Best Places for Finding a Job: The Role of Regional Occupational Structure in Residents' Employment Prospects

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Introduction

- Unemployment rates and employment growth vary substantially across regions in the U.S. (Elhorst 1995, 2003).

- Several regional characteristics influence a region's unemployment rate and employment growth.
  - Specifically, regional industry structure, i.e., industry specialization and industry diversity, have strong effects on a region's employment prospects (Izraeli and Murphy 2003; Layne, 2013).

- Researchers have started investigating the influence of occupational structure on regional economies; considering the importance of what regions do (occupation), rather than just what regions make (industry) (Thompson and Thompson 1985).

- The effects of regional occupational structure on residents' employment prospects are less well understood.

Research Questions

1. How much does a person's employment prospects depend on the local area in which they live?

2. Does a local area's occupational structure affect its residents' employment prospects beyond the effect of their own human capital?

3. Do differences in occupational structure of local areas help explain some of the variation in residents' employment prospects across these areas?

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Data and Analysis Sample

- The analysis uses the American Community Survey (ACS) 2011, 1-year Public Use Micro Sample (PUMS) file.
  - A nationally representative survey of 3 million household addresses each year
  - Collects information on the demographics, housing, and social and economic characteristics of respondents

- The universe for the analysis includes:
  - Residents aged 16 years or older,
  - In the civilian labor force at the time of the interview,
  - In each of the 2,057 local areas in the United States.

- Local Areas in the analysis: Public Use Micro Areas (PUMA) are contiguous geographies of at least 100,000 people that do not cross state boundaries.

Defining the Local Area Occupational Structure

- We conceptualize the local area's occupational structure in two ways.
  - **Primary Occupation Concentration**: the occupation group in which the local area is most specialized, and
  - **Occupation Diversity**: how many different occupation groups in which the local area is specialized.

- Both aspects of occupation composition are measured using location quotients.

- **Location quotients** compare the share of a local area's workforce employed in a specific occupation group to the share of the nation's workforce in this same occupation group.

- Location Quotient$_{OL}$ = $(E_{OL} / E_{TL}) / (E_{ON} / E_{TN})$

  - Where: E = Employed, and subscripts O = Occupation, L = Local Area, T = Total Workforce, and N = Nation.

- A location quotient equal to or greater than 1.25 denotes an occupation concentration that is at least moderately strong.

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Occupational Classification

In this research, we group the occupations into eight categories, similar to each other in type of work and earnings.

| Occupation Groups	2010 Census Occupation Codes	Example Occupations
Management, business, science, and arts occupations (except Education and Healthcare)	0010 - 1965	Chief Executives, Accountants, Engineers
Education, legal, community service, arts, and media occupations	2000 - 2960	Lawyers, Teachers, Reporters
Healthcare practitioners and technical occupations	3000 - 3540	Doctors, Nurses, Physical Therapists
Service occupations (except Protective)	3600 - 3655; 4000 - 4650	Nursing Assistants, Waiters, Janitors
Protective service occupations	3700 - 3955	Firefighters, Police Officers, Security Guards
Sales and office occupations	4700 - 5940	Cashiers, Real Estate Agents, Bookkeepers
Natural resources, construction, and maintenance occupations	6005 - 7630	Loggers, Carpenters, Mechanics
Production, transportation, and material moving occupations	7700 - 9750	Machinists, Assemblers, Pilots

Analysis Method

- To model a person's likelihood of being employed, we use a two two-level, logistic, random-intercept model where:
  - 1,498,397 residents are nested within the 2,057 local areas, and
  - a person's likelihood of being employed is allowed to vary randomly across local areas.

- We quantify the amount by which a person's likelihood of being employed is influenced by the local area in which they live.

- We separately model the effects on a person's likelihood of being employed of
  - Personal characteristics, specifically educational attainment and
  - Local area characteristics, specifically occupational structure

Local Area Occupational Structure: Primary Occupational Concentration

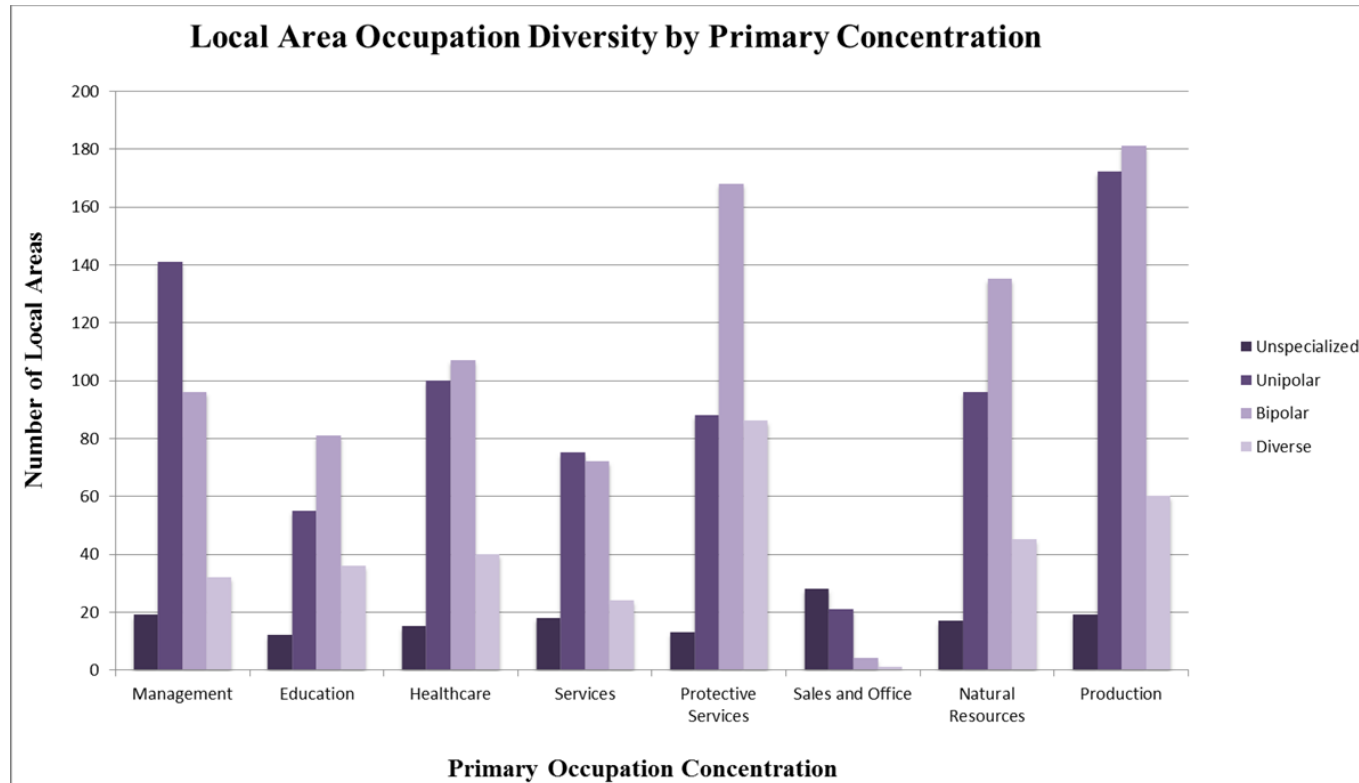**Local Area Primary Occupation Concentration**
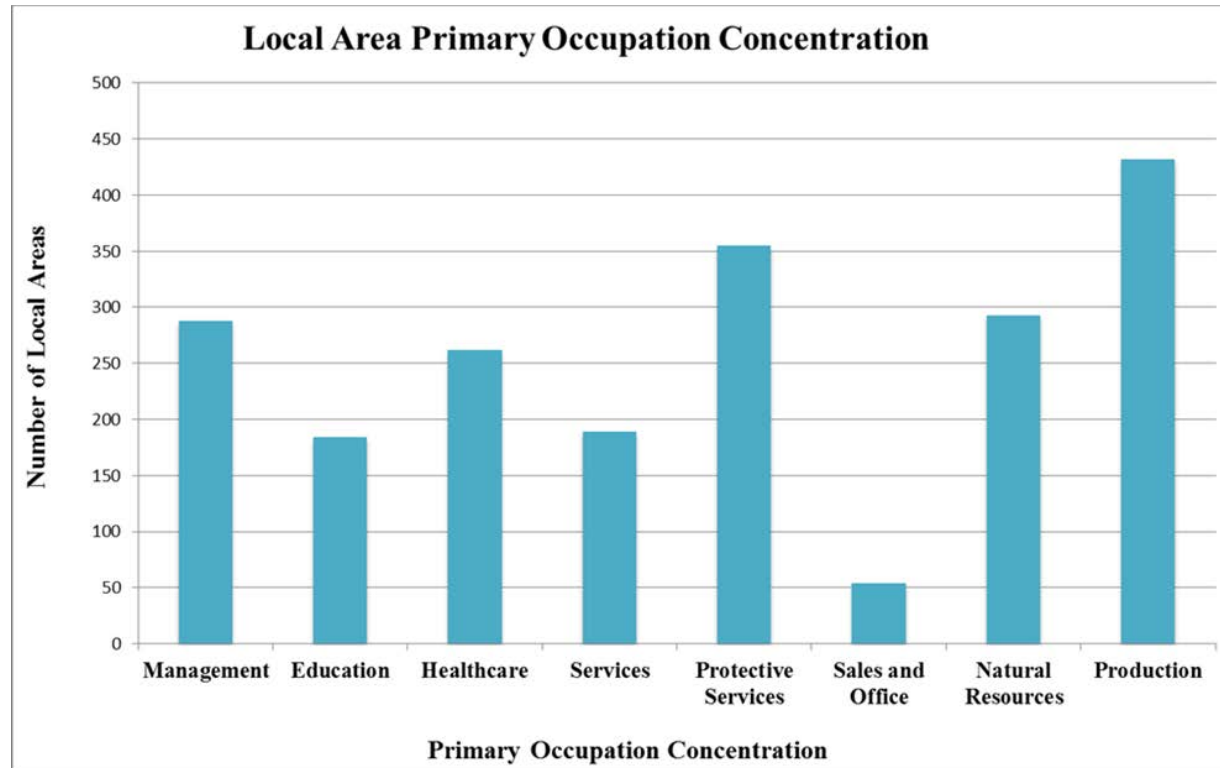
- A local area's primary occupation concentration is the occupation group with the largest Location Quotient value.
- Most local areas' primary occupation concentration is in Production, Protective Services, or Natural Resources.

Local Area Occupational Structure: Occupational Diversity

Local Area Occupation Concentration Diversity
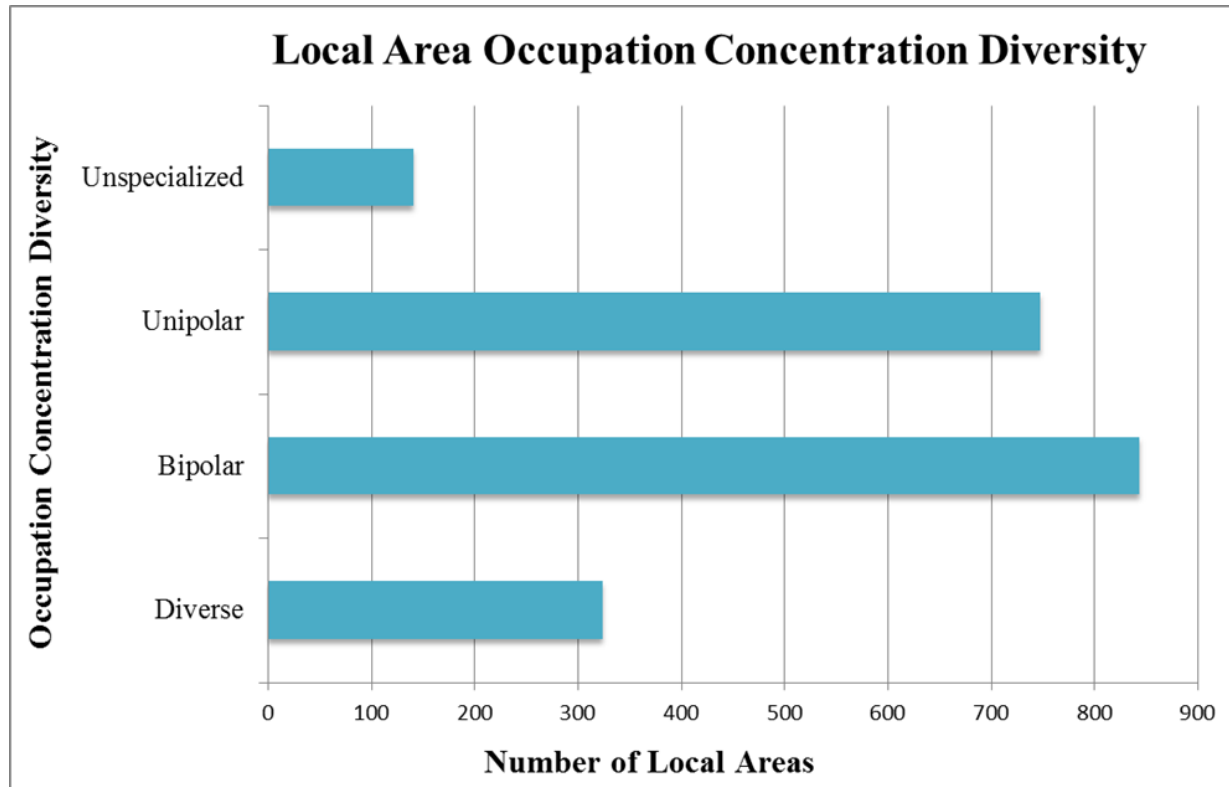
- We measure a local area's occupation diversity in four categories:
  - **Unspecialized** - No occupation concentrations,
  - **Unipolar** – One occupation concentration,
  - **Bipolar** – Two occupation concentrations, and
  - **Diverse** – Three or more occupation concentrations
- Most local areas have bipolar or unipolar occupation diversity.

Local Area Occupational Structure: Primary Concentration and Diversity

Local Area Occupation Diversity by Primary Concentration

- Most local areas with a primary concentration in production have only one or two occupation specializations.
- Nearly half of local areas with a concentration in management have only one occupation specialization.
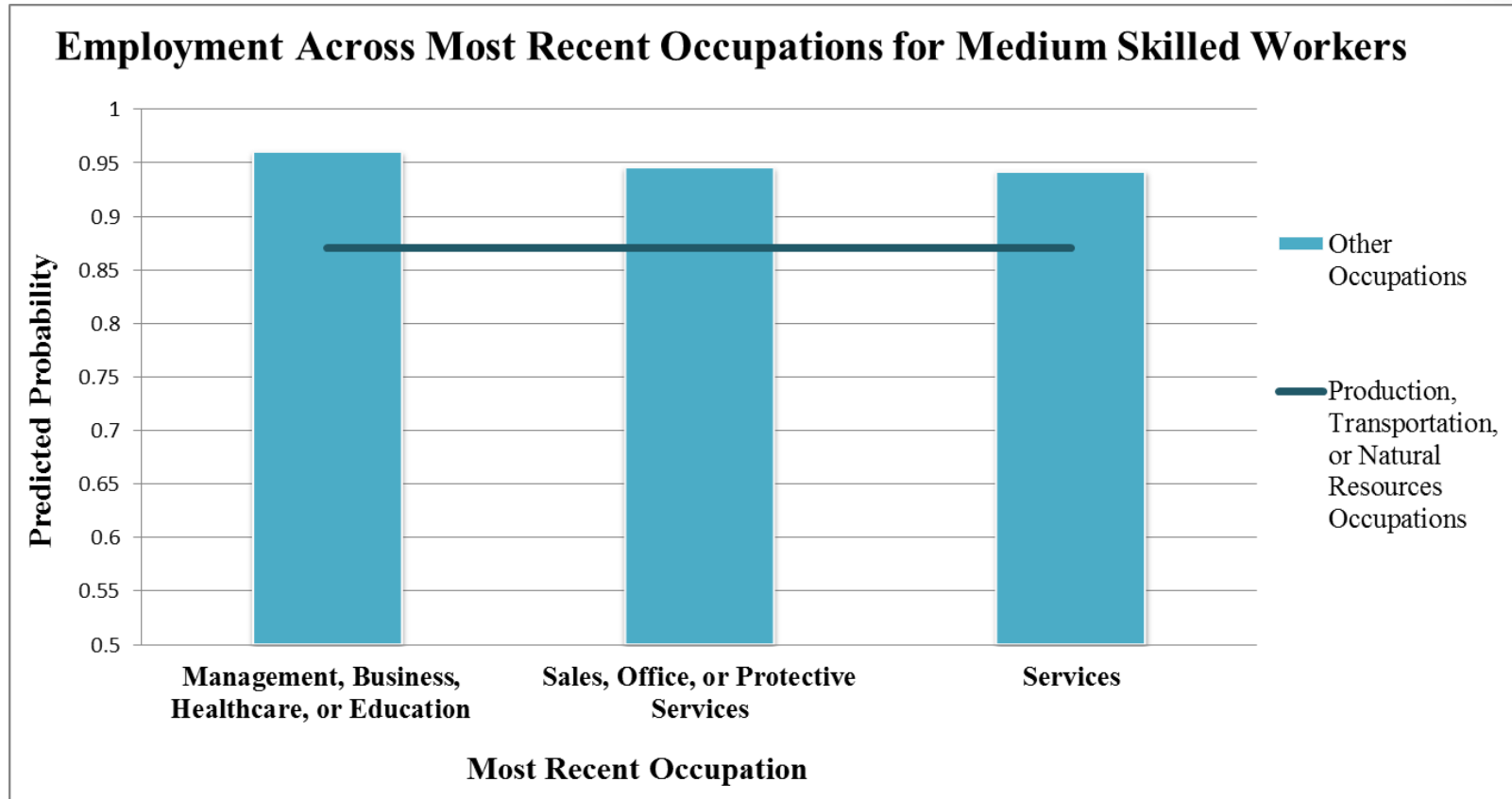
Model Results: Personal Characteristics

	Employed in 2011
	Odds Ratio
Worker Characteristics	
Management, Business, Healthcare, or Education Occupation	3.59 ***
Services Occupation	2.43 ***
Sales, Office, or Protective Services Occupation	2.59 ***
Black	0.54 ***
Asian	0.96 *
Hispanic	1.03 **
Other Race	1.10 ***
Female	0.78 ***
Under 25 years old	0.45 ***
45 to 64 years old	1.32 ***
Over 64 years old	1.47 ***
Less than High School Diploma	0.69 ***
Some College	1.23 ***
Bachelor's Degree or Higher	1.51 ***
Low English Proficiency	1.28 ***
Non-Citizen	1.20 ***
Has a Disability	0.47 ***
Constant	6.72 ***

*** < 0.001, ** < 0.01, * < 0.05

| Outcome Variance Information	Estimate	Std. Error
Variance of Constant (Model 3)	0.052	0.002
Variance of Constant (Model 1)	0.097	0.004
Psuedo Intra-Class Correlation (Model 3)	0.016	0.001
Psuedo Intra-Class Correlation (Model 1)	0.029	0.001
Proportionate Reduction in Variance (Model 1 to 3)	46.2%	

Model Fit Statistics	Estimate	
BIC (Model 3)	866813.2	
BIC (Model 1)	867658.9	
	Chi-Square	Significance
LR vs. Logistic Regression Test - DF(1) (Model 1)	7290.34	0.000

Model Results: Most Recent Occupation and Education

Employment Across Most Recent Occupations for Medium Skilled Workers

Legend:
- Other Occupations
- Production, Transportation, or Natural Resources Occupations

X-axis (Most Recent Occupation): Management, Business, Healthcare, or Education; Sales, Office, or Protective Services; Services

Y-axis: Predicted Probability

Medium skilled residents whose most recent occupation was management or services are more likely to be employed than production workers.

Model Results: Most Recent Occupation and Education

Employment Across Most Recent Occupations for Lower Skilled Workers
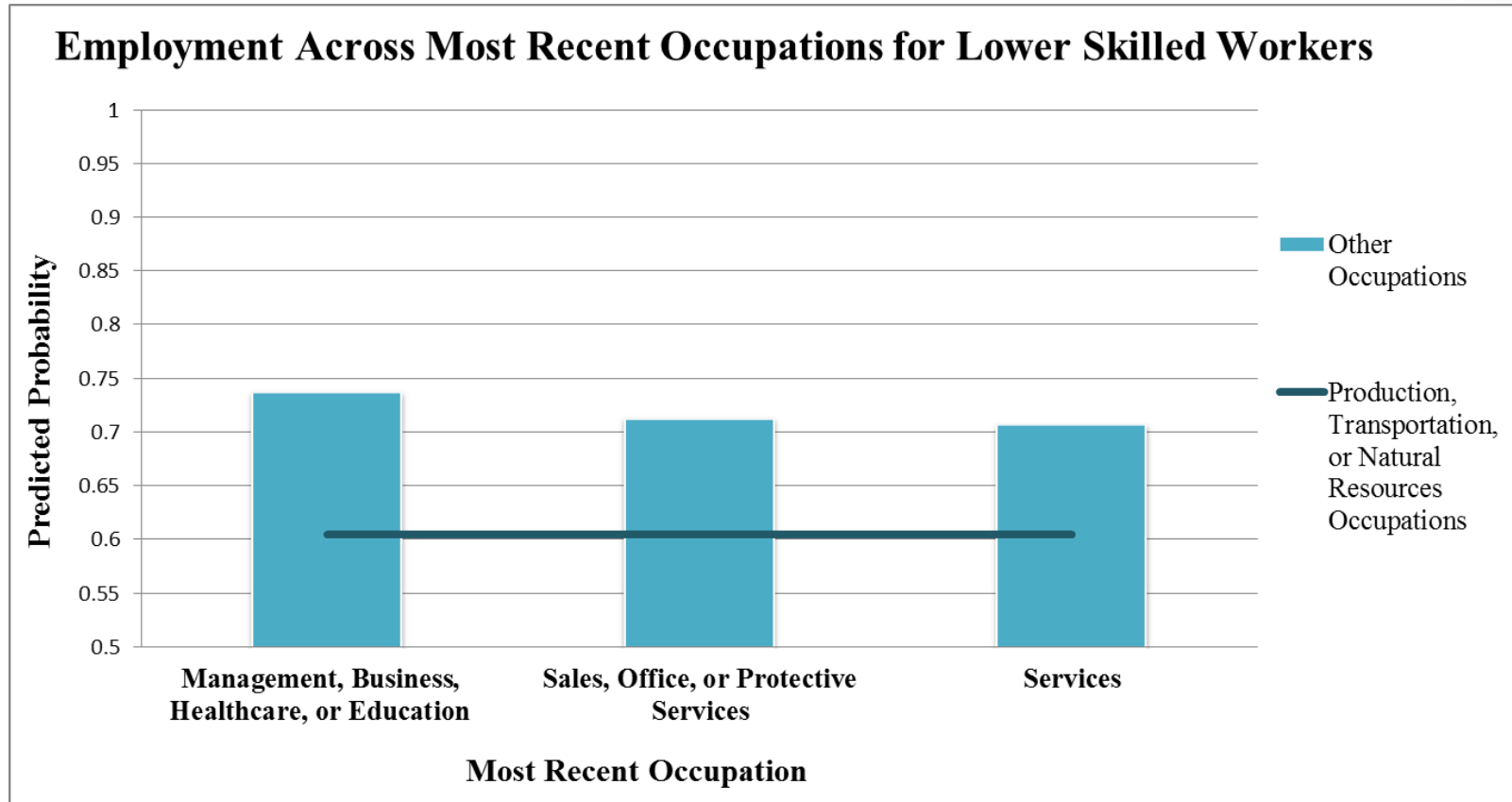
Lower skilled residents whose most recent occupation was management or services are more likely to be employed than production workers.

Model Results: Local Area Characteristics

	Employed in 2011
	Odds Ratio
Local Area Control Characteristics	
Percent of Residents with Less Than a High School Diploma	1.00
Percent of Workers Who are Part-Time or Part-Year	0.99 ***
Minimum Wage	0.83 ***
Union Representation Rate	1.00
Indexed Gross Domestic Product	1.06 ***
Percent of Residents Who are New to Area	0.99 ***
Percent of Residents Who are Non-Citizens	0.98 ***
Labor Force Participation Rate	1.01 ***
Labor Force Size	1.00 ***
Local Area Primary Occupation Concentration	
Management	0.90 ***
Education	0.92 **
Healthcare	0.95 *
Services	0.86 ***
Protective Services	0.87 ***
Sales and Office	0.84 ***
Natural Resources	1.05 *
Local Area Occupation Diversity	
Unspecialized	0.98
Bipolar	1.00
Diverse	1.00
Constant	6.72 ***

*** < 0.001, ** < 0.01, * < 0.05

| Outcome Variance Information	Estimate	Std. Error
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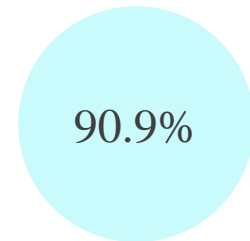# Model Results: Variance in Employment Across Local Areas
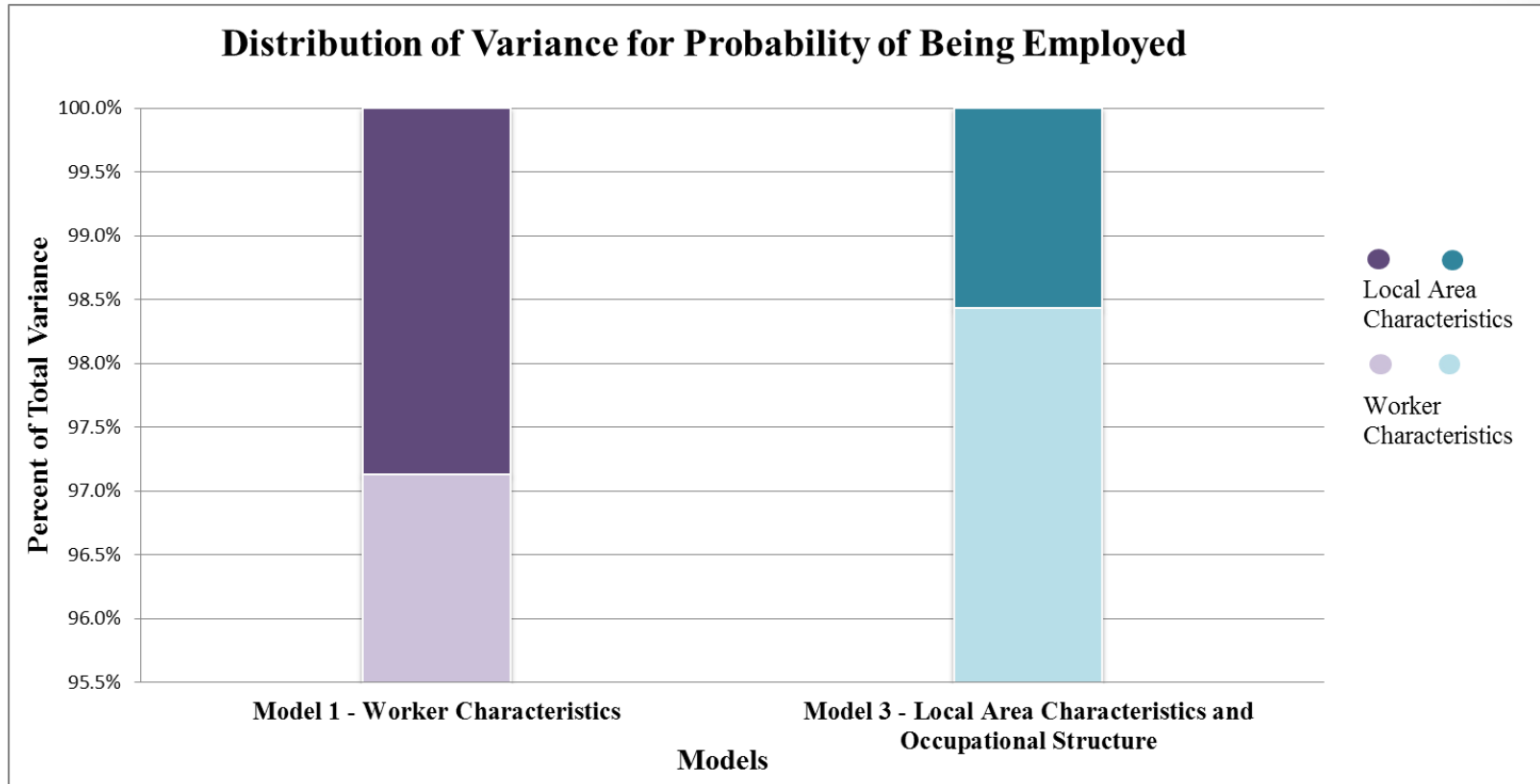
Lower Bound
Local Area
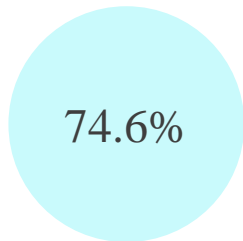
Mean
Local Area
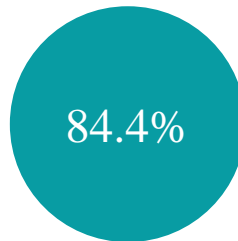
Upper Bound
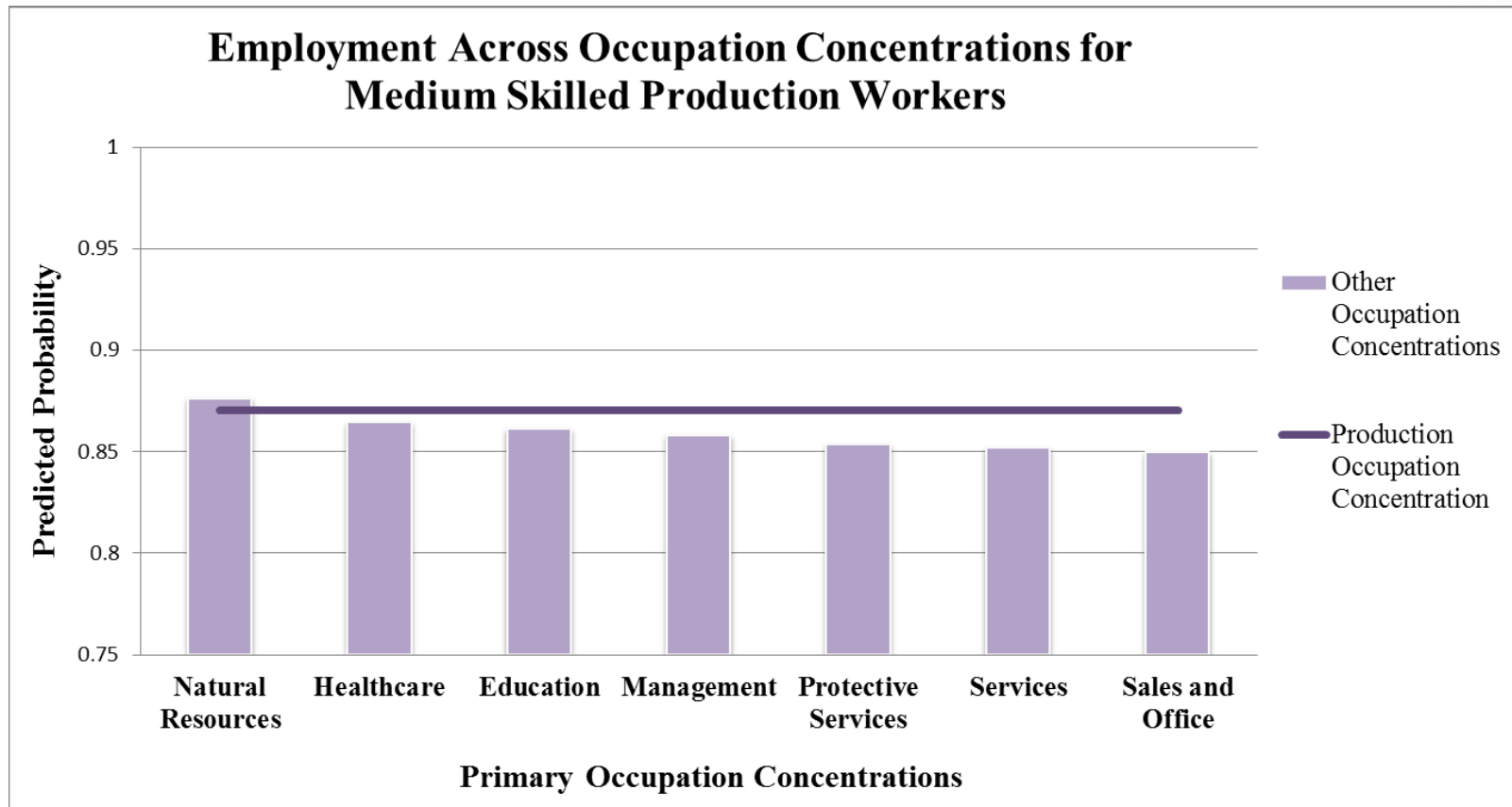Local Area

74.6%   79.9%   84.4%   88.1%   90.9%

A middle skilled production worker's probability of being employed ranges from 74.6% to 90.9% across the local areas in the U.S.

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Model Results: Explaining Variance in Employment Across Local Areas

**Distribution of Variance for Probability of Being Employed**

- About 3% of the variance in being employed is related to local area characteristics rather than personal characteristics.
- Occupational structure helps explain nearly half of the variance related to local area characteristics.

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Model Results: Occupation Concentration, Occupation, and Education

Employment Across Occupation Concentrations for Medium Skilled Production Workers

Legend:
- Other Occupation Concentrations
- Production Occupation Concentration

Y-axis: Predicted Probability
X-axis: Primary Occupation Concentrations (Natural Resources, Healthcare, Education, Management, Protective Services, Services, Sales and Office)

Medium skilled production workers living in local areas that specialize in natural resources are more likely to be employed.

Model Results: Occupation Concentration, Occupation, and Education

Employment Across Occupation Concentrations for Lower Skilled Production Workers
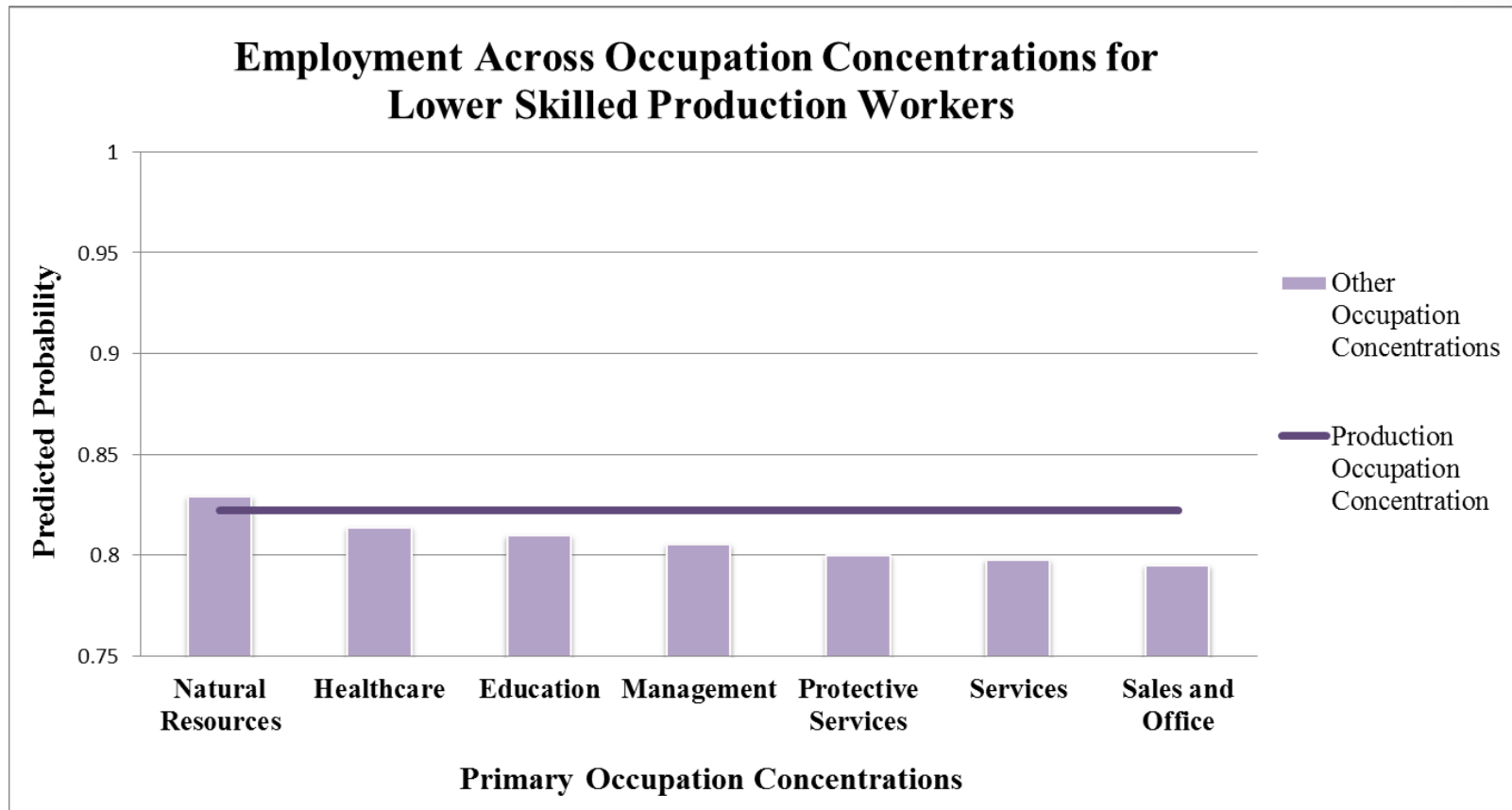
Lower skilled production workers who live in local areas that specialize in natural resources are more likely to be employed.

Conclusions

1. About 3% of a person's total employment prospects is related to the characteristics of where they live rather than their individual characteristics.

    a. However, a person's human capital and most recent occupation have much larger effects on their employment prospects.

2. A local area's occupational structure affects its residents' employment prospects above and beyond their individual characteristics.

    a. Moving to a region with a different occupation specialization can improve a person's employment prospects alone.

3. Occupational structure helps explain about 46% of the variation in employment prospects that is related to the local area characteristics.