Appendix

Table1: Demographic Profile, Full-time Workers with Certifications Compared to Those with Licenses.

Description	Manufacturing workers with certification, no license		Manufacturing workers with license	
	Number	Share of certified workers	Number	Share of licensed workers
Full-time employed	427,887		1,288,161	
Age				
16 to 24 years	23,656	6%	53,768	4%
25 to 40 years	139,351	33%	385,752	30%
40 to 54 years	171,602	40%	498,243	39%
55 years and older	93,278	22%	349,814	27%
Gender				
Female	89,977	21%	288,296	22%
Male	337,910	79%	999,865	78%
Race				
Asian	4,495	1%	5,659	0%
Black	37,121	9%	120,255	9%
Multiracial/other	38,203	9%	99,781	8%
White	350,878	82%	1,063,173	83%
Ethnicity				
Hispanic	48,405	11%	130,885	10%
Non-Hispanic	379,483	89%	1,157,276	90%
Citizenship				
Native U.S. citizen	365,584	85%	1,141,793	89%
Naturalized U.S. citizen	36,244	8%	91,385	7%
Noncitizen	26,060	6%	54,983	4%
Unionization				
Union member or covered by contract	11,362	3%	40,695	3%
Not covered by union contract	91,519	21%	258,698	20%
Education				
No high school diploma	12,103	3%	56,471	4%
High school graduate or equivalent	91,834	21%	331,242	26%
Some college or associate degree	154,190	36%	451,807	35%
Bachelor's degree	101,782	24%	269,559	21%
Advanced degree	67,979	16%	179,081	14%
Occupational group				
Administrative support	21,232	5%	77,562	6%
Business / finance	26,658	6%	64,769	5%

Computer	26,390	6%	25,382	2%
Construction	10,114	2%	56,251	4%
Engineering, science, and tech	58,730	14%	147,977	11%
Installers	34,009	8%	95,749	7%
Management	81,244	19%	166,129	13%
Production	119,521	28%	372,289	29%
Sales	6,722	2%	45,649	4%
Transportation	24,654	6%	157,290	12%
Miscellaneous / other	18,613	4%	79,114	6%

Table 2: Median Weekly Earnings, Workers with Licenses or Certifications.

Description	Certification only	License
Full-time employed	$1,107	$1,011
Age		
16 to 24 years	$750	$682
25 to 40 years	$1,028	$920
40 to 54 years	$1,356	$1,084
55 years and older	$1,261	$1,189
Gender		
Female	$1,164	$921
Male	$1,097	$1,029
Race		
Asian	$2,160	$920
Black	$1,012	$750
Multiracial/other	$1,399	$1,075
White	$1,111	$1,059
Ethnicity		
Hispanic	$923	$926
Non-Hispanic	$1,135	$1,037
Citizenship		
Native U.S. citizen	$1,084	$1,008
Naturalized U.S. citizen	$1,419	$1,214
Noncitizen	$1,196	$1,183
Unionization		
Union member or covered by contract	$1,006	$1,106
Not covered by union contract	$1,154	$999
Education		
No high school diploma	$801	$723
High school graduate or equivalent	$846	$862
Some college or associate degree	$975	$920
Bachelor's degree	$1,556	$1,311
Advanced degree	$1,714	$1,833
Occupational group		

Administrative support	$843	$806
Business / finance	$1,726	$1,704
Computer	$1,366	$1,335
Construction	$1,048	$1,205
Engineering, science, and tech	$1,515	$1,515
Installers	$1,050	$1,076
Management	$1,818	$1,554
Production	$831	$799
Sales	$1,149	$1,339
Transportation	$699	$794
Miscellaneous / other	$1,347	$1,319

Table 3: Detailed Regression Results, Factors Influencing Weekly Earnings (log) for Full-Time Manufacturing Workers that do not have a License or Certification.

Number of observations	23,551
F statistic	575.9
Prob > *F*	0.00
R-squared	0.44

	Coef.	Std. Err.	*t*	*P>|t|*
Constant	5.960	0.041	145.03	0.000
Female	-0.217	0.008	-28.20	0.000
Asian	-0.085	0.054	-1.58	0.113
Black	-0.146	0.013	-11.58	0.000
Multi/other	-0.062	0.015	-4.19	0.000
Hispanic	-0.106	0.012	-9.00	0.000
Noncitizen	-0.106	0.013	-8.13	0.000
Age	0.039	0.002	22.35	0.000
Age squared	0.000	0.000	-17.85	0.000
Union member or covered by contract	0.101	0.011	8.91	0.000
High school graduate or equivalent	0.201	0.012	16.67	0.000
Some college or associate degree	0.264	0.013	20.01	0.000
Bachelor's degree	0.545	0.015	35.33	0.000
Advanced degree	0.664	0.020	33.06	0.000
Administrative support	-0.414	0.017	-24.78	0.000
Business / finance	-0.157	0.019	-8.33	0.000
Computer	-0.030	0.021	-1.40	0.160
Construction	-0.374	0.026	-14.26	0.000
Engineering, science, and tech	-0.094	0.015	-6.19	0.000
Installers	-0.299	0.020	-14.69	0.000

Production	-0.484	0.014	-35.61	0.000
Sales	-0.292	0.023	-12.92	0.000
Transportation	-0.564	0.019	-29.54	0.000
Miscellaneous / other occupation	-0.403	0.023	-17.46	0.000
Large metro	0.066	0.009	7.18	0.000
Midsized metro	0.039	0.008	4.86	0.000
Northeast	-0.037	0.012	-3.09	0.002
Midwest	-0.068	0.010	-6.50	0.000
Southeast	-0.063	0.010	-6.21	0.000

Table 4: Detailed Regression Results, Factors Influencing Weekly Earnings (log) for Full-Time Manufacturing Workers with a License or Certification.

Number of observations	3,010
F statistic	51.12
Prob > *F*	0.00
R-squared	0.33

	Coef.	Std. Err.	*t*	P>|t|
Constant	5.775	0.141	40.83	0.000
Female	-0.213	0.025	-8.37	0.000
Asian	0.232	0.164	1.41	0.158
Black	-0.238	0.036	-6.57	0.000
Multi/other	-0.014	0.039	-0.36	0.717
Hispanic	-0.114	0.035	-3.25	0.001
Noncitizen	-0.050	0.046	-1.10	0.271
Age	0.051	0.006	8.71	0.000
Age squared	0.000	0.000	-7.30	0.000
Union member or covered by contract	0.092	0.041	2.23	0.025
High school graduate or equivalent	0.135	0.055	2.47	0.013
Some college or associate degree	0.165	0.055	3.00	0.003
Bachelor's degree	0.345	0.061	5.63	0.000
Advanced degree	0.517	0.063	8.17	0.000
Administrative Support	-0.374	0.055	-6.85	0.000
Business / finance	0.070	0.053	1.33	0.184
Computer	-0.081	0.065	-1.24	0.214
Construction	-0.253	0.069	-3.65	0.000
Engineering, science, and tech	-0.031	0.045	-0.69	0.490
Installers	-0.217	0.051	-4.23	0.000
Production	-0.381	0.047	-8.14	0.000
Sales	-0.200	0.084	-2.38	0.017
Transportation	-0.441	0.052	-8.52	0.000
Miscellaneous / other occupation	-0.132	0.055	-2.39	0.017
Large metro	0.108	0.026	4.21	0.000
Midsized metro	0.028	0.024	1.18	0.237
Northeast	-0.046	0.033	-1.42	0.155
Midwest	-0.010	0.028	-0.36	0.717
Southeast	-0.041	0.030	-1.35	0.177