

# Labor Market Returns to Community College in Michigan

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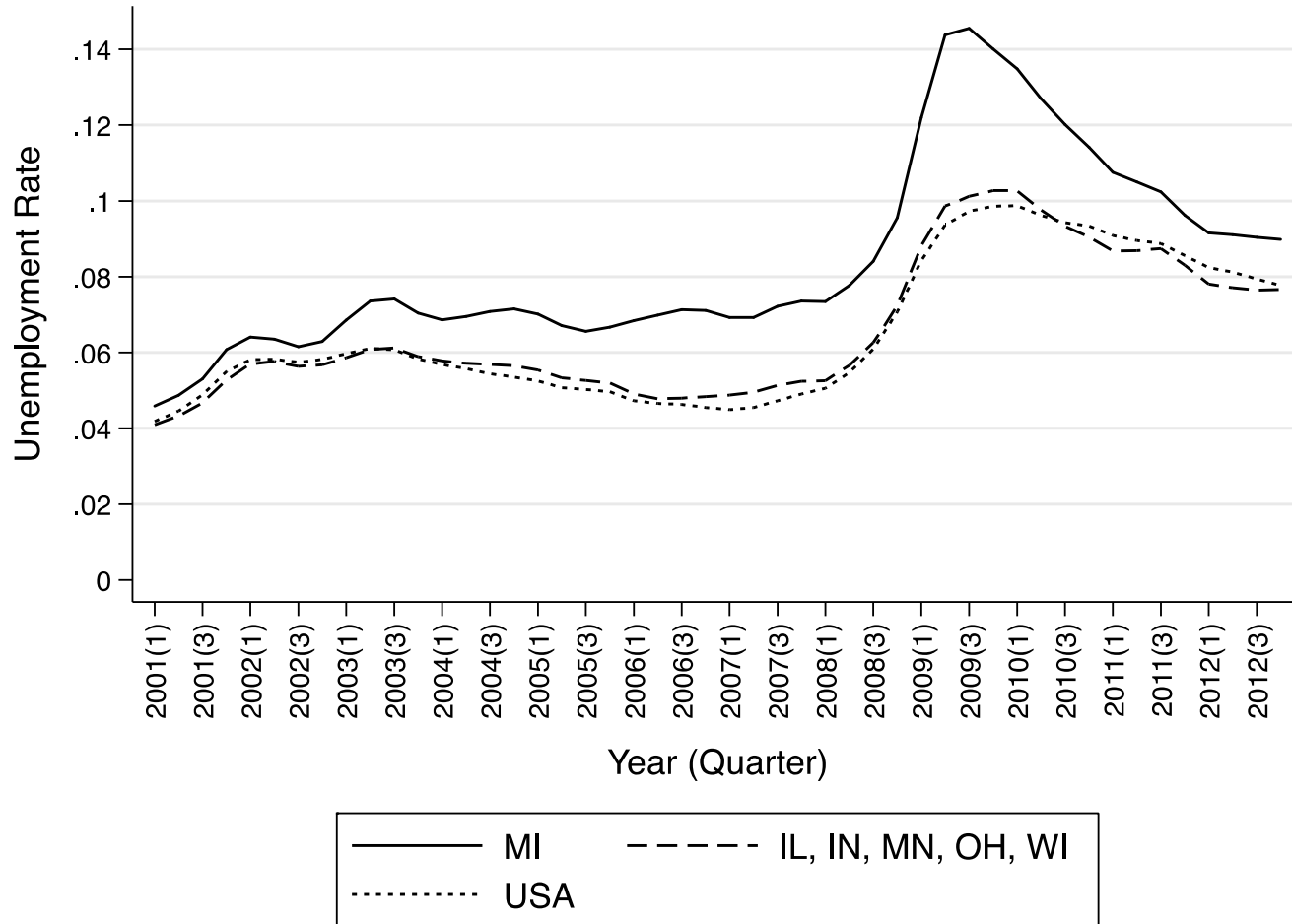
# Previous Research

- In summary of 18 studies, Belfield and Bailey (2011) suggest
  - Average return for an AA was 13% for males and 22% for females
  - 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)
  - Arkansas (Belfield, 2015)
  - California (Bahr, 2016)
  - Kentucky (Jepsen, Troske, & Coomes, 2014)
  - North Carolina (Liu, Belfield, & Trimble, 2015)
  - Tennessee (Carruthers & Sanford, 2015)
  - Virginia (Jaggars & Xu, 2016)
  - Washington (Dadgar & Trimble, 2015)

# Previous Research

- In general, these studies found
  - Earning gains with an AA are higher for females than males
  - Findings are mixed with long-term certificates, but a majority of the studies find that earnings are higher for females than males
  - 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 effects, 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
  - Use administrative records from 5 Michigan community colleges

# Why Michigan?



# Why Michigan?

- Share of population with at least an AA degree is less than 35%
- In 2001, MI was ranked 28<sup>th</sup> in the nation in the share of population over 24 years of age with at least an AA. By 2011, Michigan fell to 34<sup>th</sup>.

# 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

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|              | (1)           | (2)                    | (3)                   | (4)                | (5)                   | (6)           |
|--------------|---------------|------------------------|-----------------------|--------------------|-----------------------|---------------|
|              | No Award      | Short-Term Certificate | Long-Term Certificate | Associate's Degree | Transfer to Four-Year | All Students  |
| <b>Share</b> | 0.68          | 0.014                  | 0.035                 | 0.149              | 0.334                 | 1.00          |
| <b>N</b>     | <b>13,990</b> | <b>293</b>             | <b>722</b>            | <b>3,057</b>       | <b>6,884</b>          | <b>20,581</b> |

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# Student Characteristics

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

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)
  - AA: recipients were 12-13 percentage points more likely to be employed
  - Long-Term Certificates: recipients were 7-8 percentage points more likely to be employed
  - 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)
  - AA: recipients earned 12% (males) to 33% (females) more
  - 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
  - Humanities
  - Social/behavioral sciences
  - Life sciences
  - Math
  - Computer/information science
  - Engineering
  - Business/management
  - Health
  - Vocational/technical
  - Other technical/professional

# Field of Study: Females

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

# Field of Study: Females

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

# Field of Study: Females

- **AA** (*bold indicates the same for males*)
  - Large & Positive
    - Health
- Long-Term Certificates
  - Large & Positive
    - Health

# Field of Study: Males

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

# Field of Study: Males

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



# 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
  - 19% of AA are in health
- The most popular AA degree, humanities, has a zero return
  - 42% of AA are in humanities

# Conclusion: Certificates

- Males
  - Long-term certificates average zero
  - As a whole, short-term certificates average zero
  - However, by field, males with short-term certificates earn more in computer/information science and other technical/professional fields
- Females
  - Short-term certificates average zero
  - Similar to previous studies, females have a higher return with long-term certificates than males.
  - Long-term certificate recipients earn 13% more
    - Health drives this large return

# Thank you

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# Field of Study: Full Sample

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

# Cross-Sectional Results

|                        | (1)                            | (2)                 | (3)                          | (4)                 |
|------------------------|--------------------------------|---------------------|------------------------------|---------------------|
|                        | <u>ln(earnings) in q25-q28</u> |                     | <u>employment in q25-q28</u> |                     |
|                        | Females                        | Males               | Females                      | Males               |
| Short-term certificate | -0.19<br>(0.146)               | 0.131<br>(0.155)    | -0.003<br>(0.046)            | 0.148***<br>(0.048) |
| Long-term certificate  | -0.0179<br>(0.092)             | 0.335***<br>(0.077) | 0.076***<br>(0.027)          | 0.070**<br>(0.032)  |
| Associate's degree     | 0.319***<br>(0.044)            | 0.272***<br>(0.051) | 0.128***<br>(0.014)          | 0.115***<br>(0.019) |
| <i>n</i> (students)    | 8,137                          | 6,602               | 10,136                       | 8,582               |
| <i>r</i> -squared      | 0.066                          | 0.112               | -----                        | -----               |

# Fixed-Effects Results

|                        | (1)                 | (2)                 | (3)                   | (4)                   |
|------------------------|---------------------|---------------------|-----------------------|-----------------------|
|                        | <u>ln(earnings)</u> |                     | <u>earnings</u>       |                       |
|                        | Females             | Males               | Females               | Males                 |
| Short-term certificate | 0.004<br>(0.057)    | 0.084<br>(0.075)    | 267.6<br>(232.2)      | 1,345.0**<br>(572.6)  |
| Long-term certificate  | 0.132***<br>(0.048) | 0.036<br>(0.037)    | 619.6**<br>(262.1)    | 918.0***<br>(276.5)   |
| Associate's degree     | 0.327***<br>(0.025) | 0.118***<br>(0.025) | 2,346.0***<br>(139.0) | 1,441.0***<br>(162.8) |
| <i>n</i> (students)    | 268,003             | 220,059             | 364,422               | 311,588               |
| <i>r</i> -squared      | 11,083              | 9,470               | 11,102                | 9,479                 |