



Using Propensity Score Matching to Investigate the Economic Impact of College Outmigration

Eric Lichtenberger and Cecile Dietrich

AERA

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Motivation

- **Outmigration**

- Illinois has historically ranked near the bottom in outmigration.
- Compounding the problem is the fact that Illinois-based higher education institutions are unable to attract enough high school graduates from outside the state to make up for the loss.
- In terms of net-migration, Illinois also ranks near the bottom.
- Outmigrants are more likely to stay out-of-state upon graduation than their counterparts who enrolled in-state (Adelman, 2004).
- This represents a significant loss of tax revenue for the state (Smith & Wall, 2006).

Outmigration

- Each year the state of Illinois experiences a net loss of roughly 11,000 students.
- Outmigrants tend to be among the best and brightest Illinois high school graduates (Manley et al., 2013; Smalley et al., 2010).
- This represents a significant loss of human capital.

Research Questions

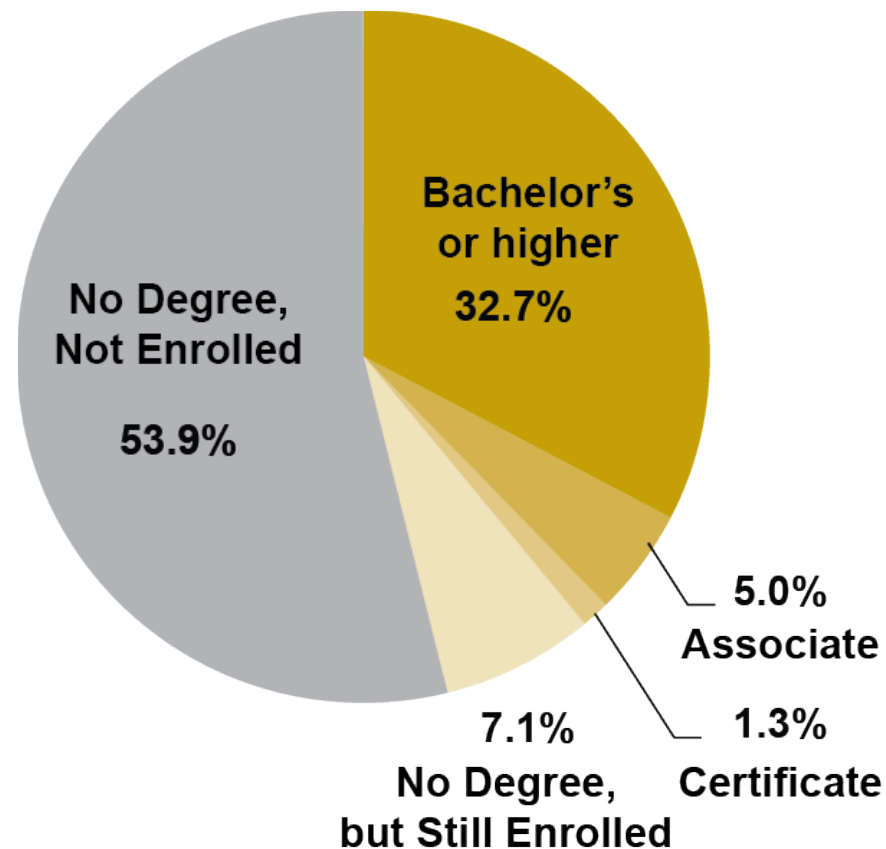
- Given the present and historical problem of outmigration, we are left with the following questions:
 - Do outmigrants return home to work and find employment in Illinois?
 - And if so, what are their earnings?
 - How do these Illinois-specific workforce outcomes compare with an observationally equivalent comparison group?
 - Also, among the outmigrants who returns?

Data Sources

- Home grown database
- ACT/PSAE (all high school graduates from 2003)
- National Student Clearinghouse (through 2010)
 - College Enrollment
 - Degrees
- Illinois-specific UI-wage records (through 2013)

Creating the 'Treatment' and Comparison Groups

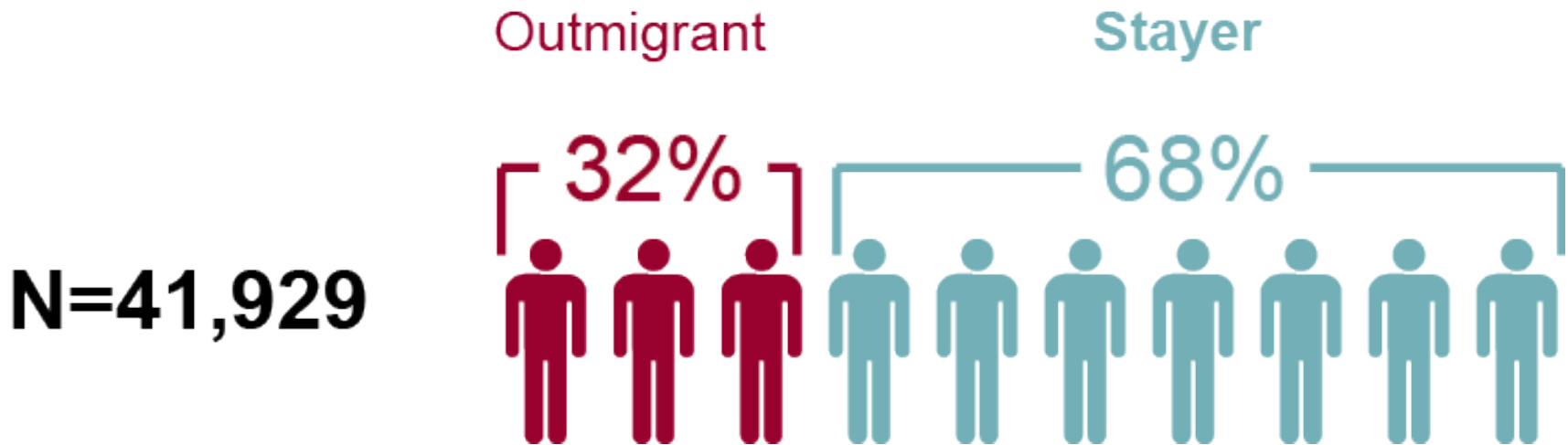
End of Study Status (seven years out) for the Illinois High School Class of 2003 (N=128,323)



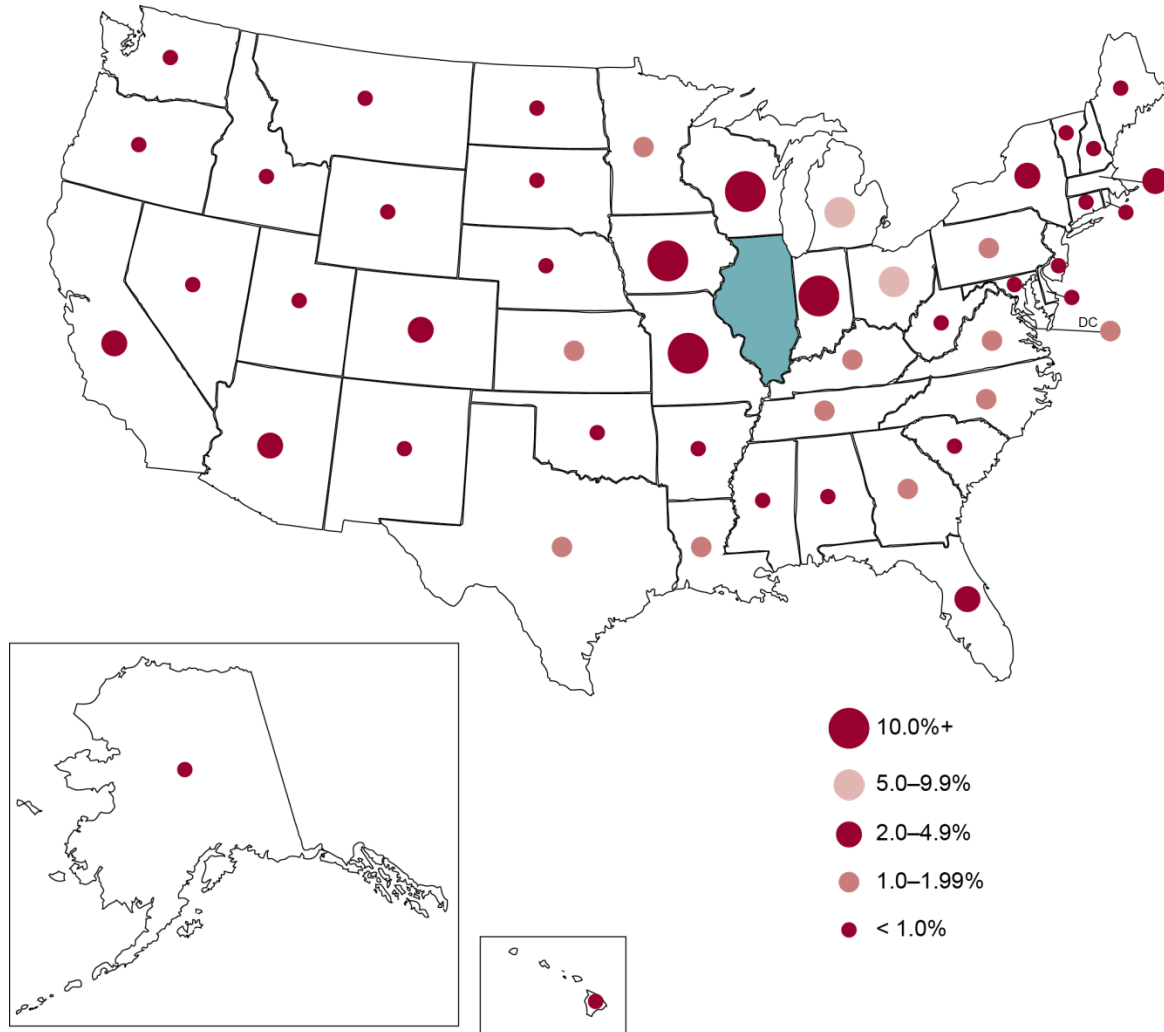
Defining Outmigrants

- Based on the location of one's bachelor's granting institution
- Included community college to four-year transfer students

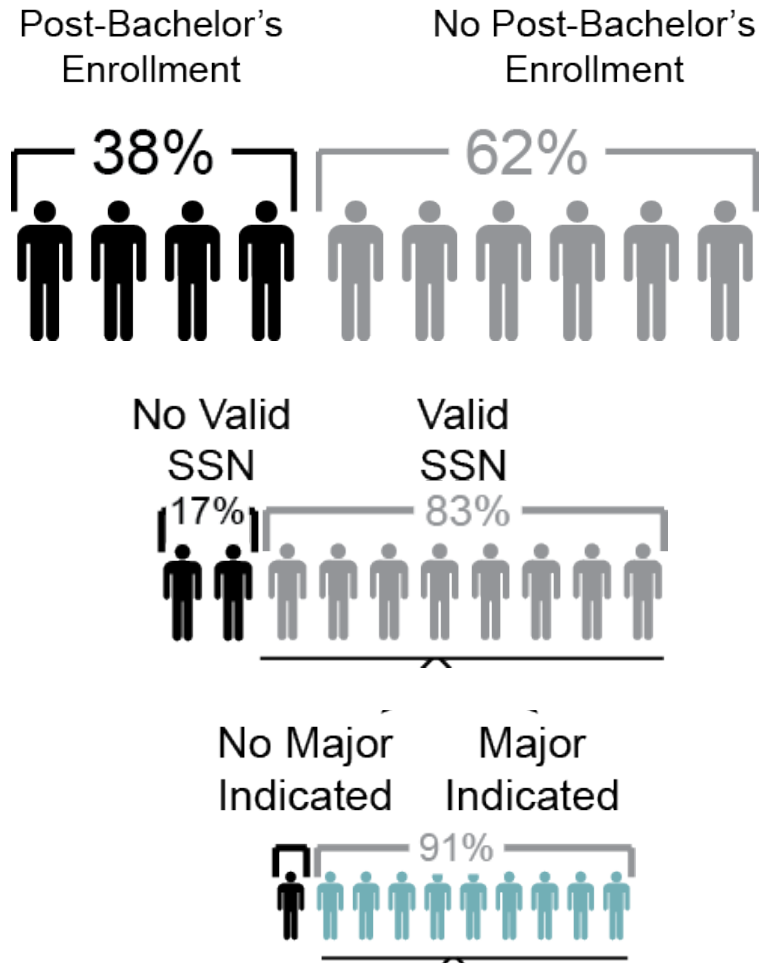
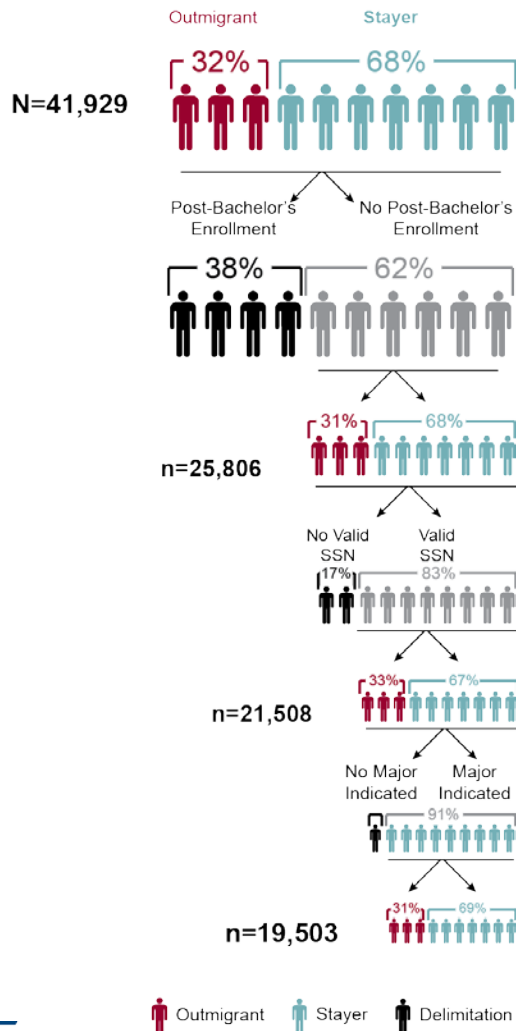
Outmigration Status



Outmigration



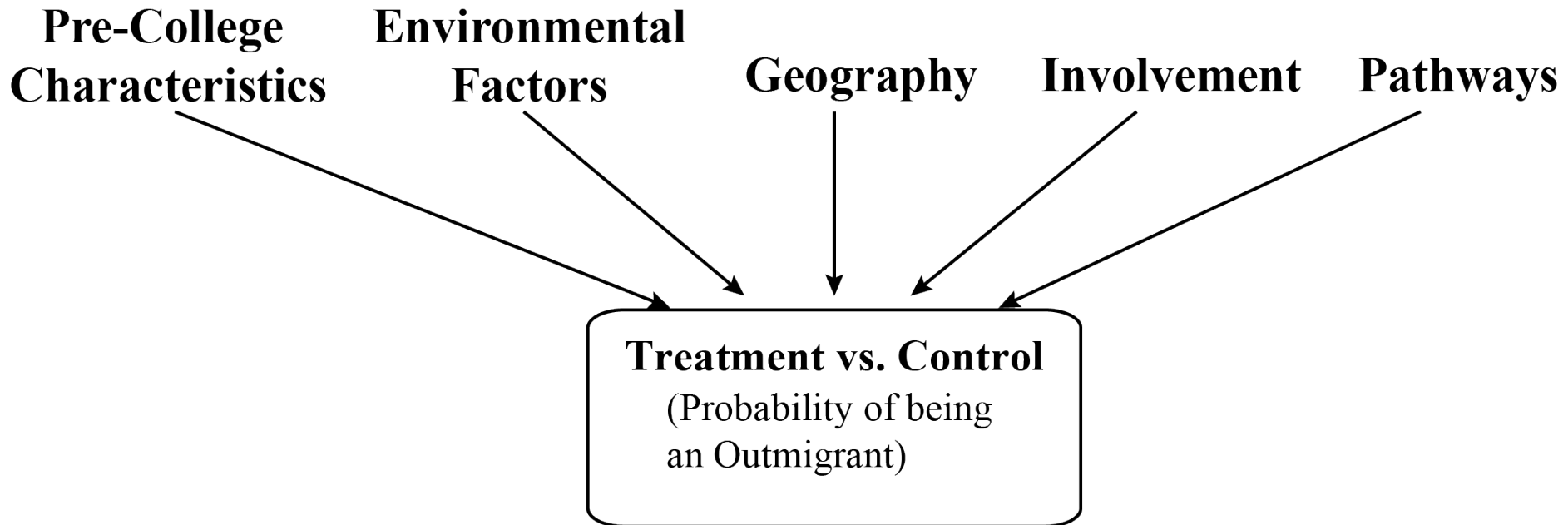
Study Group Composition Prior to Matching



Study Group Composition Prior to Matching



Conceptual Model Predicting Outmigration



Matching Methods

- Required an exact match on region and locale to control for economic and school context
- Required an exact match on the selectivity of the bachelor's granting institution to control for college context
- Required an exact match on major (2-digit CIP code) as a post-treatment adjustment
- Used predicted probabilities to find nearest neighbor
- Used a caliper of .25 SD units
- Dummy variable adjustments for those with missing data

Matched Pairs:

- Were from the same region and locale
- Had nearly the same likelihood of being an outmigrant
- Graduated from a four-year college with the same Barron's competitiveness rating
- Had the exact same major associated with their bachelor's degree
- The only observable difference between each member of the matched pairs was exposure to the 'treatment'

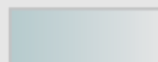
Balancing Diagnostics – Environment

	Prior to Matching			After Matching		
	Prior to Matching			After Matching		
	Outmigrants (n=6,087)	Stayers (n=13,416)	Standardized Difference	Outmigrants (n=4,400)	Stayers (n=4,400)	Standardized Difference
Control						
High School Level						
HS Mean Composite ACT	22.31	21.10	51.86	22.41	22.28	5.50
HS Percentage Low Income	0.16	0.21	-38.40	0.15	0.15	-3.45

Expected Financial Aid: Missing	0.19	0.20	-1.77	0.21	0.19	4.20
Planned Work Hours: 0	0.23	0.14	23.65	0.22	0.22	-0.69
Planned Work Hours: 1-10	0.26	0.23	6.60	0.26	0.25	1.62
Planned Work Hours: 11-20	0.24	0.32	-17.56	0.24	0.24	0.33
Planned Work Hours: 21-30	0.05	0.09	-15.41	0.05	0.06	-7.21
Planned Work Hours: 31 or more	0.01	0.01	-5.15	0.01	0.01	-5.49
Planned Work Hours: Missing	0.22	0.21	2.44	0.23	0.22	3.35

Cells are shaded according to their difference from zero

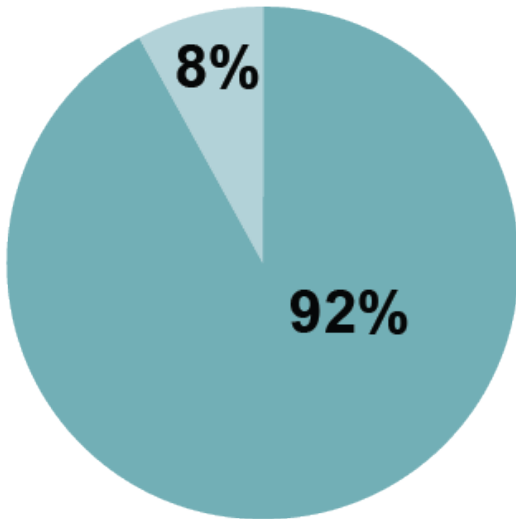
Difference favoring
Stayers



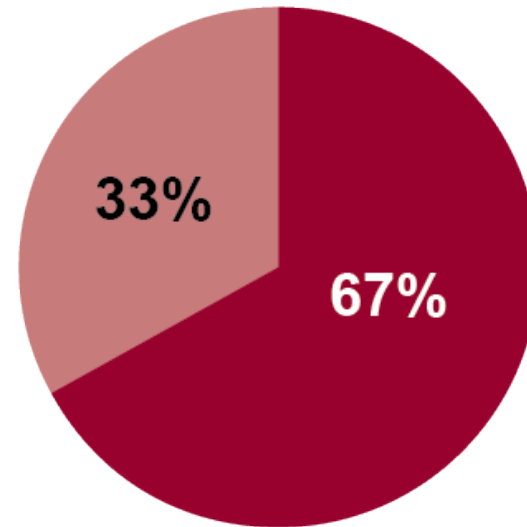
Difference favoring
Outmigrants

Overall Rate of Post-Bachelor's Illinois Employment

Stayers



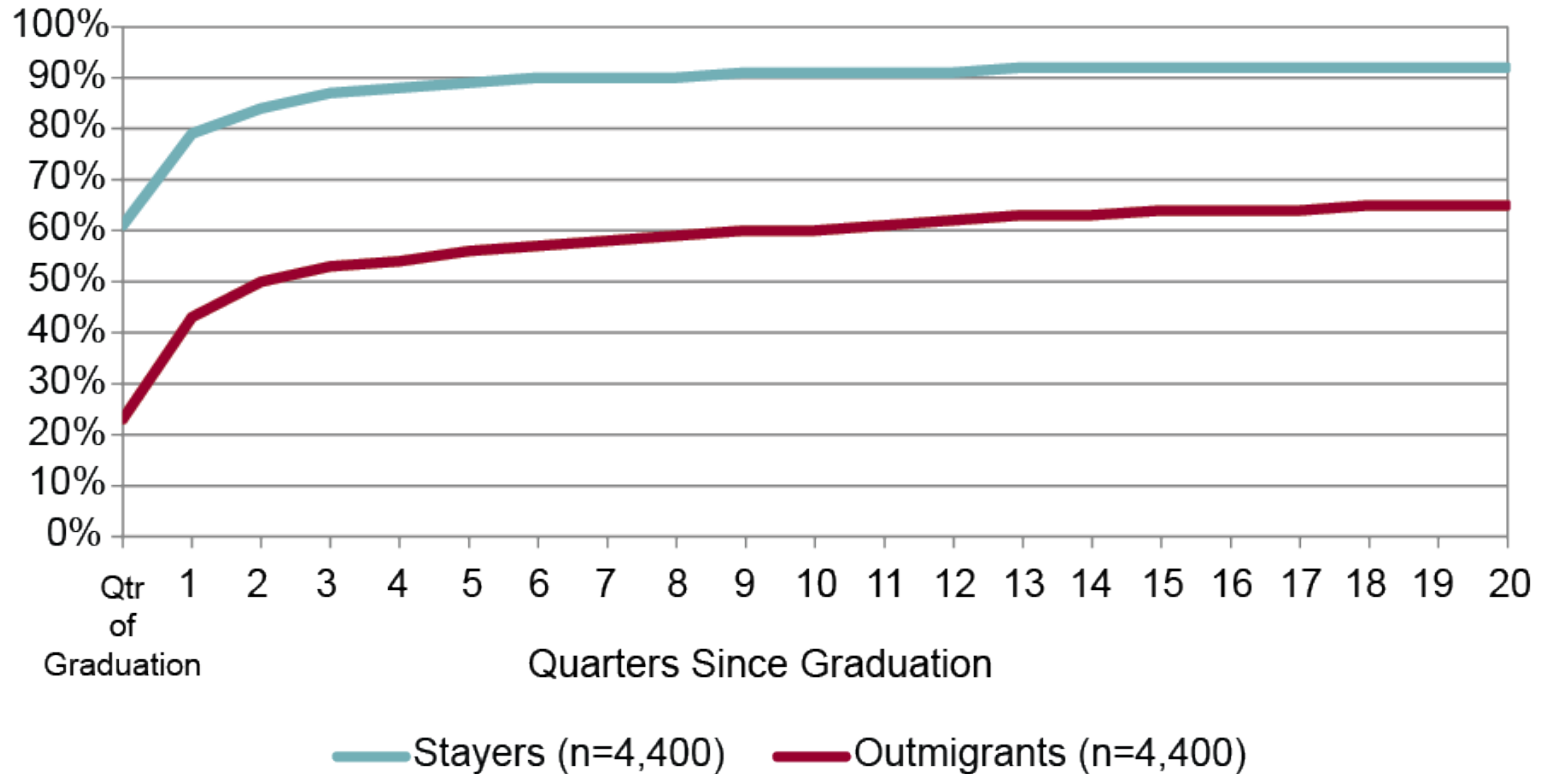
Outmigrants



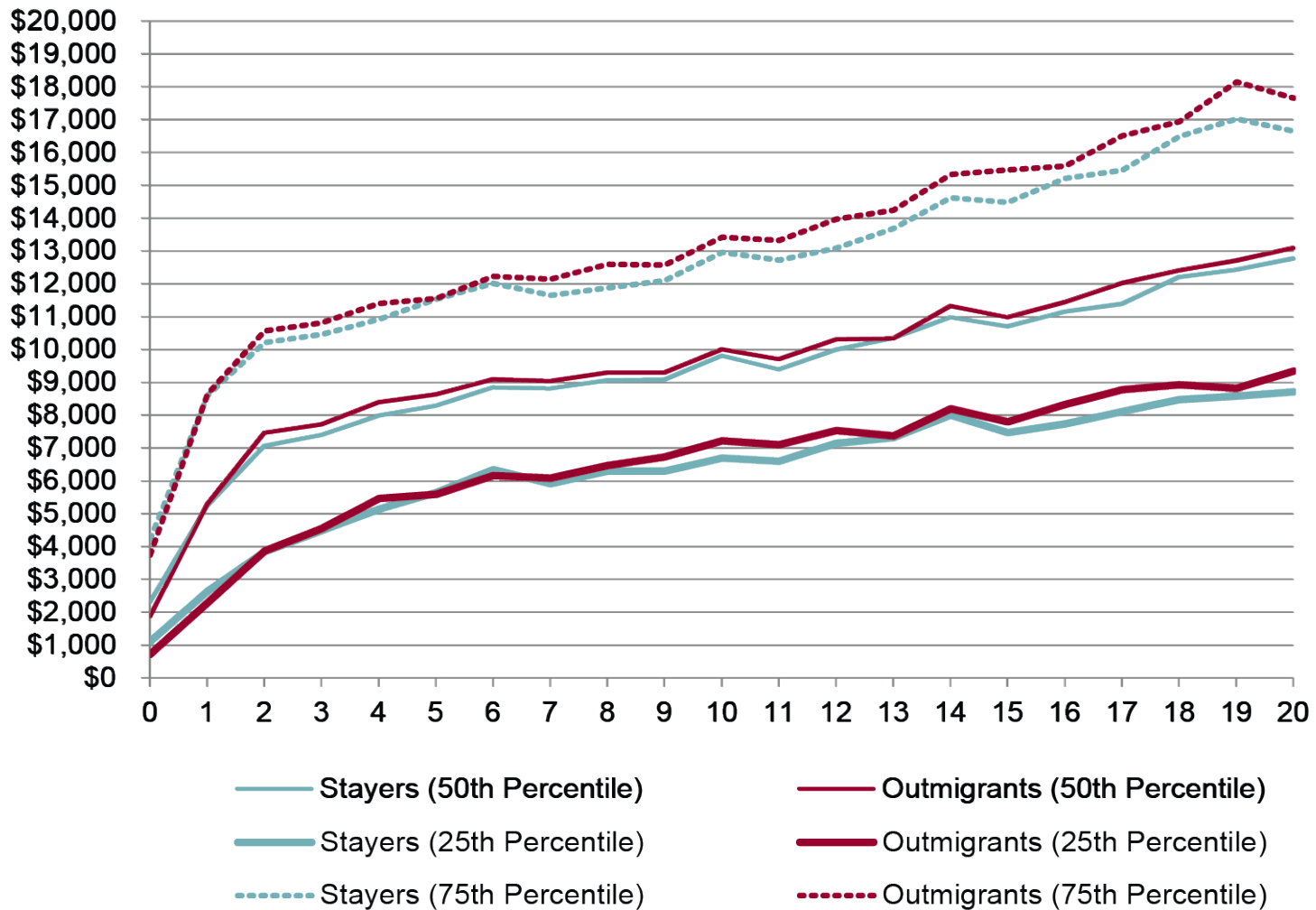
■ Employed in Illinois at Least One Quarter ■ Never Employed in Illinois

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Cumulative Rate of Illinois Employment by Outmigration Status



Quarterly Wages



Predicting Illinois Employment by Outmigration Status

	Outmigrants Odds Ratio (n=4,400)	Outmigrants Odds Ratio (n=4,400)	Stayers Odds Ratio (n=4,400)	Stayers Odds Ratio (n=4,400)
	Model 1	Model 2	Model 1	Model 2
STEM to Non-Stem		0.701***		0.769

*p<.05, **p<.01, ***p<.001

Major Findings

- Outmigrants were significantly less likely to gain employment in Illinois relative to stayers.
- Among the outmigrants, those with stronger academic profiles were less likely to obtain Illinois employment.
- Further, the outmigrants with the degrees deemed most important for the Illinois economy were even less likely to return to Illinois for employment.

Consequences of Outmigration

- Outmigrants experienced significantly lower rates of Illinois-specific employment relative to the stayers resulting in substantially lower aggregate Illinois wages among the outmigrant group.
- This in turn, represents some of the negative economic impact that outmigration has on the state of Illinois.

Policy Recommendations

- Data specific recommendations:
 - Entering into data sharing agreements with neighboring states.
 - Graduates of private high schools and the ILDS.
- Education policy specific recommendations:
 - Increasing affordable postsecondary options for Illinois students.
 - Actively recruiting outmigrants to return to Illinois for work.



Illinois Education Research Council

Southern Illinois University Edwardsville

Eric Lichtenberger, PhD

elichte@siue.edu

866-799-IERC (4372)

<http://www.siue.edu/ierc/>

