Labor Market Returns to Community College in Michigan

Peter Bahr
University of Michigan

Brian Jacob
University of Michigan

Alfredo Sosa
University of Michigan

Susan Dynarski
University of Michigan

Daniel Kreisman
Georgia State University

Mark Wiederspan
Arizona State University
Previous Research

• In summary of 18 studies, Belfield and Bailey (2011) suggest
  o Average return for an AA was 13% for males and 22% for females
  o Average return for Certificates was 7 to 22% for males and 3 to 41% for females

• More recent research has examined earnings utilizing college administrative records coupled with UI (unemployment insurance)
  o Arkansas (Belfield, 2015)
  o California (Bahr, 2016)
  o Kentucky (Jepsen, Troske, & Coomes, 2014)
  o North Carolina (Liu, Belfield, & Trimble, 2015)
  o Tennessee (Carruthers & Sanford, 2015)
  o Virginia (Jaggers & Xu, 2016)
  o Washington (Dadgar & Trimble, 2015)
Previous Research

• In general, these studies found
  o Earning gains with an AA are higher for females than males
  o Findings are mixed with long-term certificates, but a majority of the studies find that earnings are higher for females than males
  o For short-certificates, findings vary across studies and methodological approach
    • Using a cross-sectional analysis, short-term certificates have a small increase or negative association with earnings
    • With fixed affects, there are positive earnings gains

• Our study complements the work of these studies by looking at a state that has experienced unemployment and education attainment rates that are far from the national average
  o Use administrative records from 5 Michigan community colleges
Why Michigan?

[Graph showing unemployment rates over years for Michigan (MI), Illinois, Indiana, Minnesota, Ohio, Wisconsin (IL, IN, MN, OH, WI), and the USA.]
Why Michigan?

• Share of population with at least an AA degree is less than 35%

• In 2001, MI was ranked 28th in the nation in the share of population over 24 years of age with at least an AA. By 2011, Michigan fell to 34th.
Analytic Sample

- Use sample consisting of 20,581 students who:
  - Enrolled for-credit in our five colleges between Fall 2003 and Fall 2004
  - First-time college students
  - Were between the ages 17 and 60 at initial enrollment

- College administrative data includes
  - Demographics
  - Transcripts
  - Financial Aid
  - Awards

- We can follow students using:
  - Michigan UI records from 1998q2 through 2011q2
  - National Student Clearinghouse records from 1995 through 2012
## College Completion for Sample

<table>
<thead>
<tr>
<th></th>
<th>(1) No Award</th>
<th>(2) Short-Term Certificate</th>
<th>(3) Long-Term Certificate</th>
<th>(4) Associate’s Degree</th>
<th>(5) Transfer to Four-Year</th>
<th>(6) All Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share</td>
<td>0.68</td>
<td>0.014</td>
<td>0.035</td>
<td>0.149</td>
<td>0.334</td>
<td>1.00</td>
</tr>
<tr>
<td>N</td>
<td>13,990</td>
<td>293</td>
<td>722</td>
<td>3,057</td>
<td>6,884</td>
<td>20,581</td>
</tr>
</tbody>
</table>
### Student Characteristics

<table>
<thead>
<tr>
<th></th>
<th>(1) No Award</th>
<th>(2) All Students</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.487</td>
<td>0.461</td>
</tr>
<tr>
<td>Female</td>
<td>0.513</td>
<td>0.539</td>
</tr>
<tr>
<td><strong>Age at entry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20 years</td>
<td>0.432</td>
<td>0.481</td>
</tr>
<tr>
<td>20 to 26 years</td>
<td>0.259</td>
<td>0.245</td>
</tr>
<tr>
<td>27 to 45 years</td>
<td>0.246</td>
<td>0.224</td>
</tr>
<tr>
<td>46 to 60 years</td>
<td>0.062</td>
<td>0.051</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>25.67</td>
<td>24.82</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.734</td>
<td>0.752</td>
</tr>
<tr>
<td>African American</td>
<td>0.143</td>
<td>0.124</td>
</tr>
<tr>
<td>Latino/a</td>
<td>0.016</td>
<td>0.015</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>0.03</td>
<td>0.031</td>
</tr>
<tr>
<td>Other</td>
<td>0.058</td>
<td>0.059</td>
</tr>
<tr>
<td>Race missing</td>
<td>0.019</td>
<td>0.019</td>
</tr>
<tr>
<td><strong>Enrollment intensity (1st semester)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5.0 credit hours</td>
<td>0.36</td>
<td>0.34</td>
</tr>
<tr>
<td>5.0 to 11.9 credit hours</td>
<td>0.386</td>
<td>0.363</td>
</tr>
<tr>
<td>&gt;11.9 credits hours</td>
<td>0.254</td>
<td>0.297</td>
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<tr>
<td>At least 20 credits</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Proportion of all students</strong></td>
<td>0.68</td>
<td>1</td>
</tr>
<tr>
<td><strong>Count of students</strong></td>
<td><strong>13,990</strong></td>
<td><strong>20,581</strong></td>
</tr>
</tbody>
</table>

Non-completers
- Older
- More nonwhite
- Fewer credits
Methodology

- Examine earnings premium by
  - Associates
  - Certificates
    - Short: <15 credit hours
    - Long: 15+ credit hours
  - Associates and Certificates by Field of Study

- Analysis
  - Cross-sectional - examine labor market situation 7 years after initial enrollment
  - Fixed Effects - estimate the within-person earnings difference before and after degree receipt
Summary of Findings

• After 7 years of initial enrollment (compared to those with no credential)
  o AA: recipients were 12-13 percentage points more likely to be employed
  o Long-Term Certificates: recipients were 7-8 percentage points more likely to be employed
  o Short-Term Certificates:
    • Male recipients were 15 percentage points more likely to be employed.
    • Estimate close to zero for women

• For earnings (compared to those with no credential)
  o AA: recipients earned 12% (males) to 33% (females) more
  o Certificates
    • Women with long certificates earn 13% more
    • Estimate close to zero for men and for all short certificates
Summary of Findings

• Women and men go into different fields, which may explain the differential earnings returns

• We examine returns to different fields of study, by sex
  o Humanities
  o Social/behavioral sciences
  o Life sciences
  o Math
  o Computer/information science
  o Engineering
  o Business/management
  o Health
  o Vocational/technical
  o Other technical/professional
## Field of Study: Females

<table>
<thead>
<tr>
<th>Field</th>
<th>Short certificate</th>
<th>Certificate</th>
<th>Associate degree</th>
<th>Any degree/diploma</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Humanities</td>
<td>0.0%</td>
<td>25.6%</td>
<td>41.7%</td>
<td>35.7%</td>
</tr>
<tr>
<td>2 Social/behavioral sciences</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>3 Life sciences</td>
<td>0.0%</td>
<td>0.8%</td>
<td>0.2%</td>
<td>0.3%</td>
</tr>
<tr>
<td>4 Physical sciences</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.3%</td>
<td>0.2%</td>
</tr>
<tr>
<td>5 Math</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>6 Computer/information science</td>
<td>0.4%</td>
<td>2.0%</td>
<td>0.9%</td>
<td>1.0%</td>
</tr>
<tr>
<td>7 Engineering</td>
<td>2.4%</td>
<td>1.1%</td>
<td>3.0%</td>
<td>2.6%</td>
</tr>
<tr>
<td>8 Education</td>
<td>0.0%</td>
<td>0.0%</td>
<td>1.5%</td>
<td>1.3%</td>
</tr>
<tr>
<td>9 Business/management</td>
<td>6.7%</td>
<td>16.3%</td>
<td>13.7%</td>
<td>12.7%</td>
</tr>
<tr>
<td>10 Health</td>
<td>83.5%</td>
<td>38.0%</td>
<td>26.3%</td>
<td>34.2%</td>
</tr>
<tr>
<td>11 Vocational/technical</td>
<td>1.6%</td>
<td>1.4%</td>
<td>0.3%</td>
<td>0.4%</td>
</tr>
<tr>
<td>12 Other technical/professional</td>
<td>5.5%</td>
<td>14.6%</td>
<td>12.1%</td>
<td>11.6%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Count</td>
<td>254</td>
<td>355</td>
<td>1750</td>
<td>2153</td>
</tr>
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</table>
### Field of Study: Females

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Short-term certificates</th>
<th>Certificates</th>
<th>Associate degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities</td>
<td>-0.038</td>
<td>-0.008</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.062)</td>
<td>(0.029)</td>
<td></td>
</tr>
<tr>
<td>Social/behavioral sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer/information science</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.180)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>-0.098</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.109)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-0.135</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.135)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business/management</td>
<td>-0.157</td>
<td>0.068</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>(0.131)</td>
<td>(0.090)</td>
<td>(0.041)</td>
</tr>
<tr>
<td>Health</td>
<td>-0.043</td>
<td>0.244***</td>
<td>0.793***</td>
</tr>
<tr>
<td></td>
<td>(0.059)</td>
<td>(0.076)</td>
<td>(0.040)</td>
</tr>
<tr>
<td>Vocational/technical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other technical/professional</td>
<td>0.256</td>
<td>0.069</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>(0.213)</td>
<td>(0.104)</td>
<td>(0.049)</td>
</tr>
</tbody>
</table>
Field of Study: Females

• **AA** (bold indicates the same for males)
  - Large & Positive
    - **Health**

• **Long-Term Certificates**
  - Large & Positive
    - **Health**
## Field of Study: Males

<table>
<thead>
<tr>
<th>Field</th>
<th>Short certificate</th>
<th>Certificate</th>
<th>Associate degree</th>
<th>Any degree/diploma</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Humanities</td>
<td>0.0%</td>
<td>23.3%</td>
<td><strong>42.3%</strong></td>
<td><strong>36.3%</strong></td>
</tr>
<tr>
<td>2 Social/behavioral sciences</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>3 Life sciences</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.3%</td>
<td>0.2%</td>
</tr>
<tr>
<td>4 Physical sciences</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>5 Math</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>6 Computer/information science</td>
<td>11.3%</td>
<td>3.3%</td>
<td>5.7%</td>
<td>5.3%</td>
</tr>
<tr>
<td>7 Engineering</td>
<td>17.9%</td>
<td>20.7%</td>
<td>8.9%</td>
<td>11.7%</td>
</tr>
<tr>
<td>8 Education</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>9 Business/management</td>
<td>4.6%</td>
<td>5.9%</td>
<td>13.4%</td>
<td>11.8%</td>
</tr>
<tr>
<td>10 <strong>Health</strong></td>
<td><strong>29.8%</strong></td>
<td>3.0%</td>
<td>6.0%</td>
<td>8.2%</td>
</tr>
<tr>
<td>11 Vocational/technical</td>
<td>27.8%</td>
<td><strong>38.7%</strong></td>
<td>9.1%</td>
<td>14.4%</td>
</tr>
<tr>
<td>12 Other technical/professional</td>
<td>8.6%</td>
<td>5.2%</td>
<td>13.0%</td>
<td>11.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td><strong>Count</strong></td>
<td>151</td>
<td>305</td>
<td>1077</td>
<td>1371</td>
</tr>
</tbody>
</table>
## Field of Study: Males

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Short-term certificates</th>
<th>Certificates</th>
<th>Associate degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities</td>
<td></td>
<td>0.083</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.101)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>Social/behavioral sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer/information science</td>
<td><strong>0.319</strong>*</td>
<td>0.027</td>
<td><strong>0.130</strong>*</td>
</tr>
<tr>
<td></td>
<td>(0.184)</td>
<td>(0.088)</td>
<td>(0.073)</td>
</tr>
<tr>
<td>Engineering</td>
<td>-0.004</td>
<td>-0.087</td>
<td>0.055</td>
</tr>
<tr>
<td></td>
<td>(0.111)</td>
<td>(0.067)</td>
<td>(0.058)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business/management</td>
<td></td>
<td>0.048</td>
<td>-0.054</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.119)</td>
<td>(0.055)</td>
</tr>
<tr>
<td>Health</td>
<td>-0.025</td>
<td></td>
<td><strong>0.644</strong>*</td>
</tr>
<tr>
<td></td>
<td>(0.109)</td>
<td></td>
<td>(0.100)</td>
</tr>
<tr>
<td>Vocational/technical</td>
<td>0.137</td>
<td>-0.022</td>
<td><strong>0.184</strong>*</td>
</tr>
<tr>
<td></td>
<td>(0.101)</td>
<td>(0.044)</td>
<td>(0.064)</td>
</tr>
<tr>
<td>Other technical/professional</td>
<td><strong>0.263</strong></td>
<td>-0.052</td>
<td>0.103*</td>
</tr>
<tr>
<td></td>
<td>(0.130)</td>
<td>(0.107)</td>
<td>(0.055)</td>
</tr>
</tbody>
</table>
Field of Study: Males

• **AA** (bold indicates the same for females)
  - Large & Positive
    - **Health**
    - Computer/information science
    - Vocational/technical
    - Other technical/professional

• **Short-Term Certificates**
  - Large & Positive
    - Computer/information science
    - Other technical/professional
Conclusion: AA

• Similar to previous studies, females have a higher return with AA than males.

• Health fields have returns that are positive and consistent across sexes
  o 19% of AA are in health

• The most popular AA degree, humanities, has a zero return
  o 42% of AA are in humanities
Conclusion: Certificates

• Males
  o Long-term certificates average zero
  o As a whole, short-term certificates average zero
  o However, by field, males with short-term certificates earn more in computer/information science and other technical/professional fields

• Females
  o Short-term certificates average zero
  o Similar to previous studies, females have a higher return with long-term certificates than males.
  o Long-term certificate recipients earn 13% more
    • Health drives this large return
Thank you

Peter Bahr
University of Michigan
prbahr@umich.edu

Brian Jacob
University of Michigan
bajacob@umich.edu

Alfredo Sosa
University of Michigan
asosa@umich.edu

Susan Dynarski
University of Michigan
dynarski@umich.edu

Daniel Kreisman
Georgia State University
dkreisman@gsu.edu

Mark Wiederspan
Arizona State University
mwieders@asu.edu
# Field of Study: Full Sample

<table>
<thead>
<tr>
<th>Field</th>
<th>Short certificate</th>
<th>Certificate</th>
<th>Associate degree</th>
<th>Any degree/diploma</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Humanities</td>
<td>0.00%</td>
<td>24.50%</td>
<td>41.90%</td>
<td>36.00%</td>
</tr>
<tr>
<td>2 Social/behavioral sciences</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.10%</td>
<td>0.10%</td>
</tr>
<tr>
<td>3 Life sciences</td>
<td>0.00%</td>
<td>0.50%</td>
<td>0.20%</td>
<td>0.30%</td>
</tr>
<tr>
<td>4 Physical sciences</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.40%</td>
<td>0.30%</td>
</tr>
<tr>
<td>5 Math</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.10%</td>
<td>0.10%</td>
</tr>
<tr>
<td>6 Computer/information science</td>
<td>4.40%</td>
<td>2.60%</td>
<td>2.70%</td>
<td>2.70%</td>
</tr>
<tr>
<td>7 Engineering</td>
<td>8.10%</td>
<td>10.20%</td>
<td>5.20%</td>
<td>6.10%</td>
</tr>
<tr>
<td>8 Education</td>
<td>0.00%</td>
<td>0.00%</td>
<td>1.20%</td>
<td>0.90%</td>
</tr>
<tr>
<td>9 Business/management</td>
<td>5.90%</td>
<td>11.50%</td>
<td>13.60%</td>
<td>12.30%</td>
</tr>
<tr>
<td>10 Health</td>
<td>63.50%</td>
<td>21.80%</td>
<td>18.60%</td>
<td>24.10%</td>
</tr>
<tr>
<td>11 Vocational/technical</td>
<td>11.40%</td>
<td>18.60%</td>
<td>3.60%</td>
<td>5.80%</td>
</tr>
<tr>
<td>12 Other technical/professional</td>
<td>6.70%</td>
<td>10.30%</td>
<td>12.40%</td>
<td>11.40%</td>
</tr>
<tr>
<td>Total</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Count</td>
<td>405</td>
<td>660</td>
<td>2827</td>
<td>3524</td>
</tr>
</tbody>
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## Cross-Sectional Results

<table>
<thead>
<tr>
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<th>(1)</th>
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<td>0.131</td>
<td>-0.003</td>
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<td><strong>employment in q25-q28</strong></td>
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<td>-0.0179</td>
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<td>0.076***</td>
<td>0.070**</td>
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<td>(0.077)</td>
<td>(0.027)</td>
<td>(0.032)</td>
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## Fixed-Effects Results

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<td><strong>ln(earnings)</strong></td>
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