



Unemployment Insurance Benefit Estimation



UI Benefit Financing Seminar
Division of Fiscal and Actuarial Services
U.S. DOL/ETA/OUI
October 23-26, 2018



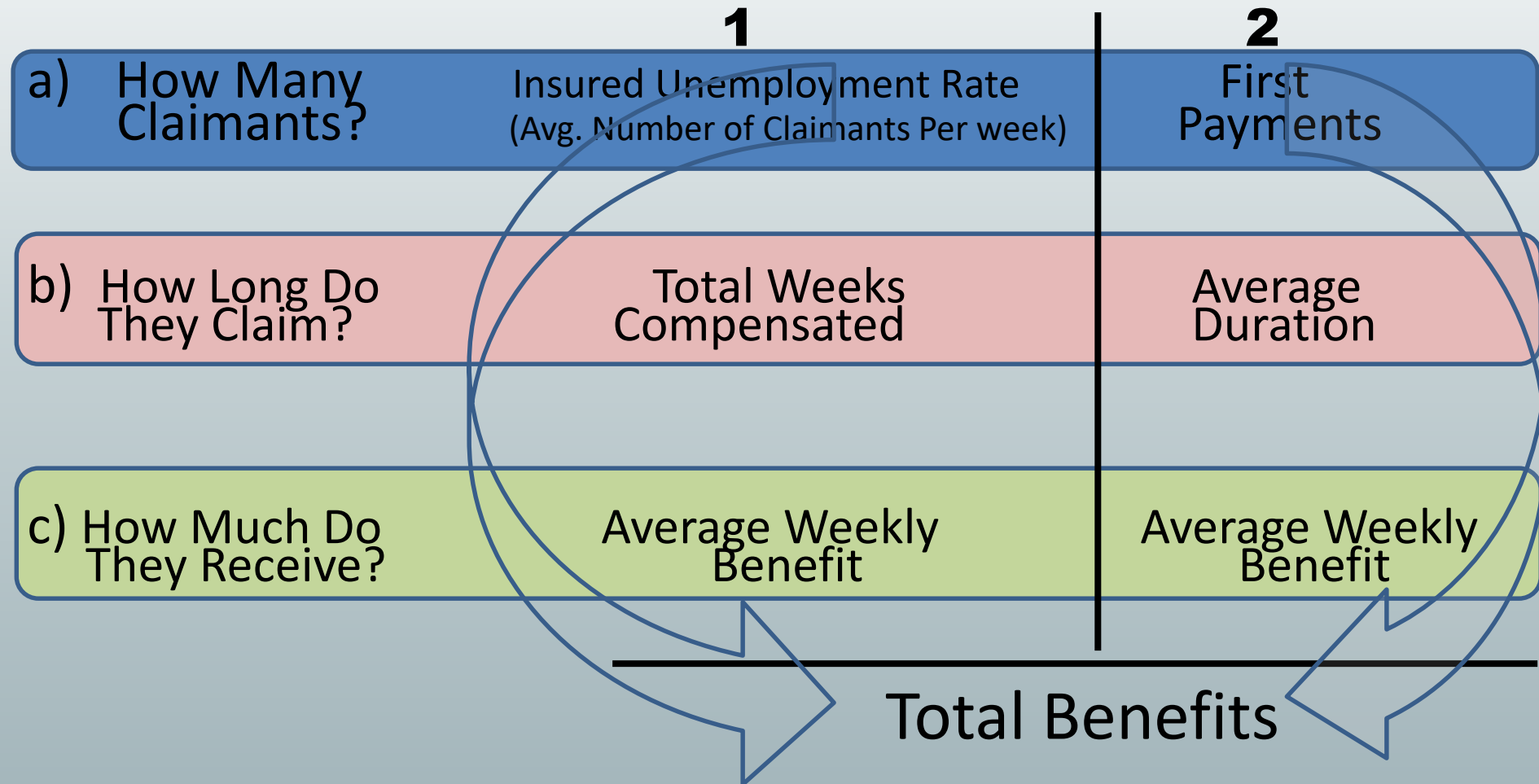
UI Benefit Modeling

Answering Three Questions:

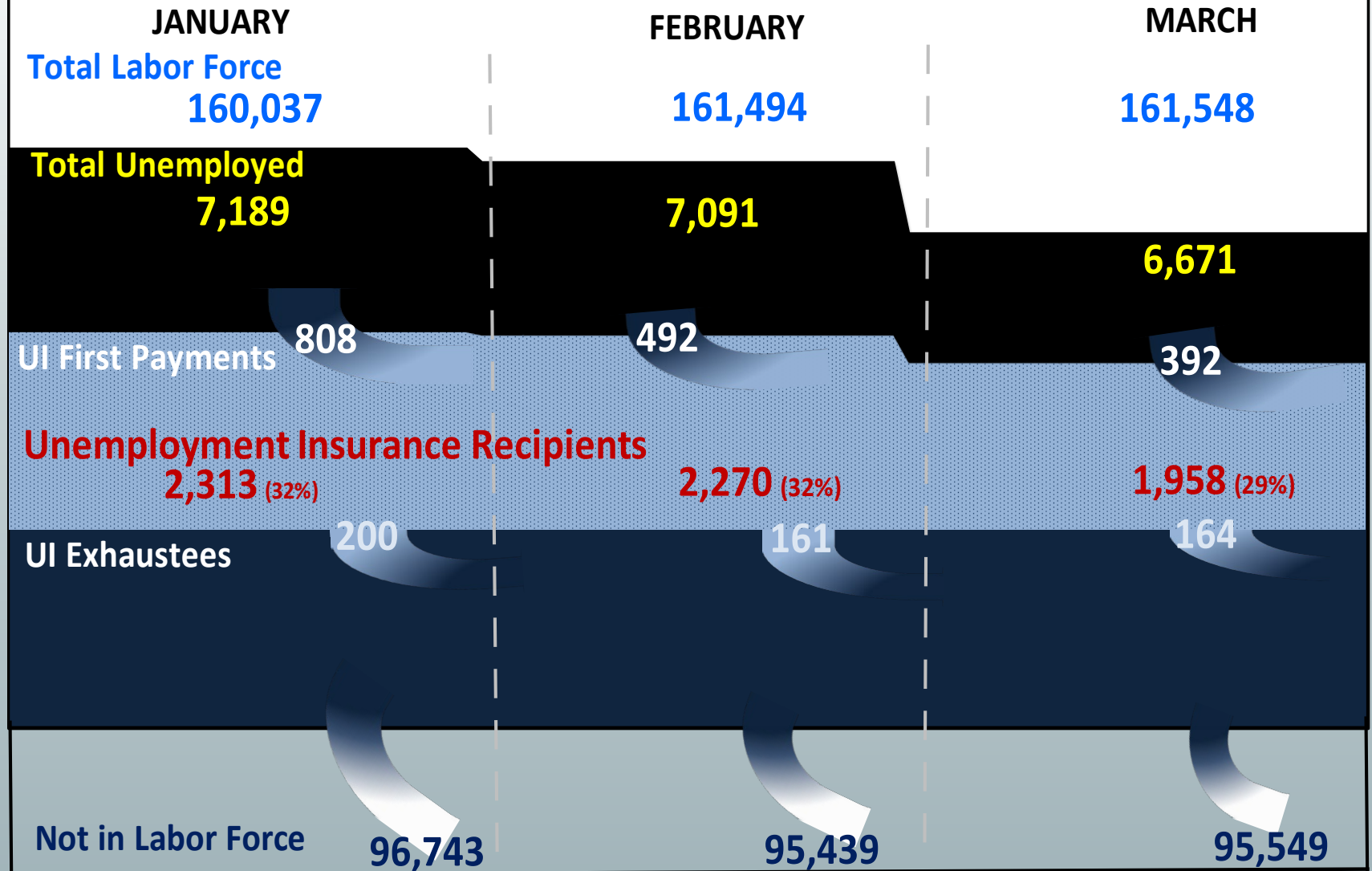
1. How Many People are Receiving Benefits?
2. For How Long Do They Receive Benefits?
3. How Much Do They Receive?



Two Paths to Calculating Total Benefits



Unemployment Flow - First Quarter CY2018 (000)



State Benefit Application Process

Initial Claim



Eligibility Determination

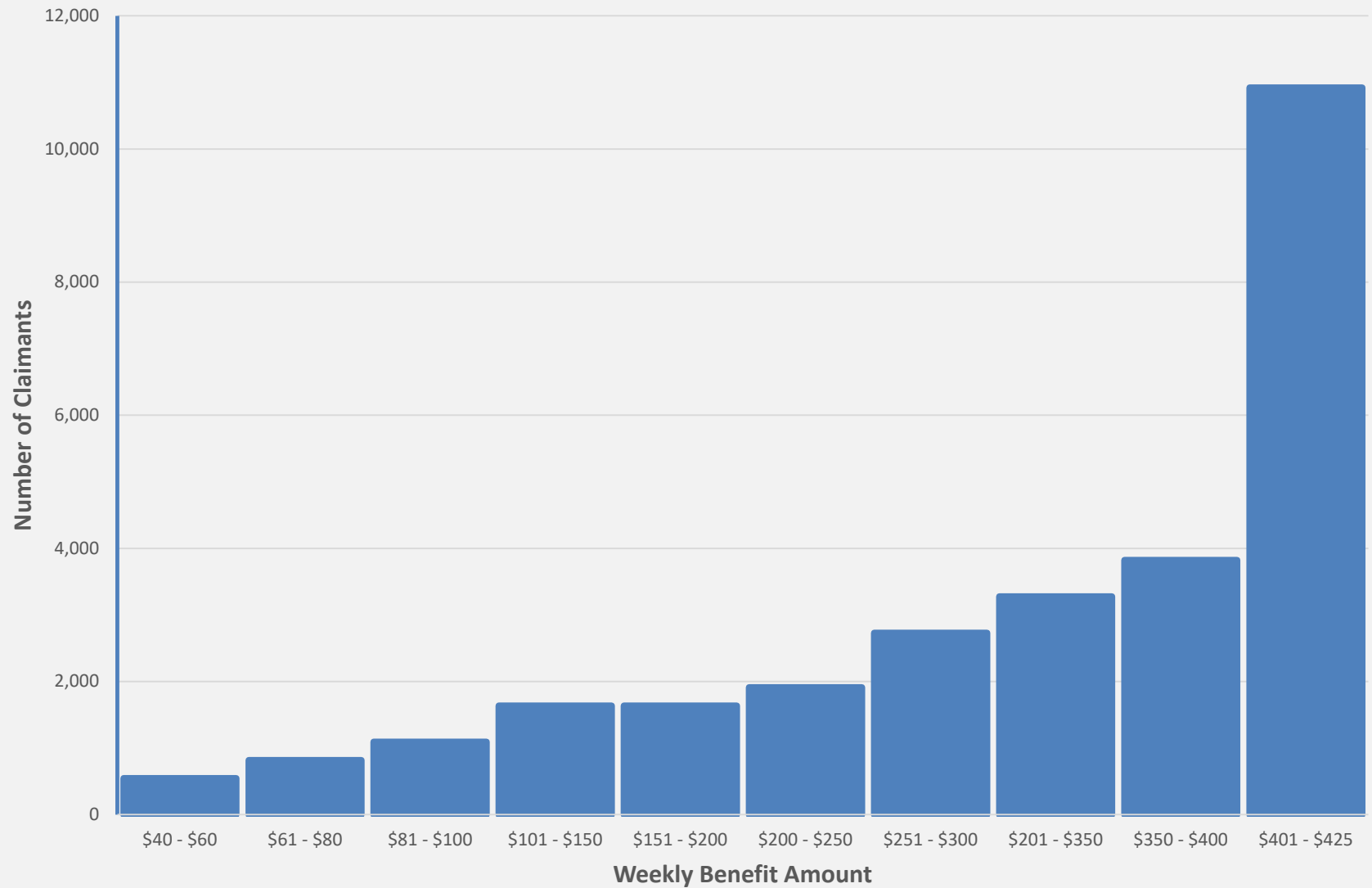
Non-Monetary Entitlement / Monetary Entitlement



Potential Maximum Duration / Weekly Benefit Amount



Distribution of Claimants by Weekly Benefit Amount



UI Benefit Cost Estimating Model

Path #1



1. How Many People are Receiving UI

Start with how many people are unemployed (forecast of State or U.S. TUR) to find **State Insured Unemployment Rate**:

a) Use historical correlations to build forecast:

I. U.S. TUR to State TUR Regression Equation

$$\text{State TUR} = B_0 + B_1(\text{U.S. TUR}) + B_2\ldots$$

X Variables: Lagged U.S. TUR, Lagged IUR, etc...

II. State TUR to State IUR Regression Equation

$$\text{State IUR} = B_0 + B_1(\text{State TUR}) + B_2\ldots$$

X Variables: Lagged TUR, (TUR-IUR), Lagged IUR, etc...

Derivation of the Insured Unemployment Rate (Quarterly)

Definitions:

1. **Insured Unemployment Rate** – The average weekly number of weeks claimed for the three months of the quarter, divided by the average covered employment for the first four of the last six completed quarters.
2. **Insured Unemployment Rate** – The average weekly number of weeks claimed for the three months of the quarter, divided by the insured labor force (the number of insured employed plus the insured unemployed). Not including reimbursables.

1. How Many People Are Receiving UI

Deriving the number of avg. claimants per week from the Insured Unemployment Rate:

$$\begin{array}{ccccc} \text{Insured Unemployment} & \times & \text{Insured Labor} & = & \text{Average Weekly} \\ \text{Rate} & & \text{Force} & & \text{Claims} \\ & & \text{(Covered Employ)} & & \end{array}$$

$$\begin{array}{ccccc} \text{Alabama} & & & & \\ \text{CY2016:} & 1.1\% & \times & 1,851,067 & = & 20,362 \end{array}$$

ETA 5159 - CLAIMS AND PAYMENT ACTIVITIES

OMB Approval No 1205-0010
Expires:3/31/2003

REPORT FOR PERIOD ENDING:

STATE:

REGION:

SECTION A. Claims Activities

Program	Line No.	Initial Claims						
		Total Sum of Cols. 2-4 (1)	New Intrastate Excluding Transitional (2)	Additional Intrastate (3)	Interstate Filed from Agent State (4)	Interstate Taken as Agent State (5)	Transitional (6)	Interstate Received as Liable State (7)
State UI	101							
UCFE, No UI	102							
UCX Only	103							
		Eligibility Reviews		Continued Weeks Claimed			Entering Self Employment, All Programs (13)	
		Intrastate (8)	Interstate Liable (9)	Intrastate (10)	Interstate Filed from Agent State (11)	Interstate Received as Liable State (12)		
State UI	201							
UCFE, No UI	202							
UCX Only	203							

SECTION B. Payment Activities

SECTION B: Payment Activities

Items		Weeks and Amounts Compensated							
		State UI Program			UCFE and UCX Programs			Self Employment, All Programs (20)	
		All Weeks Compensated (14)	Total Unemployment (15)	Interstate (16)	Total (17)	UCFE, No UI (18)	UCX Only (19)		
Number	301								
Amount	302								
		First Payments for All Unemployment				Final Payments for All Unemployment			
		State UI Program			UCFE & UCX Programs		State UI Program	UCFE & UCX Programs	
		Total (21)	Intrastate (22)	Interstate (23)	UCFE, No UI (24)	UCX Only (25)	Total (26)	UCFE, No UI (27)	UCX Only (28)
Number	303								

Comments

2. How Long Do Claimants Receive UI Benefits

How many weeks of UI benefits will claimants receive over a specified time (monthly, quarterly yearly):

- 1) Calculate the number of Weeks Compensated (Average Duration)
- 2) Use historical correlation, regression analysis, between avg. claimants per week and weeks compensated (monthly, quarterly, yearly) to derive Compensation Ratio:

Ex: Historical derivation of Yearly Compensation Ratio

$$\frac{\text{Weeks Compensated}}{\text{Avg. Weekly (Insured Unemployed * 52)}} = \text{Compensation Ratio}$$

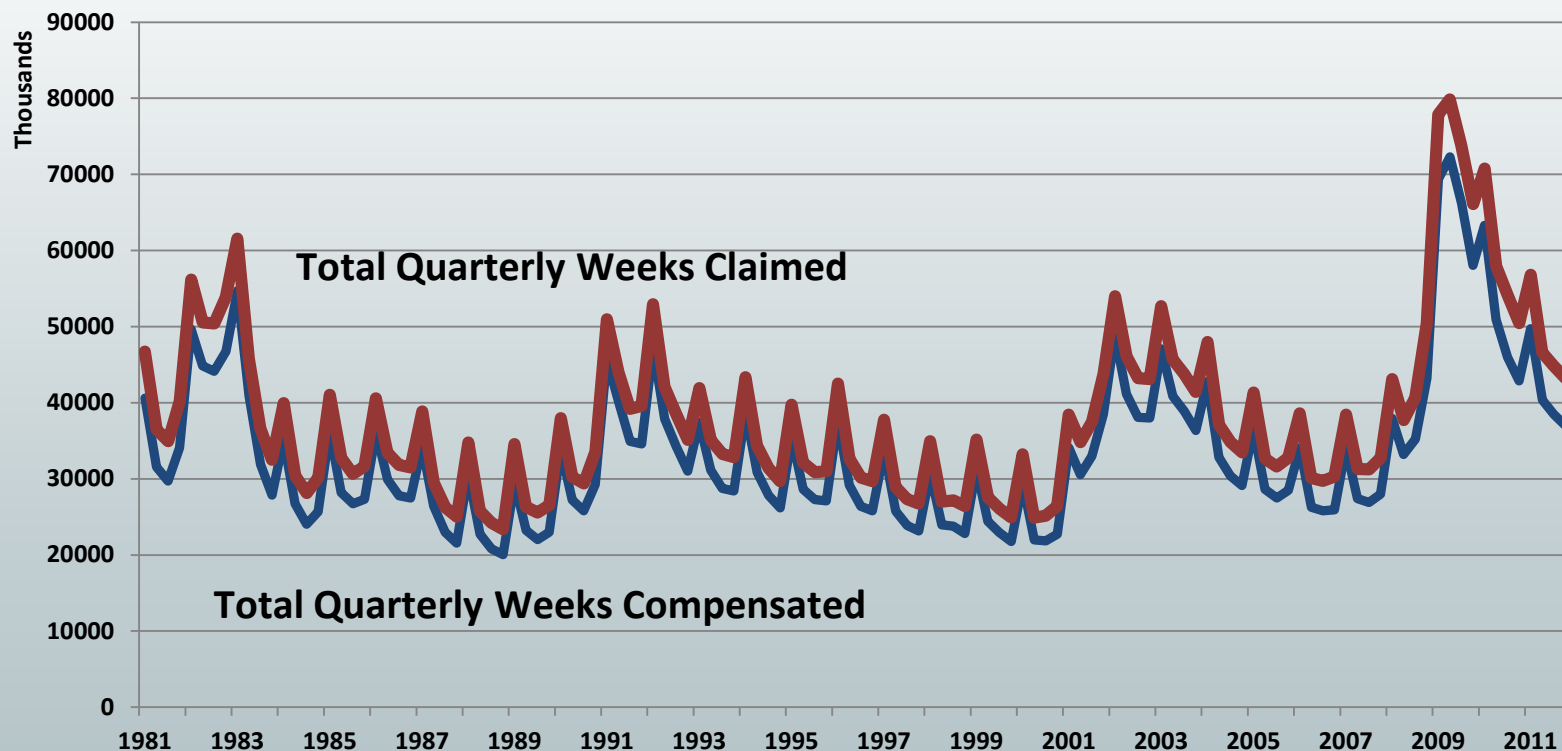
Forecast of Weeks Compensated:

$$\text{Avg. Weekly (Insured Unemployed * 52)} * \text{Compensation Ratio} = \text{Total Yearly Weeks Compensated}$$

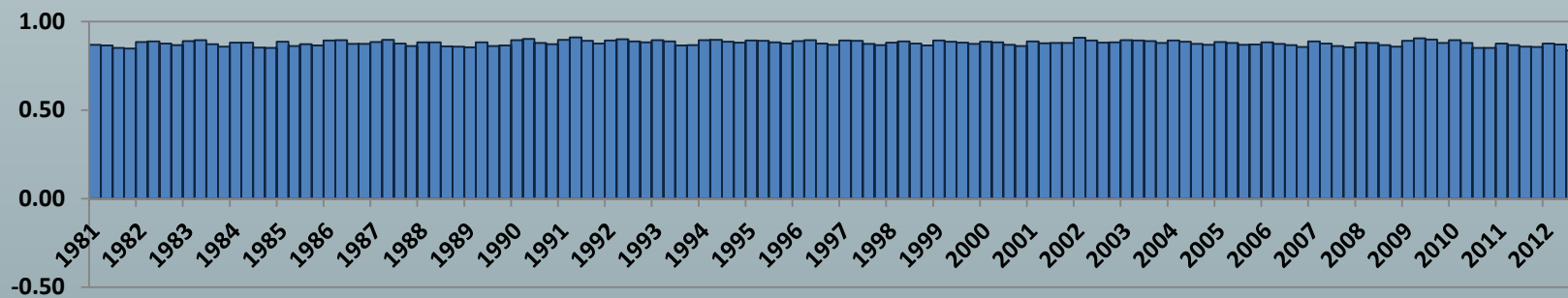
Derivation of Total Weeks Compensated

- **Total Weeks Compensated:** The number of weeks claimed for which UI benefits are actually paid. (This includes partial unemployment and interstate claims.) There are a number of reasons a week claimed may not become a week of compensation including:
 - The state has a waiting week
 - The claimant is not able or available for work
 - The claimant refuses suitable work
 - The claimant has disqualifying or deductible income

US Weeks Claimed vs US Weeks Compensated (1981-2013)



Compensation Ratio

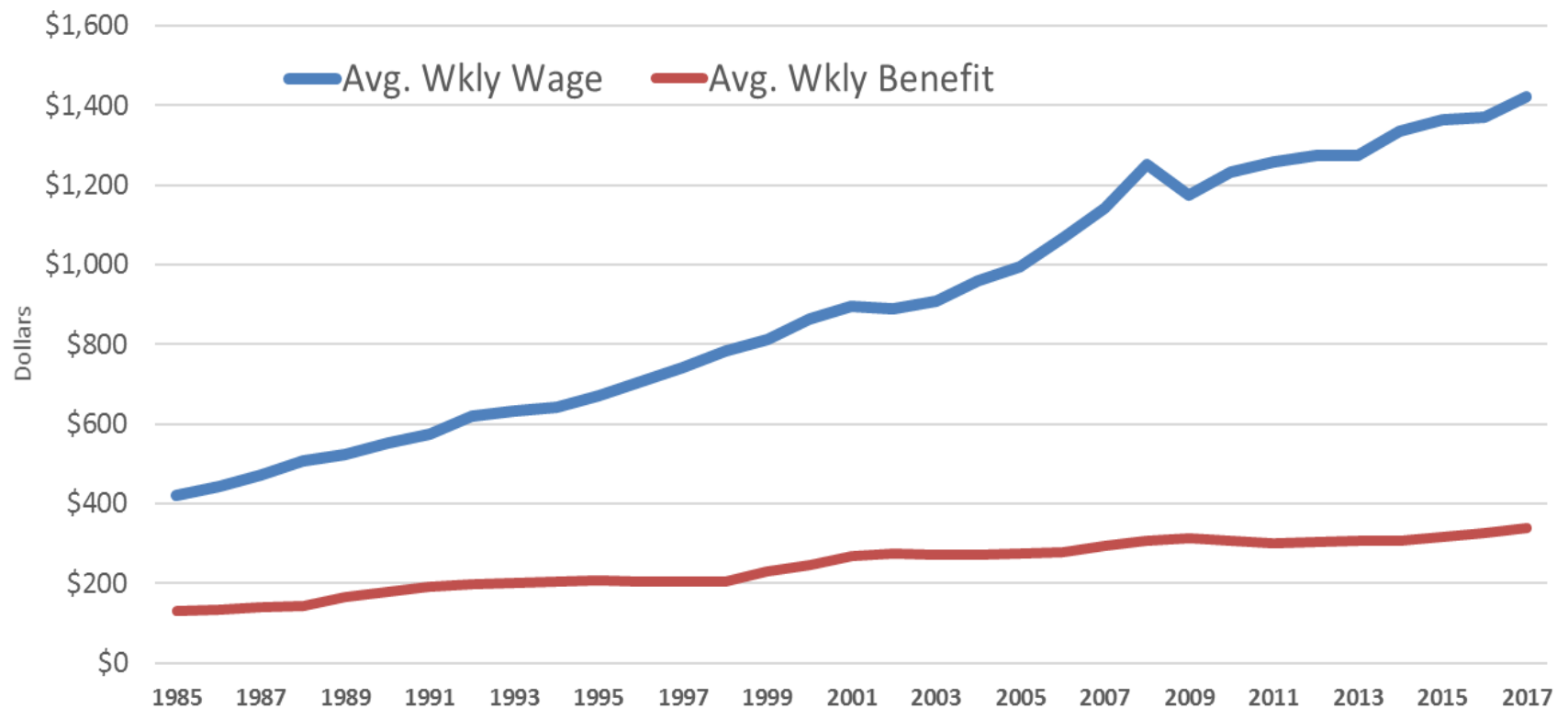


3. How Much UI Do Claimants Receive

State Benefit Formulas

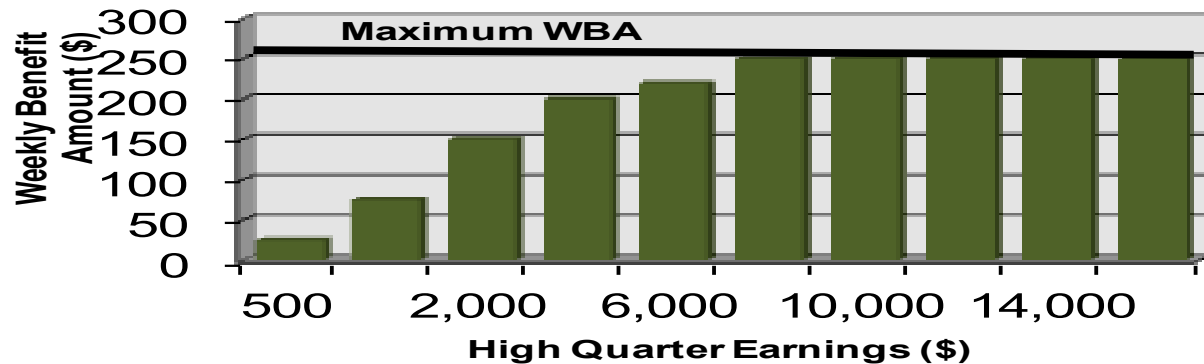
- **High Quarter Method** = (High Qtr. Wage /13 = Avg. Wkly Wage)
* Replacement Proportion = Avg Wkly Benefit
- **Multi-Quarter Method** = Multiple of total or average wages over more than 1 Quarter
- **Annual Wage Method** = Percentage of annual wages in Base Period
- **Average Weekly Wage Method** = Percentage of average weekly wage in Base Period

Avg. Weekly Wage vs. Avg. Weekly Benefit (1985-2017)

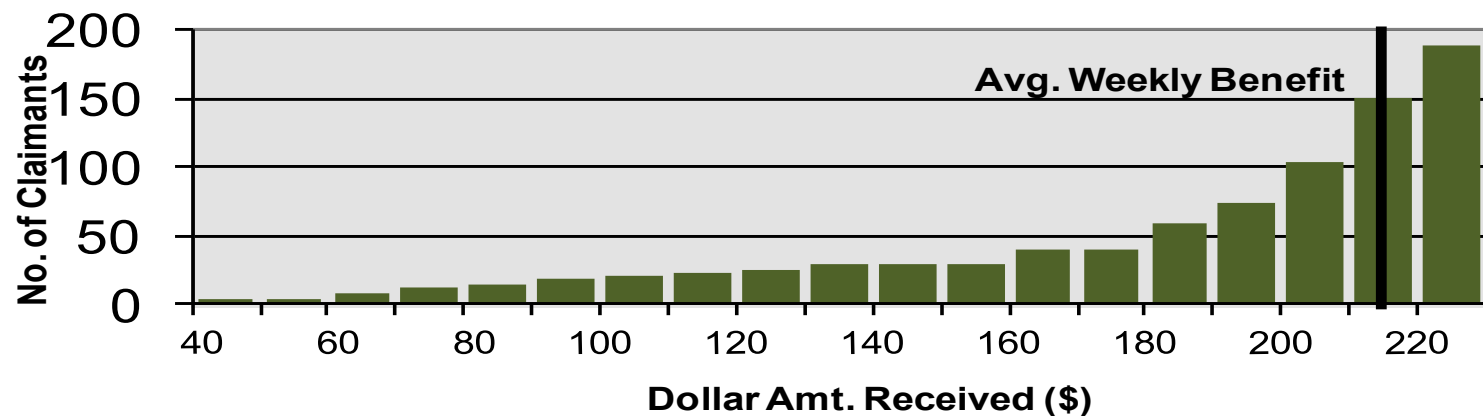


Application of Maximum Benefit and Maximum Weekly Benefit Amount

Distribution of Claimants by Earnings



Distribution of Weekly Benefit Amounts



3. How Much UI Do Claimants Receive

Use the historical correlation between the past wages received by claimants and the amount they receive in benefits:

Average Weekly Benefit Equation:

$$AWB_q = B_0 + B_1(AWW) + B_2(MWB) + B_3(IUR)$$

Where:

AWB = Average Weekly Benefit

AWW = Average Weekly Wage

MWB = Maximum Weekly Benefit

IUR = Insured Unemployment Rate

Derivation of Average Weekly Benefit cont.

2. Average Weekly Benefit equation for states with Maximum Weekly Benefit indexed to wages:

$$AWB_q = B_0 + B_1(AWW_q * MWB_q) + B_2(IUR_q)$$

3. For states with recent benefit law changes (without a distribution of claimant earnings):

$$AWB_q / AWW_q = f(MWB_q / AWW_q)$$

Calculation of Total Benefits

1) Modeling UI Benefits with Path 1:

$$\begin{array}{ccccc} \text{Weeks} & & \text{Average} & & \text{Total} \\ \text{Compensated} & \times & \text{Wkly Benefit} & = & \text{Benefits} \end{array}$$

$$\begin{array}{ccccc} \text{Alabama} & & & & \\ \text{CY2017:} & 740,606 & \times & \$221.13 & = & \$163,773,933 \end{array}$$

Estimating Total Benefits Paid

1. How
Many
People

2. How
Long

3. How
Much

State	Year	Quarter	Civilian Labor Force (000)	Covered Employment (000)	Total Unemployment Rate (%)	Total Unemployed (000)	Insured Unemployment Rate %	Average Weekly Insured Unemployed	Total Weeks Claimed	Total Weeks Compensated	Average Weekly Benefit (\$)	Total Benefits Paid (000)
AL	2016	1	2,166	1,839	6.22%	135	1.21	21,898	284,673	230,479	\$220.85	\$50,901
AL	2016	2	2,173	1,859	5.64%	123	1.08	19,838	257,893	207,732	\$220.61	\$45,828
AL	2016	3	2,174	1,839	6.00%	130	1.14	20,991	272,879	218,965	\$220.06	\$48,185
AL	2016	4	2,180	1,869	5.62%	123	1.01	18,758	243,849	193,759	\$221.92	\$42,999
AL	2017	1	2,175	1,864	5.57%	121	1.04	19,176	249,285	200,222	\$221.56	\$44,361
AL	2017	2	2,172	1,876	4.31%	94	0.92	17,238	224,090	178,875	\$221.37	\$39,598
AL	2017	3	2,166	1,863	4.20%	91	1.01	18,822	244,682	191,700	\$219.67	\$42,111
AL	2017	4	2,160	1,888	3.49%	75	0.89	16,678	216,817	169,809	\$222.03	\$37,703
AL	2018	1	2,162	1,884	4.07%	88	0.95	17,747	230,711	182,932	\$221.94	\$40,600
					TU / CLF			IUR * Cov Emp.	AWIU *13	Wks. Clmd * Comp. Ratio		Tot Wks Comp * AWB