UI benefits are not strongly or significantly correlated with unemployment rates, GDP growth, home price growth, average wages, union coverage, or UI trust fund reserves. Finally, to support the assumption of instrument exogeneity, I also construct separate instruments using the variation in PBD and maximum WBA, respectively, and conduct an overidentification test for instrument exogeneity.

Results

Table 2 reports OLS and IV estimates of administrative expenses a from equation (5). To begin, column (1) reports OLS estimates. The coefficient of 0.023 indicates that each dollar of additional benefits expenditure per person raises administrative expenses by 2.3 cents. Columns (2)-(6) implement the IV strategy. The first-stage Olea-Pflueger 2013 F-statistics range from 15 to 41, and I report Anderson-Rubin p-values for the null hypothesis that $a = 0$ at the bottom of the table. These p-values are valid under weak instruments (Keane and Neal, 2024). First-stage estimates are reported in Online Appendix Table A.2. The preferred specification in column (2) uses the primary instrument - the maximum allowable regular UI benefits, which is the maximum PBD ($\hat{Z}_{st}$) multiplied by the maximum weekly benefit amount ($\hat{z}_{st}$). The coefficient indicates that each dollar of benefit expenditure raises administrative costs by 5.6 cents. Column (3), uses this same instrument but adds a cubic in the state unemployment rate to better control for economic conditions that may affect UI policy, and the estimate remains similar.

Additionally, the negative coefficients on the log of first payments indicate the presence of economies of scale, perhaps due to the presence of fixed costs. A one percent increase in the number of UI recipients is associated with a large, \$4 decline in administrative expenses per recipient. Economies of scale in administrative expenses provide another justification for expanding UI during downturns, as per-recipient administrative expenses would fall when unemployment is higher. This complements the existing evidence on the cyclicality of moral hazard in UI (Kroft and Notowidigdo, 2016).

Next, I separately examine the effects of changes in the PBD and changes in benefit levels. For potential benefit duration, I construct the instrument $\hat{Z}_{st}\bar{z}_s$, where $\bar{z}_{st}$ is the average maximum benefit amount in state s. Similarly, for the maximum benefit amount, I construct the instrument $\bar{Z}_s\hat{z}_{st}$, where $\bar{Z}_s$ is the average PBD in state s. Column (4) reports the two-stage least squares (TSLS) using both instruments, and columns (5) and (6) report IV estimates using the two instruments separately. Formally comparing the estimates of $\hat{a}$ in columns (5) and (6) provides a joint test of two key assumptions: homogeneity of the coefficient a and the exclusion restriction of an instrument. For homogeneity, the theoretical and empirical models assume that all changes in benefit payments, whether from increases in durations or benefit amounts, lead to the same proportional increase in administrative expenses. If the policies' impacts differ, however, it would be reflected in different local average treatment effects (LATEs) estimated in columns (5) and (6). If both instruments are assumed to be valid, then an overidentification test is a test of the restriction that the LATEs of the two instruments are equal. Alternatively, under the assumption of a homogeneous coefficient a and the validity of one instrument, an overidentification test is a test of the second instrument's exclusion restriction. Using Hansen's overidentification test, I fail to reject the hypothesis that the estimates of a in columns (5) and (6) are equal. The J-statistic is 0.12 (p-value

0.729). Failing to reject the null of homogeneity and exogeneity supports these assumptions of the model. To summarize, the estimates indicate that $a \approx 0.056$, or each dollar of additional benefit expenditure is associated with 5-6 cents in administrative expenses.

4.2 Accounting Approach

As a second approach to estimating a, I rely on the DOL's accounting classification to identify variable administrative expenses. The DOL's RJM model, used to allocate federal administrative funding each year, identifies six "workload categories" that scale with the UI workload. The primary measure of claims-related workload is the projected number of average weekly insured unemployed (AWIU).[10] The workload expenses are variable in that they consist only of labor costs (personal services and personnel benefits) on activities directly related to funding and making UI payments. These activities include hours spent screening the eligibility of applicants, processing initial claims, handling ongoing claims, dealing with appeals, managing wage records, and taxing employers. Workload expenses exclude management and planning, performance analysis (auditing), support, and non-personnel expenses (IT, facilities, supplies, postage, etc.). The primary advantage of this accounting approach is its simplicity, but in doing so, it assumes the DOL's workload classification correctly identifies the relevant variable administrative expenses.

I estimate administrative cost a_{st} as the ratio of workload administrative expenses to total benefit payments made in state s and fiscal year t. Using this accounting approach, the average administrative cost is 0.049. Thus, similar to the previous estimate, workload-related expenses equal five cents per dollar of benefit payments.[11]

[10] See, for example, U.S. Department of Labor, Employment and Training Administration (2017).

[11] The primary measure of workload expenses includes activities related to processing claims and employer taxation. I focus on this measure because additional benefit payments require additional taxation, so both types of activities may generate administrative expenses. If, however, one restricts workload expenses to only claims-related activities (removing expenses from taxation and keeping wage records), the average workload expense to benefit payment ratio is 0.035.

With the accounting approach, I can also examine heterogeneity in the administrative expenses across states and time. Figure 1 (a) shows the distribution of states' average administrative expenses, $\bar{a}_s = \frac{1}{T}\sum_t a_{st}$. There is significant variation, ranging across states from less than 0.03 to more than 0.09. Since workload expenses consist only of labor costs, the variation is either due to differences in wages or differences in hours worked per benefit dollar. Empirically, it is driven by the latter. The correlation coefficient between states' administrative cost ratio and their average workload-related hours per benefit dollar is 0.87, while the correlation coefficient with states' average hourly wage is -0.21.[12] These differences in hours worked could reflect differences in efficiency across states, but it could also reflect differences in workload per recipient. For example, some states may have more frequent appeals or more time-consuming eligibility screening.[13] Lastly, it could also reflect economies of scale. States with greater average UI payments tend to have lower administrative cost ratios (the correlation coefficient is -0.41). While this section seeks to document, not explain, the variation across states, this heterogeneity suggests an area for future work.

Figure (b) shows the average value of a_{st} across states for each year in the sample period. Average annual costs vary from 0.024 to 0.069. These expense ratios move counter-cyclically, with the lowest values when benefit payments were highest in the Great Recession and the highest values when benefit payments and the number of recipients were low. Again, these results suggest economies of scale and counter-cyclical administrative expenses.

[12] Each state reports the number of hours paid per workload category and average total compensation (wages plus benefits) per workload category. From these, I compute the average wage and average hours per benefit expenditure across all workload categories in each state and year, then take the mean of these annual values for each state. The correlation coefficients are between each state's mean workload administrative expense ratio and its mean hours per benefit dollar or mean hourly wage in workload activities.

[13] Lachowska et al. (forthcoming) find that employers vary in their tendency to appeal when laid-off workers claim UI eligibility. If employer appeals also vary systematically across states, it would lead to heterogeneity in the appeals workload.

5 Policy Implications

I examine the impact of administrative expenses on two common sufficient statistics used to evaluate UI: the Baily-Chetty formula for optimal UI replacement rate, and the fiscal costs within the MVPF framework of Hendren and Sprung-Keyser (2020).

5.1 Baily-Chetty Formula

Within the Baily-Chetty framework of Section 2, the optimal benefit level will maximize individuals' expected welfare subject to the balanced budget constraint. Specifically, by setting the first-order condition in equation (3) equal to zero, the optimal benefit level equates individuals' willingness to pay (WTP) to the fiscal costs, including administrative expenses. To use the recent publication-bias-corrected estimates of Cohen and Ganong (2024), I make a few standard simplifications to the dynamic model.[14] First, individuals' WTP Markup is approximately $\gamma\frac{\Delta C}{C}$, where γ is the coefficient of relative risk aversion and $\frac{\Delta C}{C}$ is the percentage decline in consumption upon job loss (Gruber, 1997; Hendren and Sprung-Keyser, 2020; Le Barbanchon et al., 2024). Second, I assume that $\frac{dB}{db} = \frac{dD}{db}$ and $E = 0$, so that the behavioral costs depend only on the elasticity of unemployment durations and the employment rate e.[15] With these assumptions, the optimal replacement rate satisfies the following equation, which equates the WTP with the fiscal costs:

$$\gamma\frac{\Delta C(r)}{C} = \frac{\eta_{B,r}(r)}{e} + a\left(1 + \frac{\eta_{B,r}(r)}{e}\right), \tag{6}$$

[14] As an alternative to making these assumptions on the dynamic model, one could also derive the same optimal replacement rate formula from a static Baily-Chetty model (see Online Appendix C).

[15] For the dynamic version of the model, the assumption is technically that $e = \frac{(T-D)}{T-D+B}$, which equals the share of life spent employed if $B = D$.

where $\eta_{B,r}$ is the elasticity of unemployment duration with respect to the replacement rate.[16] When $a = 0$, this exactly matches the formula of Cohen and Ganong (2024) and Chetty and Finkelstein (2013).

To demonstrate the impact of administrative expenses on the optimal replacement rate, Figure 2 plots the left-hand side and right-hand side of this Baily-Chetty formula, using the preferred estimates of $\gamma\frac{\Delta C(r)}{C}$, $\eta_{B,r}$, and e from Cohen and Ganong (2024).[17] The dotted lines replicate Figure 2 in that paper, with $a = 0$. The downward-sloping black line shows the markup that individuals are willing to pay for additional insurance as a function of the replacement rate r. For the elasticity, Cohen and Ganong (2024) use both a constant elasticity equal to 0.54 (red line), which equals the average among US studies adjusted for publication bias, and their preferred estimate that allows heterogeneity in the elasticity with respect to the replacement rate (blue line).[18] Without administrative expenses, the static elasticity (blue) implies an optimal replacement rate of 16% and the heterogeneous elasticity (red) implies an optimal replacement rate of 28%. The solid lines incorporate administrative expenses $a = 0.05$ into the fiscal costs. The optimal replacement rate using a static elasticity falls from 16% to 3%. The optimal replacement rate using the preferred, heterogeneous replacement rate falls from 28% to 21%.

The accounting approach to measuring administrative expenses also suggests that administrative expenses differ across states. This can create heterogeneity in the optimal level of unemployment insurance, but it is not clear whether this is consequential. Taking the 25$^{\text{th}}$ percentile of states' administrative expenses ($a = 0.039$), the optimal unemployment insurance rate would increase from 21% to 23% (using the replacement-rate-dependent elasticity). Conversely, taking the 75$^{\text{th}}$ percentile of states' administrative expenses ($a = 0.057$), the optimal unemployment insurance

[16] When wages are exogenous, the elasticity with respect to the replacement rate equals the elasticity with respect to the benefit level. To see this, note that benefit levels b and replacement rates r are linked by $b = rw$. Therefore, $db = wdr$ and $\eta_{B,b} = \frac{dB}{db}\frac{b}{B} = \frac{dB}{wdr}\frac{wr}{B} = \eta_{B,r}$.

[17] For the willingness to pay, they use the estimates of Gruber (1997) to set $\frac{\Delta C(r)}{C} = 0.222 - 0.265r$ and $\gamma = 2$.

[18] Specifically, the elasticity is estimated to be $\eta_{1-e,r} = 0.34 + 0.39(r - 0.435)$.

rate would fall from 21% to 20%. Thus, the heterogeneity in administrative expenses across states has only a limited effect on the optimal unemployment insurance rate.

5.2 Fiscal Costs and MVPF

The Marginal Value of Public Funds (MVPF) of Hendren and Sprung-Keyser (2020) provides another measure for examining the impact of UI policy change. In response to a change in either the UI benefit b or the potential benefit duration P, the net impact on the (present discounted) government budget is $G_j = \frac{dR}{dj}$ for $j \in \{p, B\}$, where R is total revenue. The MVPF of policy j is the ratio of households' willingness to pay for the policy and the net government cost of the policy

$$MVPF_j = \frac{WTP_j}{G_j}.$$

Following Le Barbanchon et al. (2024), individuals' WTP is again calculated using the consumption approach $WTP^j \approx 1 + \gamma \left(\frac{\Delta C_j}{C}\right)$, where $\frac{\Delta C_b}{C}$ measures the consumption decline upon job loss and $\frac{\Delta C_P}{C}$ measures the consumption decline upon benefit exhaustion. From Section 2, the fiscal costs from a mechanical transfer of one dollar of additional UI payments through increasing the benefit level b or benefit duration P, accounting for administrative expenses, is[19]

$$G_b = 1 + (\text{Behavioral Cost}) + \underbrace{a\left(1 + \eta_{B,b}\right)}_{\text{Admin. Cost}}$$
$$G_P = 1 + (\text{Behavioral Cost}) + \underbrace{a\left(1 + \frac{\int_0^P \frac{dS_t}{dP} dt}{S_P}\right)}_{\text{Admin. Cost}}.$$

The new terms are the administrative costs, and, when $a = 0$, these formulas exactly match those used in Schmieder and Von Wachter (2016) and Le Barbanchon et al. (2024).

[19] Online Appendix B derives these fiscal costs and details the terms within the Behavioral Costs.

Table 3 shows the behavioral costs and administrative costs for the set of papers reported in Le Barbanchon et al. (2024).[20] The behavioral costs are taken directly from Table B.2 in Le Barbanchon et al. (2024), which uses values from the papers (and a constant job-finding hazard approximation) to quantify the behavioral costs. Column (1) reports values using only the UI tax of 3% (setting $E = 0$ in the government's budget), and column (2) reports values using the full labor tax wedge (31.5% for 2014), which incorporates exogenous government expenditure ($E > 0$).

The administrative fiscal costs of an additional dollar of expenditure are reported in column (3) for $a = 0.05$. For UI benefit increases, I compute administrative costs as $a(1+\eta_{B,b})$ using estimates of the elasticity of benefit payments reported in Le Barbanchon et al. (2024). The estimated administrative costs range between 0.05 and 0.09 per dollar of expenditure, with the variation reflecting differences in the estimated behavioral elasticities. These administrative costs are 11-80% as large as the behavioral costs when using the UI tax wedge, or 4-40% as large when using the full tax wedge. For PBD extensions, I compute administrative expenses using information on $\frac{dD}{dP}$ and S_P from Schmieder and Von Wachter (2016) Table 1.[21] In the two PBD studies, administrative costs per dollar of expenditure are 0.05 and 0.12. Thus, administrative expenses raise fiscal costs of a policy change by five to twelve cents per dollar of additional benefit expenditure.

Lastly, I compare these costs to individuals' WTP and calculate the MVPF. To compute willingness to pay, I follow Le Barbanchon et al. (2024) and use the 8.5% decline in consumption upon job loss from Hendren (2017) and the 25% decline upon UI exhaustion from Ganong and Noel (2019), with $\gamma = 2$. These values imply that individuals are, ex ante, willing to pay \$1.17, for

[20] I drop four papers from the full table in Le Barbanchon et al. (2024). Calculating the administrative costs for benefit increases requires an estimate of $\eta_{B,b}$, so I exclude papers for which Le Barbanchon et al. (2024) does not report this value. Calculating administrative expenses for PBD extensions requires an estimate of $\frac{dD}{dP}$, so I exclude the one paper for which this value is unavailable in Schmieder and Von Wachter (2016).

[21] Schmieder and Von Wachter (2016) directly reports estimates of $\frac{dD}{dP}$ and $\frac{dB}{dP}$. I infer S_P from these estimates under their assumption of a constant unemployment exit hazard. With this assumption, $\frac{dB}{dP} = S_P + \frac{dD}{dP}\xi$ where $S_P = e^{-Ps}$ and $\xi = 1 - (1 + Ps)e^{-Ps}$, $S_P = e^{-Ps}$. With estimates of $\frac{dB}{dP}$ and $\frac{dB}{dP}$, I solve for Ps and then compute S_P.

an additional dollar of UI benefits, a markup of 0.17 over the actuarially fair rate of 1. Even if there were no behavioral distortions, administrative costs would equal 0.05, and, with behavioral distortions, the administrative costs range from 0.05-0.09. Thus, administrative costs offset 30-50% of the 0.17 markup that individuals are willing to pay for the consumption-smoothing benefits of additional UI. Columns (5) and (6) report the impact of administrative expenses on the MVPF. Including administrative expenses reduces the MVPF of UI in all cases, although by rather small amounts (0.01-0.05). Additionally, in all cases, the MVPF is less than one, indicating that an additional dollar of UI expenditure provides less than one dollar of benefit per dollar of government expenditure.

6 Conclusion

This paper examines the effect of administrative expenses on the optimal UI replacement rate and the fiscal costs of UI generosity. First, I incorporate administrative expenses into the standard Baily-Chetty formula for UI. Second, guided by the formula, I estimate the key parameter related to administrative expenses: the variable administrative cost per dollar of benefit expenditure. On average, each dollar of UI benefits requires five cents of administrative expenditure, though there is some heterogeneity across states. Finally, I examine the welfare implications of these administrative costs. Within the Baily-Chetty calculations of Cohen and Ganong (2024), including administrative expenses reduces the optimal UI replacement rate from 28% to 21% when using their preferred estimates. Within the MVPF framework, administrative costs raise the fiscal costs of UI policy changes by five to twelve cents per dollar of expenditure.

An important caveat is that the welfare implications in this paper relate to marginal changes in UI benefits or benefit durations. Similarly, the estimated administrative cost estimates reflect, to the extent possible, the additional administrative labor costs in response to marginal policy changes. Of course, whether costs are variable or fixed depends on the time horizon considered and the magnitude of the policy change. Permanent or large changes in UI policy may alter capital in addition to labor, which would increase the importance of administrative costs. Additionally, the empirical estimates suggest that administrative costs exhibit economies of scale in the number of insured unemployed. As a result, economic conditions or policy changes that increase the number of unemployed will reduce per-person administrative costs, thereby increasing the optimal UI replacement rate and benefit duration.

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Table 1: Summary Statistics

Variable (1)	Mean (2)	SD (3)	Min (4)	Max (5)
Administrative Expenditure Per Recipient	470.9	230.1	125.3	3,406.1
Total Administrative Expenditures (millions)	60.0	73.5	5.9	524.6
Workload Expenditure (millions)	28.5	37.7	1.8	289.1
Total Benefits Paid Per Recipient	4,467.5	1,294.0	1,663.2	9,282.4
Total Benefits Paid (millions)	769.8	1,102.3	19.3	10,491.1
Extended Benefits Paid (millions)	31.5	128.1	0.0	2,060.6
Unemployment Rate (%)	5.7	2.0	2.1	13.6
First Payments (thousands)	160.8	205.1	5.4	1,795.0
Potential Benefit Duration (weeks)	25.7	2.1	12.0	30.0
Max Weekly Benefit Amount	388.7	91.7	200.0	676.7
Max Benefit Amount (thousands)	10.0	2.7	2.8	20.3

Summary statistics for the sample of 918 annual state observations (plus Washington D.C.) from 2002-2019. All dollar values are in 2010 dollars. Total Benefits Paid is the sum of regular and extended UI payments.

Table 2: Regression Estimates

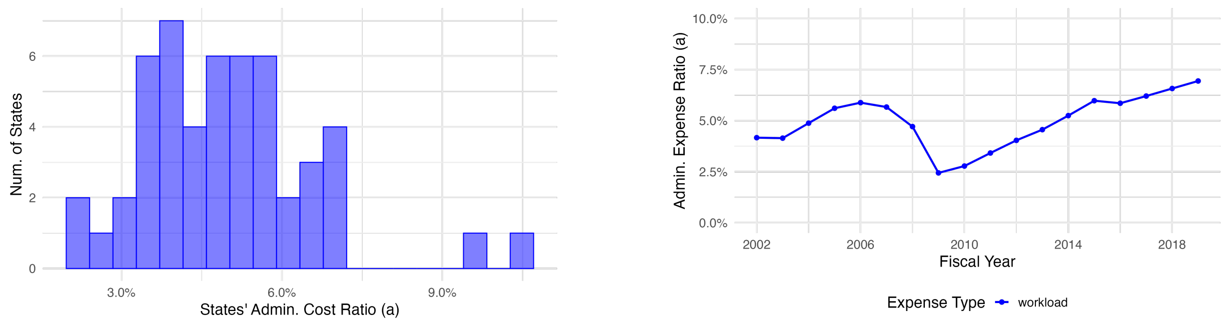
Dependent Variable:			Admin. Costs Per Recipient			
	OLS	IV		2SLS	IV	
	(1)	(2)	(3)	(4)	(5)	(6)
Benefits Per Recipient	0.023	0.056**	0.061**	0.055**	0.064**	0.051*
	(0.016)	(0.023)	(0.027)	(0.023)	(0.030)	(0.029)
Unemp. Rate	20.4*	14.9	83.2	15.0	13.5	15.6
	(11.0)	(11.2)	(96.2)	(11.1)	(13.5)	(10.5)
ln(First Payments)	-392.8***	-412.1***	-425.1***	-411.7***	-417.0***	-409.5***
	(36.5)	(42.9)	(46.8)	(42.5)	(51.7)	(40.1)
Observations	918	918	918	918	918	918
R^2	0.732	0.734	0.735	0.734	0.732	0.733
Instruments		$\hat{Z}_{st}\hat{z}_{st}$	$\hat{Z}_{st}\hat{z}_{st}$	$\hat{Z}_{st}\bar{z}_s,\ \bar{Z}_s\hat{z}_{st}$	$\hat{Z}_{st}\bar{z}_s$	$\bar{Z}_s\hat{z}_{st}$
F-stat (1st stage)		41	38.6	17.6	24.6	15.2
AR test (p-val)		0.018	0.030		0.036	0.075
AR CI (95%)		[0.008, 0.110]	[0.002, 0.120]		[-0.012, 0.161]	[-0.007, 0.123]
Hansen J (p-val)				0.729		
State FE fixed effects	✓	✓	✓	✓	✓	✓
Year FE fixed effects	✓	✓	✓	✓	✓	✓
Unemp. Rate Cubic			✓			

Data: 2002-2019 annual, state-level observations. The policy instruments $\hat{Z}_{st}$ and $\hat{z}_{st}$ indicate the potential benefit duration and the maximum weekly benefit amount, respectively, for regular UI benefits in each state and year. The terms $\bar{Z}_s$ and $\bar{z}_s$ equal the average PBD and average maximum UI benefit level in each state, respectively. The terms Zz represent the products of the two variables, Z and z. Standard errors are clustered at the state level. The table also reports Olea-Pflueger F-statistics from the first stage, p-values from the Anderson-Rubin (AR) test of the significance of $\hat{a}$, valid confidence intervals from inverting the AR test, and the p-value of Hansen's J statistic for overidentification.

Table 3: Fiscal Costs and MVPF

Study	Policy	Behav. Cost (UI) (1)	Behav. Cost (Full) (2)	Admin. Cost (3)	WTP (4)	MVPF ($\gamma = 2$, Full) No Admin (5)	MVPF ($\gamma = 2$, Full) Admin. (6)
Solon (1985)	Benefit	0.08	0.14	0.05	1.17	1.03	0.98
Meyer and Mok (2007)	Benefit	0.41	0.81	0.07	1.17	0.65	0.62
Meyer and Mok (2007)	Benefit	0.08	0.16	0.07	1.17	1.01	0.96
Meyer and Mok (2007)	Benefit	0.16	0.31	0.07	1.17	0.89	0.85
Landais (2015)	Benefit	0.14	0.40	0.09	1.17	0.84	0.79
Card et al. (2015)	Benefit	0.82	1.24	0.09	1.17	0.52	0.50
Card et al. (2015)	Benefit	0.64	1.63	0.07	1.17	0.44	0.43
Katz and Meyer (1990)	PBD	1.05	1.89	0.12	1.50	0.52	0.50
Johnston and Mas (2018)	PBD	0.36	0.69	0.05	1.50	0.89	0.86

This table reports estimates of the behavioral costs and administrative costs for the set of papers reported in Le Barbanchon et al. (2024), excluding four papers for which estimates of $\eta_{B,b}$ or $\eta_{D,b}$ are unavailable. The behavioral costs and WTP are taken directly from Table B.2 in Le Barbanchon et al. (2024). Column (1) reports behavioral costs using only the UI tax of 3%, and column (2) reports costs using the full labor tax wedge (31.5% for 2014). Column (3) reports the administrative costs for $a = 0.05$. Column (4) reports the WTP using the consumption drop values from Le Barbanchon et al. (2024) and $\gamma = 2$. Finally, columns (5) and (6) report the impact of administrative expenses on the MVPF with and without administrative expenses.



(a) Across states

(b) Over time

Figure 1: Variation in Workload-Related Administrative Costs

Data: 2002-2019 annual, state-level observations. Figures show the variation across states (figure a) and over time (figure b) in the administrative cost ratio a_{st}, defined as the ratio of workload administrative expenses to total (regular plus extended) benefit payments in state s and fiscal year t. Figure (a) reports a histogram of the mean value of a_{st} for each state s. Figure (b) reports the mean values of a_{st} for each year t.

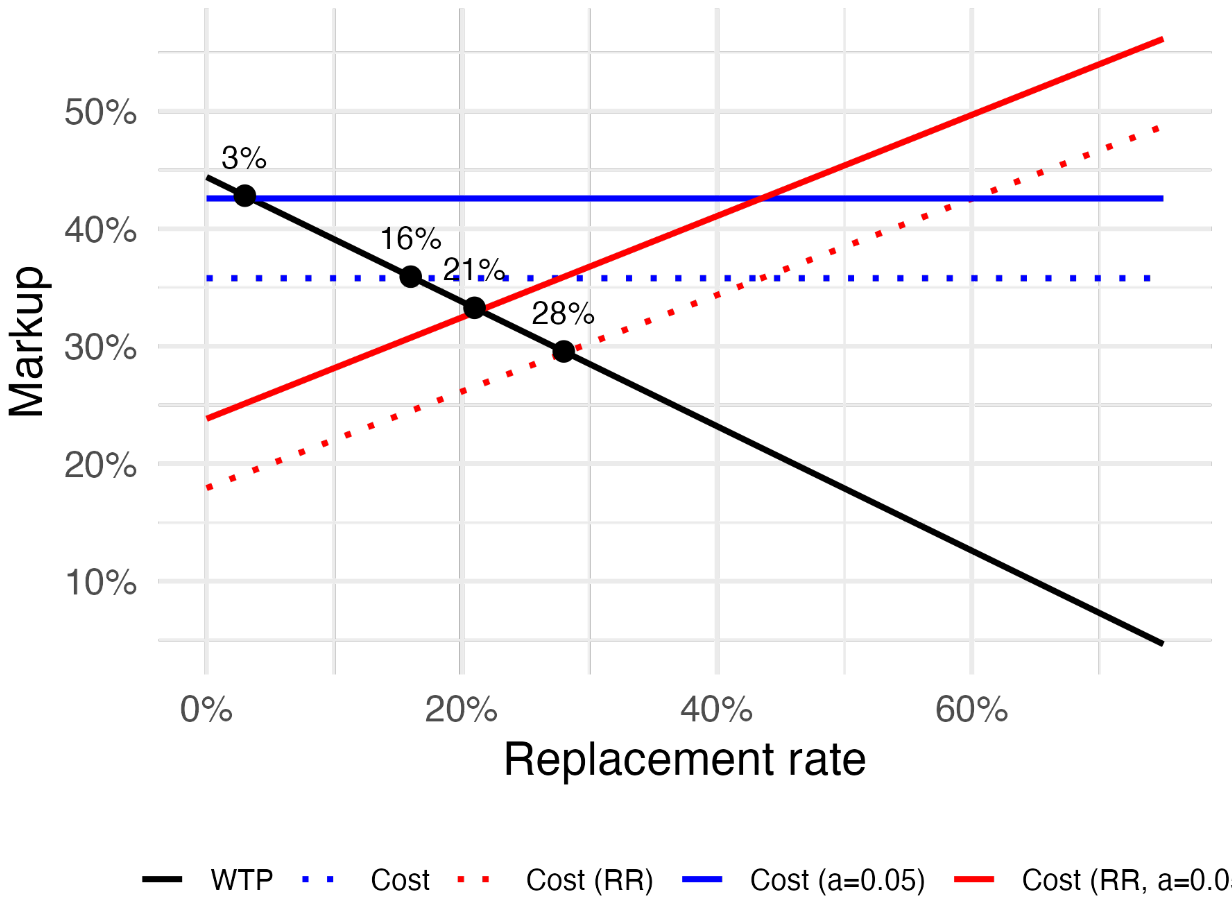


Figure 2: Optimal Replacement Rate With and Without Administrative Expenses

This figure plots the willingness to pay (WTP) and fiscal costs of an increase in the UI replacement rate from the Baily-Chetty formula in equation (6). The WTP and fiscal costs are measured as the markup over the actuarially fair rate. Administrative expenses are set to $a = 0$ (dotted) and $a = 0.05$ (solid). The remaining parameters in equation (6) are directly from Cohen and Ganong (2024) Figure 2. The CRRA parameter $\gamma = 2$ and the consumption drop upon unemployment $\frac{\Delta C(r)}{C}$ is from Gruber (1997). The employment rate $e = 0.95$. The duration elasticity is the publication-bias-corrected estimates from the Bayesian model averaging procedure in Cohen and Ganong (2024). The horizontal lines use the average elasticity for the US of 0.34, and the upward-sloped line uses their preferred elasticity estimate that increases with the replacement rate.

A Appendix Tables and Figures

Table A.1: RJM Activity Descriptions

Functional Activity Code	Workload	Category	Examples of Tasks
Initial Claims	Y	PS&PB	Processing, factfinding, eligibility determination, computing benefits, and interviewing persons regarding new claims. All activities not elsewhere classified that can be identified with UI.
Weeks Claimed	Y	PS&PB	Interviewing claimants periodically, preparing and distributing benefit checks, processing weekly continued claims.
Nonmonetary Determinations	Y	PS&PB	Obtaining facts and determining whether a claimant is entitled to receive benefits, making decisions, notifying interested parties.
Appeals	Y	PS&PB	Recording, scheduling, and processing appeals.
Wage Records	Y	PS&PB	Receiving and maintaining wage record files. Reconciling total wage information with wage and tax summary information.
Tax	Y	PS&PB	Preparing and processing employer tax report forms. Establishing and maintaining experience rating accounts, records, and files. Determining tax rates. Identifying employers.
Benefit Payment Control	N	PS&PB	Reviewing and post-auditing initial determinations, benefit payments, wage records, and other benefit payment data. Maintaining statistics on program activities. Correcting records for overpayment or underpayment. Fraud control.
UI Performs	N	PS&PB	Assessing program operations and developing plans for improvement. Benefit Accuracy Measurement including denials. Data validation. Benefit timeliness and quality.
Support	N	PS&PB	Directly administering and supervising the UI program. Fiscal management activities.
AS&T	N	PS&PB	Performing the overall administration of employment security programs. Organizing and planning by central office personnel. Conducting management analysis activities. Overhead office services or support activities that cannot be charged directly to another functional activity code.
IT/Communications	N	NPS	IT equipment, programmers, software
Non-IT	N	NPS	Facilities, travel, office equipment, supplies
Personal Service Contracts	N	NPS	Contractors, consultants, training, advertising.
Non-RJM	N	–	Postage, Trade Readjustment Allowances, Systematic Alien Verification Entitlement

RJM labor expenses are allocated to ten PS&PB functional activity codes, six of which are considered workload expenses. PS&PB indicates Personal Services (wages and salaries) and Personnel Benefits expenses (retirement, FICA, Insurance). NPS indicates Non-Personal Services. Non-RJM expenses are expenses that do not enter the RJM funding allocation model. See ET Handbook 401, 6th Edition Resource Justification Model (RJM) Appendix C for more information on tasks within each category.

Table A.2: First-Stage Estimates

Dependent Variable:	Benefits Per Recipient				
	(1)	(2)	(3)	(4)	(5)
Max Total Payments ($\hat{Z}_{st}\hat{z}_{st}$)	0.278***	0.273***			
	(0.043)	(0.044)			
Unemp. Rate	176.4***	-39.2	180.1***	150.3***	195.8***
	(27.8)	(230.6)	(29.4)	(34.2)	(31.0)
ln(First Payments)	-190.5	-138.5	-213.9	311.6	-72.0
	(261.0)	(265.7)	(267.4)	(347.7)	(286.5)
PBD ($\hat{Z}_{st}\bar{z}_s$)			0.230***	0.304***	
			(0.059)	(0.061)	
Max Benefit Level ($\bar{Z}_s\hat{z}_{st}$)			0.303***		0.337***
			(0.083)		(0.087)
Observations	918	918	918	918	918
R^2	0.907	0.907	0.907	0.883	0.899
F-stat (excl. inst.)	41	38.6	17.6	24.6	15.2
State FE fixed effects	✓	✓	✓	✓	✓
Year FE fixed effects	✓	✓	✓	✓	✓
Unemp. Rate Cubic		✓			

Data: 2002-2019 annual, state-level observations. The policy instruments $\hat{Z}_{st}$ and $\hat{z}_{st}$ indicate the potential benefit duration and the maximum weekly benefit amount, respectively, for regular UI benefits in each state and year. The terms $\bar{Z}_s$ and $\bar{z}_s$ equal the average PBD and average maximum UI benefit level in each state, respectively. The terms Zz represent the products of the two variables, Z and z. Standard errors are clustered at the state level. The table also reports Olea-Pflueger effective F-statistics for the excluded instruments.

B Dynamic Model

The balanced budget equation (2) captures the fiscal impact of changes to UI policy. Differentiating the balanced budget with respect to b, we get

$$(T-D)\frac{d\tau}{db} = B(1+a) + \frac{dB}{db}b(1+a) + \frac{dD}{db}\tau.$$

Differentiating equation (2) with respect to potential benefit duration, P, we get

$$(T-D)\frac{d\tau}{dP} = b(1+a)S_P + b(1+a)\int_0^P \frac{dS_t}{dP}dt + \frac{dD}{dP}\tau.$$

These formulas implicitly yield the required tax increase resulting from a change in b or P.

The government chooses policy parameters b and P to increase welfare (equation (1)) subject to the balanced budget constraint (equation (2)). Differentiating equation (1) and applying the envelope theorem yields

$$\frac{dW}{db} = Bu'(c_{l,t\leq P}) - (T-D)v'(c_h)\frac{d\tau}{db}.$$

Substituting the tax effect, and normalizing by a dollar of additional unemployment benefit valued at the employed marginal utility, we arrive at the equation for the welfare impact of an increase in the UI benefit level resulting in a mechanical transfer of one dollar (raising benefits by $\frac{1}{B}$):

$$\frac{dW}{db}\frac{1}{v'(c_h)B} = \underbrace{\left(\frac{u'(c_{l,t\leq P}) - v'(c_h)}{v'(c_h)}\right)}_{\text{WTP Markup}} - \underbrace{\left(\eta_{B,b} + \eta_{D,b}\frac{\tau}{b}\frac{D}{B}\right)}_{\text{Behav. Cost}} - \underbrace{a\left(1+\eta_{B,b}\right)}_{\text{Admin. Cost}}.$$

Similarly, differentiating equation (1) with respect to P, we get

$$\frac{dW}{dP} = S_P b\tilde{u}'(c_{l,t>P}) - (T-D)v'(c_h)\frac{d\tau}{dP}.$$

Substituting $\frac{d\tau}{dP}$ and normalizing by the marginal utility of an additional dollar, the welfare effect of a one-dollar mechanical transfer (raising benefit durations by $\frac{1}{S_P b}$) equals

$$\frac{dW}{dP}\frac{1}{v'(c_h)S_P b} = \underbrace{\left(\frac{\tilde{u}'(c_{l,t>P}) - v'(c_h)}{v'(c_h)}\right)}_{\text{WTP Markup}} - \underbrace{\frac{1}{S_P}\left(\int_0^P \frac{dS_t}{dP}dt + \frac{dD}{dP}\frac{\tau}{b}\right)}_{\text{Behav. Cost}} - \underbrace{a\left(1 + \frac{\int_0^P \frac{dS_t}{dP}dt}{S_P}\right)}_{\text{Admin. Cost}}.$$

B.1 MVPF Terms

The willingness to pay for a dollar of additional benefits or potential benefit duration is

$$WTP_b = 1 + \frac{u'(c_{l,t\leq P}) - v'(c_h)}{v'(c_h)}$$
$$WTP_P = 1 + \frac{\tilde{u}'(c_{l,t>P}) - v'(c_h)}{v'(c_h)}.$$

These values can be interpreted as the amount individuals are willing to pay for an additional dollar of (expected) insurance from raising b or P, respectively.

From equations (3) and 4, the fiscal costs of increasing b or P, including administrative expenses, are

$$G_b = 1 + \underbrace{\left(\eta_{B,b} + \eta_{D,b}\frac{\tau}{b}\frac{D}{B}\right)}_{\text{Behav. Cost}} + \underbrace{a\left(1 + \eta_{B,b}\right)}_{\text{Admin. Cost}}.$$
$$G_P = 1 + \underbrace{\frac{1}{S_P}\left(\int_0^P \frac{dS_t}{dP}dt + \frac{dD}{dP}\frac{\tau}{b}\right)}_{\text{Behav. Cost}} + \underbrace{a\left(1 + \frac{\int_0^P \frac{dS_t}{dP}dt}{S_P}\right)}_{\text{Admin. Cost}}.$$

These terms come from the costs in equations (3) and (3). They can be interpreted as the total cost of providing an additional dollar of expected insurance by raising b or P, respectively.

C Static Baily-Chetty Optimal Replacement Rate

Here, I derive the Baily-Chetty optimal replacement rate, updating the static model of Chetty (2006) and Chetty and Finkelstein (2013) to include administrative expenses. In the static model, individuals face the risk of losing their jobs. The government provides unemployment insurance by paying out benefit b when an individual is unemployed, and this is financed by a lump-sum tax $\tau(b)$ paid when the individual is employed. Consumption while unemployed (low state) is $c_l = A + b$, where A are the exogenous assets of the agent. Consumption while employed (high state) is $c_h = A + w - \tau(b)$.

The central behavioral distortion created by unemployment insurance is moral hazard. Individuals can influence the probability of entering unemployment by exerting effort e at a cost $\psi(e)$, where the units of effort are normalized to equal the probability of remaining employed. Individuals choose effort e to maximize expected utility:

$$V(b) = \max_e (1-e)u(c_l) + ev(c_h) - \psi(e)$$

The government chooses the benefit level b to maximize individuals' expected utility $V(b)$ subject to the government's budget constraint. I assume that the government's budget constraint takes the form

$$e\tau(b) = (1-e)b(1+a) + E, \tag{7}$$

where a represents the administrative expenses associated with each dollar of UI payments and E includes exogenous government expenditure. The exogenous expenditure E is general enough to include any fixed costs of operating UI programs alongside any other fixed government expenditures.

Differentiating equation (7) with respect to b, we observe the effect of administrative expenses on the fiscal costs of raising the benefit level:

$$\frac{d\tau}{db} = \left(\frac{1-e}{e}\right)(1+a) + \left(\frac{1-e}{e}\right)\eta_{1-e,b}\left[1+\frac{\tau}{b}+a\right] \tag{8}$$

where $\eta_{1-e,b} = \frac{d(1-e)}{db}\frac{b}{1-e}$ is the elasticity of the probability of unemployment with respect to the benefit level.

The Baily-Chetty formula evaluates the welfare impact of an increase in benefit payments by differentiating $V(b)$ with respect to b, subject to the government's balanced budget constraint:

$$\frac{dV}{db} = (1-e)u'(c_l) - ev'(c_h)\frac{d\tau}{db}.$$

The relevant behavioral changes and costs are those that enter the fiscal costs $\frac{d\tau}{db}$ in equation (8). The standard Baily-Chetty formula normalizes $\frac{dV}{db}$ by $(1-e)v'(c_h)$ so it can be interpreted as the value of a dollar increase in benefit payments relative to the value of an additional dollar while employed. With this normalization,

$$\frac{dV/db}{v'(c_h)(1-e)} = \left(\frac{u'(c_l)-v'(c_h)}{v'(c_h)}\right) - \eta_{1-e,b}\left(1+\frac{\tau}{b}\right) - a\left(1+\eta_{1-e,b}\right). \tag{9}$$

The terms in this expression closely match those in the full dynamic model from equation (3).

To arrive at the form used in Cohen and Ganong (2024), I now assume there is no exogenous government expenditure ($E=0$).[22] With this assumption, the balanced budget equation (7) implies

[22]No exogenous expenditure is often assumed in the literature, including in the original formulation of Chetty (2006). More recent reviews, namely Schmieder and Von Wachter (2016) and Le Barbanchon et al. (2024), evaluate the welfare impact with and without exogenous government expenditure.

that $1+\frac{\tau}{b}=\frac{1}{e}+a\frac{1-e}{e}$. Substituting this into equation (9), we get :

$$\frac{dV/db}{v'(c_h)(1-e)} = \underbrace{\left(\frac{u'(c_l)-v'(c_h)}{v'(c_h)}\right)}_{\text{WTP Markup}} - \underbrace{\frac{\eta_{1-e,b}}{e}}_{\text{Behav. Cost}} - \underbrace{a\left(1+\frac{\eta_{1-e,b}}{e}\right)}_{\text{Admin. Cost}}. \tag{10}$$

To determine the optimal replacement rate, set the first-order condition in equation (10) equal to zero. When bringing the formula to the data, the WTP Markup equals $\gamma\frac{\Delta C(r)}{C}$, where r is the replacement rate. Additionally, with exogenous wages w, benefits $b=rw$, which implies that $\eta_{1-e,b}=\eta_{1-e,r}$.[23] Cohen and Ganong (2024) further allows the elasticity to vary with the replacement rate r. Making these substitutions yields the final formula

$$\gamma\frac{\Delta C(r)}{C} = \frac{\eta_{1-e,r}(r)}{e} + a\left(1+\eta_{1-e,r}(r)\right).$$

To evaluate the formula, $\eta_{1-e,r}(r)$ is replaced with the elasticity of covered unemployment duration, $\eta_{B,r}(r)$.

[23]This is because $\ln(r)=\ln(b/w)=\ln(b)-\ln(w)$, so that $\eta_{1-e,b}=\frac{d\ln(D)}{d\ln(r)}\frac{d\ln(r)}{d\ln(b)}=\frac{d\ln(D)}{d\ln(r)}=\eta_{1-e,r}$.