

IMPROVING THE OCCUPATIONAL OUTLOOK ESTIMATING EMPLOYMENT USING LICENSING DATA

LONG-TERM EMPLOYMENT PROJECTIONS RESEARCH

Purpose

Occupational licenses are a potential source of employment estimates that have not been utilized. Although we have relatively reliable estimates of non-self-employment by occupation, analysts are considering the use of licensing data to refine estimates of self-employment by occupation. This study will determine whether the effort spent gathering licensing data is worth the information that may result.

Method

The first step to link licenses with occupational totals is to create a crosswalk from licenses to occupation codes. Next, using the crosswalk, one determines how many licenses are usable based on how closely the occupations match the codes. Then, one collects license data and compares it to existing occupational estimates.

Occupation Identification

In Minnesota, both the Economic Security and Trade and Economic Development agencies maintain lists of licenses and contact information. If such a compiled list does not exist in a given state, Chart 1 can be used to access information about the Minnesota agencies which maintain the licensing boards that may also exist in other states.

The project team took the most complete list and matched OES codes to the licenses. OES codes were necessary for this study because the most current self-employment data are from the 1990 Census, which used OES codes. When the detailed 2000 Census data are available, SOC codes should be utilized. Whenever possible, the project team avoided “All Other” categories because only one-to-one matches can be used. For this study, the 87 initial separate licenses corresponded to 73 OES codes. Each license matched a code, but 14 were duplicates. For example, three types of EMT licenses shared a single OES code. (The crosswalk of licensed occupations to OES codes is available by e-mailing Minnesota’s LMI Helpline at lmi@ngwmail.des.state.mn.us.)

Chart 1: Minnesota Boards of Licensure

Board	Quantity
Commerce	16
Health	14
Architecture, Engineering, Land Surveying, Land Architecture, Geoscience, and Interior Design	7
Medical Practice	6
Electricity	5
Dentistry	3
Labor and Industry	3
Barber Examiners	2
Marriage & Family Therapists	2
Nursing	2
Pharmacy	2
Social Work	2
Accountancy	1
Administration	1
Agriculture	1
Assessors	1
Attorney General's Office	1
Campaign Finance & Public Disclosure	1
Children, Families, and Learning	1
Chiropractic Examiners	1
Dietetics and Nutrition Practice	1
Emergency Medical Services	1
Law Examiners	1
Natural Resources	1
Nursing Home Administrators	1
Optometry	1
Peace Officer Standards	1
Podiatric Medicine	1
Psychology	1
Veterinary Medicine	1
Total	82

Data Collection

When licenses had been matched, the next step was to contact the licensing boards. Any licenses with generalized occupation codes (such as All Other Therapists) were discarded because there were an unknown number of employees with that code beyond the amount given by the licensing board. Thus, there was no way of comparing data from licensing boards with the pre-existing data. The project team found that 24 of the 73 codes (33 percent) were unusable for this reason. See Chart 2 for occupation list.

Obtaining Minnesota license data was straightforward. Most boards keep good records of licensees. It was important to distinguish between active and total licensees: for this study, analysts were interested in active licensees. Some boards were also able to provide the number of licensees with in-state addresses. Some occupations had a much larger set of total registered licensees than active users of those licenses. This difference was due largely to retired persons and those taking family leave but continuing their licensed status. Although the project team expected that the process of calling boards for licensing data would be lengthy, data collection took a total of only 16 hours. Data for just three licenses could not be obtained, and this was due to unreachable licensure boards.

After contacting boards of licensure, team members checked to see if license data were available through any additional sources. In Minnesota, the Health Department gathers information on licensed healthcare workers' active status by sending out a survey with its regular relicensing packets. Project analysts obtained this data to supplement what had already been received from the boards.

Chart 2: Licenses with Unusable Data

Licensed Occupation	OES Code	Reason for Exclusion
Nursing home administrator	15008	Grouped with non-licensed occupations
Building contractor & remodeler, residential	15017	Grouped with non-licensed occupations
Food, beverage, lodging	15026	License not matched to individuals
Cosmetology manager	19999	Grouped with non-licensed occupations
Accountant, certified public	21114	Grouped with non-licensed occupations
Securities agent	21199	Grouped with non-licensed occupations
Building official, certified	21908	Grouped with non-licensed occupations
Engineer	22100	Only a small percent of workers have licenses--not required in occupation
Soil scientist	24199	Grouped with non-licensed occupations
Barber instructor	31314	Grouped with non-licensed occupations
Cosmetology instructor	31314	Grouped with non-licensed occupations
Marriage and family therapist,licensed	32399	Grouped with non-licensed occupations
Marriage and family therapist,licensed	32399	Grouped with non-licensed occupations
Alcohol and drug counselor	32399	Grouped with non-licensed occupations
Rehabilitation consultant, qualified (QRC)	32399	Grouped with non-licensed occupations
Acupuncturist	32999	Grouped with non-licensed occupations
Athletic trainer	34058	Grouped with non-licensed occupations
Real Estate Closer	43014	Grouped with non-licensed occupations
Fund-raiser, professional	49999	Grouped with non-licensed occupations
Insurance adjuster	53302	Grouped with non-licensed occupations
Home health aide - class C individual paraprofession	66011	Extremely inaccurate data--licenses listed fewer than 1% of 1998 workers
Beekeeper	79015	Grouped with non-licensed occupations
Water conditioner contractor	81002	Grouped with non-licensed occupations
Alarm and communication system contractor	81005	Grouped with non-licensed occupations
Electrical contractor	81005	Grouped with non-licensed occupations
Water conditioner installer	85118	Grouped with non-licensed occupations
Well contractors	85118	Grouped with non-licensed occupations
Manufactured home installer	85999	Grouped with non-licensed occupations
Water supply operator	95002	Grouped with non-licensed occupations

Occupation Estimation

By combining each of the sources, analysts saw that some occupations had up to five license estimates— total, active, and in-state addresses from the license boards as well as total and active estimates from the Department of Health. Whenever available, analysts used active and Minnesota address totals rather than registered licensees. Team members performed all analysis on the highest and lowest estimates of licensees. Although it was assumed that these would give a wide range of possible results, the high and low estimates were close enough that they made no more than a 1.0 percent difference in results. Analysts then used the low estimates for the remainder of the study, although using high estimates would not have made a noticeable difference in the results.

The next step was to compare the license data totals to the pre-existing estimates of employment. It is important to use a number that includes self-employment since many licensed workers do not hold wage and salary jobs. The project team used the most recent data that included self-employment, the 1998 industry totals and occupational staffing patterns to estimate the number of self-employed in the licensed occupations. The occupational breakdown of self-employment from the 1990 Census was applied to 1998 industry totals. These data still use OES occupations. In the future, national self-employment data using SOC codes will be available from the Current Population Survey. The 2000 Census data will not be available until 2003 when the 2002-2012 occupational projections are made.

Total Employment Results

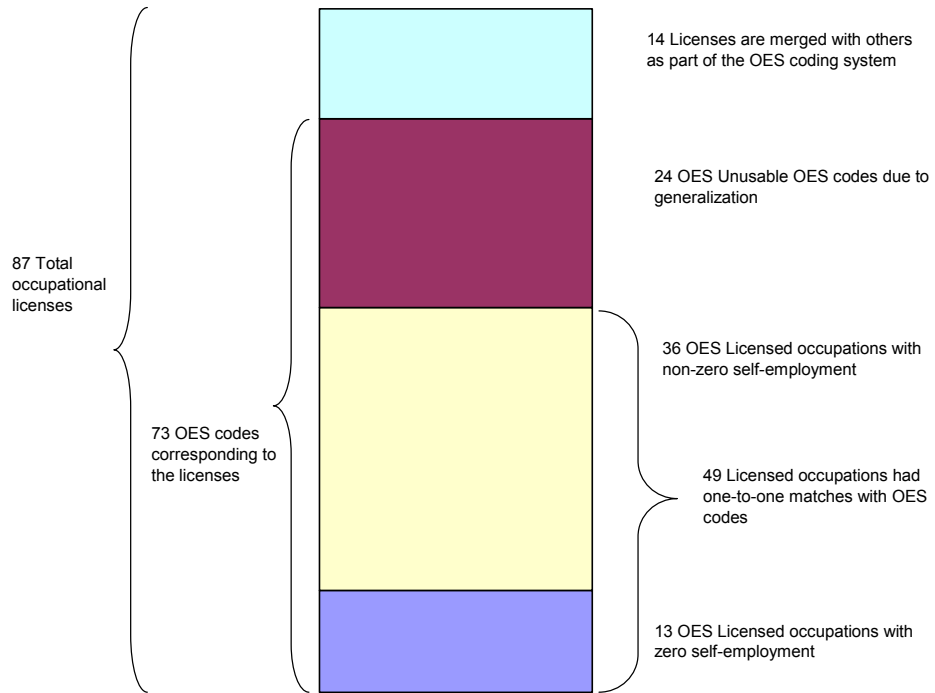
Forty-nine occupations had OES codes that were one-to-one matches. These occupations comprised 282,895 workers (10 percent of 1998 employment baseline, according to previous calculations). Using the license data, these totals varied between 321,000 and 325,000, which was 19 to 20 percent larger than employment estimates combining OES estimates and self-employment. However, when the absolute value of the difference between each occupation's licensed and previous estimate was taken, the average difference was 45 percent, and the median difference was 56 percent. The large differences were due to the licenses sometimes overestimating but sometimes underestimating totals, depending on occupation. Differences of nearly 50 percent were

too large to assume that license data in the aggregate had much validity. The definition of an “active” license could mean very different things to the licensing boards, and there was no way to determine this.

Chart 3: License Data of all Usable Occupations

OES Code	Occupation	Baseline Employment	Licensed Employment *	Absolute Difference	Percent Difference
32314	Audiologist/speech-language pathologist,cert. hearing instr. Dispenser	1,458	1,491	33	2%
32102	Physician	12,879	12,555	324	3%
32521	Dietitians & Nutritionists	961	994	33	3%
87502	Plumber	6,745	6,994	249	4%
32302	Respiratory care Profession	1,232	1,286	54	4%
32908	Dental hygienist	3,114	2,870	244	8%
22311	Land surveyor	529	487	42	8%
32505	Nurse, licensed practical	16,920	18,763	1843	11%
85932	Elevator constructor and master elevator constructor	454	399	55	12%
32105	Dentist	3,212	2,822	390	12%
32114	Veterinarian	1,333	1,575	242	18%
66002	Registered dental assistant	4,533	3,698	835	18%
27108	Psychologist	3,121	3,700	579	19%
28311	Abstracter	497	398	99	20%
31300	Teacher (prim, sec, spec.ed)	66,224	52,965	13259	20%
22308	Landscape architect	319	394	75	24%
27305	Social worker (non-clinical)	10,804	7,675	3129	29%
32511	Physician Assistant	911	629	282	31%
32108	Optometrist	637	879	242	38%
32502	Nurse, registered or professional	39,809	57,392	17583	44%
87202	Electricians	10,708	15,530	4822	45%
27302	Social worker, clinical	4,736	2,600	2136	45%
34008	Lobbyist	85	41	44	52%
68008	Manicurist	399	622	223	56%
32305	Occupational therapist	1,498	2,336	838	56%
68005	Cosmetologist or esthetician	12,279	19,296	7017	57%
32517	Pharmacist	3,452	5,462	2010	58%
34041	Interior designer, certified	2,377	942	1435	60%
43002	Insurance agent	15,004	5,613	9391	63%
63014	Law enforcement officer	5,086	8,500	3414	67%
32308	Physical therapist	1,766	3,039	1273	72%
66021	Occupational therapy assistant	459	802	343	75%
21917	Assessor	525	919	394	75%
22302	Architect	1,924	3,476	1552	81%
68002	Barber & Barber apprentice	1,400	2,587	1187	85%
28108	Attorney	10,428	19,354	8926	86%
87808	Roofer, residential, and contractors of residential Roofing	2,189	248	1941	89%
32111	Podiatrist	90	171	81	90%
39011	Mortician	674	1,300	626	93%
85723	Electrical installer or lineworker	2,353	129	2224	95%
43011	Real estate appraiser	1,406	2,903	1497	106%
43005	Real estate broker	1,006	2,086	1080	107%
43008	Real estate salesperson	9,552	19,810	10258	107%
24111	Geologist	280	632	352	126%
32518	Pharmacy Technicians	1,703	4,707	3004	176%
32113	Chiropractor	620	2,054	1434	231%
32508	EMT's	2,990	14,615	11625	389%
87803	Lead worker, Asbestos worker, cert.	488	3,490	3002	615%
77008	Fisher (commercial)	67	513	446	666%
	Averages	269,778	320,252	122167	
	Standard Deviation		119%	45%	132%

Chart 4: Usability of Licensed Occupations



The Role of Self-Employment

Although employment estimates appeared to vary wildly from license data totals, it was still possible that the differences were due to poor estimations of self-employment using current techniques. Hence, by looking at the occupations without self-employment and ascertaining whether the problems remained, it could be determined if the license data were misrepresenting employment— since current employment estimating methods have known accuracy relative to the occupations.

Only 13 occupations in our study had usable OES codes along with no self-employment. These constituted an estimated 84,705 jobs using current calculations or between 92,000 and 93,000 jobs using license data, which is 10 percent higher. In the aggregate, these numbers were more accurate than when self-employment was included in calculations. When the absolute value of the difference between each occupation's licensed and previous estimate was taken, the average difference was 47 percent, and the median difference was 45 percent. The average difference of this test group was nearly identical, but the median difference was somewhat lower than for the occupations in the larger study. Given that the differences in the test group were still quite large, the errant data appeared to be the licensing information rather than the self-employment estimates currently in use.

Since the occupations without self-employment had somewhat more similar numbers than those with self-employment, it could be assumed that the occupations with self-employment vary even more. For these occupations, analysts took the totals using each method for each occupation and multiplied them by the percent actually self-employed as estimated by the 1990 Census.

Thirty-six of the usable 50 licensed occupations had non-zero self-employment according to the 1990 Census. These occupations constituted 35,863 workers according to current calculations or between 43,000 and 45,000 using active license data— 22 to 23 percent higher. When the absolute value of the difference between each occupation's licensed and previous estimate was taken, the average difference was 68 percent, and the median difference was 45 percent. Thus, the average difference was much higher than the occupations without self-employment, but the median difference was very similar. However, both these calculations are significantly different from current estimates.

To see if the differences are largely from any particular categories, analysts grouped them by the first digit of their OES codes. None of the occupational groups were noticeably closer than the average. It seemed that the medical occupations matched or “crosswalked” the most directly to licenses and therefore might be more accurate. However, licensing data show the group as 17 percent below previous estimates, which is still a large difference.

Chart 5: License Data for Occupations without Self-Employment

OES Code	Occupation	1998 Emp	Low Lic Emp	% Diff (Low)
28311	Abstracter	497	398	25%
31000	Teacher	66,224	52,965	25%
68008	Manicurist	399	622	36%
63014	Law enforcement officer	5,086	8,500	40%
66021	Occupational therapy assistant	459	802	43%
21917	Assessor	525	919	43%
32511	Physician Assistant	911	629	45%
32518	Pharmacy Technicians	1,703	4,707	64%
32113	Chiropractor	620	2,054	70%
32508	EMTs	2,990	14,615	80%
27302	Social worker, clinical	4,736	2,600	82%
87803	Lead worker or asbestos worker, cert	488	3,490	86%
77008	Fisher (commercial)	67	513	87%
		84,705	92,814	
	Averages		110%	47%
	Standard Deviation			23%

Conclusion

Neither overall employment nor self-employment appears to be accurately calculated using license data. Differences between this and other methods are too large even for occupations that match with licensed codes. However, at least for Minnesota, the license information was much easier to collect than expected. Thus, it may be useful to find other ways to apply the license data. However, it does not appear to be helpful in the attempt to improve occupational estimates— at least not en masse.

Conducting a future study using variations of this method could give more meaningful results. One possibility would be to focus on particular occupations: if an analyst knows that one occupation or category of occupations has a tight correspondence between licenses and actual workers, this could be a more accurate use of license numbers. Another alternative would be to track license data over time and look at trends. Since U.S. Census data are available only every 10 years, the rise and fall of active licenses could provide a timely supplemental data source in the intervals.