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State unemployment insurance reserves are not adequate

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ABSTRACT

Regular unemployment insurance (UI) benefits are paid from reserves held in state accounts at the U.S. Treasury. The Great Recession exhausted the majority of UI reserve accounts, and not all states have rebuilt reserves. We examine the adequacy of current state and systemwide UI reserves to weather a mild, moderate, or severe recession in the coming months. Our results suggest that a recession as severe as the average of those occurring since 1975 would cause 18 states to exhaust UI reserves. Our simulations account for the fact that several states have cut benefit generosity since the Great Recession ended. Results suggest that despite federal incentives for forward funding, reserves are insufficient in many states. By accepted standards, state benefit provisions are not excessive, but state-imposed constraints on financing make the system slow to recover from debt. We suggest modest actions for UI financing reform.

JEL Classification Codes: H71, H81, J65

Key Words: Unemployment insurance, benefit financing, forward funding, taxable wage base, reserve ratio, adequate reserves, average high-cost rate, federal loans, state revenue bonds

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The federal-state unemployment insurance (UI) system pays temporary partial earnings replacement to involuntarily unemployed applicants while they are actively seeking reemployment. The UI system is an automatic stabilizer for state economies, injecting spending from benefit payments quickly in economic downturns, and withdrawing spending during business recoveries because of fewer beneficiaries and higher tax contributions. There is now an increasing risk of recession in the near future. This raises questions about whether state UI systems are adequately prepared for another dramatic increase in benefit payments.¹

High unemployment in the Great Recession severely drained state UI reserve accounts, resulting in widespread borrowing. Thirty-six of 53 state UI programs took loans to pay regular UI benefits during the most recent crisis.² Most states used the borrowing procedure available from the U.S. Treasury under Title XII of the Social Security Act, some issued state revenue bonds, others increased taxes, some allowed the federal unemployment tax obligation to rise, and 10 states cut benefit generosity (Vroman 2018). Despite federal assistance that helped many indebted states during the Great Recession, as of December 2018, two states still had outstanding bond debts (Michigan and Pennsylvania), and one UI program (U.S. Virgin Islands) is still paying on loans from the U.S. Treasury.³

In this paper, we briefly review the aggregate history of UI benefit financing, assess the current levels of state reserves, then simulate the financial impacts on individual state UI reserve positions of a mild, moderate, and severe recession in the near term. Our simulations account for

¹ O’Leary and Kline (2016) estimate that as of December 31, 2015, a majority of states were in jeopardy of exhausting UI reserves if a moderate recession occurred soon. This paper relies on our earlier work but improves on the previous methodology by explicitly accounting for changes in state benefit provisions.

² In addition to the 50 states, UI operates in Washington, D.C., Puerto Rico, and the U.S. Virgin Islands.

³ Temporary waivers to states on loan interest from UI debts accumulated during the recession are explained in Chocolaad, Vroman, and Hobbie (2013).

the changes in 10 states that reduced UI benefit generosity. Results of the simulations provide notice to states likely to face shortfalls in UI benefit reserves during the next economic crisis.

STANDARDS FOR UI RESERVE ADEQUACY

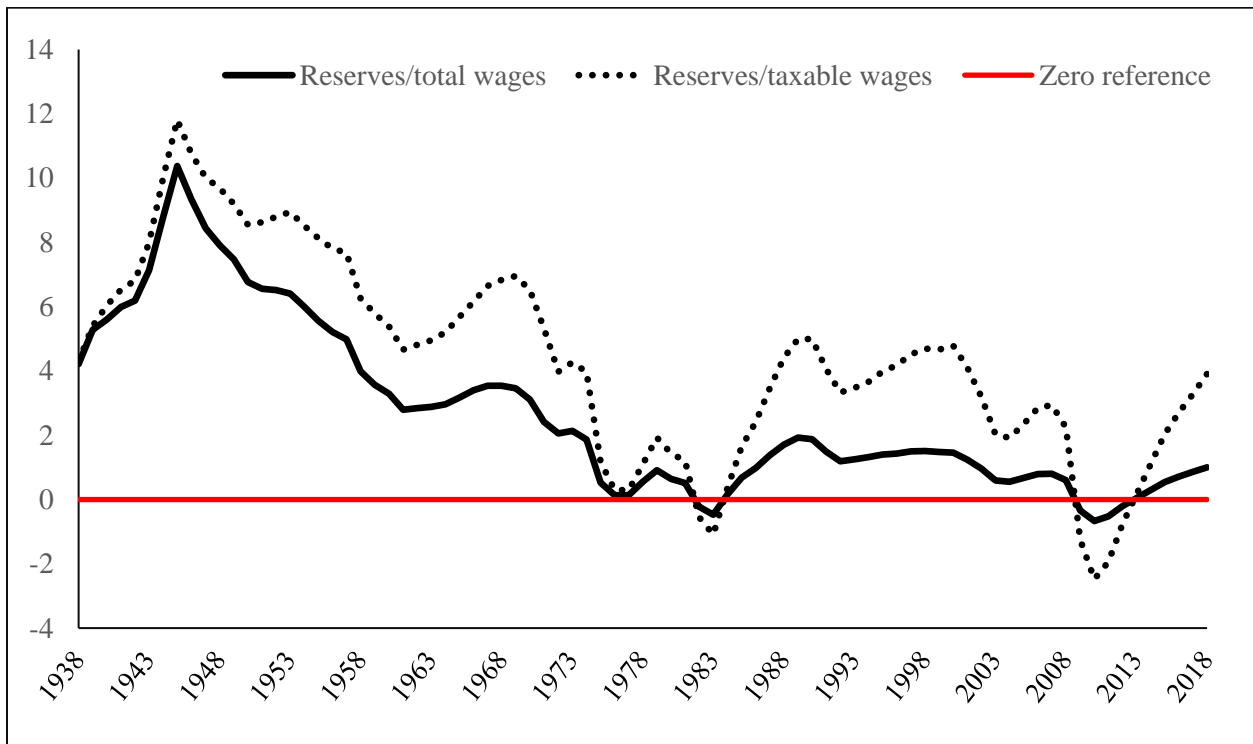
Forward funding of UI benefits contributes to the system being countercyclical rather than procyclical. Having money in reserve when unemployment rises means states do not have to immediately raise employer UI taxes to pay benefits during recessions. Accumulating reserves during economic recoveries slightly dampens expansions and helps avoid severe financial crises in the depths of recessions. To achieve adequate forward funding, state accounts in the federal Unemployment Trust Fund (UTF) should maintain balances “sufficient to pay at least one year of UI benefits at levels comparable to its ‘high cost’” (Advisory Council on Unemployment Compensation 1996, p. 11) over the previous 20 years.⁴ In 2010, a federal incentive for states to meet this forward funding standard was introduced. The final regulation on this matter was published by the U.S. Department of Labor (USDOL) in the *Federal Register* on September 17, 2010, as 20 CFR, Part 606. To satisfy the rule, states should hold one year of average recent recession-level benefits in the UTF by year end 2019 and thereafter. States meeting this standard qualify for interest-free, short-term Title XII loans should borrowing be needed to pay benefits. At the start of 2019, UI reserves in 24 states reserves were still not sufficient to meet the prescribed standard (USDOL 2019a).

USDOL defines the UTF reserve ratio as deposits in state UI reserve accounts at the U.S. Treasury divided by total wages paid in UI-covered employment. The aggregate reserve ratio

⁴ The Advisory Council on Unemployment Compensation was the most recent federal advisory council convened by Congress on the topic of UI. The bipartisan council published final recommendations in 1996.

combining net balances for all 53 programs is represented by the solid curve in Figure 1. This net measure accounts for any Title XII borrowing by states, but Figure 1 does not account for debt financed either by state revenue bonds or other borrowing. The UI system reserve ratio was around 2 percent of total wages before both the 1991 and the 2001 recessions. During each of those recessions, more than a dozen states were forced to borrow, but the combined system stayed positive.

Figure 1 Reserve Ratios for the UI System—Combined Net Reserves of All 53 States and Territories as a Percent of Total and Taxable Wages, 1938–2018



SOURCE: USDOL (2019b).

Taxable wage bases, which determine the size of taxable payrolls, vary widely across states and are an indicator of state attitudes toward forward funding UI benefits. The 2019 UI taxable wage base is \$52,700 in Washington State but only \$7,000 in Arizona, California, Florida, Puerto Rico, and Tennessee. The Federal Unemployment Tax Act (FUTA) taxable wage base has been fixed at \$7,000 per worker since 1983, and state taxable wage bases must be at

least as high as the FUTA taxable wage base. Many states have not raised their taxable wage bases very much above the minimum required level. More than half of all states (29) have taxable wage bases at or below \$15,000.⁵

The FUTA taxable wage base has been increased only three times since it was set at \$3,000 in 1939. It was raised in 1972, 1978, and finally in 1983 to \$7,000. UI was established under the Social Security Act of 1935, and the UI and Social Security taxable wage bases were the same until 1950. The Social Security taxable wage base was raised for the sixth time in 1972 then starting in 1975 it was tied to the National Average Wage Index and has increased almost every year since. Despite some states having UI taxable wage bases much higher than others only about 26 percent of all UI-covered earnings are now subject to UI taxes.⁶ Whereas about 85 percent of all covered earnings are taxable under Social Security (Whitman and Shoffner 2011).

Raising state taxable wage bases would be an effective means of improving forward funding of UI benefits. Vroman and Woodbury (2014) also say that tax bases should be indexed to wage increases. Because as earnings increase over time, to maintain adequate UI wage replacement rates, benefits should increase too. Furthermore, Vroman (2011) finds a high correlation between indexing the tax base and trust fund solvency. And as Vroman and Woodbury (2014, p. 261) say, “Only 6 of the 16 state UI programs that were indexed had to borrow from the federal government during the Great Recession, while 29 of the 35 that were not indexed needed to borrow.”

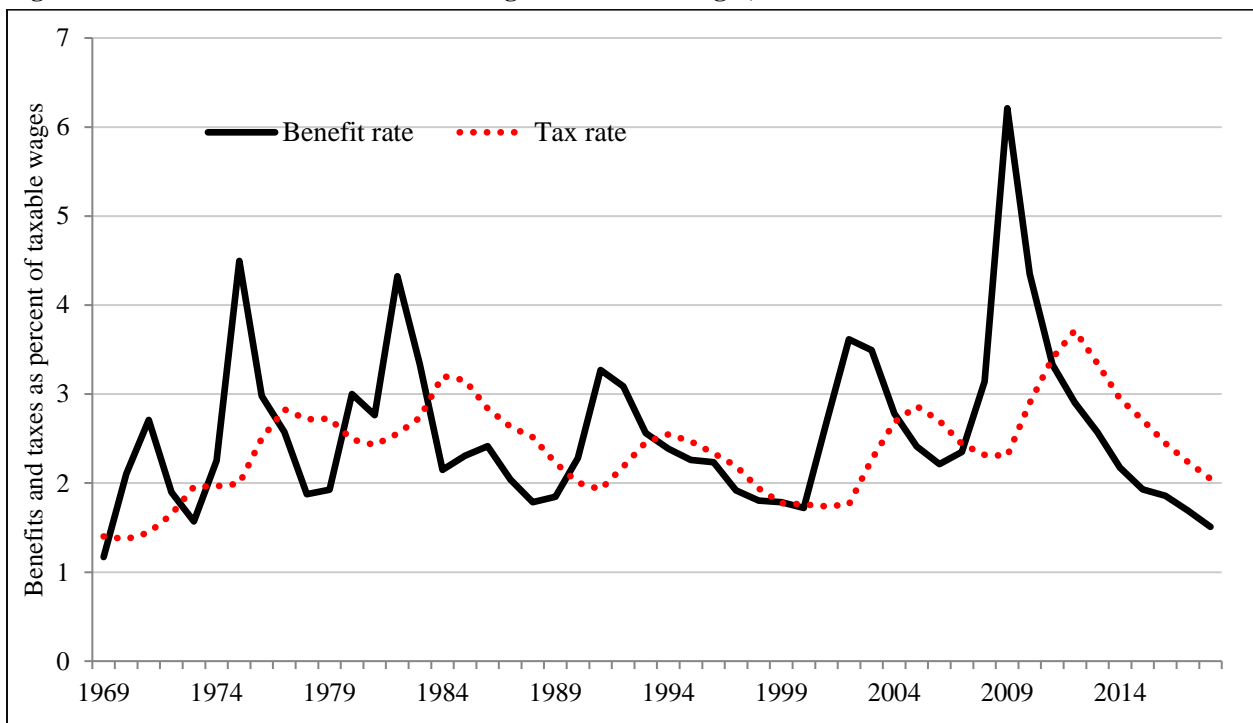
⁵ The national average weekly wage in UI-covered employment was \$1,097 in the first quarter of 2019. Therefore, \$15,000 is barely higher than average covered full-time earnings in one calendar quarter.

⁶ UI taxable earnings of \$1.7 trillion were 25.7 percent of \$6.6 trillion in UI-covered earnings in 2018 (USDOL 2019b).

STRUCTURAL IMBALANCE BETWEEN BENEFITS AND TAXES

UI financing operates with a lag to avoid procyclical effects, but tax revenues should balance with benefit payments over time. In recent years there has been an imbalance (Figure 2). As a percentage of taxable earnings, over the 50-year period from 1969 to 2018, benefits averaged 2.56 percent while tax payments averaged 2.39 percent—a structural deficiency of 0.2 percentage points or a 7.2 percent average annual shortfall in tax revenues.⁷ After high unemployment in 1980 and 1982, UI reserves recovered by 1989 to peak at 2 percent of total wages and 5 percent of taxable wages before the 1991 recession. Before the 2001 recession, UI system reserves recovered to about 1.5 percent of total wages and 4.8 percent of taxable wages. In the weak recovery that followed, UI reserves reached only 0.8 percent of total wages and 2.9

Figure 2 UI Benefits and Taxes as Percentages of Taxable Wages, 1969–2018



SOURCE: USDOL (2019b).

⁷ The ratio of benefits paid to total wages is called the benefit-cost rate. Ratios are based on actual data for UI benefits paid and tax contributions.

percent of taxable wages before the Great Recession. These levels proved to be insufficient as combined reserves of the system were negative from 2009 to 2011.

If the United States is to be adequately prepared to weather a future severe recession, these historical data suggest that pre-recession reserves should be close to 2.0 percent of total wages or 5.0 percent of taxable wages. By the end of 2018, after several years of economic growth and labor market improvement, reserves have recovered to only 1.0 percent of total wages and 3.91 percent of taxable wages.

STATE RESPONSES TO THE GREAT RECESSION UI FUNDING CRISIS

Federal UI conformity rules require states to experience rate employer UI taxes, meaning that employer UI tax rates rise after benefit charges against their accounts increase. Tax changes in most states operate with three- or four-year lags so as not to be procyclical. Following the Great Recession many states allowed their tax systems to automatically raise rates, some states took legislative action to raise rates, other states with inadequate state tax systems or without political will to raise taxes allowed the FUTA offset to decline with the difference applied to reduce Title XII debt to the Treasury. Some of these states took legislative action to override automatic increases in employer tax rates, and some sold revenue bonds adding new statutory taxes (Vroman 2018).

The statutory mechanism for financing state UI benefit payment debt is to borrow from the U.S. Treasury under Title XII of the Social Security Act. However, financing of UI debt with state revenue bonds has become increasingly popular among states. Eight states sold bonds in recent years to finance UI debt (Arizona, Colorado, Idaho, Illinois, Michigan, Nevada, Pennsylvania, and Texas). For example, in late 2011, Michigan repaid its \$3.2 billion UI debt to

the U.S. Treasury by raising money through a bond sale. At the time, Title XII loans were charging 2.94 percent, whereas the Michigan bonds were sold at an effective rate of 0.24 percent. This strategy was expected save Michigan close to \$150 million over the term of the debt. Michigan's remaining debt in private markets (including principal and interest) totaled \$821.3 million as of fiscal year ending date September 30, 2018, with the final repayment of those bonds not expected until 2021. Pennsylvania's outstanding debt including future interest payments was nearly \$1.1 billion as of June 30, 2018, with final repayment expected in 2022 (Commonwealth of Pennsylvania 2018). The bonding process is a good financial strategy when municipal bond rates are lower than interest charges by the U.S. Treasury for UI borrowing, but revenue bonds add taxes that are general obligations outside the usual employer-financed UI system and can delay repayment, thereby weakening the countercyclical feature of UI forward funding.

REDUCTIONS IN BENEFIT GENEROSITY

In the years following the Great Recession, many states made program changes to improve their UI reserve positions. Since it is particularly important in simulating the UI financing consequences of future recessions, we closely examine the 10 states that cut UI benefit generosity since 2010 (Table 1). The 2008 Emergency Unemployment Compensation (EUC) program that provided federally funded extensions of benefit durations prohibited cuts in weekly benefit amounts for states wanting federally paid EUC available for exhaustees of regular UI. However, EUC did not address the potential duration of benefits. Nine states limited benefit reductions to shortening potential durations only. However, North Carolina both shortened potential duration and reduced the maximum weekly benefit amount from a formula-based \$504 to a fixed \$350, which will remain in effect until further legislative action. This reduction in

maximum benefits, effective July 1, 2013, ended federal EUC payments to more than 70,000 North Carolina UI beneficiaries and prevented others from receiving federally paid EUC through the end of 2013.

Table 1 Reserve Positions on December 31, 2018, of States that Reduced Maximum Duration of UI Benefits to Fewer than 26 Weeks Since 2011

State	Net reserve position (\$000s)				Avg recession peak-to-trough change ^a
	Net reserves 2010	Net reserves 2018	Taxable wages 2018	Reserve ratio 2018	
Arkansas	-279,053	742,675	11,342,908	6.55	-2.80
Florida	-1,854,444	3,872,081	65,752,041	5.89	-2.48
Georgia	-512,613	2,199,750	42,761,848	5.14	-2.89
Idaho	-96,997	654,766	16,068,015	4.07	-1.77
Illinois ^b	-2,374,242	1,923,563	68,406,823	2.81	-5.96
Kansas	-44,715	825,504	22,574,773	3.66	-1.66
Michigan ^c	-3,522,379	4,210,290	37,541,863	11.21	-8.40
Missouri	-703,580	942,973	29,854,246	3.16	-3.28
North Carolina	-2,282,946	3,592,731	76,611,951	4.69	-2.88
South Carolina	-879,672	919,712	25,389,375	3.62	-4.19
Total above states	-12,550,641	19,884,045	396,303,843	5.02	-3.63
All other states	-18,162,982	46,607,120	1,305,318,802	3.57	-3.06
All states	-30,713,623	66,491,165	1,701,622,645	3.91	-3.17

^a Recessions include 2008–09, 2001–02, 1991–92, 1980–83 and 1974–75. For these five recessions, the peaks in business activity prior to the recession are designated as 2007, 2000, 1990, 1979 and 1973. After these peak years, for each state, we searched for the minimum net reserve balance and used that value to define the funding trough. For each of the five recessions, the change in the reserve ratio is calculated by taking the change in the net reserve balance from peak-to-trough and dividing by peak-year taxable wages. These five values are then averaged.

^b Illinois shortened potential duration to a uniform 25 weeks in 2012 but restored the maximum to 26 the following year. Illinois shortened duration to a uniform 24 weeks for 2019.

^c Net reserves for 2018 do not reflect the outstanding Michigan bond debt of \$821.3 million on December 31, 2018. SOURCE: USDOL (2019b) and authors' computations.

Effective in January 2012, Michigan permanently cut the maximum duration of regular UI benefits from 26 to 20 weeks. Arkansas, Missouri, and South Carolina also cut potential UI duration to a maximum of 20 weeks. Illinois shortened potential duration to 25 weeks for the year 2012 only and returned the maximum to 26 weeks in 2013, but has since reduced the maximum to 24 weeks. New laws in Florida, Georgia, Kansas, and North Carolina established rules to vary the maximum potential duration of UI benefits directly with the level of unemployment. Effective July 1, 2012, Georgia cut the maximum duration of benefits from 26

weeks to a range of 14 and 20 weeks, with potential duration longer for a higher unemployment rate.

Florida adopted a similar variable maximum approach, with the potential duration falling to as few as 12 weeks if the unemployment rate is at or below 5 percent. Each 0.5 percentage-point increase above 5 percent adds one week to the maximum potential UI benefit duration in Florida, which peaks at 23 weeks for unemployment rates at or above 10.5 percent. In 2013, North Carolina set the maximum duration range to be 12 to 20 weeks, and in 2016, Kansas adopted a variable potential duration ranging from 16 to 26 weeks.

States may have cut durations to reduce future obligations to pay benefits, and states might have been emboldened because of an expectation that federal extensions of benefits would be forthcoming in high unemployment periods (O’Leary 2013). The federally funded extensions of UI in the Great Recession yielded potential durations of at least 39 weeks at times in all states and up to 99 weeks in some states. Cuts in the maximum potential duration of regular state UI benefits could also have been motivated by concerns that excessive durations in the recession reduced incentives for return to work. However, there is research evidence that work disincentives from longer benefit durations are weak in recession periods (Schmieder, von Wachter, and Bender 2012). Furthermore, evidence from several studies of reducing potential UI duration suggest only a small increase in reemployment rates from shortening potential durations of unemployment benefits. Among eight studies reviewed, the mean estimated nonemployment increase to longer duration is about 10 percent (Filges, Jonassen, and Jørgensen 2018).

Table 1 summarizes the year-end 2018 net reserve balances of the 10 states that lowered their maximum potential durations of UI from 26 weeks.⁸ Florida reserves were \$1.9 billion in

⁸ This table does not account for state sales of revenue bonds to finance UI debt; only Title XII loans are figured into the balances listed.

debt before recovering to a \$3.9 billion surplus by the end of 2018. Georgia's net reserves were \$513 million in debt in 2010 but recovered to a \$2.2 billion surplus by the end of 2018. Michigan reserves were \$3.5 billion in debt in 2010 and have recovered substantially, to a positive \$4.2 billion on deposit at the U.S. Treasury, with bond debt of \$821 million remaining so that reserves actually were \$3.4 billion at the end of 2018. Despite the 2018 year-end reserve positions listed in Table 1, our simulations suggest that 2 of the 10 states (Illinois and South Carolina) still do not have reserve positions sufficient to survive an "average" recession without borrowing.

In terms of recovering from the Great Recession, the benefit-cutting states have returned to better reserve positions with a weighted average reserve ratio just over 5.02, while the remaining states averaged reserves of 3.57 percent of taxable wages at year end 2018. Our financing simulations reported below suggest that shortening potential UI durations generally improves state reserve positions, but the cuts do not entirely eliminate the likelihood of borrowing in future recessions. Nonetheless, shortening potential durations certainly reduces the adequacy of income replacement to unemployed workers and their households, thereby reducing the countercyclical strength of spending spurred by UI.

There are no federal conformity standards for weekly benefit amounts or potential duration of UI. However, the Advisory Council on Unemployment Compensation (1996, p. 22) enunciated accepted benefit standards, stipulating that "each state should replace at least 50 percent of lost earnings over a six-month period [26 weeks], with a maximum weekly benefit amount equal to two-thirds of the state's average weekly wages." It is important to note that states cutting benefits may have even weaker countercyclical systems because the duration of EUC type benefits have historically been provided in proportion to the potential duration of

regular state UI benefits.⁹ The North Carolina cuts in potential duration and maximum weekly benefit amount are estimated to have reduced the countercyclical strength of the state system by two-thirds (O’Leary 2013).

SIMULATING IMPACTS OF RECESSIONS ON UI RESERVES

Simulations of state UI reserve balances in mild, moderate, and severe recessions are based on histories from recessions in 2008–2009, 2001–2002, 1991–1992, 1980–1983, and 1974–1975. For these five recessions, the preceding peaks in business activity were designated as 2007, 2000, 1990, 1979, and 1973, respectively. After the peaks, we search for the minimum net reserve balance for each state and use that to define the trough reserve level following a recession. The length of time from peak to trough differs across states and reflects experience-rating features in state UI tax law, as well as variation in the timing and impacts of declining economic conditions. For each of the five recessions, the change in reserve ratio is calculated as the difference in net reserve balance from peak to trough divided by peak-year taxable wages. The dip in reserve ratio for an “average” recession is computed as the peak-to-trough drop in reserve ratio averaged over all five historical periods. For simulations, we define the dip for a “mild” recession as the average drop during the 2001–2002 and 1991–1992 recessions, and the dip for a “severe” recession as the average over the 2008–2009, 1980–1983, and 1974–1975 recessions. Our simulations of a near term future recession start with the official net reserve

⁹ Many states vary potential UI duration across individual beneficiaries based on their prior recent earnings. EUC for individuals with potential durations less than the state maximum is available in proportion to their actual completed duration at the time of exhausting regular benefits.

balances for each state at the end of 2018, after deducting any outstanding bond debt. The simulations examine reserves as a fraction of taxable wages.

Simulating Regular UI Benefits under Shorter Potential Durations

Five states adopted shorter fixed potential durations, while five chose to have variable potential durations. Our simulations were calibrated using micro data for one state from each of the two groups. For the group that reduced to a fixed potential duration, we used Michigan UI administrative data, and for the states that switched to a variable potential duration we used Georgia data. The Michigan data begin in January 2001, while the Georgia data begin in January 1996. Both series end in December 2010.¹⁰

Fixed potential duration states

Available Michigan data span the relatively mild 2001–2003 recession and the severe 2007–2009 recession. To include some data from recovery periods the mild simulation used Michigan data from 2001 to 2006, with the year 2000 assumed to be the year preceding peak expansion in Michigan and in all states simulated. The business cycle trough year is set for each state depending on the state’s UI reserve balance. By this measure, in Michigan the trough in reserves did not occur until 2006. For Michigan, the computations for the severe recession are based on data from 2007 (the assumed peak business cycle year for all states) through 2010 (the last available data).

To simulate the effects of the shorter potential UI duration in either mild or severe recessions we first sum the actual regular UI compensation received across all regular UI

¹⁰ Full benefit year data are incomplete for UI applicants in the last few months of 2010. Therefore, the Georgia analysis uses regular UI beneficiaries whose benefit year begin date is in September 2010 or earlier. For Michigan, the benefit year must have begun in August 2010 or earlier, as defined by the benefit year begin date.

Table 2 Summary of the Methodology for Estimating the Percentage Reduction in Regular UI Benefit Costs during Recession

State	Recession type		
	Mild	Average	Severe
Initial estimates (% change)			
20 weeks (MI, MO, SC)	-11.7	-13.6	-14.9
16 weeks (AR)	-23.2	-26.0	-27.8
24 Weeks (IL)	-3.2	-3.9	-4.4
Peak-to-trough actual duration (weeks)			
Arkansas	13.2	13.3	13.4
Illinois	17.9	18.1	18.2
Michigan	14.3	15.3	16.0
Missouri	15.0	14.7	14.4
South Carolina	12.8	12.7	12.7
Peak-to-trough potential duration (weeks)			
Arkansas	23.2	22.9	22.8
Illinois	26.0	25.8	25.7
Michigan	23.5	23.6	23.7
Missouri	22.6	22.4	22.3
South Carolina	23.0	23.2	23.3
Ratio of actual-to-potential			
Arkansas	0.570	0.580	0.587
Illinois	0.688	0.699	0.706
Michigan	0.608	0.649	0.676
Missouri	0.664	0.654	0.647
South Carolina	0.555	0.549	0.546
Ratio of actual-to-potential relative to Michigan			
Arkansas	0.937	0.894	0.868
Illinois	1.132	1.076	1.044
Michigan	1.000	1.000	1.000
Missouri	1.092	1.007	0.957
South Carolina	0.912	0.846	0.807
Final estimates (% change)			
Arkansas	-21.7	-23.2	-24.1
Illinois	-3.6	-4.2	-4.6
Michigan	-11.7	-13.6	-14.9
Missouri	-12.8	-13.7	-14.3
South Carolina	-10.7	-11.5	-12.0

NOTE: Based on Michigan micro data for states that lowered their maximum potential regular UI duration to a fixed number of weeks less than 26 after the Great Recession.

SOURCE: Authors' computations based on USDOL (2019b) and Michigan micro administrative UI data.

beneficiaries. Next, assuming no behavioral response to the shorter potential duration, we calculate an alternate estimate for each beneficiary's UI compensation that is limited by the reduced potential duration value (16, 20, or 24, depending on the state) multiplied by the

beneficiary's weekly benefit amount (WBA). If the beneficiary's actual regular UI compensation is less than the reduced potential duration multiplied by the WBA, that amount is used.

Otherwise, the value limited by 16, 20, or 24 times the WBA is used. These revised amounts are then summed across all regular UI beneficiaries and the percentage difference from the actual amount paid is calculated.

The first row of Table 2 shows the results of computations for 20 weeks potential duration using the Michigan administrative UI data. This computation suggests in the case of maximum potential duration changing from 26 to 20 weeks that Michigan UI beneficiaries would receive 11.7 percent less in UI compensation during a mild recessions and 14.9 percent less in a severe recession. Overall the simulated mean reduction in UI compensation paid during recession years was 13.6 percent for Michigan.¹¹ UI compensation reductions are considerably larger for the Arkansas case of 16 weeks maximum potential UI duration with declines of -23.2 and -27.8 during the mild and severe recessions, respectively (-26.0 percent on average). Given the more modest change to 24 weeks potential duration in Illinois, UI benefits paid decline -3.2 percent in a mild recession and -4.4 percent in a severe downturn (-3.9 percent on average).

The next step is to transfer these percentage change estimates based on the Michigan data to Arkansas, Illinois, Missouri, and South Carolina. We used state-specific information to compute the recession share of potential regular UI benefits used in each state. Data from the UI Financial Data Handbook (ETA 394, USDOL 2019) were used to calculate the average peak-to-trough values for actual and potential regular UI duration (Table 2). Next, the resulting actual-to-potential ratios for Arkansas, Illinois, Missouri and South Carolina relative to the ratio for

¹¹ Since the mild estimate will be used in simulations for two recessions (2001–2003 and 1991–1992) and the severe estimate for three recessions (2008–2009, 1980–1983 and 1974–1975), the mean is not the middle of the two values since the weights two-fifths mild and three-fifths severe.

Michigan were multiplied by the percentage reduction estimates to approximate the benefit payment impacts for each state.

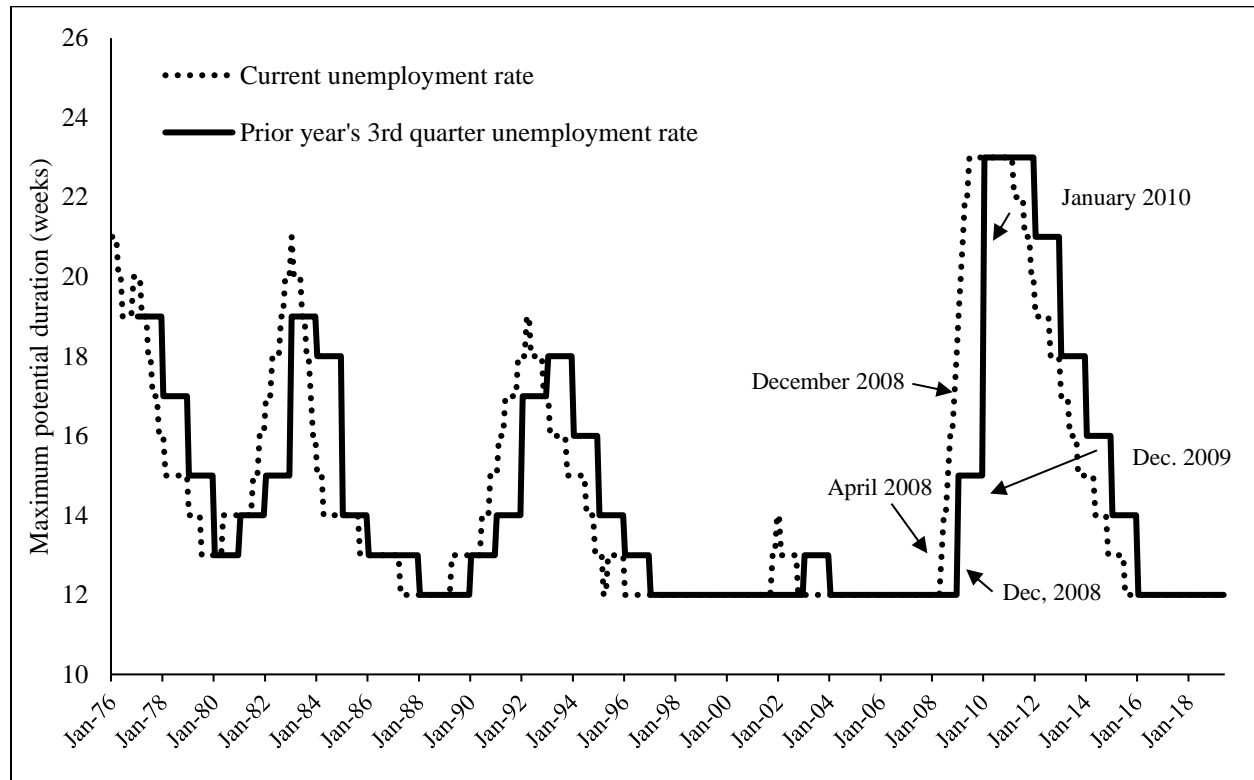
Variable potential duration states

Simulations for the reduction in regular UI benefit payments for the variable duration states of Florida, Georgia, Idaho, Kansas, and North Carolina are similar to the procedure for fixed duration states. The main refinement involves accounting for the state-specific rules for using state unemployment rates to set the potential duration of UI benefits.

Simulations used monthly unemployment data from USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics program and applied state UI statutory rules for the available Georgia data period from January 1996 to December 2010. The resulting potential UI durations for each of the four states over time were then applied to the Georgia micro data to produce UI benefit payment reduction estimates for each state in mild and severe recessions. Examples of translating unemployment rates into UI potential durations are given in Figure 3 for Florida and Figure 4 for Kansas.

Each graph shows how the potential UI duration values would have changed historically with respect to the two unemployment rate measures, had the variable potential UI duration laws been in effect before. The figures contrast the simulated potential UI durations based on the actual and the policy effective unemployment rates for 1976 through 2017. The graphs highlight some important facts about how the state laws translate unemployment rates into potential UI durations. First, there is a two-month lag in published Local Area Unemployment Statistics state rates. Second, because of the statutory rules for translating unemployment measures into potential UI durations, economic conditions may deteriorate or improve substantially before potential benefit duration changes are made.

Figure 3 Florida's Maximum Potential Duration of Regular UI based on the Current and Prior Year's Third-Quarter Monthly Average Unemployment Rate



SOURCE: Florida statute 443.111 and USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics: <https://data.bls.gov/cgi-bin/dsrv?la> monthly unemployment rate seasonally adjusted for Florida 1/31/1976 to 3/31/2019.

For example, the Florida rule summarized in Figure 3 uses the average monthly unemployment rate in the third quarter of the prior calendar year to determine potential UI duration for the full following calendar year beginning January 1.¹² In Florida the shortest potential UI duration is 12 weeks when the unemployment rate is at or below 5 percent. The potential duration increases by one week for each 0.5 percentage point increase in the unemployment rate. The potential duration reaches 23 weeks when the unemployment rate is 10.5 percent or higher. Under the Florida law, benefit durations do not adjust quickly enough to

¹² For Florida, see FL Stat § 443.111. <http://www.leg.state.fl.us>; for Georgia, see HB 347. www.legis.ga.gov; for Idaho, see HB 485, 2016 second regular session. <https://legislature.idaho.gov/sessioninfo/2016/legislation/>; for Kansas, see KS § 44-704 (2017). <http://www.kslegislature.org>; For North Carolina, see NC Stat § 96-14.2. www.ncleg.net.

changes in the degree of hardship faced by unemployed workers. For example, the three-month average unemployment rate for the third quarter of 2008 was 6.7 percent, so that rate would set the potential duration of regular UI for 2009 at 15 weeks. However, the labor market deteriorated rapidly thereafter, and Florida unemployment reached 11.2 percent in December 2009. The Florida UI statute would have set the 2010 potential UI duration at 23 weeks starting January 2010. The difference in potential duration for someone applying for UI in December 2009 and January 2010 would be 8 weeks or up to \$2,200 at the Florida maximum UI weekly benefit amount of \$275. This could induce strategic behavior to delay UI application, thereby slowing income transfers and the automatic stimulus to dampen a recession. Conversely, under improving economic conditions, it would be strategic to quickly apply for benefits, thus perhaps even inducing employer collusion to time layoffs.

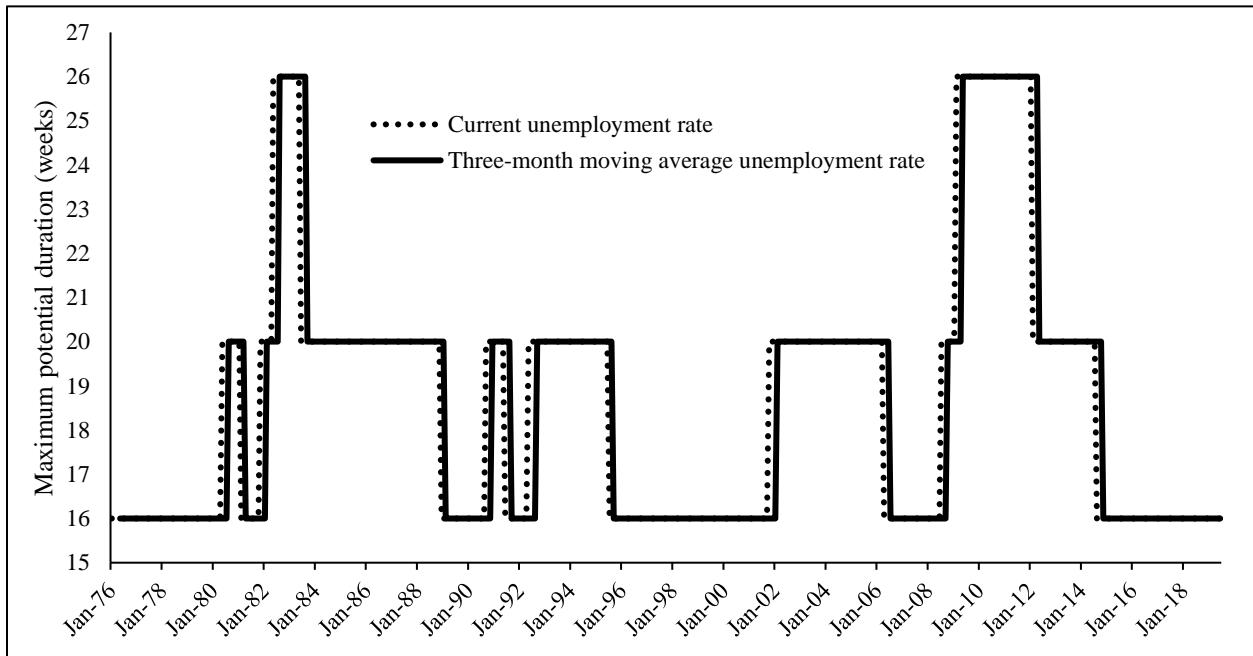
The other four states with variable potential durations have laws that result in shorter lags after unemployment rate changes. Both Georgia and North Carolina have laws that can reset their potential UI durations twice each year—in January and July.¹³ The seasonally adjusted unemployment rate in October determines the potential UI duration for the following January through June, and the April rate determines the potential UI duration for July through December. The statutes in Idaho and Kansas respond most quickly to unemployment rate changes. In Idaho, potential duration is reevaluated for each quarter. The Idaho unemployment rate from the prior November determines potential duration for the first quarter of the year and the rates from February, May, and August set maximum duration for the second, third, and fourth quarters, respectively.¹⁴ Kansas (Figure 4) uses the most recently available three-month average of

¹³ Graphs showing these systems are given in Appendix A as Figures A3 and A4 for Georgia and A9 and A10 for North Carolina.

¹⁴ Graphs applying the Idaho rules for setting potential UI duration are given in Appendix Figures A5 and A6.

seasonally adjusted unemployment rates. Graphically, the rapid Kansas adjustments can be seen in the small horizontal distance between curves representing a potential UI duration set based on the current month unemployment rate and one set using the average of the three preceding months.

Figure 4 Kansas’s Maximum Potential Duration of Regular UI based on the Current and Three-Month Moving Average Unemployment Rate



SOURCE: Kansas statute 44-704 (2017) and USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics: <https://data.bls.gov/cgi-bin/dsrv?la> monthly unemployment rate seasonally adjusted for Kansas 1/31/1976 to 3/31/2019.

Using the legal statutes and unemployment rate histories for each state, we calculated the potential UI durations and inserted those values into the Georgia micro data during the mild and severe recession periods observed. The resulting initial estimates of the percentage reductions in regular UI benefit outlays are reported in the first section of Table 3. Each of these estimates are computed on the micro data by the same method used for the fixed duration states—with payments to each beneficiary figured at or below the new simulated threshold. Each state’s initial percentage benefit reduction estimate was then multiplied by its peak-to-trough ratio of actual-to-

Table 3 Methodology for Estimating the Percentage Reductions in Regular UI Benefits in Recessions

State	Recession type		
	Mild	Average	Severe
Initial estimates (% change)			
Florida	-32.4	-26.8	-23.0
Georgia	-26.2	-21.6	-18.6
Idaho	-3.6	-2.6	-2.0
Kansas	-12.8	-9.1	-6.7
North Carolina	-28.0	-24.5	-22.1
Peak-to-trough actual duration (weeks)			
Florida	15.2	14.7	14.5
Georgia	11.6	11.6	11.5
Idaho	12.7	12.9	13.0
Kansas	14.5	14.4	14.4
North Carolina	11.2	11.8	12.1
Peak-to-trough potential duration (weeks)			
Florida	20.9	20.6	20.3
Georgia	21.2	20.3	19.8
Idaho	20.4	20.2	20.0
Kansas	23.2	23.0	22.8
North Carolina	23.3	23.3	23.3
Ratio of actual-to-potential			
Florida	0.726	0.717	0.711
Georgia	0.550	0.570	0.583
Idaho	0.622	0.637	0.647
Kansas	0.626	0.628	0.630
North Carolina	0.480	0.505	0.522
Ratio of actual-to-potential relative to Georgia			
Florida	1.319	1.259	1.219
Georgia	1.000	1.000	1.000
Idaho	1.130	1.118	1.109
Kansas	1.137	1.103	1.080
North Carolina	0.873	0.887	0.895
Final estimates (% change)			
Relative ratio times initial estimates			
Florida	-42.7	-33.7	-28.0
Georgia	-26.2	-21.6	-18.6
Idaho	-4.1	-3.0	-2.2
Kansas	-14.6	-10.1	-7.2
North Carolina	-24.4	-21.7	-19.8

NOTE: Based on Georgia micro data for states adopting a variable maximum potential duration less than 26 weeks based on the state unemployment rate.

SOURCE: Authors' computations based on USDOL (2019b), Georgia micro administrative UI data, and USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics: <https://data.bls.gov/cgi-bin/dsrv?la> unemployment rate seasonally adjusted.

potential duration relative to the same ratio for Georgia. The final estimates for percentage

benefit reductions in each state for mild or severe recessions were then applied to annual, UI

Financial Handbook (ETA 394) data on UI benefit and employer tax payments in each of the recessions in each state's relevant peak-to-trough interval.

Reductions in regular UI outlays due to shorter maximum entitlements mean that employer reserve positions would not deteriorate as much as actually occurred during the recessions when state statutes provided a 26-week potential duration. In turn, employer tax rates would not increase as much because of relatively smaller regular UI benefit charges. Unfortunately, our micro data are limited to UI applicants and UI benefit recipients, so we cannot simulate the impact of reduced benefit charges on employer tax rates. Given this limitation, we assume that employer tax payments decline by the same percentage as the reduction in regular UI benefit payments.¹⁵

The top row in the bottom panel of Table 4 shows the simulated improvement in UI reserves totaled across the 10 states due to their reduced UI benefit durations. Table 5 presents decompositions of the simulated changes in reserves by listing the simulated changes in recession period benefit payments and tax revenues. Since experience rating changes UI tax rates in direct relation to benefit payments, state UI tax revenues usually increase along with tax rates. As a first approximation, our simulations apply the same recession factors to benefits and taxes. Simulation results in Table 5 suggest that total recession benefits paid in the 10 benefit reduction states would fall by between \$6.1 and \$6.5 billion, with total tax revenues falling by between \$3.5 and \$3.7 billion during recessions. Certainly, UI tax-paying businesses will retain more

¹⁵ Summaries of changes in employer tax revenues and UI benefit payments from the accounting point-of-view for each state are found in Appendix Tables A1–A10. The tables summarize the changes for each of the five recessions used in the simulations. The first row for each recession is the expansion peak value for tax revenue and benefit costs that occurred just prior to the downturn. The peak years for each recession are assumed to be the same for each state in the simulations. The recession trough years will vary across states. The percentage changes are applied to each year after the peak through the trough. The year-to-year net change in each state's reserve balance is summed and that total added to their trough reserve balance that is used in the simulations. For most states and their recession experience, the values in Tables A1–A10 suggest net additions to trough reserve positions.

Table 4 Simulated Post-Recession UI Reserve Balances of States that Reduced Maximum Potential Durations of Regular UI Benefits after the Great Recession (\$000s)

	Mild recession	Average recession	Severe recession
Unadjusted for entitlement changes (\$1,000)			
Total value at trough	9,359,999	3,738,933	-8,445
Arkansas	559,948	424,868	334,815
Florida	2,880,108	2,242,217	1,816,956
Georgia	1,281,930	964,763	753,318
Idaho	455,164	369,956	313,150
Illinois	-463,182	-2,154,326	-3,281,755
Kansas	559,614	451,281	379,059
Michigan	1,623,501	236,362	-688,397
Missouri	-29,048	-36,701	-41,803
North Carolina	2,208,093	1,383,857	834,366
South Carolina	283,870	-143,344	-428,153
Adjusted for entitlement changes (\$1,000)			
Total value at trough	11,926,105	6,434,591	2,773,582
Arkansas	616,639	505,764	431,848
Florida	3,644,756	2,897,204	2,398,836
Georgia	1,645,354	1,311,465	1,088,872
Idaho	469,429	380,828	321,761
Illinois	-358,707	-1,979,937	-3,060,756
Kansas	666,387	514,507	413,254
Michigan	1,854,814	639,966	-169,933
Missouri	117,487	101,783	91,313
North Carolina	2,897,358	2,067,077	1,513,557
South Carolina	372,588	-4,066	-255,169
Difference in reserve position (\$1,000)			
Total value at trough	2,566,107	2,695,659	2,782,027
Arkansas	56,691	80,896	97,033
Florida	764,648	654,988	581,881
Georgia	363,424	346,702	335,554
Idaho	14,266	10,873	8,611
Illinois	104,475	174,389	220,999
Kansas	106,773	63,226	34,195
Michigan	231,313	403,603	518,464
Missouri	146,535	138,484	133,116
North Carolina	689,265	683,220	679,191
South Carolina	88,718	139,277	172,984

NOTE: Assuming 2018 are peak reserve levels with and without adjustment for reduced potential duration.

SOURCE: Authors' computations based on USDOL (2019b) and Georgia and Michigan micro administrative data.

Table 5 Simulated Recession Effects on UI Benefit Payments and UI Tax Revenues of States that Reduced Potential Durations of Regular UI Benefits after the Great Recession (\$000s)

	Benefit payments reduction	Tax revenues reduction	Net reserves increase
Mild recession	6,086,424	3,520,317	2,566,107
Arkansas	187,359	130,668	56,691
Florida	1,577,290	812,642	764,648
Georgia	588,666	225,243	363,423
Idaho	39,649	25,383	14,266
Illinois	248,916	144,442	104,475
Kansas	350,373	243,601	106,773
Michigan	727,193	495,880	231,313
Missouri	382,778	236,242	146,535
North Carolina	1,783,810	1,094,545	689,266
South Carolina	200,389	111,671	88,718
Average recession	6,344,014	3,648,353	2,695,661
Arkansas	247,305	166,410	80,895
Florida	1,331,906	676,918	654,988
Georgia	707,313	360,611	346,702
Idaho	33,050	22,178	10,872
Illinois	434,550	260,160	174,390
Kansas	221,578	158,350	63,227
Michigan	1,018,075	614,471	403,604
Missouri	409,359	270,875	138,484
North Carolina	1,642,853	959,633	683,220
South Carolina	298,024	158,747	139,278
Severe recession	6,515,740	3,733,710	2,782,030
Arkansas	287,270	190,238	97,032
Florida	1,168,316	586,435	581,882
Georgia	786,411	450,856	335,555
Idaho	28,651	20,041	8,610
Illinois	558,306	337,306	221,000
Kansas	135,714	101,517	34,197
Michigan	1,211,996	693,531	518,465
Missouri	427,080	293,963	133,117
North Carolina	1,548,881	869,692	679,189
South Carolina	363,115	190,130	172,984

NOTE: Assuming 2018 are peak reserve levels.

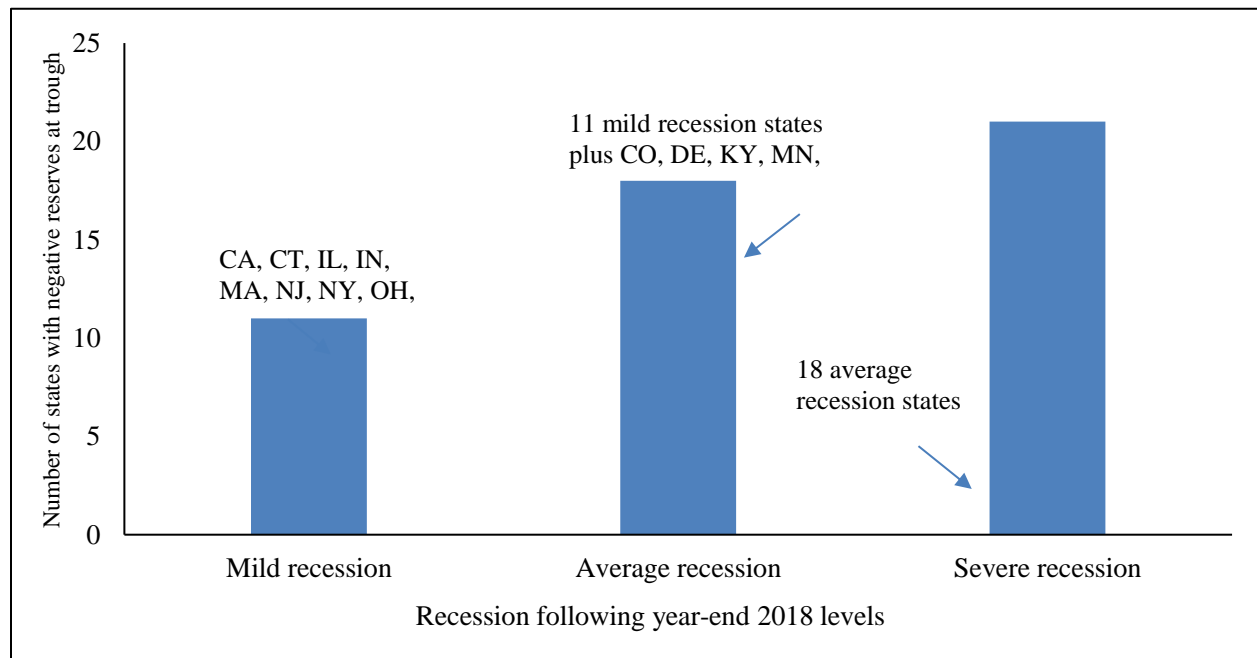
SOURCE: Authors' computations based on USDOL (2019b) and Georgia and Michigan micro administrative data.

money to invest and spend in other ways during recessions, but these amounts will be eclipsed by the reduction in recession period consumer spending because of the larger reduction in UI benefit payments. There is also a larger income multiplier for changes in UI benefits than for

changes in business taxes.¹⁶ So, the depressing impact on economic activity is likely to be larger. Our simulations of benefit reductions provided first order estimates. Using the USDOL Benefit Financing Model simulations of the North Carolina cuts in benefit durations and amounts suggests that the UI benefit payments in a future recession will be about one-third what they would be absent the cuts (O’Leary and Van Erden 2012).

Graphic summaries of our simulation results for all 53 UI programs are given in Figures 5 and 6. Figure 5 summarizes the number of states that experience negative net reserves if a mild, moderate, or severe recession started in 2019. The simulations suggest that 11, 18, and 21 states would have negative net reserves, respectively, if a recession starting in 2019 were mild,

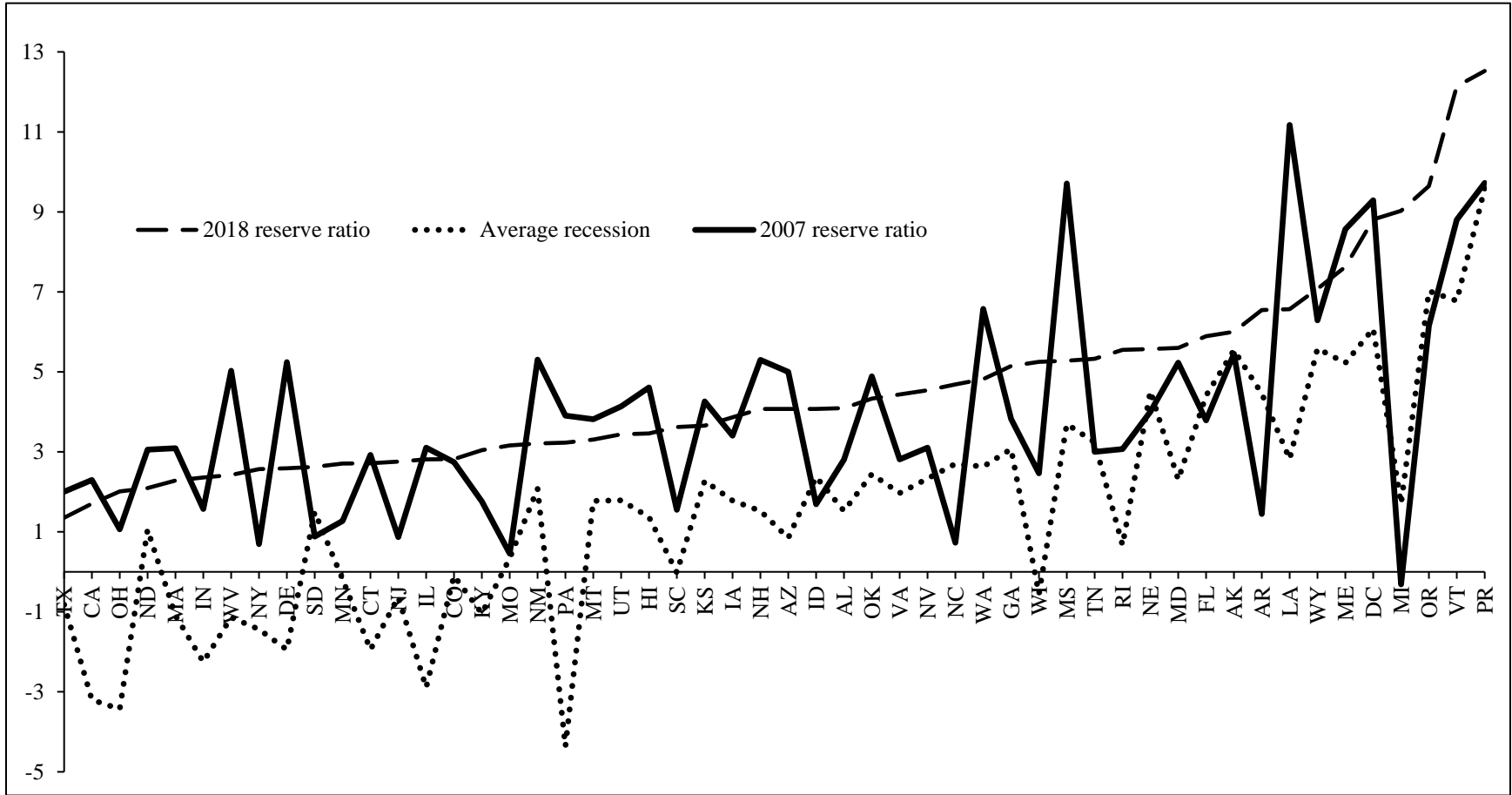
Figure 5 Numbers of States that Would Have Negative Reserves at the Simulated Recession Trough if a Mild, Average, or Severe Recession Followed the Peak Defined as the Observed 2018 Reserve Levels



SOURCE: Results of authors’ computations using sources summarized in Tables 6 and 7.

¹⁶ Chimerine, Black, and Coffey (1999) estimate the UI benefit multiplier on income to be about 2.5, largely because unemployed workers spend every penny of UI on goods and services. Business do not necessarily spend every dollar retained from tax reductions on new goods and services, so the tax reduction income multiplier is much smaller (Auerback 2018).

Figure 6 Net Reserve Ratio for 2018 for State UI Programs (except Virgin Islands), their 2007 Reserve Ratio and their Simulated Trough Values If an “Average” Recession Occurs from the 2018 Level



NOTE: Virgin Islands with a reserve ratio of -17.61 for an average recession is excluded to improve the display for other states.
 SOURCE: Authors' computations based on USDOL (2019b) and Georgia and Michigan micro administrative data.

moderate, or severe. At the end of 2010, the worst year for state UI reserves during the Great Recession, a total of 30 states had negative net reserve ratios. Our simulation suggests that 21 states are at risk of exhausting UI reserves if another severe recession occurs.

Figure 6 arrays states from lowest to highest net reserve ratio on taxable wages at year end for 2018, as represented by the dashed curve. The solid curve shows the pre–Great Recession reserve ratio peak for each state in 2007, and the dotted curve represents the simulated trough reserve ratio for each state should an average recession commence in 2019. Just 30 states are currently at or above their 2007 reserve ratio levels. Under mild or average recession scenarios, the overall UI system is sufficiently funded, but an average recession would require 18 states to borrow to pay UI benefits with combined debt estimated at \$15.3 billion. Reserve balances for each state, currently and under simulated recession scenarios, are listed in Table 6, with associated reserve ratios listed in Table 7.¹⁷ Rows for states in both of these tables are sorted from lowest to highest UI reserve ratio at year end 2018.

STATE RESPONSES TO THE GREAT RECESSION

How did state UI reserve positions get to where they are today? A standard measure of UI reserve adequacy is the high cost multiple (HCM). It is the number of years of recession level benefits in the state UI reserve account based on the highest 12-month benefit payout rate in history. The average high cost multiple (AHCM) is a HCM based on the average benefit experience in the three highest payout rate years in the past 20. For many states, the three biggest recent payout years are now 2009, 2010, and 2011. The USDOL has recommended that states

¹⁷ Virgin Islands is excluded from Figure 6 because, as reported in Table 7, the simulated Virgin Islands reserve ratio for an average recession of -17.61 would compress display of reserve ratios for the other 52 state programs.

Table 6 Net Reserve Position of the States and Territories (adjusted for bond debt) for 2018 and Simulated Trough Values Should a Recession Occur from That 2018 Level

State	Net reserve ratio for 2018	Net reserves adjusted for bond debt	Simulated trough reserves		
			Mild recession	Average recession	Severe recession
Overall	3.79	64,575,761	25,551,982	7,965,482	-3,762,425
Virgin Islands	-12.47	-68,329	-85,767	-96,487	-107,208
Texas	1.35	1,542,291	-24,076	-931,809	-1,536,965
California	1.70	2,231,396	-3,777,806	-4,196,086	-4,474,939
Ohio	2.01	943,446	-214,234	-1,610,290	-2,540,994
North Dakota	2.09	197,995	132,219	99,793	78,176
Massachusetts	2.28	1,212,906	-1,343,921	-578,836	-68,780
Indiana	2.36	653,186	-126,651	-624,095	-955,725
West Virginia	2.42	169,934	143,463	-80,002	-228,979
New York	2.57	2,373,468	-1,490,692	-1,330,832	-1,224,259
Delaware	2.59	153,175	8,664	-115,242	-197,845
South Dakota	2.62	127,711	91,924	72,800	60,050
Minnesota	2.71	1,645,875	556,508	-111,435	-556,730
Connecticut	2.72	568,773	-365,149	-407,602	-435,905
New Jersey	2.75	2,599,598	-464,457	-594,603	-681,367
Illinois	2.81	1,923,563	-358,707	-1,979,937	-3,060,756
Colorado	2.82	964,545	423,754	-33,999	-339,168
Kentucky	3.04	540,208	178,310	-184,487	-426,351
Missouri	3.16	942,973	117,487	101,783	91,313
New Mexico	3.21	454,730	478,256	294,633	172,218
Pennsylvania	3.23	1,684,431	-522,055	-2,277,565	-3,447,905
Montana	3.31	348,527	350,469	187,421	78,722
Utah	3.44	1,129,574	925,366	587,859	362,854
Hawaii	3.46	555,477	292,274	219,949	171,732
South Carolina	3.62	919,712	372,588	-4,066	-255,169
Kansas	3.66	825,504	666,387	514,507	413,254
Iowa	3.86	1,188,972	1,088,560	548,294	188,116
New Hampshire	4.07	311,354	158,323	116,786	89,094
Arizona	4.07	871,051	507,727	181,328	-36,272
Idaho	4.07	654,766	469,429	380,828	321,761
Alabama	4.10	631,051	394,303	235,206	129,141
Oklahoma	4.33	1,074,345	876,103	605,468	425,044
Virginia	4.43	1,323,663	636,634	588,479	556,375
Nevada	4.54	1,488,685	1,117,273	763,946	528,395
North Carolina	4.69	3,592,731	2,897,358	2,067,077	1,513,557
Washington	4.82	4,609,820	2,874,050	2,521,441	2,286,368
Georgia	5.14	2,199,750	1,645,354	1,311,465	1,088,872
Wisconsin	5.25	1,740,206	918,369	-183,659	-918,344
Mississippi	5.28	685,887	592,460	480,441	405,762
Tennessee	5.33	1,175,137	880,410	713,611	602,412
Rhode Island	5.55	450,962	184,390	54,275	-32,468
Nebraska	5.57	441,800	408,289	358,482	325,277
Maryland	5.60	1,191,203	685,876	490,728	360,629
Florida	5.89	3,872,081	3,644,756	2,897,204	2,398,836
Alaska	6.01	471,314	398,277	434,981	459,451
Arkansas	6.55	742,675	616,639	505,764	431,848
Louisiana	6.57	982,344	969,666	421,312	55,743
Wyoming	7.08	338,063	352,214	266,894	210,014
Maine	7.63	465,423	355,512	318,609	294,007
District of Columbia	8.81	475,988	411,772	328,477	272,947
Michigan	9.03	3,388,990	1,854,814	639,966	-169,933
Oregon	9.65	4,486,683	3,810,954	3,266,013	2,902,719
Vermont	12.14	464,156	323,106	258,898	216,093
Puerto Rico	12.52	615,992	515,209	471,798	442,858

SOURCE: Authors' computations based on USDOL (2019b) and Georgia and Michigan micro administrative data.

Table 7 Reserve Position of the States and Territories (adjusted for bond debt) for 2018 and Simulated Reserve Ratio Trough Values Should a Recession Occur from That Level

	Taxable wages for 2018	Reserve ratio for 2018	Simulated trough values		
			Mild recession	Average recession	Severe recession
Overall	1,701,622,645	3.79	1.50	0.47	-0.22
Virgin Islands	547,934	-12.47	-15.65	-17.61	-19.57
Texas	113,991,245	1.35	-0.02	-0.82	-1.35
California	131,098,991	1.70	-2.88	-3.20	-3.41
Ohio	46,987,742	2.01	-0.46	-3.43	-5.41
North Dakota	9,459,147	2.09	1.40	1.05	0.83
Massachusetts	53,166,868	2.28	-2.53	-1.09	-0.13
Indiana	27,665,692	2.36	-0.46	-2.26	-3.45
West Virginia	7,012,698	2.42	2.05	-1.14	-3.27
New York	92,468,676	2.57	-1.61	-1.44	-1.32
Delaware	5,917,937	2.59	0.15	-1.95	-3.34
South Dakota	4,871,193	2.62	1.89	1.49	1.23
Minnesota	60,763,846	2.71	0.92	-0.18	-0.92
Connecticut	20,939,189	2.72	-1.74	-1.95	-2.08
New Jersey	94,371,102	2.75	-0.49	-0.63	-0.72
Illinois	68,406,823	2.81	-0.52	-2.89	-4.47
Colorado	34,208,396	2.82	1.24	-0.10	-0.99
Kentucky	17,777,369	3.04	1.00	-1.04	-2.40
Missouri	29,854,246	3.16	0.39	0.34	0.31
New Mexico	14,174,339	3.21	3.37	2.08	1.21
Pennsylvania	52,176,590	3.23	-1.00	-4.37	-6.61
Montana	10,542,965	3.31	3.32	1.78	0.75
Utah	32,843,503	3.44	2.82	1.79	1.10
Hawaii	16,046,353	3.46	1.82	1.37	1.07
South Carolina	25,389,375	3.62	1.47	-0.02	-1.01
Kansas	22,574,773	3.66	2.95	2.28	1.83
Iowa	30,781,262	3.86	3.54	1.78	0.61
New Hampshire	7,649,841	4.07	2.07	1.53	1.16
Arizona	21,396,188	4.07	2.37	0.85	-0.17
Idaho	16,068,015	4.07	2.92	2.37	2.00
Alabama	15,408,153	4.10	2.56	1.53	0.84
Oklahoma	24,790,312	4.33	3.53	2.44	1.71
Virginia	29,850,771	4.43	2.13	1.97	1.86
Nevada	32,798,437	4.54	3.41	2.33	1.61
North Carolina	76,611,951	4.69	3.78	2.70	1.98
Washington	95,724,903	4.82	3.00	2.63	2.39
Georgia	42,761,848	5.14	3.85	3.07	2.55
Wisconsin	33,144,616	5.25	2.77	-0.55	-2.77
Mississippi	12,992,246	5.28	4.56	3.70	3.12
Tennessee	22,067,371	5.33	3.99	3.23	2.73
Rhode Island	8,127,262	5.55	2.27	0.67	-0.40
Nebraska	7,934,583	5.57	5.15	4.52	4.10
Maryland	21,269,908	5.60	3.22	2.31	1.70
Florida	65,752,041	5.89	5.54	4.41	3.65
Alaska	7,847,939	6.01	5.07	5.54	5.85
Arkansas	11,342,908	6.55	5.44	4.46	3.81
Louisiana	14,961,482	6.57	6.48	2.82	0.37
Wyoming	4,777,926	7.08	7.37	5.59	4.40
Maine	6,102,430	7.63	5.83	5.22	4.82
District of Columbia	5,402,305	8.81	7.62	6.08	5.05
Michigan	37,541,863	9.03	4.94	1.70	-0.45
Oregon	46,517,819	9.65	8.19	7.02	6.24
Vermont	3,822,377	12.14	8.45	6.77	5.65
Puerto Rico	4,918,896	12.52	10.47	9.59	9.00

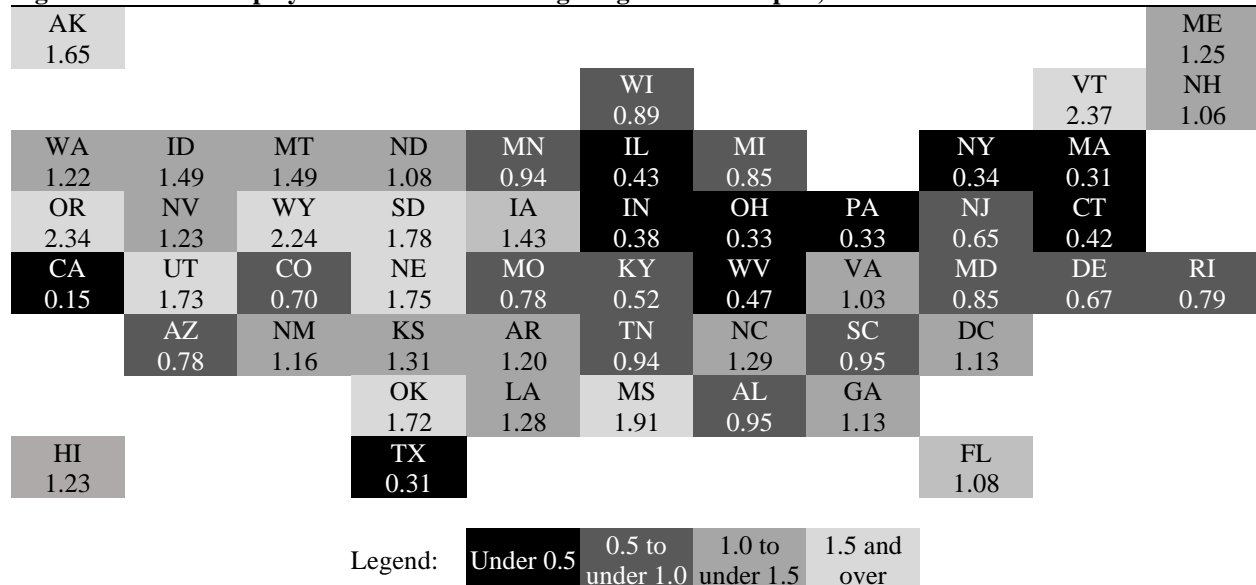
SOURCE: Authors' computations based on USDOL (2019b) and Georgia and Michigan micro administrative data.

have an AHCM of at least one. That is, at least one year of recession level benefits in reserve. Figure 7 is a graphic representation of 2018 ACHMs for state UI programs at the end of 2018.

STATE RESPONSES TO THE GREAT RECESSION

How did state UI reserve positions get to where they are today? A standard measure of UI reserve adequacy is the high cost multiple (HCM). It is the number of years of recession level benefits in the state UI reserve account based on the highest 12-month benefit payout rate in history. The average high cost multiple (AHCM) is a HCM based on the average benefit experience in the three highest payout rate years in the past 20. For many states, the three biggest recent payout years are now 2009, 2010, and 2011. The USDOL has recommended that states have an AHCM of at least one. That is, at least one year of recession level benefits in reserve. Figure 7 is a graphic representation of 2018 ACHMs for state UI programs at the end of 2018.

Figure 7 State Unemployment Insurance Average High Cost Multiples, 2018



SOURCE: USDOL (2019b).

The pattern of state UI reserve sufficiency displayed in Figure 7 shows the geographic distribution of preparedness among states for paying UI benefits in the next recession. The pattern is influenced somewhat by the regional impacts of the Great Recession, but it is more a reflection of the UI policy actions taken by states since 2010. Table 8 provides a summary of six groupings of state UI financing policies since the Great Recession. The groupings of states are ordered from left to right by policy actions that least helped state UI reserves to those that most improved UI reserves. States are listed in the rows of the table from least prepared at the top to best prepared at the bottom in terms of their 2018 year-end AHCM values. The rows are grouped into four bands of reserve adequacy, with the top group including states having AHCM values less than 0.5, or less than six months of recession level benefits in reserve. The next band is $0.5 \leq \text{AHCM} < 1.0$, then $1.0 \leq \text{AHCM} < 1.5$, and the bottom group being $1.5 \leq \text{AHCM}$.

FUTA Credit Reduction

The three columns on the left of Table 8 include the group of states that passively dealt with UI debt from the Great Recession through state inaction. All the states listed in this group go smaller than normal federal FUTA credit reductions. Employers in states with UI laws in conformity with federal requirements pay a FUTA tax rate that is reduced 90 percent from the statutory 6.0 percent rate. That means a FUTA tax rate of 0.6 percent on the first \$7,000 of annual earnings paid to each employee. FUTA taxes normally pay for federal and state program administration, the federal share of the permanent extended benefits program, loans to states with insufficient reserves, and reemployment services. When states owe money to the U.S. Treasury from UI loans on January 1 in two consecutive years and fail to repay those debts in full by November 10 of the second year, then the FUTA tax reduction is cut by five percentage points

Table 8 States by 2018 Average High Cost Multiple and Policy Responses to UI Reserve Deficiency from the Great Recession

FUTA credit reductions		Override laws		Issued bonds		Reduced durations		Financing reforms		Let UI law work	
State	AHCM	State	AHCM	State	AHCM	State	AHCM	State	AHCM	State	AHCM
CA	0.15	MA	0.31	TX	0.31						
OH	0.33	OH	0.33								
NY	0.34			PA	0.33						
IN	0.38										
CT	0.42			IL	0.43	IL	0.43	WV	0.47		
KY	0.52										
NJ	0.65	NJ	0.65								
DE	0.67							DE	0.67		
				CO	0.70			CO	0.70		
MO	0.78			AZ	0.78	MO	0.78				
RI	0.79	MI	0.85	MI	0.85	MI	0.85	RI	0.79	MD	0.85
WI	0.89									WI	0.89
MN	0.94							TN	0.94	MN	0.94
								SC	0.95	AL	0.95
										VA	1.03
FL	1.08	FL	1.08			FL	1.08	NH	1.06	DC	1.13
GA	1.13	GA	1.13			GA	1.13	ND	1.08	NM	1.16
AR	1.20					AR	1.20	AR	1.20	HI	1.23
				NV	1.23			WA	1.22	ME	1.25
NC	1.29					NC	1.29	NC	1.29	LA	1.28
						KS	1.31	KS	1.31	IA	1.43
				ID	1.49	ID	1.49			MT	1.49
										AK	1.65
								OK	1.72	UT	1.73
								SD	1.78	NE	1.75
								MS	1.91	WY	2.24
								VT	2.37	OR	2.34
Mean	0.72		0.72		0.76		1.05		1.22		1.37
Median	0.73		0.75		0.74		1.11		1.14		1.25

NOTE: States are listed from lowest to highest value of the 2018 average high cost multiple (AHCM). The AHCM is the number of years of recession level benefits in the state UI reserve account at the U.S. Treasury based on the three highest UI benefit payment rates in the past 20 years.

SOURCE: Groupings of states are based on Vroman (2018). The state ACHM values are from USDOL (2019b).

that year with the penalty increasing by that same increment each year a debt remains

outstanding. The FUTA tax cut falls from 90, to 85, 80, 75 percent and so forth in consecutive years if outstanding debt remains on January 1. The FUTA tax payments made for rates in excess of 0.6 percent are applied to pay down the debt for the state borrowing.

Since 2009 a total of 25 state UI programs had FUTA credit reductions resulting from borrowing (USDOL 2019c). Because FUTA credit reduction was the main means of retiring debt for them, 16 of these states are listed in the first column of Table 8. This list includes many of the states with the lowest 2018 AHCM values.

Other states that also had FUTA credit reductions are listed among those issuing bonds to pay off debt: Pennsylvania, Illinois, Arizona, Michigan, and Nevada. Higher FUTA tax rates for these states quickly ended after proceeds from revenue bonds retired U.S. Treasury debt. South Carolina, Vermont, and Virginia each paid higher FUTA rates for only one year. The Virgin Islands territory is still paying a higher FUTA tax rate after annual increases since 2011. The majority of states listed in the first column of Table 8 also could have been listed in the right-most column as having let their systems work, but the bulk of loan repayment for states listed in column one came not from letting their own state UI financing systems work, but from the FUTA tax increases. Allowing FUTA credit reductions to repay U.S. Treasury debt was a passive response to a funding crisis for many states with inadequate UI financing systems. The FUTA credit reductions have a cliff effect. After building over years to a high level they fall to zero with reserves slow to rebuild afterward. These states need serious examination of their financing systems.

Override Laws

Many state benefit financing systems have preset reserve thresholds that trigger shifts up in the UI tax schedule to increase rates on all employers when reserves decline below specified levels. These automatic adjustments are intended to rebuild reserves. Six states listed in Table 8 overrode their state laws that would have increased employer UI tax rates because reserves had fallen. Presumably states took such actions to shield businesses from rate increases and

accommodate renewal early in the economic recovery, but several of these states failed to later take restorative action. These decisions delayed rebuilding reserves, and 4 of the 6 states still have deficient reserves below the recommended 1.0 AHCM that would permit zero-interest short-term borrowing from the UTF.

Issued Bonds

Eight states issued revenue bonds to generate money to pay UI benefits or pay off U.S. Treasury debt during or after the Great Recession. In this period municipal bond rates were below 0.25 percent while U.S. Treasury rates were nearly 3.0 percent. The bonding maneuver saved states in this instance, but it can be a risky strategy when interest rates are volatile. Furthermore, for many states bonding involves shifting employer debt to a general obligation of the state. Bonding can be part of a strategy to keep employer tax rates low, but special taxes are normally assessed to retire bond debt, and these taxes are in addition to employer UI taxes. Six of the bonding states listed have 2018 AHCM below the 1.0 level recommended. This posture suggests the intention to bond-finance UI benefits in future recessions. Indeed Texas, the bonding state with the lowest 2018 AHCM, immediately bond-financed benefits when UI reserves were exhausted, and Texas employers never faced higher FUTA tax rates from the Great Recession. Gradually rebuilding reserves during an economic expansion remains a more prudent strategy with better countercyclical effects.

Reduced Durations

Our reserve simulations account for the reductions in benefit durations introduced in 10 states. We explained the weaker countercyclical strength of these systems and how the mechanisms for setting variable potential durations could be improved. Four of the 10 states have 2018 AHCM below the 1.0 target level. That is, despite paying out fewer benefits, the UI

reserves for most of these states still have not recovered to a level sufficient for another recession. Several aspects of UI system reform should be considered by these states.

Active Finance Measures

In the wake of the Great Recession, 16 states listed in Table 8 undertook reforms to improve their UI benefit financing systems. Many increased their taxable wage bases, some reset reserve triggers for rate increases, and only 4 of these 16 states also cut benefit generosity. These 16 states are neither clustered in one region nor do they share industrial makeup. Policy actions for most of these states reflect an appreciation for the UI system in contributing to the viability and strength of their state workforces.

Let UI Law Work

The group of 17 states listed in the right columns of Table 8 simply let their UI financing systems work during and after the Great Recession. States in this group are clustered toward the bottom rows of the table reflecting higher 2018 AHCMs than most other states. What are the characteristics that make these state UI systems resilient? Nearly all of these states pay higher than average UI benefits, but all states in this group have financing systems that balance their benefit provisions. Balance between system financial inflows and outflows is essential.

Most state UI systems replace about 50 percent of prior weekly earnings up to a state maximum. The level of the state maximum weekly benefit determines the average wage replacement rate. Thirty-three states index their maximum weekly benefit amount by automatically resetting it annually as a proportion of average weekly wages in UI-covered

employment.¹⁸ Of these 33 states, 17 also index their state UI taxable wage bases to adjust annually.¹⁹ Among the 17 states that let their UI law work and did not revise things since the Great Recession, 10 states index both the benefit maximum and the taxable wage base, including 9 of the 11 states in this group with the highest 2018 AHCM values. Most of these states pay higher than average benefits, have higher than average taxable wage bases, and have tax rates that are responsive over a wide range to changes in UI benefit charges.

SUMMARY AND EXTENSIONS

Our simulation analysis suggests that current levels of UI reserves are not large enough in many states to avoid borrowing in the next recession. Indeed, the system as a whole will reach a net negative position if a severe recession should emerge in the coming months. While systemwide reserves are estimated to be sufficient for an average recession, 18 states would still rely on borrowing and would accumulate an estimated \$15.3 billion in debt. There is a structural imbalance between taxes and benefits in the system that has worsened in recent years. By accepted standards of adequacy, benefit levels and durations throughout the system are not excessive, but financing is inadequate in many states.

From a negative net reserve position in 2012, UI system net reserves recovered to \$64.6 billion by the end of 2018. However, a severe recession in the near future would generate a systemwide debt of \$3.8 billion resulting from 21 states accumulating an estimated \$21.7 billion

¹⁸ In the second quarter of 2019, average weekly wage in UI-covered employment was \$1,097 in the United States. Indexed maximum state UI weekly benefit amounts are commonly set between 50 and 67 percent of the state average weekly wage in UI-covered employment.

¹⁹ Indexed state UI taxable wage bases are usually set between 50 and 100 percent of average annual earnings in UI-covered employment. In July 2019 average annual earnings were nearly \$55,000 in UI-covered employment.

in new borrowing. During the Great Recession, systemwide indebtedness reached \$30.7 billion in 2010. At the end of 2018 total UI system reserves stood at 3.8 percent of 2018 UI taxable wages. Our simulations suggest that systemwide reserves need to be at least 4.0 percent of 2018 UI taxable wages to avoid a systemwide debt should a severe recession occur. A higher level of reserves would be prudent. The inadequacy of forward funding in many states has been accompanied by reductions in potential benefit durations in 10 states, and in one of these states the maximum weekly benefit amount was also cut more than 30 percent, thereby lowering the average UI wage replacement rate in the state.

The federal-state UI system was originally designed to encourage forward funding of UI benefits to help improve the automatic countercyclical functioning of the UI benefit and tax system. To encourage forward funding, USDOL now provides an incentive of zero interest for short-term loans to states maintaining year-end reserves at the average high cost rate—that is, an average high cost multiple of one. If many states responded to this incentive, then individual state and overall system reserve adequacy would improve. Contrary to the concept of forward funding, some states have adopted a pay-as-you-go UI benefit financing approach that relies of external bond sales. This state strategy to reduce employer UI taxes works in the current low-interest-rate environment, but it could present systemic risks and is likely to have procyclical effects particularly as interest rates rise. More generally, a major hindrance to adequate UI benefit system financing among states is the low \$7,000 federal taxable wage base that sets the floor for state taxable wage bases. The low taxable wage base can also inhibit employer demand for low-wage workers. Indeed low-wage multiple job holders generate two or three times the UI tax contributions of high-wage single job holders. Increasing and indexing the federal taxable

wage base would improve UI benefit financing in many states and could improve low-wage labor demand.

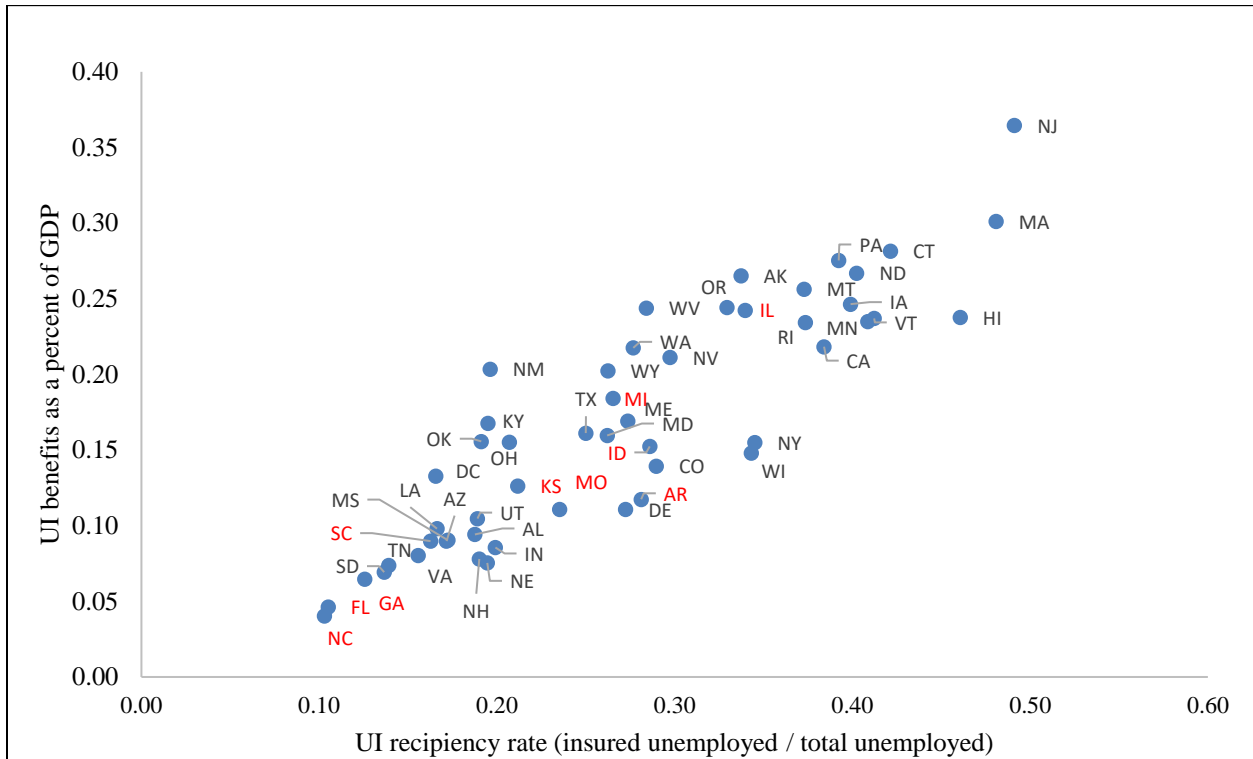
Ten states with negative UI reserve balances in 2010 reduced the potential duration of benefits in their states by 2012. Our simulations suggest that after an average recession these 10 states will retain a combined \$2.7 billion more in UI reserves than in the absence of benefit cuts, but 2 of these states will still experience a reserve deficit—that is, only one fewer state than if benefits had not been cut. The lost UI benefits to households in the 10 duration-cutting states in an average recession is estimated to be \$6.3 billion, while aggregate tax reductions are estimated at \$3.6 billion. Given marginal propensities to consume and invest, stimulus from business investment after tax cuts is unlikely to make up for lower consumer spending. For example, Vroman (2010, p. 63) writes that “the average tax multiplier is estimated to be -1.4 compared to 2.0 for regular UI benefits, and 2.0 for extended benefits.”

The scatter plot in Figure 8 summarizes state UI program positions in terms of the proportion of unemployed receiving benefits and the share of state GDP devoted to paying UI benefits. The benefit-cutting states denoted in red are mostly in the lower left corner of the scatterplot, meaning lower than average UI reciprocity among the unemployed and lower shares of state GDP allocated to UI. While states in the upper right corner of the scatterplot in Figure 8 invest modestly more to maintain accessible UI. However, some of these more generous states need to address financing deficiencies soon because they are late in preparing for the next recession.

Among the 10 states that shortened potential duration of UI benefits half tied the potential duration to the state unemployment rate. Variable potential duration might be inspired by the belief that when unemployment is low, jobs are more widely available, and successful job search

can be concluded more quickly. In practice the rules applied to translate state unemployment rates into state potential duration differ greatly. Florida sets potential duration at the start of each

Figure 8 Regular UI Benefits as a Percent of Private Sector GDP and the UI Reciprocity Rate for the 50 States and the District of Columbia, 2017



NOTE: States that cut benefit generosity since 2010 denoted in red.
 SOURCE: State GDP is from U.S. Department of Commerce, Bureau of Economic Analysis, Regional Product Division (2019), total unemployed is from Bureau of Labor Statistics (2019), and insured unemployed is from USDOL (2019b).

year, for the whole year, based on unemployment in the third quarter of the previous year. In a rapidly deteriorating economy this rule can have the effect of providing no more than 14 weeks of benefits in a 52-week period. However, later in the year, if unemployment has risen sharply—as happened in 2009—and job offers evaporate, then 14 weeks of benefits could be inadequate to support reemployment. The Kansas procedure wherein the potential duration is updated quarterly based on the most recently available data results in potential benefit durations being better aligned with labor market conditions.

Early studies of the economic development effects of interstate tax differences on business location decisions focus on markets straddling state borders (Carlton 1983; Wheaton 1983). Neither study finds evidence that UI tax differences affected business location decisions, because cross-state differences in UI tax rates were not large and UI taxes were a small part of the total state tax bill for businesses. However, a later survey by Newman and Sullivan (1988) suggests that UI could have an effect because interstate differences were getting bigger in some markets straddling state borders. A recent study by Guo (2019) applying a research design focused on multisite manufacturing companies finds evidence that internal corporate decisions about which state to locate production and employment are influenced by state UI taxes. Guo finds that within multisite manufacturing companies, plant closures are more likely where UI taxes are higher. Her research design exploits interstate UI tax differences that have emerged and widened because some states have neglected UI financing while others have periodically raised or indexed UI tax bases. She concludes that “state-level administration of UI taxation introduces a wedge that contributed to the slow pace of hiring after the Great Recession, and to misallocation in the economy” (p. 29). Reducing or eliminating tax wedges between states could increase efficiency in allocation.

The federal-state UI system was established during the Great Depression by the Social Security Act of 1935. The taxable wage base is the foundation for adequate forward funding of UI benefits. The federal taxable wage base, which was equal to the Social Security taxable wage base when Federal Unemployment Tax Act (FUTA) became law in 1939, is now less than 6 percent of the Social Security tax base. The level of the state taxable wage base is an indicator of employer support for the state UI system. Boosting the FUTA tax base would raise the state tax base minimum and nudge many states to improve benefit financing, help restore the

reemployment emphasis of UI programs, and support better information technology and skilled staffing for state program administration. It would also improve forward funding of the system and reduce tax wedges between states, thereby improving the efficient allocation of resources among states.

CONCLUSION

The federal-state UI system exists to provide partial temporary income replacement to involuntarily unemployed workers as they seek reemployment. UI also plays an important macroeconomic role by automatically injecting spending during business downturns and withdrawing spending during expansions. Forward funding of benefits reinforces the UI countercyclical role, but differences in UI financing are emerging between states that can lead to misallocation of productive resources. Improved mechanisms and incentives for forward funding could improve economic outcomes and UI benefit adequacy. Immediate reforms should include increasing and indexing the federal unemployment taxable wage base, paying higher interest rates on state reserve deposits held at the U.S. Treasury, and charging lower interest rates for crisis loans to states—rates at or below prevailing municipal bond rates.²⁰ Many states are likely to experience reserve deficiencies in the next recession. UI financing reforms should start immediately.

²⁰ For detailed proposals on UI financing matters, see O’Leary and Wandner (2018).

Appendix A

**Tables Summarizing Simulations of Regular UI Benefits
for States with Shorter Potential UI Durations**

and

Figures Summarizing State Rules for Variable Potential Duration

Table A1 Arkansas Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve
	Actual level	Simulated reduction	Actual level	Simulated reduction	Balance change
2007	244,347		269,144		
2008	250,374	-60,340	318,703	76,807	16,467
2009	246,187	-59,331	596,216	143,688	84,357
2010	333,418	-80,354	407,235	98,144	17,790
		-200,025		318,639	118,614
2000	175,800		168,301		
2001	156,435	-33,946	266,384	57,805	23,859
2002	167,305	-36,305	292,729	63,522	27,217
2003	221,369	-48,037	285,476	61,948	13,911
		-118,289		183,276	64,987
1990	122,214		130,216		
1991	124,311	-26,975	166,150	36,055	9,079
1992	139,822	-30,341	172,543	37,442	7,100
		-57,317		73,496	16,180
1979	74,160		67,485		
1980	69,061	-16,644	113,321	27,310	10,667
1981	92,995	-22,412	98,381	23,710	1,298
1982	98,722	-23,792	137,122	33,046	9,254
		-62,847		84,067	21,219
1973	28,835		20,344		
1974	31,850	-7,676	33,146	7,988	312
1975	31,804	-7,665	90,741	21,869	14,204
1976	47,383	-11,419	55,439	13,361	1,941
		-26,760		43,218	16,458

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 2.

Table A2 Florida Actual Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual level	Simulated reduction	Actual level	Simulated reduction	
2007	880,107		1,067,319		
2008	774,767	-216,935	1,708,790	478,461	261,526
2009	757,481	-212,095	2,916,853	816,719	604,624
2010	1,121,142	-313,920	2,107,829	590,192	276,272
		-742,949		1,885,372	1,142,423
2000	398,303		634,750		
2001	525,447	-224,366	924,470	394,749	170,383
2002	553,559	-236,370	1,177,430	502,763	266,393
2003	671,942	-286,919	1,108,828	473,470	186,550
		-747,655		1,370,981	623,326
1990	251,364		460,325		
1991	305,302	-130,364	801,433	342,212	211,848
1992	466,926	-199,377	824,306	351,979	152,601
		-329,741		694,191	364,449
1979	335,149		112,808		
1980	228,941	-64,103	153,073	42,860	-21,243
		-64,103		42,860	-21,243
1973	64,483		39,682		
1974	70,802	-19,825	109,013	30,524	10,699
1975	93,112	-26,071	306,911	85,935	59,864
1976	186,538	-52,231	218,883	61,287	9,057
		-98,127		177,746	79,619

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 3.

Table A3 Georgia Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual level	Simulated reduction	Actual level	Simulated reduction	
2007	524,366		559,031		
2008	489,989	-91,138	917,418	170,640	79,502
2009	482,534	-89,751	1,657,492	308,294	218,542
2010	627,975	-116,803	1,089,577	202,661	85,858
2011	720,737	-134,057	873,186	162,413	28,356
		-431,750		844,007	412,257
2000	132,339		306,832		
2001	133,695	-35,028	592,872	155,332	120,304
2002	127,540	-33,415	759,529	198,997	165,581
2003	134,248	-35,173	729,739	191,192	156,019
		-103,617		545,521	441,904
1990	273,903		306,182		
1991	267,308	-70,035	453,248	118,751	48,716
1992	298,874	-78,305	362,685	95,023	16,718
		-148,340		213,774	65,435
1979	193,336		122,395		
1980	173,414	-32,255	176,269	32,786	531
1981	161,757	-30,087	176,712	32,868	2,782
1982	147,552	-27,445	305,109	56,750	29,306
1983	183,315	-34,097	226,923	42,208	8,111
		-123,883		164,612	40,729
1973	58,966		31,700		
1974	55,902	-10,398	75,966	14,130	3,732
1975	49,518	-9,210	221,524	41,203	31,993
1976	98,538	-18,328	135,882	25,274	6,946
		-37,936		80,607	42,671

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 3.

Table A4 Idaho Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual revenue	Simulated reduction	Actual benefits	Simulated reduction	
2007	129,587		117,370		
2008	96,565	-2,124	211,273	4,648	2,524
2009	130,356	-2,868	383,004	8,426	5,558
		-4,992		13,074	8,082
2000	90,378		98,804		
2001	83,249	-3,413	140,700	5,769	2,355
2002	93,172	-3,820	173,306	7,106	3,285
2003	103,273	-4,234	176,309	7,229	2,994
2004	111,424	-4,568	137,870	5,653	1,084
		-16,036		25,756	9,720
1990	67,174		55,326		
1991	46,906	-1,923	77,069	3,160	1,237
1992	57,749	-2,368	78,227	3,207	840
		-4,291		6,367	2,076
1979	42,767		33,823		
1980	43,806	-964	54,101	1,190	226
1981	44,526	-980	56,098	1,234	255
1982	46,551	-1,024	91,929	2,022	998
1983	65,362	-1,438	68,885	1,515	78
		-4,405		5,962	1,557
1973	15,561		12,404		
1974	18,330	-403	16,304	359	-45
1975	19,177	-422	25,792	567	146
		-825		926	101

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 3.

Table A5 Illinois Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual level	Simulated reduction	Actual level	Simulated reduction	
2007	2,228,241		1,758,189		
2008	1,853,128	-85,244	2,209,468	101,636	16,392
2009	1,437,434	-66,122	4,286,691	197,188	131,066
2010	1,828,824	-84,126	2,895,592	133,197	49,071
		-235,492		432,021	196,529
2000	1,093,063		1,155,272		
2001	1,007,109	-36,256	1,841,964	66,311	30,055
2002	1,047,931	-37,726	2,347,328	84,504	46,778
2003	1,315,329	-47,352	2,340,076	84,243	36,891
		-121,333		235,057	113,724
1990	984,788		908,189		
1991	886,606	-31,918	1,272,517	45,811	13,893
1992	919,619	-33,106	1,277,517	45,991	12,884
		-65,024		91,801	26,777
1979	796,538		665,180		
1980	828,719	-38,121	1,205,902	55,471	17,350
1981	812,505	-37,375	1,199,868	55,194	17,819
1982	946,020	-43,517	1,576,263	72,508	28,991
1983	1,036,658	-47,686	1,361,443	62,626	14,940
		-166,699		245,800	79,100
1973	326,224		177,384		
1974	306,856	-14,115	246,321	11,331	-2,785
1975	175,645	-8,080	673,612	30,986	22,906
1976	294,719	-13,557	692,298	31,846	18,289
1977	483,871	-22,258	647,996	29,808	7,550
		-58,010		103,970	45,960

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 2.

Table A6 Kansas Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual level	Simulated reduction	Actual level	Simulated reduction	
2007	228,187		177,673		
2008	216,833	-15,612	259,545	18,687	3,075
2009	200,867	-14,462	650,657	46,847	32,385
2010	350,392	-25,228	424,999	30,600	5,372
2011	388,535	-27,975	312,053	22,468	-5,507
		-83,277		118,602	35,325
2000	142,975		153,878		
2001	172,883	-25,241	215,264	31,429	6,188
2002	182,443	-26,637	318,659	46,524	19,888
2003	226,509	-33,070	316,897	46,267	13,197
		-84,948		124,220	39,272
1990	168,237		145,384		
1991	165,618	-24,180	177,277	25,882	1,702
1992	171,439	-25,030	181,487	26,497	1,467
1993	175,533	-25,628	168,641	24,622	-1,006
1994	176,921	-25,830	143,579	20,963	-4,868
1995	54,852	-8,008	137,277	20,042	12,034
1996	34,348	-5,015	113,911	16,631	11,616
1997	35,979	-5,253	101,705	14,849	9,596
1998	39,427	-5,756	117,277	17,122	11,366
1999	42,525	-6,209	139,221	20,326	14,118
		-130,910		186,935	56,025
1979	79,660		57,631		
1980	83,266	-5,995	113,832	8,196	2,201
1981	88,241	-6,353	103,779	7,472	1,119
1982	105,685	-7,609	207,251	14,922	7,313
		-19,958		30,590	10,632
1973	47,462		19,916		
1974	49,177	-3,541	32,508	2,341	-1,200
1975	51,274	-3,692	58,074	4,181	490
		-7,232		6,522	-711

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 3.

Table A7 Michigan Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual level	Simulated reduction	Actual level	Simulated reduction	
2007	1,541,194		1,772,196		
2008	1,495,409	-222,816	2,149,288	320,244	97,428
2009	1,302,742	-194,109	3,635,514	541,692	347,583
2010	1,418,577	-211,368	1,975,665	294,374	83,006
		-628,292		1,156,310	528,017
2000	1,016,490		888,583		
2001	962,178	-112,575	1,594,986	186,613	74,039
2002	944,412	-110,496	1,820,861	213,041	102,545
2003	1,093,178	-127,902	1,907,151	223,137	95,235
2004	1,308,935	-153,145	1,790,965	209,543	56,398
2005	1,436,075	-168,021	1,728,177	202,197	34,176
2006	1,516,376	-177,416	1,877,441	219,661	42,245
		-849,555		1,254,191	404,636
1990	1,050,913		1,134,852		
1991	1,050,860	-122,951	1,488,274	174,128	51,177
		-122,951		174,128	51,177
1979	724,110		595,577		
1980	617,517	-92,010	1,141,476	170,080	78,070
1981	624,164	-93,000	935,815	139,436	46,436
1982	598,996	-89,250	1,524,401	227,136	137,885
1983	833,591	-124,205	945,485	140,877	
		-398,466		677,529	279,063
1973	338,702		183,064		
1974	296,241	-44,140	458,362	68,296	24,156
1975	283,801	-42,286	835,930	124,554	82,267
1976	470,122	-70,048	487,646	72,659	2,611
		-156,474		265,509	109,034

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 2.

Table A8 Missouri Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual level	Simulated reduction	Actual level	Simulated reduction	
2007	555,538		413,759		
2008	581,010	-83,084	569,002	81,367	-1,717
2009	529,641	-75,739	1,097,990	157,013	81,274
2010	551,395	-78,849	809,425	115,748	36,898
2011	627,404	-89,719	615,861	88,068	-1,651
		-327,391		442,196	114,804
2000	237,621		313,857		
2001	236,257	-30,241	470,749	60,256	30,015
2002	250,142	-32,018	564,205	72,218	40,200
2003	319,273	-40,867	591,919	75,766	34,899
2004	376,988	-48,254	497,995	63,743	15,489
		-151,380		271,983	120,603
1990	187,894		289,305		
1991	196,935	-25,208	396,898	50,803	25,595
1992	253,684	-32,472	371,986	47,614	15,143
1993	309,638	-39,634	314,639	40,274	640
		-97,313		138,691	41,378
1979	214,282		148,396		
1980	106,817	-15,275	278,426	39,815	24,540
1981	141,392	-20,219	253,067	36,189	15,970
1982	245,509	-35,108	301,768	43,153	8,045
		-70,602		119,156	48,555
1973	61,042		68,057		
1974	91,078	-13,024	96,444	13,791	767
1975	89,523	-12,802	225,707	32,276	19,474
1976	156,972	-22,447	150,222	21,482	-965
		-48,273		67,549	19,276

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 2.

Table A9 North Carolina Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual level	Simulated reduction	Actual level	Simulated reduction	
2007	899,017		689,718		
2008	867,921	-171,848	1,022,205	202,397	30,548
2009	735,634	-145,656	2,487,117	492,449	346,794
2010	760,440	-150,567	1,716,853	339,937	189,370
2011	860,771	-170,433	1,316,141	260,596	90,163
		-638,504		1,295,379	656,875
2000	300,504		477,408		
2001	315,885	-77,076	918,969	224,228	147,152
2002	412,690	-100,696	1,066,002	260,104	159,408
2003	745,955	-182,013	922,214	225,020	43,007
		-359,785		709,353	349,568
1990	212,849		297,935		
1991	219,058	-53,450	472,812	115,366	61,916
1992	265,845	-64,866	362,149	88,364	23,498
1993	281,002	-68,564	244,942	59,766	-8,799
1994	219,125	-53,466	261,869	63,896	10,430
1995	196,848	-48,031	315,503	76,983	28,952
1996	96,091	-23,446	381,767	93,151	69,705
1997	229,976	-56,114	346,357	84,511	28,397
1998	299,852	-73,164	378,427	92,336	19,172
1999	327,033	-79,796	415,731	101,438	21,642
		-520,899		775,812	254,913
1979	239,095		111,759		
1980	223,017	-44,157	230,529	45,645	1,487
1981	205,880	-40,764	248,402	49,184	8,419
1982	196,252	-38,858	448,630	88,829	49,971
1983	227,470	-45,039	295,316	58,473	13,434
		-168,819		242,130	73,311
1973	63,780		28,723		
1974	81,809	-16,198	61,205	12,119	-4,080
1975	75,295	-14,908	300,648	59,528	44,620
1976	99,129	-19,628	173,802	34,413	14,785
		-50,734		106,060	55,326

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 3.

Table A10 South Carolina Regular UI Tax Contributions and Benefit Costs in Peak-to-Trough Years and the Simulated Changes to Reserve Balance (values in \$000s)

	Tax revenue loss (-)		Benefit cost savings (+)		Net reserve balance change
	Actual level	Simulated reduction	Actual level	Simulated reduction	
2007	274,887		339,400		
2008	264,061	-31,687	474,040	56,885	25,197
2009	235,642	-28,277	910,924	109,311	81,034
2010	256,190	-30,743	547,335	65,680	34,937
		-90,707		231,876	141,169
2000	170,704		196,634		
2001	167,135	-17,883	374,324	40,053	22,169
2002	179,995	-19,259	410,218	43,893	24,634
2003	222,429	-23,800	401,843	42,997	19,197
		-60,943		126,943	66,000
1990	167,085		132,339		
1991	158,661	-16,977	234,323	25,073	8,096
1992	157,962	-16,902	212,344	22,721	5,819
		-33,879		47,793	13,915
1979	113,139		65,571		
1980	115,419	-13,850	124,314	14,918	1,067
1981	109,900	-13,188	133,197	15,984	2,796
1982	106,991	-12,839	238,869	28,664	15,825
1983	123,708	-14,845	150,363	18,044	3,199
		-54,722		77,609	22,887
1973	40,529		18,027		
1974	36,402	-4,368	39,022	4,683	314
1975	31,058	-3,727	157,022	18,843	15,116
1976	72,349	-8,682	81,309	9,757	1,075
		-16,777		33,282	16,505

SOURCE: USDOL (2019b) and authors' computations using estimates in Table 2.

Figure A1 Florida's Seasonally Adjusted Unemployment Rate and the Third Quarter Average from the Prior Year that is Used to Determine Maximum Regular UI Entitlement

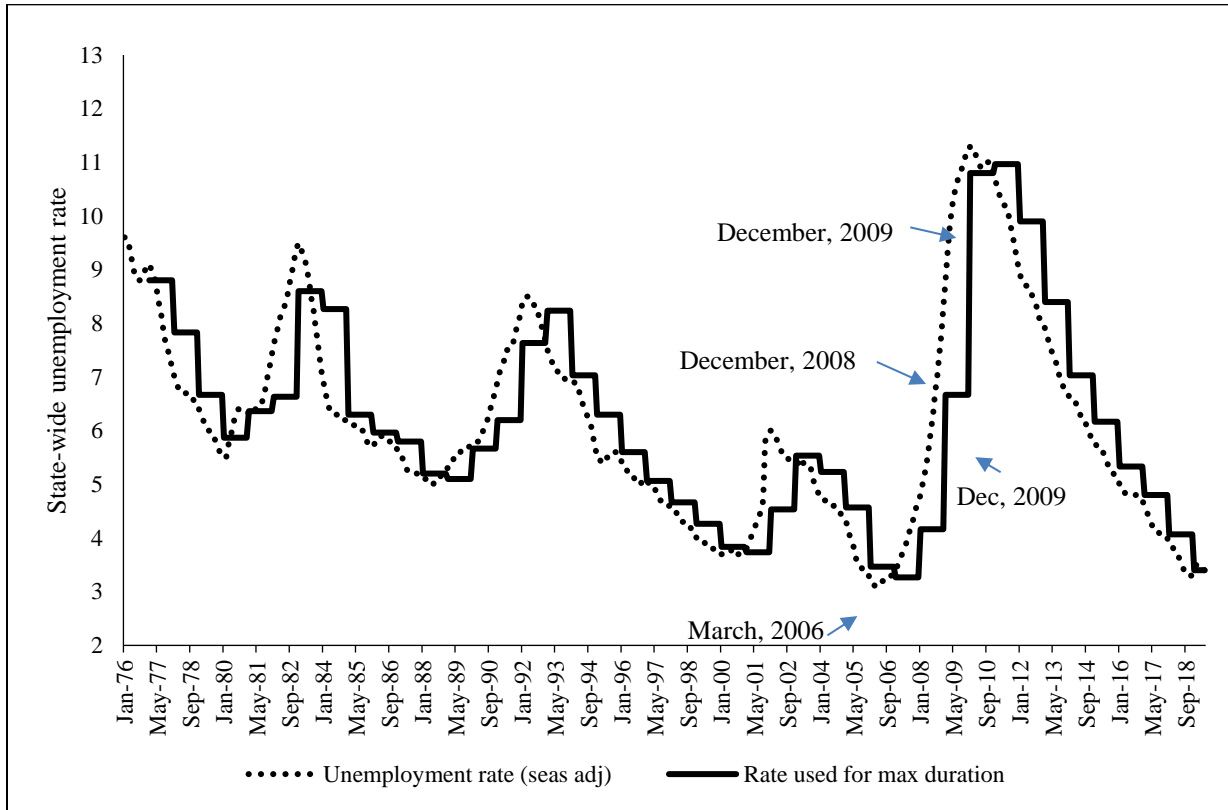
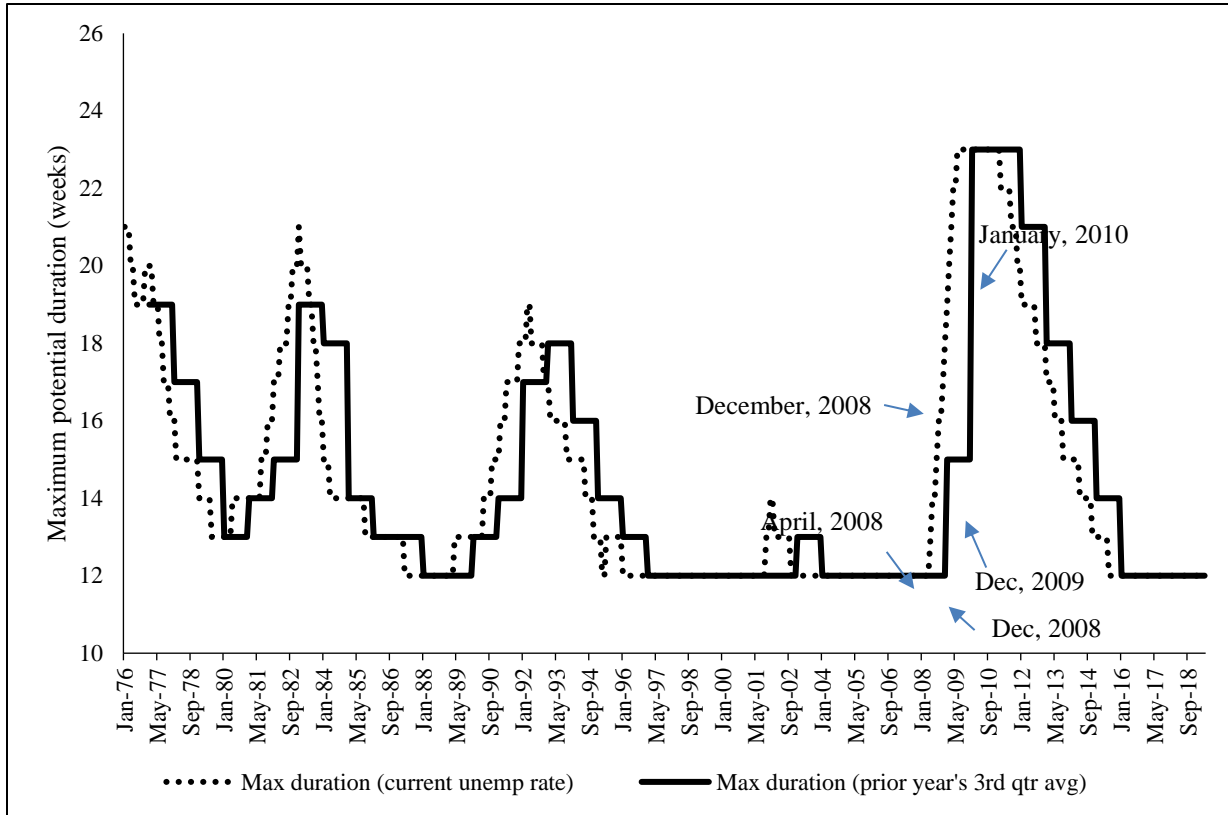


Figure A2 Florida's Maximum Potential Regular UI Duration Using Current Law and the Monthly Seasonally Adjusted Unemployment Rate and the Maximum Resulting from the Law as Written which uses the Prior Year's Third Quarter Average



SOURCE: Florida statute 443.111 and USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics: <https://data.bls.gov/cgi-bin/dsrv?la> monthly unemployment rate seasonally adjusted for Florida 1/31/1976 to 3/31/2019.

Figure A3 Georgia's Seasonally Adjusted Unemployment Rate and the April and October Rates Used to Determine Maximum Regular UI Duration for July–December (April) and the following January–June (October)

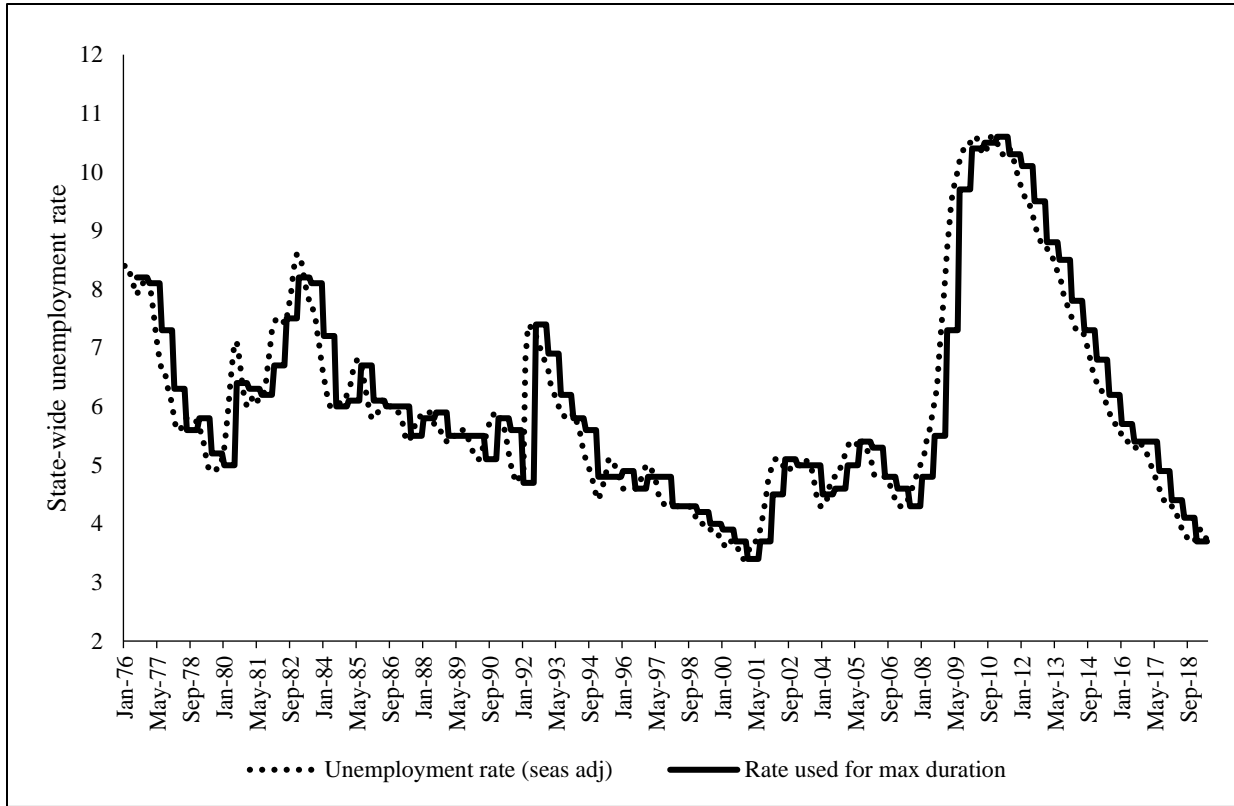
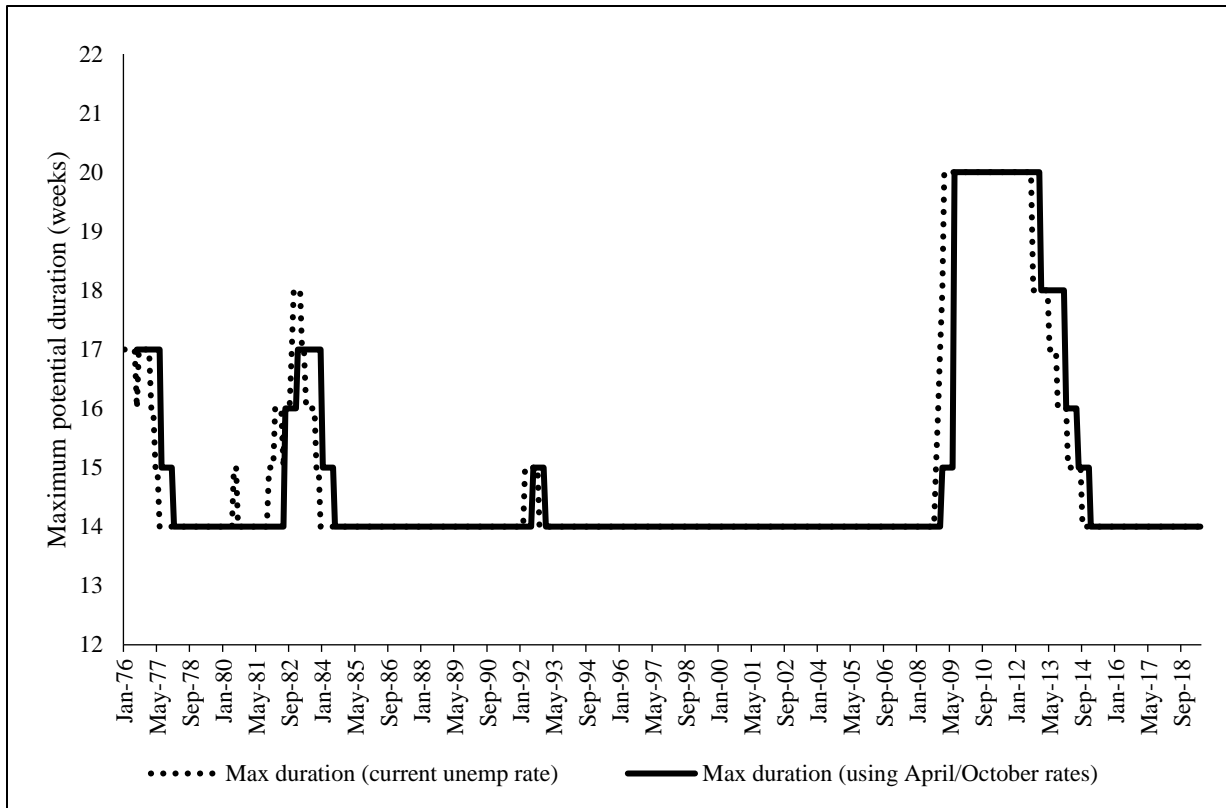


Figure A4 Georgia's Maximum Regular UI Duration Using the State Unemployment Rate and the Maximum Resulting from the April and October Rates Used to Determine Maximum Entitlement for July–December (April) and January–June (October)



SOURCE: HB 347, www.legis.ga.gov and USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics: <https://data.bls.gov/cgi-bin/dsrv?la> monthly unemployment rate seasonally adjusted for Georgia 1/31/1976 to 3/31/2019.

Figure A5 Idaho's State Unemployment Rate and the Rates Used to Determine Maximum Regular UI Duration for January–March (Prior November), April–June (February), July–September (May) and October–December (August)

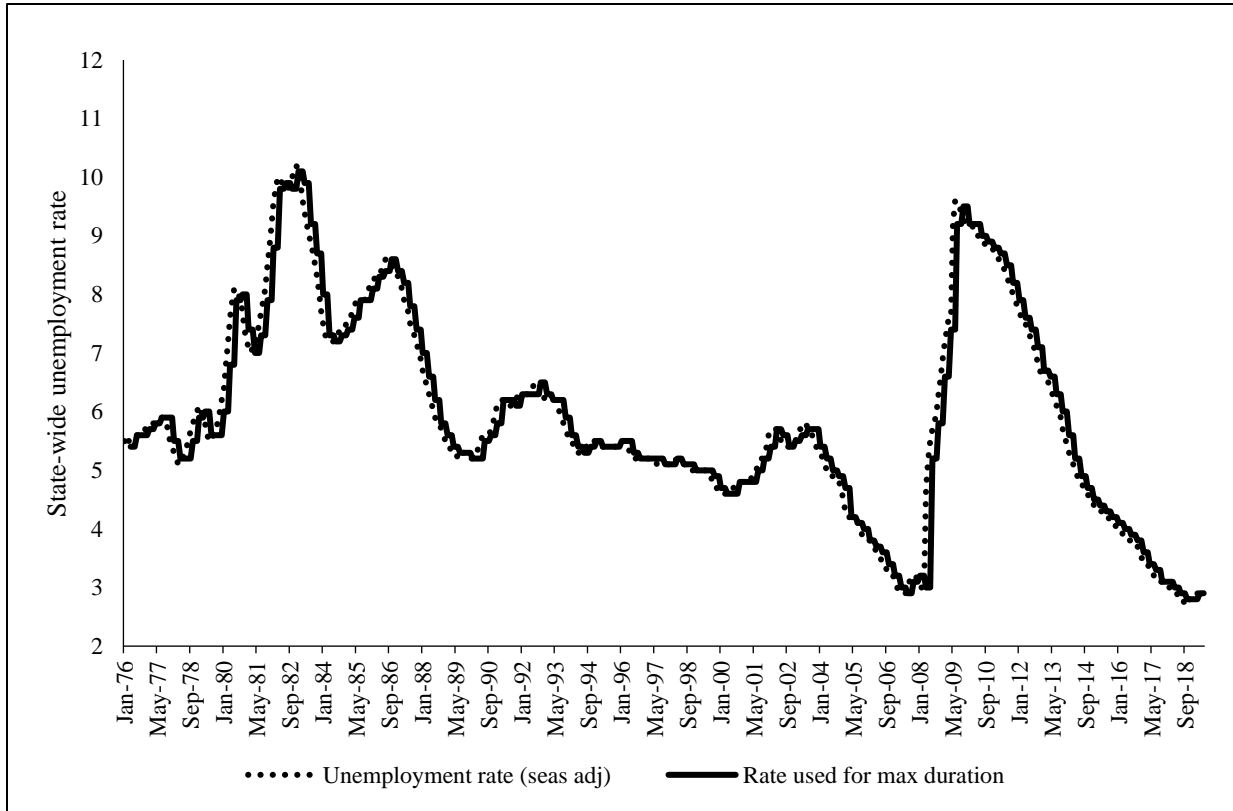
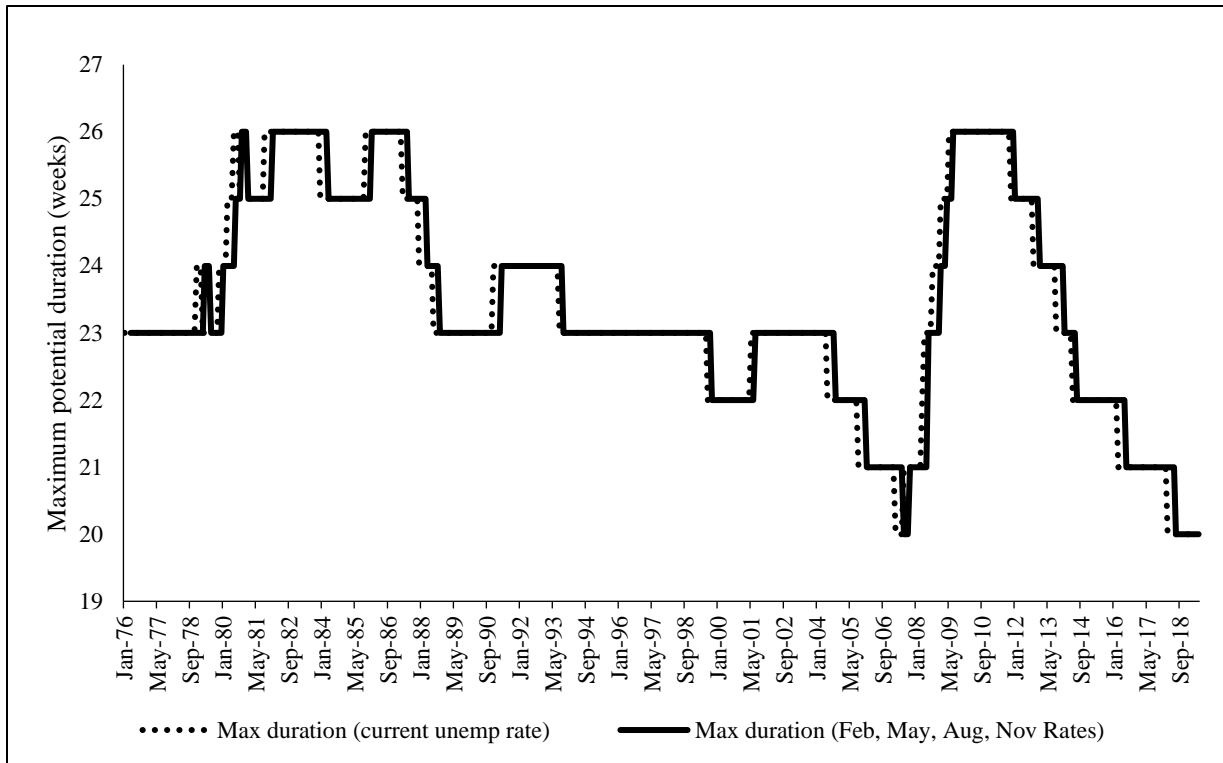


Figure A6 Idaho's Maximum Regular UI Duration Using the State Unemployment Rate and the Maximum Resulting from the Rates Used to Determine Maximum Entitlement for Jan–Mar (Prior November), Apr–Jun (February), Jul–Sep (May) and Oct–Dec (August)



SOURCE: HB 485, 2016 second regular session, <https://legislature.idaho.gov/sessioninfo/2016/legislation/> and USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics: <https://data.bls.gov/cgi-bin/dsrv?la> monthly unemployment rate seasonally adjusted for Idaho 1/31/1976 to 3/31/2019.

Figure A7 Kansas's State Unemployment Rate and the Three-Month Moving Average Rate with a Two-Month Reporting Lag that is Used to Determine Maximum Regular UI Duration

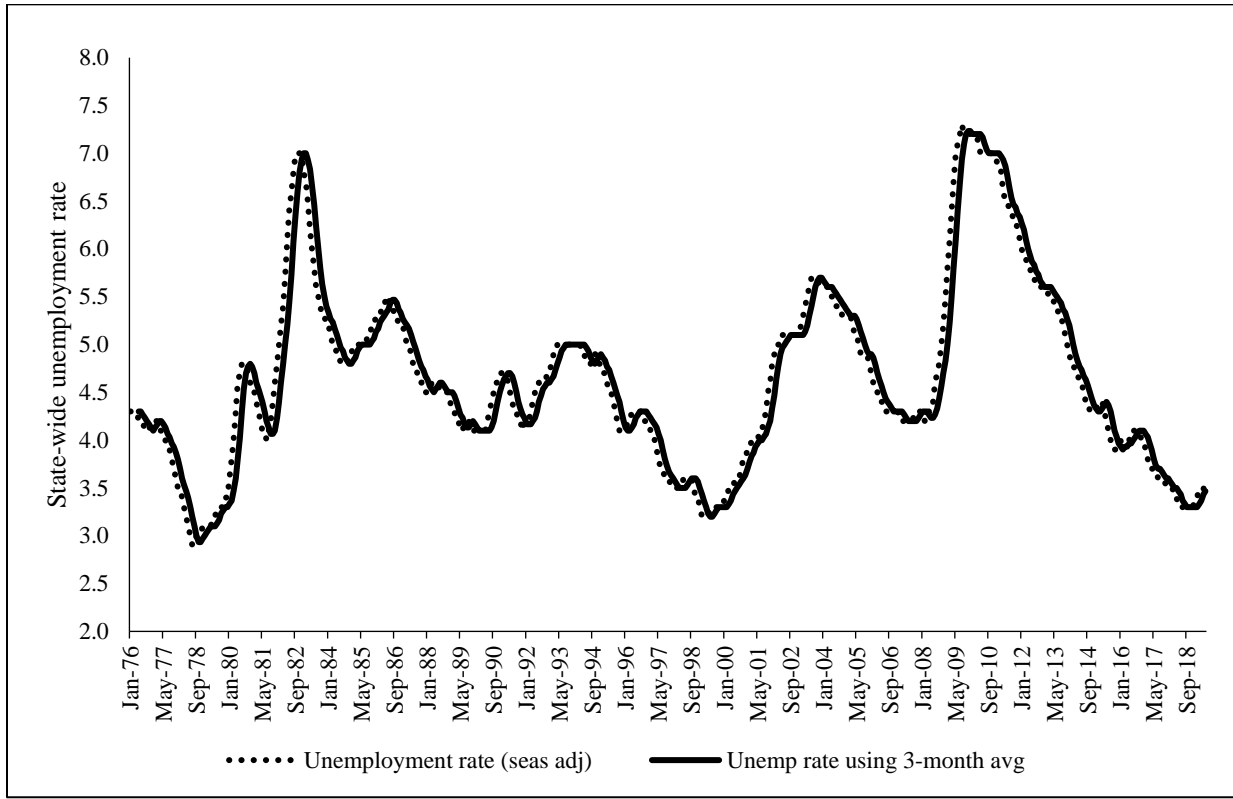
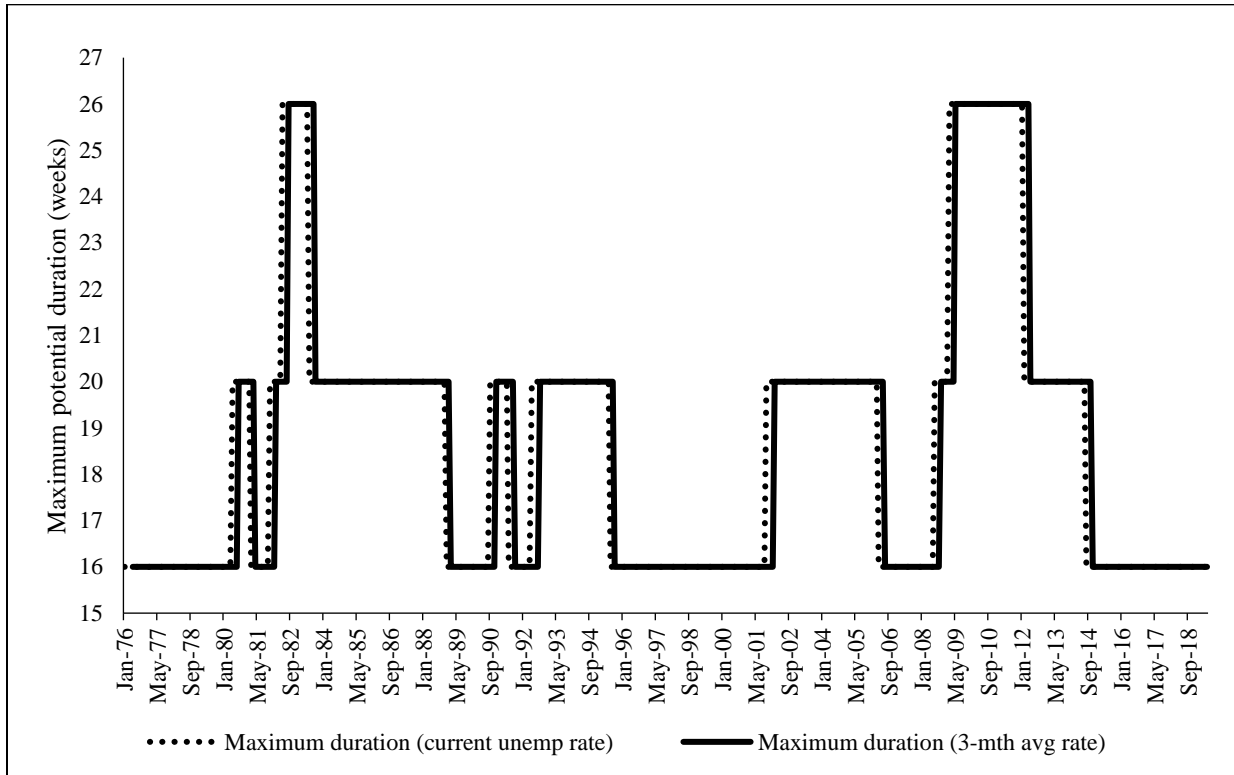


Figure A8 Kansas's Maximum Potential Regular UI Duration Using the State Unemployment Rate and the Maximum Resulting from the Three-Month Moving Average Rate Actually Used



SOURCE: Kansas statute 44-704 (2017) and USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics: <https://data.bls.gov/cgi-bin/dsrv?la> monthly unemployment rate seasonally adjusted for Kansas 1/31/1976 to 3/31/2019.

Figure A9 North Carolina's State Unemployment Rate and the April and October Rates Used to Determine Maximum Regular UI Duration for July–December (April) and January–June (October)

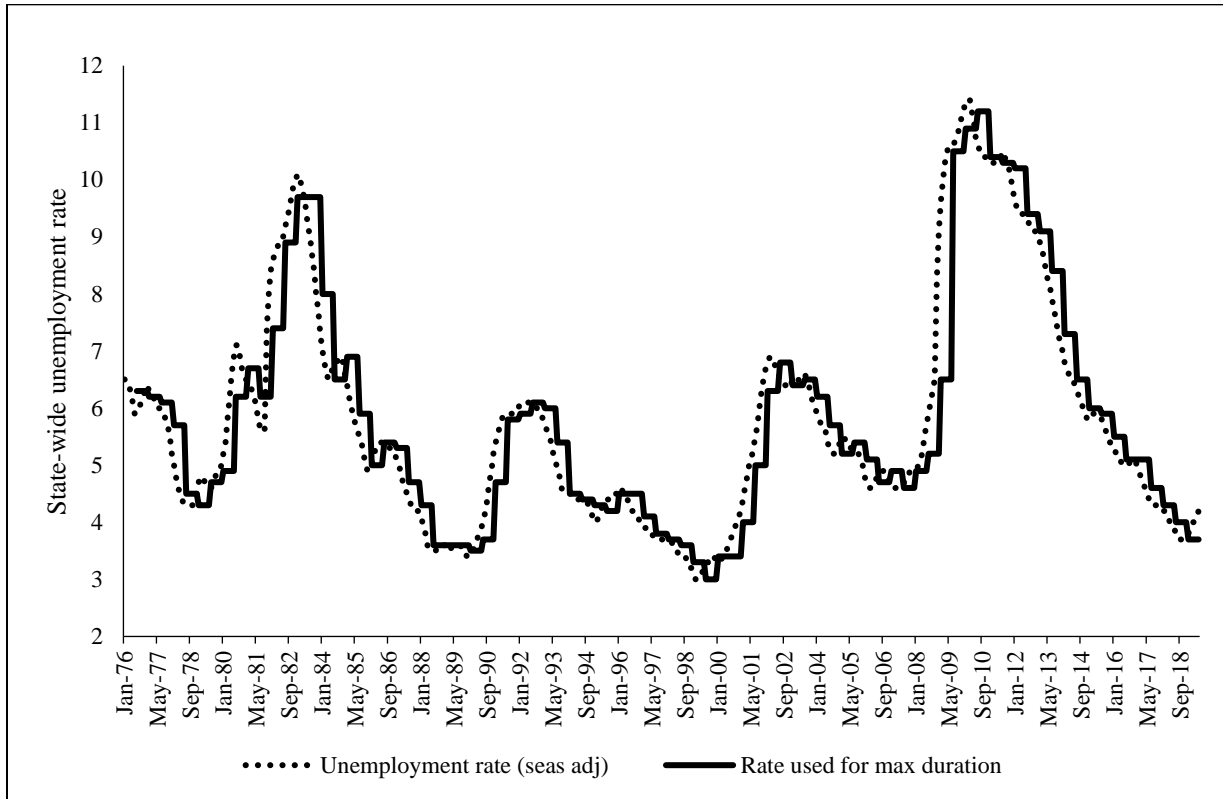
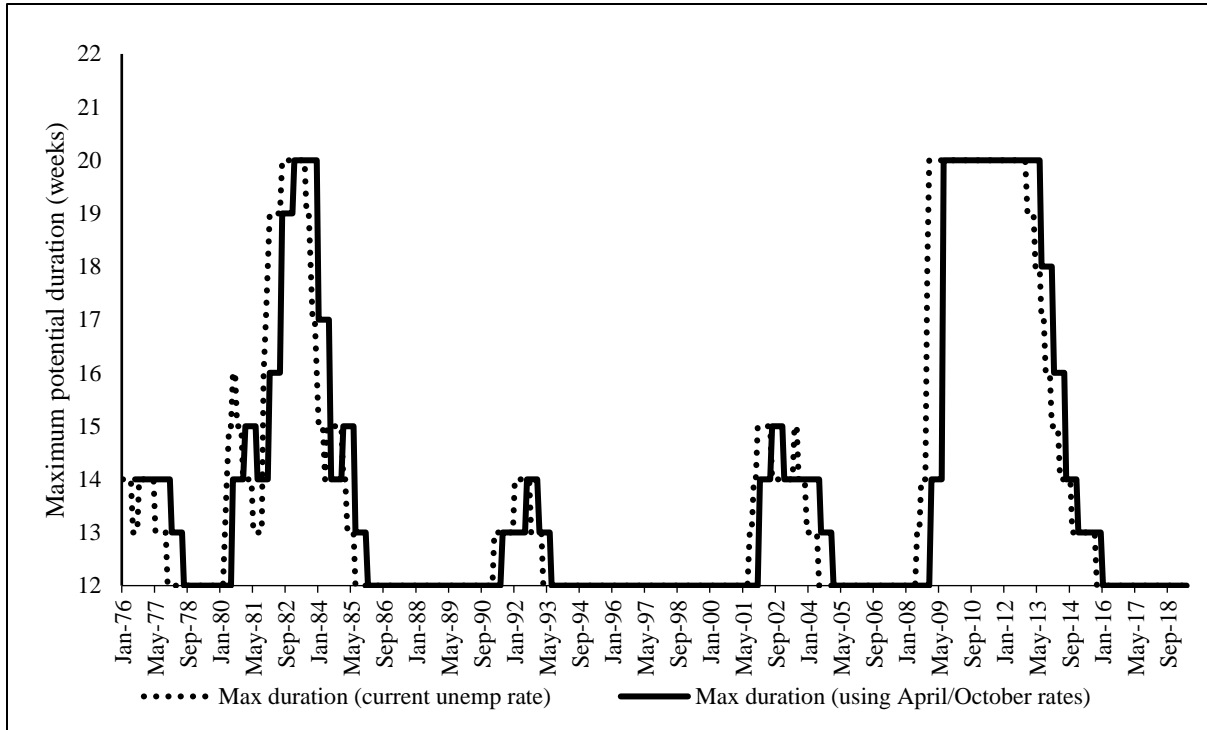


Figure A10 North Carolina's Maximum Regular UI Duration based on the State Unemployment Rate and the Maximum from the April and October Rates Used for July–December (April) and January–June (October)



SOURCE: North Carolina statute 96-14.2 and USDOL, Bureau of Labor Statistics, Local Area Unemployment Statistics: <https://data.bls.gov/cgi-bin/dsrv?la> monthly unemployment rate seasonally adjusted for Kansas 1/31/1976 to 3/31/2019.

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