

IMPROVING THE OCCUPATIONAL OUTLOOK EXECUTIVE SUMMARY

LONG-TERM EMPLOYMENT PROJECTIONS RESEARCH

Background

For Fiscal Year ending June 30, 2002, Minnesota is undertaking five related research projects for the Long-Term Employment Projections Consortium. The overall goal of these projects is to provide states with some advice on how they may be able to improve their occupational projections at the state and sub-state level, using projections results from one state as an example. The five specific projects are:

- 1) Devise the best strategy for optimizing occupational aggregation.
- 2) Suggest viable ways to incorporate occupational information on supply and skills.
- 3) Demonstrate how data assembled on licenses can improve occupational estimates.
- 4) Evaluate options for projecting self-employment.
- 5) Designate the benefits and pitfalls of using increasingly localized staffing patterns when projecting employment at the sub-state level.

Minnesota is a medium-sized state with an industry structure that closely approximates the nation, so it serves as a suitable proxy for the “typical” state during exploratory employment projections research. States with industry, occupational or regional structures that deviate significantly from Minnesota’s pattern may find some of these suggested improvements more valuable than others. This work is only intended to help states prioritize their efforts and avoid wasting resources.

Products

The products from this project are this executive summary and five distinct reports. This summary includes brief results from the five component projects, melds the findings from each of them into a coherent strategy, and offers suggestions for both state projections work in present/future rounds and for additional research. The project reports include detailed descriptions of the methods, major findings, supporting evidence, and specific implications for the long-term occupational projections process.

Consolidated Results (based on findings to date)

The overall result of the Minnesota case-study research indicates that states are likely to improve the value of their long-term projections by devoting more effort to a few extra items (but not all of them were studied as part of this research). The most rewarding results will probably come from: 1) producing most sub-state projections using more detailed sub-state staffing patterns, and 2) editing self-employment estimates with all methods at hand, including some licensing data. The value of experimenting with aggregating occupations that eliminates potential misinterpretation is still undetermined.

There will be less value in spending time with: 3) adding skills information to projected employment tallies (since O*NET’s skills information is based on yesterday’s— not tomorrow’s— skills, the place for skills may lie in better aggregation of final results), and

4) trying to collect and use counts of licensed individuals as an alternative way of capturing total employment in most occupations.

Moreover, 5) independently projecting occupational supply to align with demand is unwise, for employment projections as now constructed already represent the expected intersection of supply and demand. Analysts ought to better inform users about what occupational projections really represent—that is, the likely number of jobs in each occupation given known and anticipated trends, not the simple demand for workers; analysts should determine whether additional labor supply assumptions should be built into their process. If shortages are an issue, there is also a need to monitor occupational wages and possibly to initiate well-constructed and -interpreted job vacancy surveys.

Major Findings from Each Project Component

Optimal Occupational Aggregation (In Progress)

The objective of this project is to demonstrate how different publication rules can reduce the scope for misinterpretation of occupational employment projections. There are three ways to interpret what is meant by “optimal.” It may mean simple ease of interpretation for users, the alignment of similar occupations by both description and projected behavior, or a lack of volatility from one projection round to the next. That third goal, and the only one which can be tested by statistical research, means maximizing the number of occupations projected while minimizing biennial volatility: how much base-to-base and projected-year-to-projected-year changes vary.

The project team determined that using output from both 1998-2008 and 2000-2010 projections was not possible given coding changes. Therefore, the project analysts will now set up an approach to consider when 2002 to 2012 information is available so that the work can progress at that time. The approach will be to cross-compare aggregations of projected occupational employment under a number of possible scenarios, with minimal volatility the measure and the impact on ease of interpretation and similar occupations noted. The SOC coding structure will serve as the default. Tested alternatives will include intra-SOC aggregation, skills clusters and educational requirements. This is the proper place for skills information from O*NET to be used in the projections process.

Supply and Skills (Completed)

The objective of this project is to flesh out the role that projecting supply and skills has in state and area employment projections in order to determine whether or not these items ought to be embedded in the suggested process embraced by all states. Because supply and skills are so different, this project has been segregated into its two component parts.

A position paper dismisses the value of independently projecting supply in long-term work using economic theory and national methods of data collection and long-term employment projections. There is no reason to change the projections process or to incorporate an independent supply projection; in fact, doing so might be dangerous. There are some suggestions on how shortages and surpluses might be handled: by collecting short-term vacancies as an early guide and by tracking relative occupational wages over the long run. States are also urged to look into their own ways of assuring that projections indeed represent the expected intersection of

supply and demand by incorporating some sort of supply constraint.

The idea of incorporating skills into long-term projections is not dismissed outright, but its role is diminished from what many may believe. Skills information is embedded into O*NET, a static system that has captured occupational descriptors at a past point in time— now many years ago. There are provisions for updating this information, but no systematic method has yet been devised to project skills into the future in the way the national change factor matrix deals with occupational staffing. The suggestion is to use skills as a base-year enhancement and/or as an occupational aggregator.

Self-Employment (In Progress)

The objective of this project is to convince states of the importance of strongly considering problems that poor self-employment estimates generate and to guide states on how to better make these estimates. With only old (1990) Census information at hand for most of the project's term, the approach is to simulate the 1998-2008 projections using both ways of estimating the numbers of self-employed. The sensitivity of published projections results in a preferred choice of methods. There is also a discussion of where, when and how to utilize more complete information on licenses. If available, 2000 Census data will be gathered. With all four options at hand (old Census, new Census, sharing-out and licenses), an alternative 2010 Minnesota self-employment projection will be revealed and suggestions offered for future rounds.

Licensed Occupations (Completed)

The objective of this project is to explore whether collecting data on the number of licenses by occupation: 1) is likely to improve overall occupational employment estimates (since self-employment is not surveyed by OES) and 2) is worth the time spent.

Licensed occupations in Minnesota were identified and data on them collected much more easily than originally expected thanks to information from other state agencies that had already amassed data from licensing boards. So, collection of this information may not be the biggest roadblock. Less satisfying, however, was the effort to come up with numerical values that aligned with occupational base-year data. Only 49 (of 87) occupations had one-to-one matches between licensed titles and SOC codes, though they did represent 10 percent of the 1998 baseline. More critically, there was typically a large difference between the number of people holding licenses by occupation and the estimated baseline employment level (wage and salary plus self-employed), and a large variation in that difference. For occupations without self-employment, while the typical differences remained large, the variation was much lower, though still uncomfortably wide.

The usefulness of licensing data for systematically estimating employment is therefore limited. Identifying and cross-linking licenses to occupational projections is a worthwhile effort for career advisory purposes. However, unless states have a readily available source of numbers, it is not worth the effort to collect all the data. There are probably too few uses. The most efficient way to utilize a state's resources would be to work backward, concentrating any research on those occupations with a high proportion of self-employment— where different methods of counting yield widely variable results and where the overall estimate is volatile when compared to base year values from prior projections rounds. The best way to use this information may be as a check on (and possibly a hand-adjustment to) baseline employment for these occupations.

Sub-state Occupational Projections (Completed)

The objective of this project is to determine the sensitivity of sub-state occupational employment projection results to the choice of geographic staffing patterns used. In general, there is no right answer as to whether using a statewide or an area-specific staffing pattern is the preferred choice since there is no census of occupational employment as the benchmark; “accuracy” is thus a misnomer. All else being equal, statewide staffing would generate smaller sampling error but may misrepresent the kinds of occupations found in the area by including a job distribution from elsewhere. When projecting employment for sub-state areas, most states have used statewide staffing (possibly substituting national staffing on a case-by-case basis for some industries) because there have been no good, widely available alternatives. With the expansion of the OES survey and the development of the EDS system, there is now a choice. But does it matter? Would the end result be similar using either approach and therefore negate the worth of the extra effort?

In order to complete this project within the year yet incorporate direct SOC-collected data, projections were simulated using a hybrid of 1998 base-year industry estimates and 1999-2000 state OES survey and 2000-2010 national change factors (actual values did not matter, but differences among them did). Simulated projections were run using statewide staffing as the default, with local and metro/non-metro staffing patterns as alternatives. All six sub-state areas in Minnesota were compared in the aggregate and at the major occupational group level. One region that showed a great degree of sensitivity was further scrutinized at the specific occupational level, with most attention given to how 10-year occupational change would be reported to users.

The findings of the research show that there is indeed a difference in end results as staffing pattern choices are made— this is especially true as regions get smaller. The main danger is not that occupations are missed, but that the size of occupations in an area might be wrongly specified, and that it is impossible to say in general which pattern is better. If a state contains a dominant metropolitan area, as Minnesota does with the Twin Cities, then for other areas, statewide staffing might be a poor choice— even though sampling errors on average would undoubtedly be lower. But for these smaller regions, findings show that industry structure mattered more than size alone in determining how much occupational growth varied from the default. Results from the area that was studied in depth suggest that for some occupations, the area-specific pattern might more closely represent reality, though that depends on whether prominent employers are captured in the survey (which they were in this case).

The other danger is that an unfortunate choice of staffing pattern yields poor advice when it comes to which occupations are best bets for long-term growth. Even after size is accounted for, the differences in rank order and growth quintile can be substantial. At the very least, reporting of results for medium and small areas at the sub-state level ought to be conservative and use higher cutoffs for inclusion, mask precision by grouping into ranges, and avoid the use of rank tables for percent change.

Beyond cautious reporting, the main suggestion is that, depending on knowledge of the area and soundness of their OES survey, analysts should explore all their options. Presuming or pre-selecting a pattern won't suffice. Without time to choose and/or edit staffing patterns industry by industry— ultimately the preferred approach— the next-best strategy would be to run sub-state projections using more than one type of pattern and let the results guide the ultimate determination.

Recommendations for Present/Future Projections Rounds

Some of the results from this set of research projects might still be usable in this current round of projections and in the subsequent work done in the year ending June 30, 2003; this could include the intra-state publication of these numbers and sub-state employment projections. Therefore, the suggestions from the fifth project (sub-state staffing patterns) are of most immediate value. Some states might also wish to consider the implication from the first project (optimal aggregation) that urges using O*NET to enhance reporting of base year estimates. Also, projections analysts can decide to what extent they wish to become expert in associated work such as vacancy surveys and occupational wage monitoring as suggested in the second project (supply and demand).

This work also has implications for the next round of projections (2002-2012) due on June 30, 2004. Specifically, the findings from projects number three (self-employment) and four (licenses) warrant a change in approaches, time and perhaps tools. Steps should be taken to study and make better use of 2000 Census data and then to devise some options for “updating” this data between 10-year intervals (see “Further Research” below).

Recommendations for Further Research

Before the statewide round of 2012 projections gets underway, however, there are three suggestions for further research that ought to be considered. Ideally, these would be implemented by the time that the next BLS national projections are released in November 2003.

Most immediate and helpful would be further work on isolating the reasons behind large variations at the sub-state level when statewide vs. area-specific staffing patterns are used. As it stands, the present research demonstrates the large distinctions found using different approaches and emphasizes that the statewide estimate is not necessarily better. But it does not provide any clue as to whether the differences in estimates are due to sampling error or to real differences in industry staffing patterns. There is also no tool to guide analysts in picking and choosing among the options for any given industry and area (e.g., national vs. state, area vs. some blend). Our preliminary research also suffers from two shortcomings: it utilizes only two years of OES survey data, rather than the three years that ostensibly might yield better estimates at a sub-state level, and it covers only a single state, which may not be representative in all respects. Our suggestion is that such work commence after the first three years of direct-SOC surveys is complete and that it involve several states who, together, emulate the nation, both in terms of industry structure and in terms of sub-state areas for which information is demanded by users (large, small and medium-sized metro, non-metro regions and regions with some of each).

Another area requiring more work is the development of better methods and tools that can utilize the options for estimating and projecting numbers for occupations that have a large degree of self-employment. This may not matter much for retraining wage and salary workers, but that is a short-term concern in any event. Usage of long-term outlook information has always been more geared toward career advising and training program development and should provide students the option of earning a living regardless of whether the opportunity is a job, a contract or an entrepreneurial venture. Currently, the methods for counting these occupations— let alone projecting them— are crude and/or outdated. Variations using the methods at hand are too great. The Micro Matrix system ought to deviate in this regard from BLS (whose national data are relatively much better) and put more emphasis on options that incorporate data from other national sources. This topic deserves more attention.

A final suggested study would track and analyze occupational wages and job growth over time. As the current research demonstrates, occupational projections represent the number of jobs that will clear the market at a given future point in time— that is, the expected intersection of supply and demand. In addition, the latest job vacancy information is starting to show that certain occupations appear to exhibit shortages even in a market that is balanced overall. Since neither short-term vacancy nor long-term projections work is capable of isolating chronic shortages, the best alternative may be to see whether growth in relative wages for any occupations persists for years at rates above or below all occupations. These might be signals that markets are not clearing properly and that more (or less) training is warranted. Whether there is some correlation between former projected occupational employment growth and past relative wage growth might also be revealing. According to theory, both price and quantity should clear in the long run as people migrate physically or choose to educate themselves in lucrative fields. Because they are open systems subject to larger-scale migration, states and areas are a better test of market clearing than the nation, where immigration is controlled. If chronic shortages are revealed by higher relative wages at the labor market level, then there is a stronger case for targeted public educational investment.

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