MLDS Center

Maryland Longitudinal Data System

Better Data • Informed Choices • Improved Results

Examining Wage Trajectories for High School Graduates with Some College Experience

Mathew C. Uretsky
Dawnsha Mushonga

November 15, 2024
MLDS Center Research Series
mldscenter.maryland.gov

MLDS Center
Maryland Longitudinal Data System

Acknowledgements

- Co-Authors: Dr. Bess Rose; Dr. Angela K. Henneberger
- This research was supported by the Maryland Longitudinal Data System (MLDS) Center. We are grateful for the assistance provided by the MLDS Center. We appreciate the feedback received from the MLDS Center and its stakeholder partners. All opinions are the authors' and do not represent the opinion of the MLDS Center or its partner agencies.

Background Literature

- Postsecondary education is associated with higher rates of employment, increased earnings, and broader social advancement (Gonzalez et al., 2023; Lovenheim & Smith, 2023).
- Compared to high school graduates, bachelor's degree holders earn up to 75% more over the course of their lifetime while those with an associate's degree earn 25% more (Carnevale et al., 2021; Gonzalez, 2023).
- Possessing some college experience has been shown to contribute to as much as 19% higher earnings over a high school diploma (Carnevale et al., 2021).

Theoretical Frameworks

- **Human capital theory**- suggests that education enhances an individual's productivity and skills, which in turn increases their value in the labor market (Becker, 1964).
- **Credentialism**- proposes that formal qualifications are used to maintain social hierarchies and control entry into higher-status and better-paying occupations (Collins, 1979).
- **Signaling theory**- asserts that educational credentials signal employers about an individual's abilities and potential productivity in the workplace (Spence, 1973).

Gaps in Research

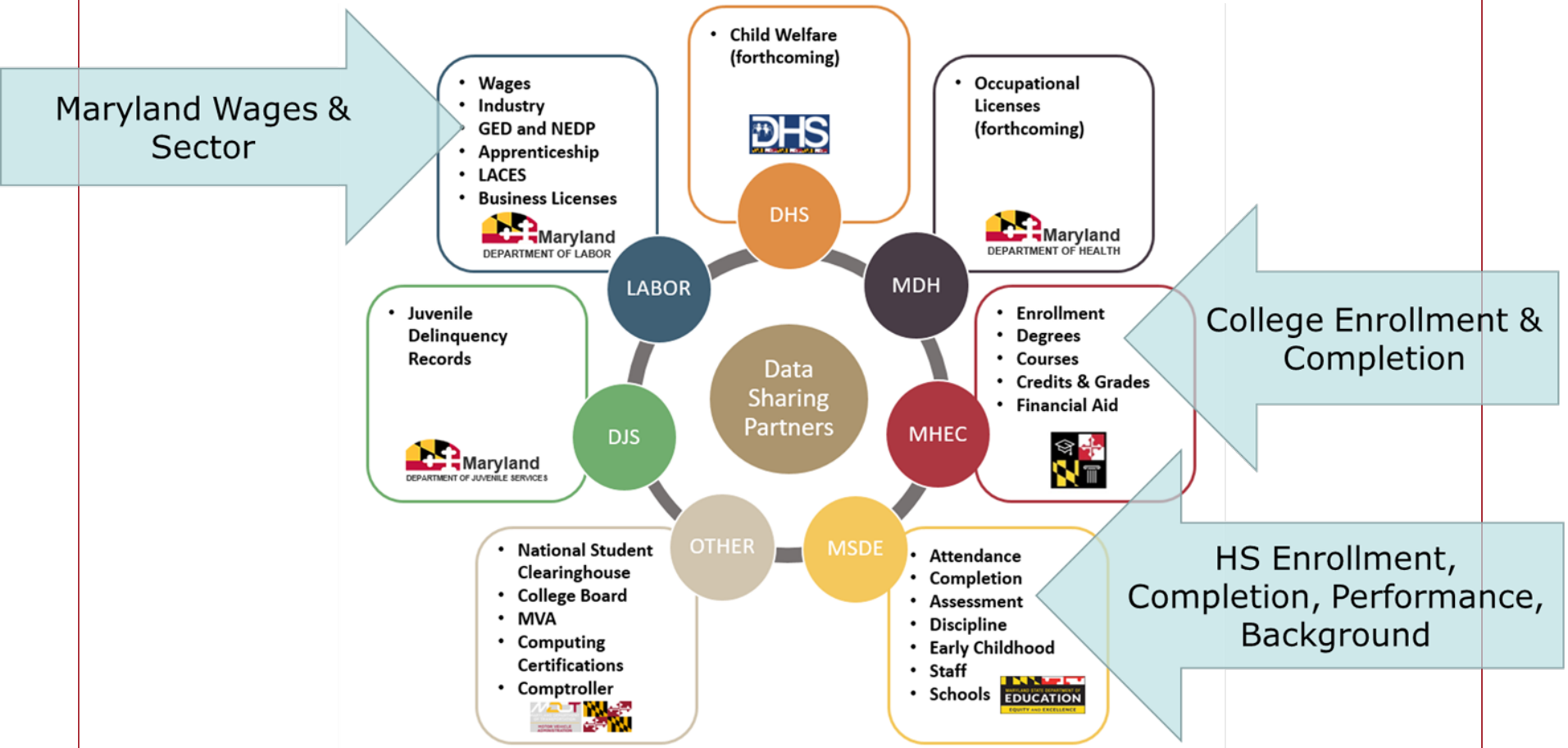
- A substantial proportion of students **leave college without graduating** (Lovenheim & Smith, 2022); however, little is known about the returns to partially completed schooling and how these returns evolve over an individual's career.

- Furthermore, many studies do not account for the potential **reduction in earnings during college enrollment**.

Research Question

Among high school graduates, what are the effects of leaving college without a degree on **immediate workforce earnings** and **earnings trajectories over time** relative to their peers who completed their degree programs or never attended college?

MLDS Center Data



MLDS Center
Maryland Longitudinal Data System

Cohort & Exclusion Criteria

- Followed 8th grade cohort
  - 8 years after their expected graduation date (6/2012)
    - Following educational and workforce trajectories
    - 31 quarters of wages from June 2012 to March 2020
    - Final sample: N=40,243; Observations = 604,857
- Exclusion criteria
  - No High school diploma
  - No wage data
  - Post-Covid wages data (March 2020 +)
  - Attended Private or Out of State College
  - Earned a Graduate Degree

MLDS Center
Maryland Longitudinal Data System

Sample Characteristics (*N* = 40,243)

Demographics	
Male	48%
Black	39%
White	44%
Asian	3%
Other-Race	13%
Special Education	13%
Free/reduced meals (FRPMs)	51%

MLDS Center
Maryland Longitudinal Data System

Sample Characteristics
(College Enrollments and Degrees)

	Percent of Sample	Percent of Time in Condition
2-Year College	39%	33%
4-Year College	24%	42%
Associate's Degree	5%	32%
Bachelor's Degree	15%	49%
2-Year, No Degree	23%	65%
4-Year, No Degree	4%	53%

Key Measures

- Key Measures
  - Inflation adjusted (2020) quarterly wages from UI data
  - College enrollment and degree attainment for
    - 2-and 4-year Maryland colleges
- Covariates
  - Gender
  - Race/ethnicity
  - Special Education
  - Free and Reduced Meals Program
  - Jurisdiction
  - Industry (NAIC codes)

Analytic Approach

- Growth Curve Modeling
  - Based on the multilevel model nesting framework
  - Time is nested with person

$$Y_{ti} = \pi_{oi} + \pi_{1i} TIME_{ti} + e_{ti}.$$

  - Models individual-specific growth trajectories over time
    - Intercept: Average starting point
    - Slope: Average rate of change over time

$$\pi_{0i} = \beta_{00} + \beta_{01} \text{Predictor}_i + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11} \text{Predictor}_i + r_{1i}.$$

Continuous vs. Discontinuous Growth

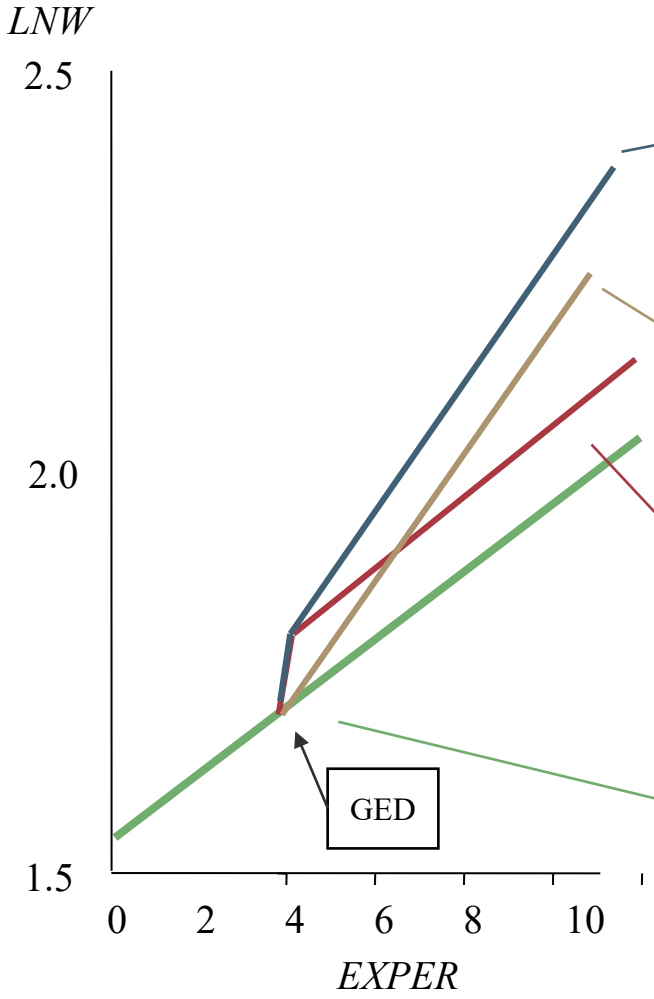
- Continuous Growth
  - Smooth, uninterrupted change over time

$$Y_{ti} = \pi_{oi} + \pi_{1i} TIME_{ti} + e_{ti}.$$

- Discontinuous Growth
  - Characterized by abrupt changes to or phases in a trajectory
    - e.g., earning a degree, beginning meds
  - Modeled as separate growth phases before and after the discontinuity

(Singer & Willett , 2003 pg. 196)

What might the wage trajectory look like for someone who got a GED 3 years after labor force entry (post dropout)?



Immediate shifts in both elevation & rate of change

An immediate shift in rate of change; no difference in elevation

An immediate shift in elevation; no difference in rate of change

No effect of GED whatsoever

adapted from Singer & Willett, gseacademic.harvard.edu/alda/Presentations

MLDS Center
Maryland Longitudinal Data System

Mathematical Representation

Level 1

$$LNW_{ij} = \pi_{0j} + \pi_{1j}EXPER_{ij} + \pi_{2j}EXPER_{ij}^2 + \pi_{3j}PS\ ENROLL_{ij} +$$

$$\pi_{4j}PS\ EXPER_{ij} + \pi_{5j}PS\ EXPER_{ij}^2 + \pi_{6j}PS\ EXIT_{ij} + \pi_{7j}POST\ PS\ EXPER_{ij} +$$

$$\pi_{8j}POST\ PS\ EXPER_{ij}^2 + \pi_{9j}JURISDICTION_j + \pi_{10j}SECTOR_j + \sum_{k=1}^{6} \beta_{kj}\pi_{1j}EXPER_{ij} + \varepsilon_{ij}$$

Level 2

$$\pi_{0j} = \beta_{00} + \beta_{01}ASIAN_j + \beta_{02}BLACK_j + \beta_{03}OTHER_j + \beta_{04}FEMALE_j +$$

$$\beta_{05}SPEC\ ED_j + \beta_{06}FRPM_j + r_{0j}$$

$$\pi_{1j} = \beta_{10} + r_{1j}$$

$$\pi_{2j} = \beta_{20}, \pi_{3j} = \beta_{30}, \pi_{4j} = \beta_{40}, \pi_{5j} = \beta_{50}, \pi_{6j} = \beta_{60}, \pi_{7j} = \beta_{70}, \pi_{8j} = \beta_{80}$$

2-Year or 4-Year

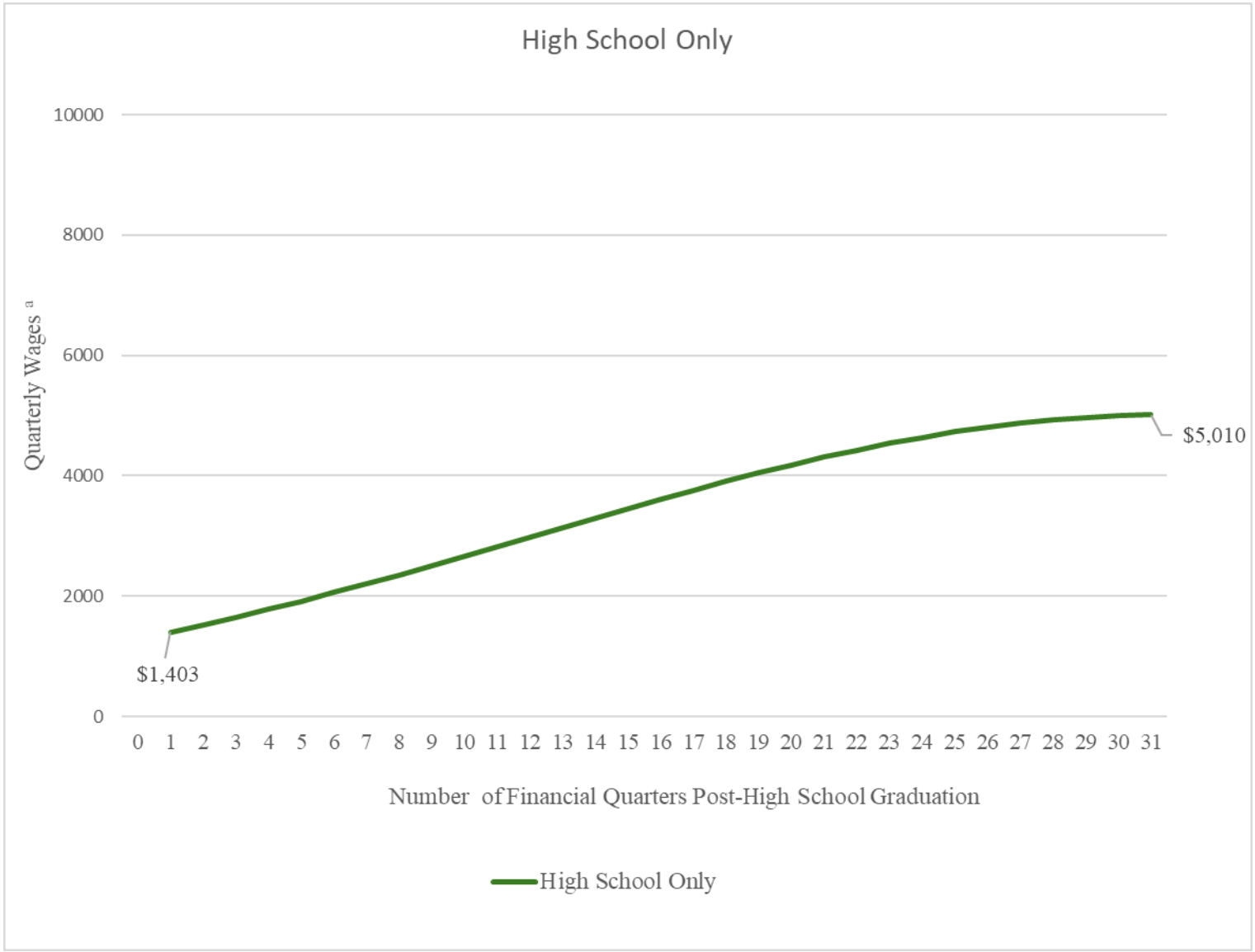
Associates, Bachelors, or No Degree

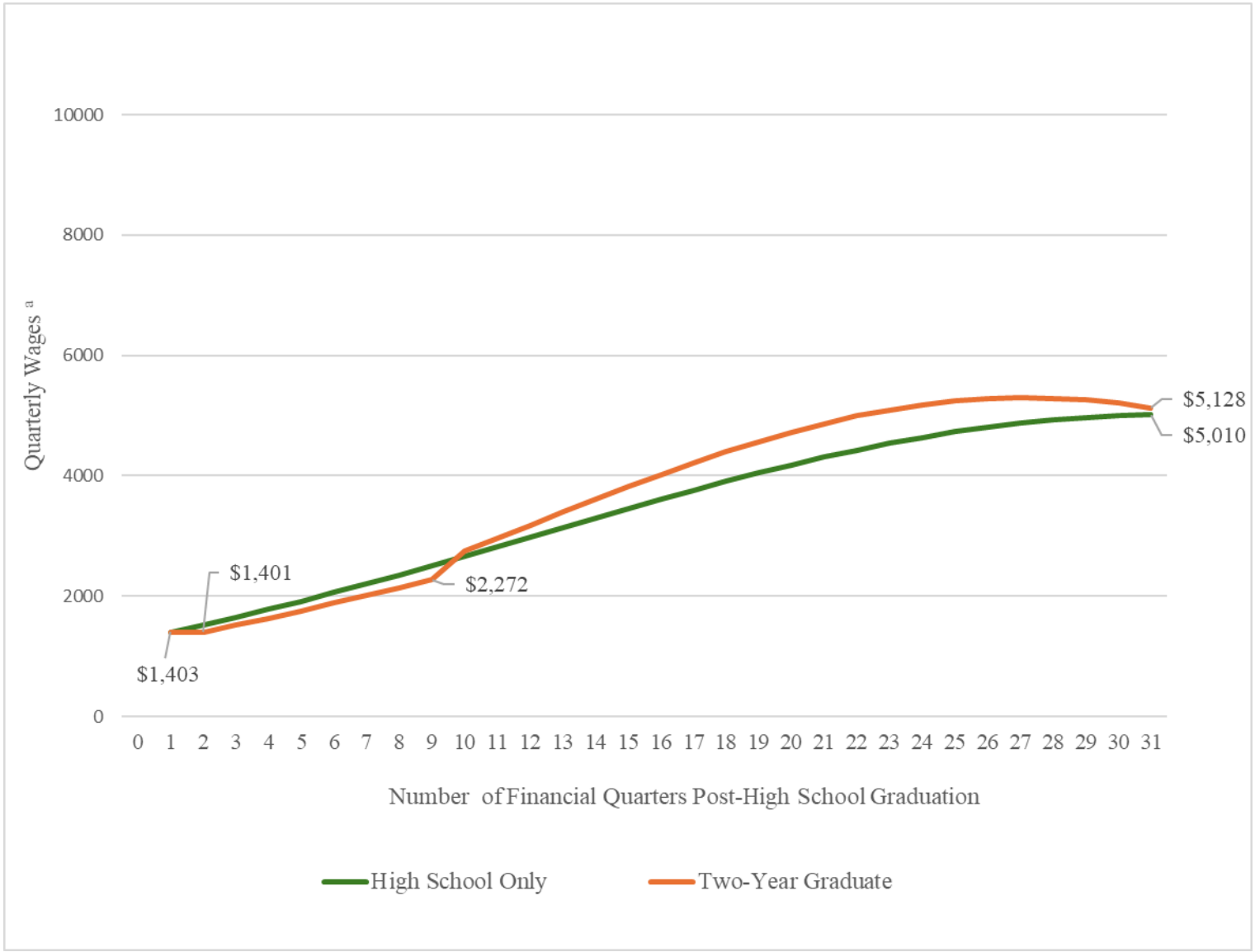
Fixed Effects

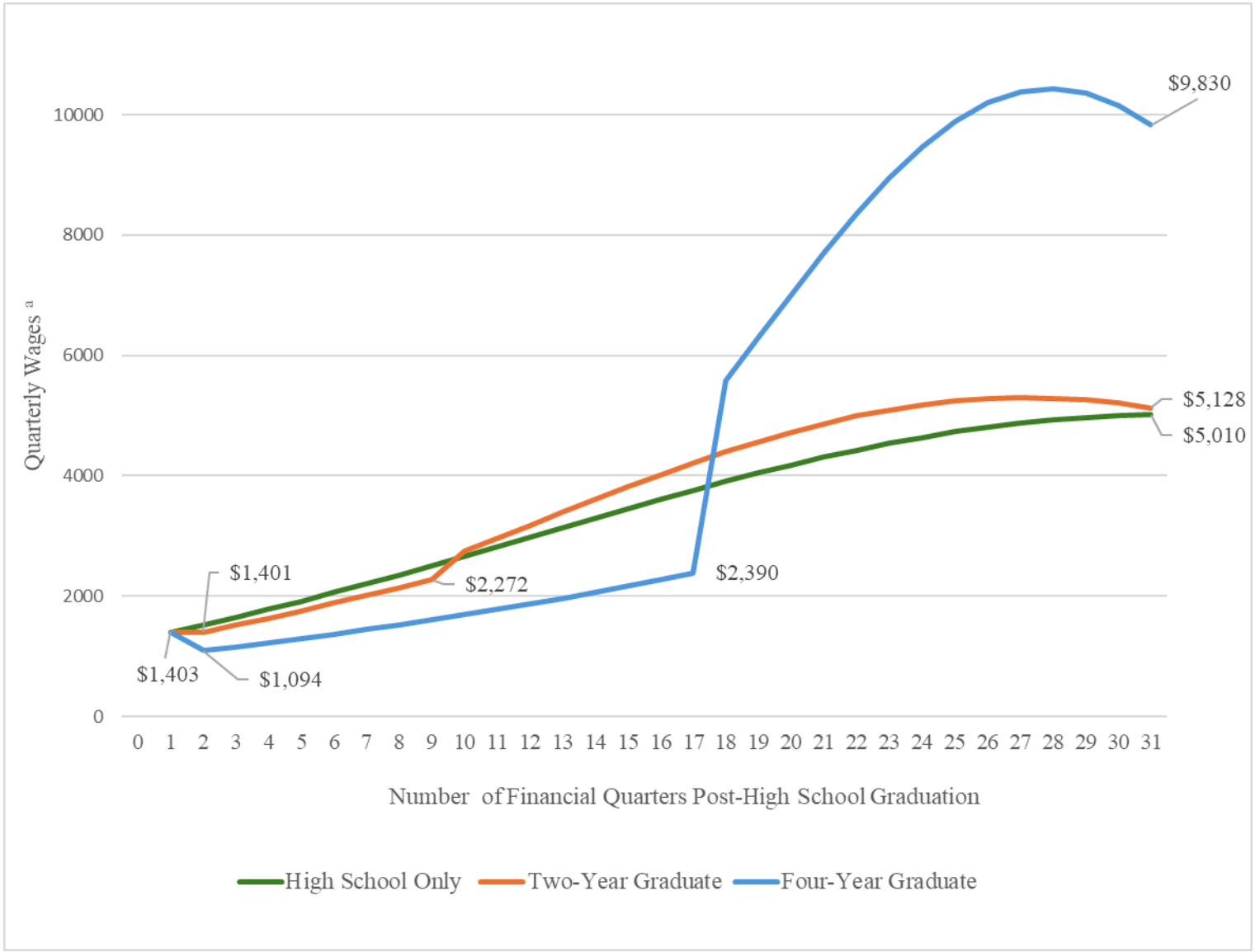
Random Effects

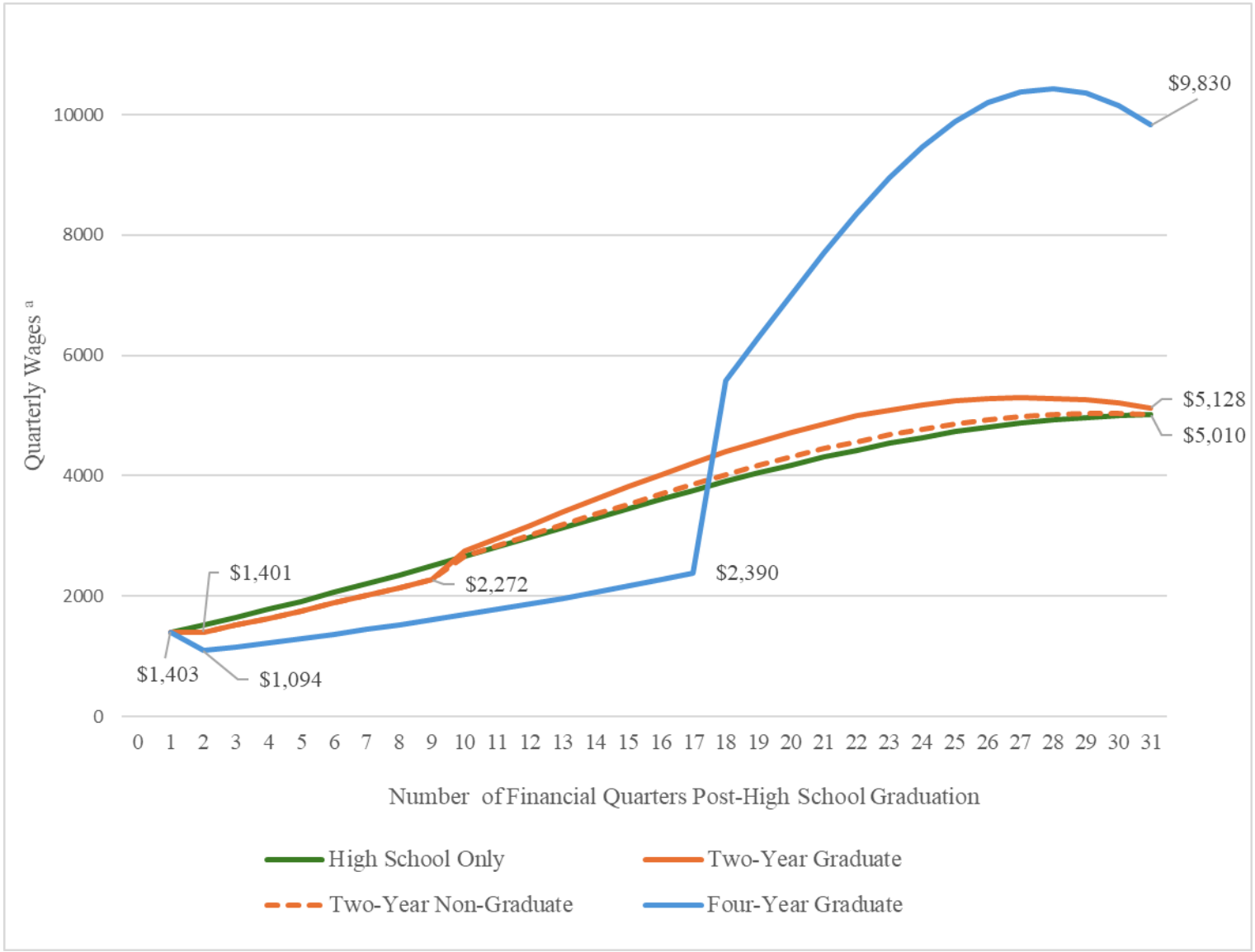
Results

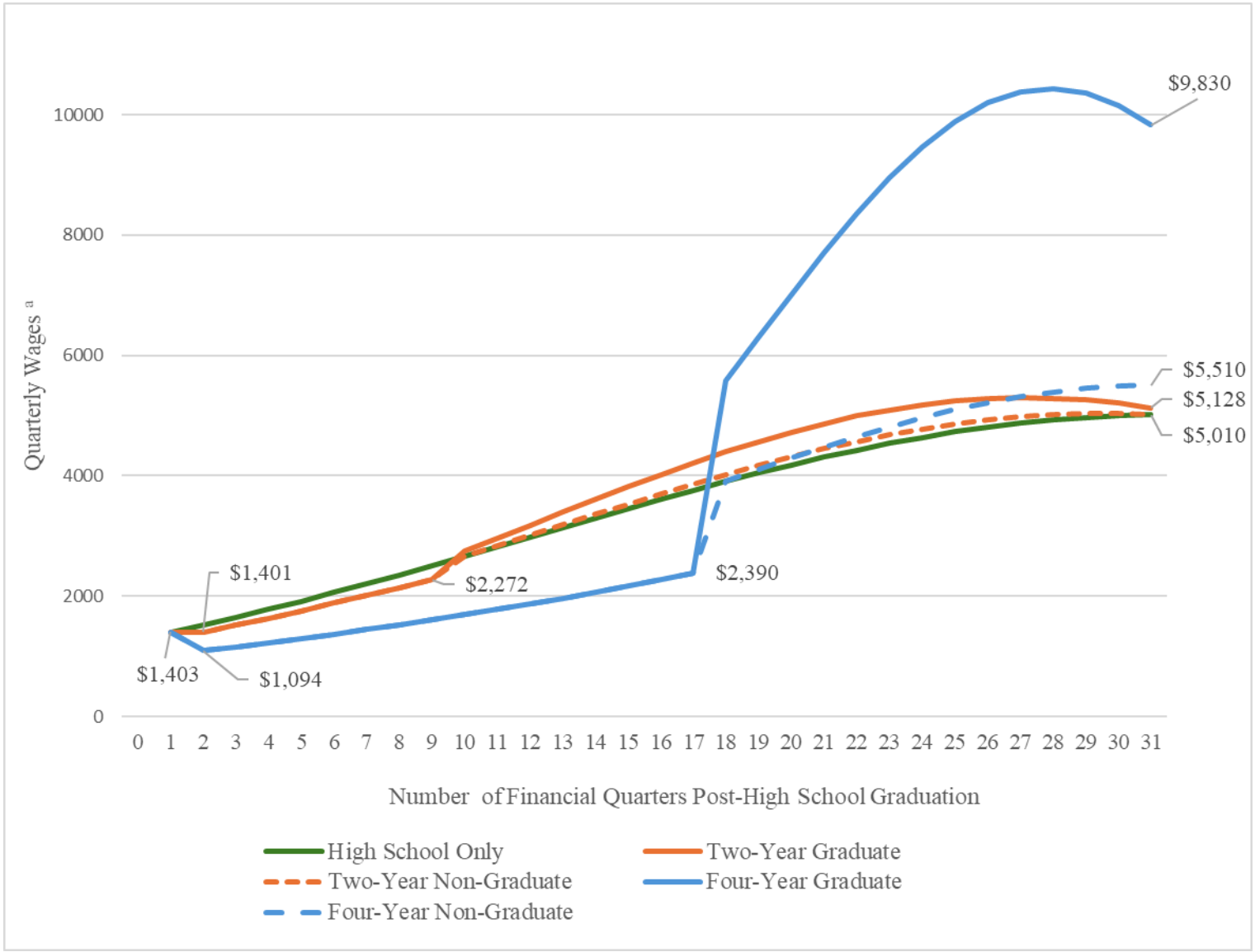
Quadratic Discontinuous Growth Model Examining the Relationship Between Academic Pathways and Quarterly Wages (*N*=40,243; Observations=604,857)


High School Only
10000
8000
6000
4000
2000
0
Quarterly Wages [a]
$1,403
$5,010
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Number of Financial Quarters Post-High School Graduation
High School Only


10000
8000
6000
4000
2000
0
Quarterly Wages [a]
$1,403
$1,401
$2,272
$5,128
$5,010
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Number of Financial Quarters Post-High School Graduation
High School Only
Two-Year Graduate


$9,830
10000
8000
6000
4000
2000
0
Quarterly Wages [a]
$5,128
$5,010
$1,401
$2,272
$2,390
$1,403
$1,094
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Number of Financial Quarters Post-High School Graduation
High School Only
Two-Year Graduate
Four-Year Graduate


$9,830
10000
8000
6000
4000
2000
0
Quarterly Wages [a]
$5,128
$5,010
$1,401
$2,272
$2,390
$1,403
$1,094
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Number of Financial Quarters Post-High School Graduation
High School Only
Two-Year Graduate
Two-Year Non-Graduate
Four-Year Graduate


$9,830
10000
8000
6000
4000
2000
0
Quarterly Wages [a]
$5,510
$5,128
$5,010
$1,401
$2,272
$2,390
$1,403
$1,094
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Number of Financial Quarters Post-High School Graduation
High School Only
Two-Year Graduate
Two-Year Non-Graduate
Four-Year Graduate
Four-Year Non-Graduate

Limitations

- No information on tuition costs or student loan debt
- Limited to graduates of MD public schools who did not attend out-of-state colleges or state-aided independent (private) colleges
- Early wage growth patterns may differ from later growth

Limitations of Wage Data

- The MLDS UI data only include students who worked for employers subject to Maryland UI; for example federal employees and contractors are excluded

- There are other measures of success that may be influenced by college enrollment, degree attainment, and exit without a degree, including
  - personal satisfaction
  - civic engagement
  - and overall well-being

Discussion

- Higher levels of educational attainment contribute to increased wages over time, in alignment with this study's theoretical frameworks (e.g., *human capital, credentialism, and signaling*).
- 2-year and 4-year degree holders experience
  - Immediate wage boost &
  - Increased rate of wage growth, with larger increases for those with 4-year degrees (Kim & Tamborini, 2019; Lovenheim & Smith, 2022).

Discussion

- Consistent with other research
  - Bachelor's degree holders earn significantly higher wages than
    - Those with 2-year degrees,
    - Some college experience, or
    - No college experience (Carnevale et al., 2021; Gonzalez, 2023).
- Those with some college experience (2-year & 4-year college) earn more over time than those who never attended college (Belfield & Bailey, 2017; Giani et al., 2019).
- The unique contribution of this study is examining wage outcomes for students with partial college education compared to high school graduates and degree completers.

Implications

- Significant variation in wages by educational pathway
  - 4-year graduates - pronounced wage advantage
  - Some college no degree - slight wage advantage
- Educational wage advantages are time dependent
  - Longer gaps before enrollment OR terms of enrollment may diminish advantage
  - Should consider cost of enrollment
  - Trade-off between lower wages during enrollment and eventual benefit of degree
  - May take time to “catch up” after leaving college

Implications, continued

- Minimize time to degree and non-completion
  - Work study, financial aid, on-campus childcare, Career Counseling and Job Placement Services, Transportation Assistance, Emergency Financial Assistance

Next Steps

- Examine variations in wage trajectories, college enrollment, and degree effects across race, gender, and past disadvantage experiences
- Others…?

MLDS Center
Maryland Longitudinal Data System

Thank You!