

## Hometown Discount Methodology

Data for the study was largely provided by the Indiana Workforce Intelligence System (IWIS) data warehouse collected and maintained at the Indiana Department of Workforce Development (DWD) in partnership with the Indiana Business Research Center (IBRC), Commission for Higher Education (CHE), and Department of Education (DOE). It should be noted that while individual records were used, no identifier was extracted from the IWIS system. A random identifier was created with each record and anonymity maintained. Only aggregate results are provided with the study.

The study examined data collected specifically for the Zimmer (2011) study and included data for individuals applying for unemployment insurance (UI) benefits from 2004 through 2009 in a time series panel. Only individuals with wage data prior (starting Q1 of 2004) and post UI claims (ending Q4 of 2009) were included in the data set. This intentionally excluded individuals entering the study time period already collecting benefits or those exiting the study time period collecting benefits. The intent was to examine the effects of UI claims on wages by age cohort, so established wage records prior and post UI claim was essential.

Several considerations were made with regard to the available wage data. First, wage data were provided in quarterly terms. The second consideration was the determination of a person's wages before and after contact with the reemployment market. It was unlikely that people separated or reintegrated with firms precisely on the first of a quarter. It was therefore very likely that wage records for the quarters directly before and after the claims period were partial records. To accommodate this potential, the study used an average of the 2<sup>nd</sup> and 3<sup>rd</sup> quarters directly preceding separation and the 2<sup>nd</sup> and 3<sup>rd</sup> quarters directly following workforce reintegration. The result was a yearly wage before claim of approximately \$31,442. The comparable time period average per capita income was \$32,769 for Indiana according to the Bureau of Economic Analysis.

The wage difference was calculated using the calculated average wages post UI claim minus the calculated average wages pre UI claim (Figure 1). A positive difference was reflective of higher wages in the new position, while a negative difference was reflective of a decrease in wages. This variable was used to capture the impact of unemployment on wages for individuals passing through the UI system.

### Figure 1

$$\text{Wage Difference} = (\text{Qtr Wages Post UI Claim} - \text{Qtr Wages Pre UI Claim})$$

As the study was focused on reintegration, records for which wages are not matched after UI participation were dropped. This undoubtedly included those unable to find work and those moving for work outside the state (for which wage records were unattainable). These individuals did not have available data and were beyond the scope of this study.

The total time spent on UI was captured and measured as the total number of weeks of UI benefits received. This included all benefits (including State and Federal regular and extended benefit programs).

The year of initial UI claim was included and individual year binaries computed. Yearly trends in wage difference should be captured by this variable. Additionally, as the wage data was in nominal terms, this should account for any inflationary influence.

Demographics and race were incorporated into the model to the extent the data allowed. A binary gender variable was used with positive being an indication of male. Race binary variables were created, but complete separation was limited with data. The data provides for three options which were African American, Other, and White.

Binary variables were created to ascertain the influence of educational attainment. The data provided the highest level of achievement by applicant during the claims period, regardless of whether it was obtained prior or during the study period. The achievement levels were:

- High School Graduate or Equivalent
- 1 yr College / Tech / Vocational School
- 2 yrs College or Associate’s Degree / Technical School
- 3 yrs College / Tech / Vocational School
- Bachelor’s Degree
- Master’s Degree
- Doctorate Degree

An age of reemployment variable was created. It was computed as the difference between the year of workforce reintegration and the birth year. Only those aged 18 through 100 were considered for the study. Records outside this range were dropped from evaluation.

The claimant pool completed a profile when registering for benefits. The profile included a Standardized Occupational Code (SOC) for the occupation from which the applicant was separated. Unfortunately, SOC information was not available for applicant positions at workforce reintegration. The SOC descriptions were listed in Table 1:

**Table 1 - SOC Code Classification**

Numeric Code	Letter Code	Description
11	MGT	Management Occupations
13	BFO	Business and Financial Operations Occupations
15	CMA	Computer and Mathematical Occupations
17	ARE	Architecture and Engineering Occupations
19	LPS	Life, Physical, and Social Services Occupations
21	CSS	Community and Social Services Occupations
23	LEG	Legal Occupations
25	ETL	Education, Training, and Library Occupations
27	AEM	Arts, Design, Entertainment, Sports, and Media Occupations
29	HPT	Healthcare Practitioners and Technical Occupations
31	HSS	Healthcare Support Occupations
33	PSS	Protective Service Occupations
35	FPS	Food Preparation and Serving Related Occupations
37	BGM	Building and Grounds Cleaning and Maintenance Occupations
39	PCS	Personal Care and Service Occupations
41	SAL	Sales and Related Occupations
43	AMD	Office and Administration Support Occupations
45	FFF	Farming, Fishing, and Forestry Occupations
47	COE	Construction and Extraction Occupations
49	IMR	Installation, Maintenance, and Repair Occupations
51	PRO	Production Occupations
53	TMM	Transportation and Material Moving Occupations
55	MIL	Military Specific Occupations

A variable was created which captured whether the individual claimant stayed within the same industry classification (by NAICS Industry Code). While it was not clear if the person maintained a similar position, this at least provided some information as to whether the individual stayed within the same industry. The variable was binary and positive if the employee NAICS industry codes were the same before and after entry into the reemployment market.

Multiple filters were used to exclude every year claimants which would bias the results. Prior Indiana law did little to discourage manufacturing firms from utilizing the UI system as a low cost method to impose vacation and

retooling periods. As these individuals should not be considered truly unemployed, their actions would bias the results. Recent laws have been enacted to reduce this practice, but historical data would likely include these individuals. Dual filters were created to help ensure their exclusion.

Finally, a proximity binary variable was created. As the claimant entered the UI process, residency information was collected including a zip code. The binary was positive if the residency zip code was the same as the reintegration employer zip code. The proximity variable was used to test for the revealed preference of living in close to work, and thus the true valuation of daily commuting, when including explicit and implicit factors. Unfortunately, this was not a perfect system, as applicants would sometimes move for jobs without updating their unemployment residency file. Another possibly complication is that employers often have multiple locations and may only be listed by a central location. However, it was assumed these anomalies would not impact the results with a large sample.

Missing variables were excluded and a complete dataset was achieved. Of the initial 521,941 claimants, 104,558 were available for the study. Of the 104,558 observations, 19,616 (18.76%) had matching residency and post UI employer zip codes. Summary statistics are provided:

**Table 2 - Summary Statistics**

	Zip After UI	
	Mean	Std. Dev
Observations	104,558	
Total Weeks Claimed	15.6236	13.8156
Wage Before Claim *	7,860.6010	6371.2630
Wage After Claim *	6,794.4300	6269.3430
Wage Difference **	-1,066.1720	5779.8100
Age Re-employed	40.5222	12.0604
Gender - Male	0.5935	0.4912
NAICS Same	0.3662	0.4818
Race		
White	0.8453	0.3616
African American	0.1023	0.3030
Education ***		
Doctorate	0.0080	0.0893
Master's	0.0169	0.1289
Bachelor's	0.0945	0.2925
3 Yrs Tech./Voc.	0.0205	0.1418
2 yrs Associate's / Voc.	0.1304	0.3368
1 yr Tech/Voc.	0.0720	0.2585
High School	0.5340	0.4988
Proximity	0.1876	0.3904

\* Wages by Qtr. (2nd and 3rd Qtr. Average)

\*\* Difference between 2nd and 3rd Qtr. average wages:

Qtr. Wages before Claim and Qtr. Wages After Re-employment

\*\*\* Highest Attainment

## The Model

A regression model was constructed to test for influences on the wages differential of individuals moving through the reemployment market. The model used wage difference as the dependent variable and included various independent variables to test for influence. A fixed effects model was utilized in this evaluation. As the focus was proximity of home and work, yearly influences needed to be controlled, but were not of explicit interest to the study. The fixed effects model used the following format:

$$\text{Wage Difference}_a = \beta_0 + \sum_i \beta_i (X_i) + \varepsilon$$

Wage Difference<sub>a</sub> : Individual wage difference

X<sub>j</sub> : Total Weeks Claimed

NAICS Same

Wage Before Claim

Age Reemployed

Gender (Binary - Male)

Zip After (Binary –Proximity Home/Work Variable)

Race (Binary - White)

Education (Binaries - Doctorate, Master's, Bachelor's, 3 yrs Tech./Voc.,  
2 yrs Assoc./Voc., 1 yr Tech./Voc., High School)

Year (Binaries – 2005, 2006, 2007, 2008, 2009)

SOC Code (Binaries – MGT, BFO, CMA, ARE, LPS, CSS, LEG, ETL, AEM, HPT, HSS, PSS, FPS,  
BGM, PCS, SAL, AMD, FFF, COE, IMR, PRO, TMM, MIL)

**Table 3 - Wage Difference Results for Unemployment Insurance Claimants**

Observations	104,588			
Variable	37			
F-Value	1100.39			
Prob>F	0.0000			
	Coeff.	Std. Er.	t	p
<b>Wage Difference #</b>				
Total Weeks Claimed	-18.139	1.152	15.74	0.000 *
NAICS Same	1,597.484	34.121	46.82	0.000 *
Wage Before Claim <sup>§</sup>	-0.518	0.003	189.74	0.000 *
Age Re-employed	0.296	1.322	0.02	0.823
Gender - Male	945.370	35.839	26.38	0.000 *
Proximity	-572.424	39.220	14.60	0.000 *
Race				
White	357.333	42.502	8.41	0.000 *
Education				
Doctorate	1,013.630	175.408	5.78	0.000 *
Master's	1,518.642	128.118	11.85	0.000 *
Bachelor's	1,424.680	69.189	20.59	0.000 *
3 yrs Tech./Voc.	485.437	114.854	4.23	0.000 *
2 yrs Assoc. / Voc.	908.187	61.409	14.79	0.000 *
1 yr Tech./Voc.	425.419	71.813	5.92	0.000 *
High School	159.796	48.157	3.32	0.001*
SOC Codes				
SOC 11 MGT	-548.118	82.091	6.68	0.000 *
SOC 13 BFO	-437.389	96.039	4.55	0.000 *
SOC 15 CMA	274.505	142.958	1.92	0.055
SOC 17 ARE	377.809	126.281	2.99	0.003*
SOC 19 LPS	-982.055	344.123	2.85	0.004*
SOC 21 CSS	-1,035.396	171.467	6.04	0.000 *
SOC 23 LEG	-585.193	255.533	2.29	0.022
SOC 25 ETL	-1,050.536	138.982	7.56	0.000 *
SOC 27 AEM	-951.430	157.117	6.06	0.000 *
SOC 29 HPT	-146.366	123.471	1.19	0.024
SOC 31 HSS	-821.855	107.929	7.61	0.000 *
SOC 33 PSS	-1,323.391	208.428	6.35	0.000 *
SOC 35 FPS	-1,441.368	89.825	16.05	0.000 *
SOC 37 BGM	-1,355.086	104.572	12.96	0.000 *
SOC 39 PCS	-1,286.696	162.922	7.90	0.000 *
SOC 41 SAL	-1,000.291	81.190	12.32	0.000 *
SOC 43 AMD	-588.632	73.912	7.96	0.000 *
SOC 45 FFF	-1,449.620	258.391	5.61	0.000 *
SOC 47 COE	-113.472	67.223	1.69	0.091
SOC 49 IMR	432.934	80.329	5.39	0.000 *
SOC 51 PRO	-242.687	51.750	4.69	0.000 *
SOC 53 TMM	-130.003	71.389	1.82	0.069
SOC 55 MIL	-2,492.694	267.596	9.32	0.000 *
Constant	1,854.168			
* Significant at the 1% level				
# Difference between 2nd and 3rd Qtr. average wages: Qtr. Wages before Claim and Qtr. Wages After Re-employment				
§ Wages by Qtr. (2nd and 3rd Qtr. Average)				