

Defining the Skilled Technical Workforce

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Middle-Skill Jobs: Education, Training, and
Certification Pathways

How others have defined “middle-skilled workers” or similar concepts

Adam Smith	“The policy of Europe considers the labor of all mechanics, artificers, and manufacturers, as skilled labor.”
Philip Toner	"Trades and Technical Workers," as classified by Australian New Zealand Standard Classification of Occupations
Autor, Levy, Murnane	Those performing routine cognitive tasks
Autor, Katz, Kierney	Occupations in middle third of median wage distribution or mean years of schooling distribution
Holzer	Occupations between 75 and 150 of US median

My proposed definition of a skilled technical worker:

1. the occupation requires a high level of skill in a technical domain
2. and does not require a bachelor's degree for entry

How to measure

1. O*NET Version 19

- a) 942 occupational categories
- b) Mean sample size of 29 workers per occupation for knowledge survey (1-7 scale; 4.5 or higher considered “high”)
- c) Data on skills (“knowledge”) and education

What is a technical domain?

Biology

Building and Construction

Chemistry

Computers and Electronics

Design

Engineering and Technology

Food Production

Mathematics

Mechanical

Medicine and Dentistry

Physics

Production and Processing

Telecommunications

implied non-technical domains

Administration and Management

Clerical

Communications and Media

Customer and Personal Service

Economics and Accounting

Education and Training

English Language

Fine Arts

Foreign Language

Geography

History and Archeology

Law and Government

Personnel and Human Resources

Philosophy and Theology

Psychology

Public Safety and Security

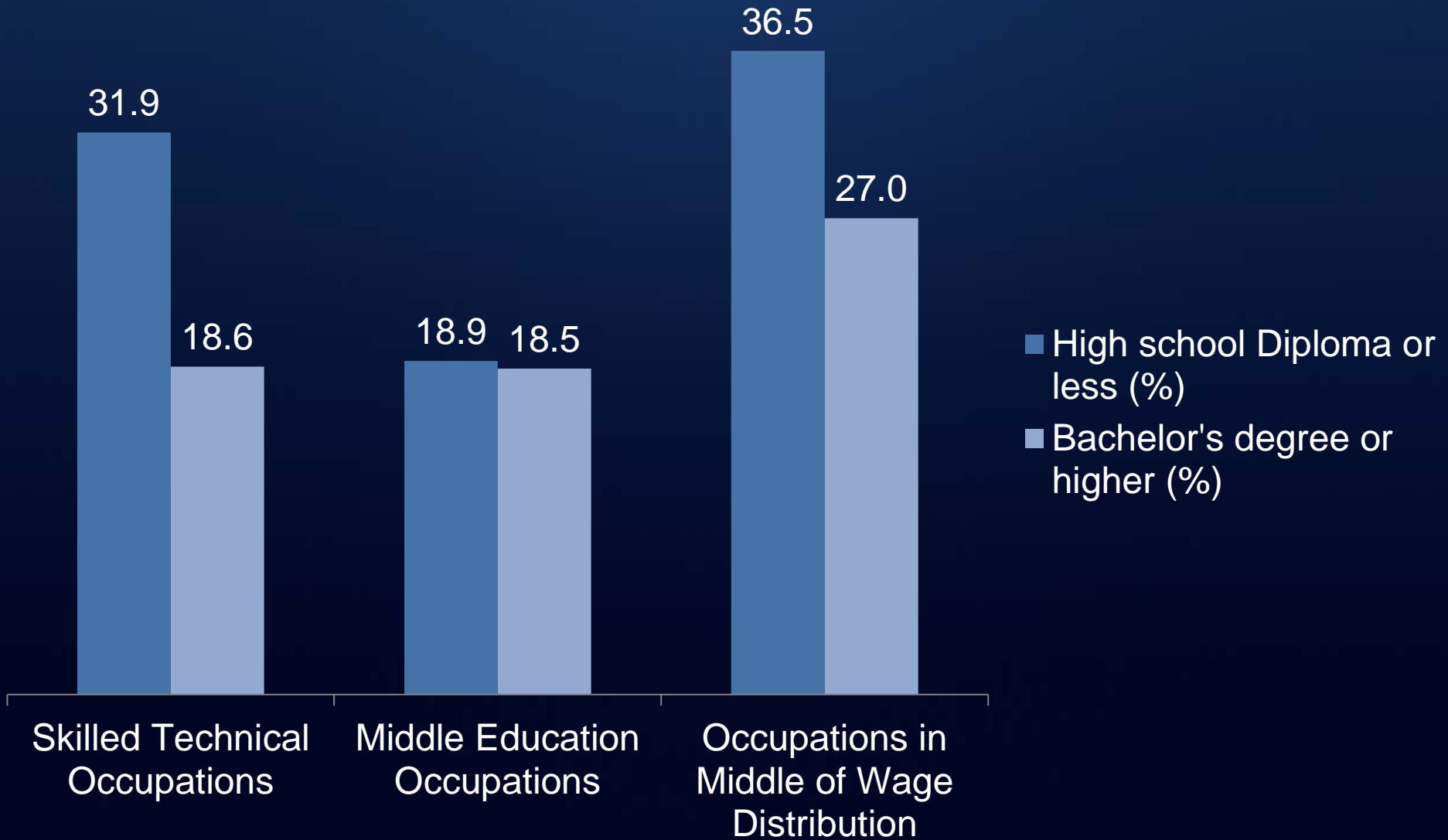
Sales and Marketing

Sociology and Anthropology

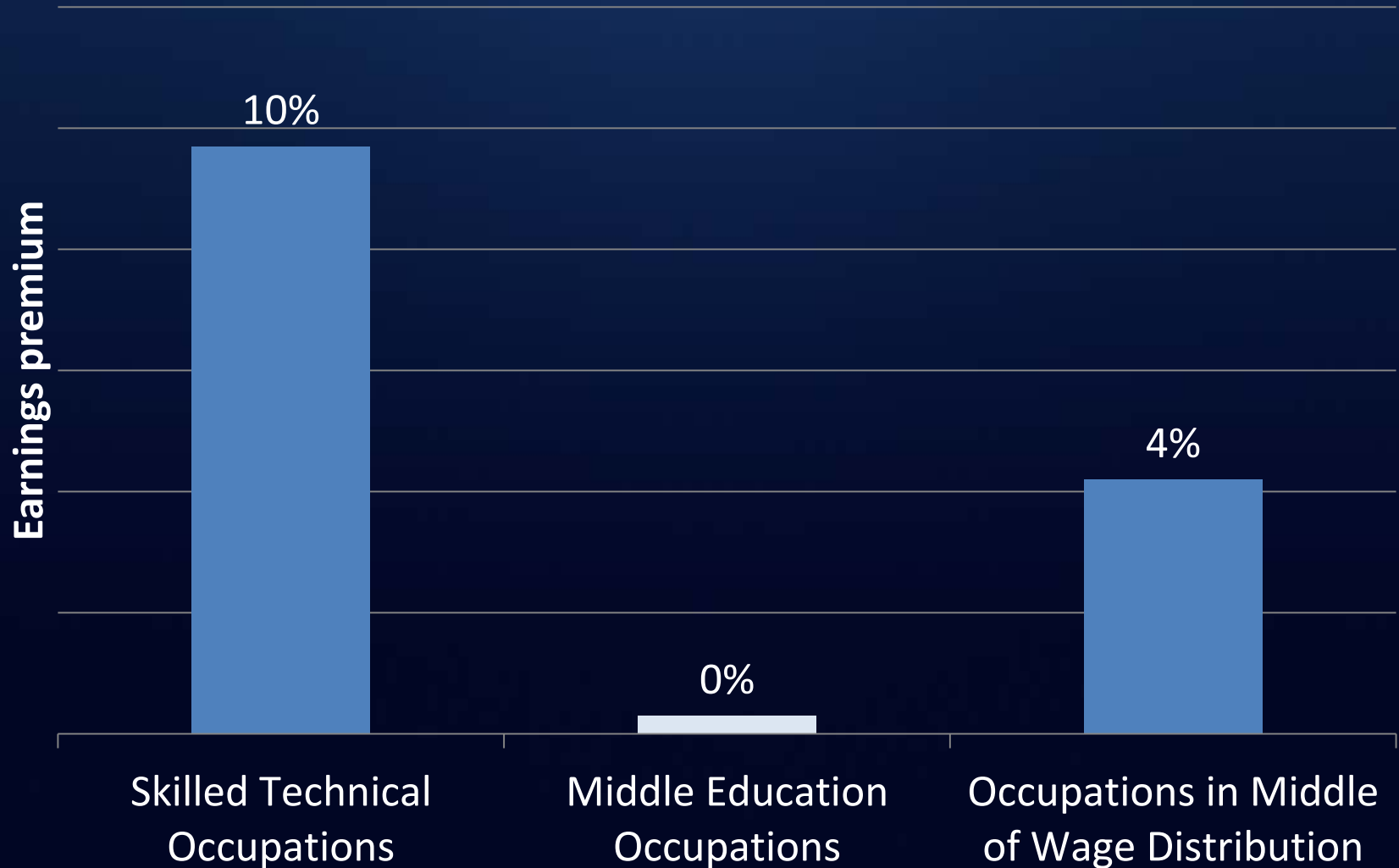
Therapy and Counseling

Transportation

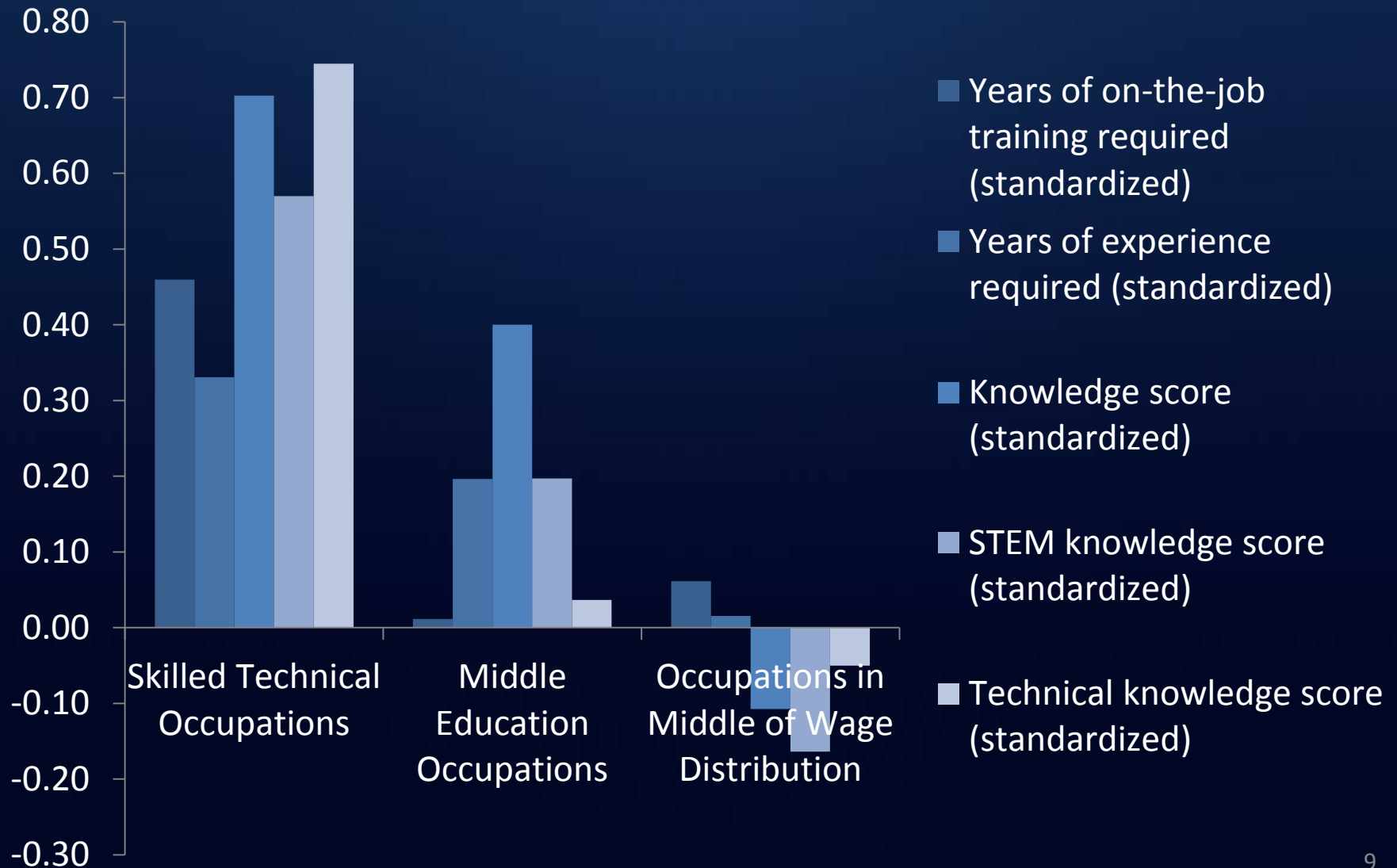
Comparing the education of workers across definitions



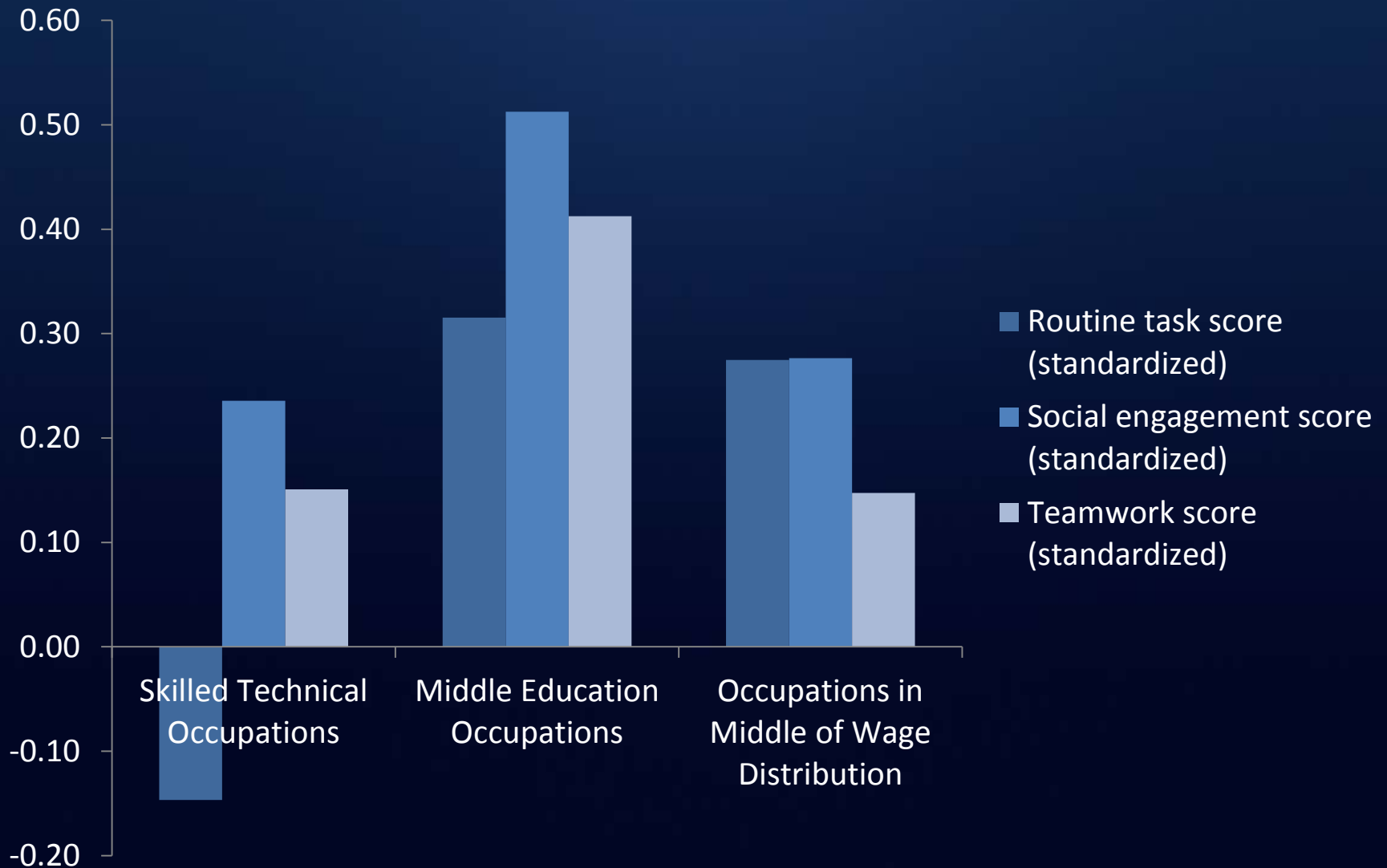
Earnings premium is highest for skilled technical occupations, conditional on education and experience



Standardized indexes of training, experience, and skill by middle skill definition



Skilled technical workers score lower on routine and social engagement



Most common broad occupational categories of skilled technical workers using above definition

	Workers	Share of occupation
Installation, Maintenance, and Repair	4,418,880	84%
Healthcare Practitioners and Technical	3,343,020	43%
Construction and Extraction	2,825,350	53%
Production	2,576,660	29%
Computer and Mathematical	824,640	22%
Architecture and Engineering	653,650	27%
Protective Service	308,790	9%
Transportation and Material Moving	231,790	3%
Arts, Design, Entertainment, Sports, and Media	213,330	12%

Practical & Policy Implications

1. Pre K- high school education

Broad need to enhance quality of education, especially math—school reforms (charters, vouchers, teacher ratings and performance pay) offer promise

2. Last two years of high school

Career and technical education options (eg Magnet schools, community college partnerships)

3. Higher education

Accountability needed. Use data on student economic outcomes (employment, salary, loan repayment) and value-added framework to provide incentives for higher quality

4. Private led training; flexible skilled-based HR policy