The Effect of Distance on College Outcomes for Commuting Students in the California State University System

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The California State University (CSU)

- Largest university system in the US

- 23 campuses,

  other centers and programs

- Fall 2016 enrollment:

  478,638 students systemwide

What We Know About Commuters

- More time commuting = less time studying

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- Informal Processes

  - Less likely to come to events on days they don't have class (office hours, study groups, club fairs)

  - Less non-classroom time spent on campus →

    - Fewer chances to get embedded into networks

    - Fewer chances to become aware of campus resources

Commute Distance Matters

- Distance from home matters for college selection and college enrollment, especially for low-income students (Han, 2014), (Turley, 2009)

- Distance from home has a large and significant effect on the probability of completing for low-income female students (Roeper, 2016)

- The further away from campus the student lived - both for walking and driving distance - the less likely they were to take advantage of educational resources (Kuh, 2001)

BUT, Prior Research Uses Survey Data

No papers that estimate the effect of commuting distance on outcomes using *administrative data*.

Is Commute Distance Associated with Graduation and Persistence?

Data: Fall 2009 FTFT Freshman Cohort

- 2009 = Most recent cohort for whom we have finalized 6-year graduation rates.
- Universe: those living at home with parents/family their first term
  - 34.4% systemwide
  - N = 13,488

Outcome Variables

- 4-year graduation
- 6-year graduation
- 1-year persistence
- 2-year persistence

Independent Variable: Logged Distance

- Logged distance in miles from high school of graduation to CSU Campus

- A small number of high schools were unable to be mapped, new *N*=13,369
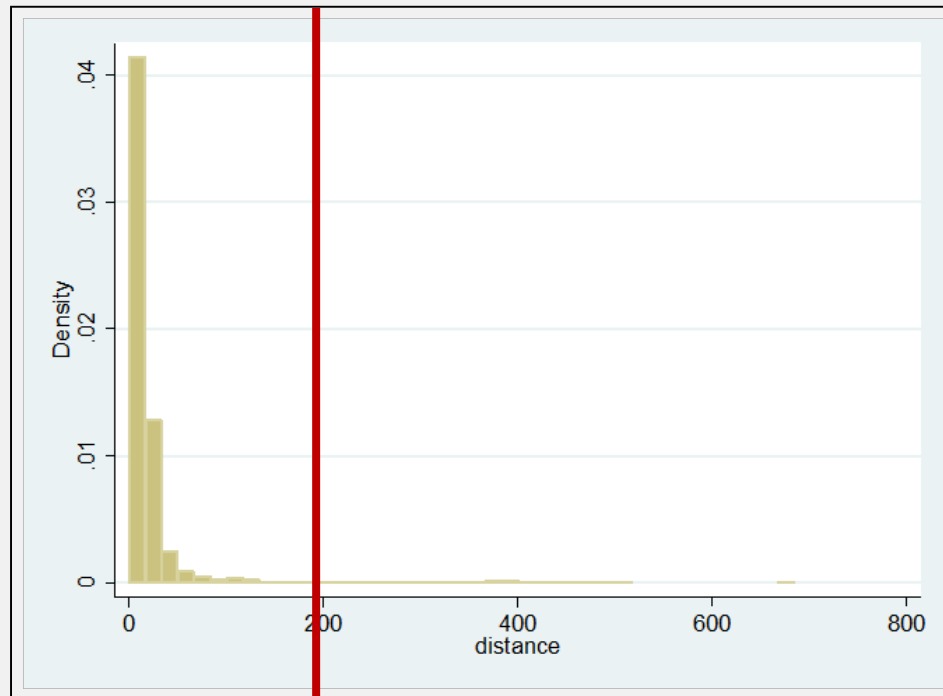
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Independent Variable: Logged Distance

- 25th p = 6.9, median = 11.5, 75th p = 19.4 miles
- Long right tail, dropped extremes (>= 200 mi)
  N=13,191

Descriptives with final analysis pop

Variable	Percentage of Commuters (*N*=12,175)	Percentage of Total FTFT Fall 2009 Cohort (*N*=49,483)
Graduate in 4 years or less	12.8%	**17.8%**
Graduate in 6 years or less	56.4%	**57.0%**
Persist after 1 year	**84.6%**	82.3%
Persist after 2 years	**77.3%**	73.6%
Female	**60.6%**	57.9%
No Parent Holds BA ("First Generation")	**64.2%**	50.1%
Pell Grant at entry	**53.7%**	52.7%
Fully Prepared	32.8%	**42.0%**

Method: Binary Logistic Regression

Model 1

Graduate in 4 years or less$_i$
$$= \beta_0 + \beta_1 \log(Distance_i) + \beta_2 Female_i + \beta_3 No\ Parent\ Holds\ BA_i$$
$$+ \beta_4 Pell\ at\ Entry_i + \beta_5 Fully\ Prepared_i + \varepsilon_i$$

Model 2

Graduate in 6 years or less$_i$
$$= \beta_0 + \beta_1 \log(Distance_i) + \beta_2 Female_i + \beta_3 No\ Parent\ Holds\ BA_i$$
$$+ \beta_4 Pell\ at\ Entry_i + \beta_5 Fully\ Prepared_i + \varepsilon_i$$

Model 3

Persist After 1 year$_i$
$$= \beta_0 + \beta_1 \log(Distance_i) + \beta_2 Female_i + \beta_3 No\ Parent\ Holds\ BA_i$$
$$+ \beta_4 Pell\ at\ Entry_i + \beta_5 Fully\ Prepared_i + \varepsilon_i$$

Model 4

Persist After 2 years$_i$
$$= \beta_0 + \beta_1 \log(Distance_i) + \beta_2 Female_i + \beta_3 No\ Parent\ Holds\ BA_i$$
$$+ \beta_4 Pell\ at\ Entry_i + \beta_5 Fully\ Prepared_i + \varepsilon_i$$

Results: Probability Models

	Model 1	Model 2	Model 3	Model 4
Dependent Variable:	Graduate in 4 years or less	Graduate in 6 years or less	Persist after 1 year	Persist after 2 years
Logged commute distance	.043	-.089***	-.125***	-.117***
	(.032)	(.022)	(.030)	(.026)
Female	.659***	.375***	.144**	.100*
	(.061)	(.038)	(.052)	(.045)
First-generation	-.346***	-.267***	-.277***	-.222***
	(.061)	(.044)	(.062)	(.053)
Pell at entry	-.332***	-.037	.193***	.185***
	(.061)	(.040)	(.055)	(.047)
Fully prepared	.983***	.605**	.685***	.540***
	(.058)	(.042)	(.062)	(.051)
Constant	-2.480***	.266***	1.828***	1.350***
	(.108)	(.071)	(.098)	(.084)
Pseudo R squared	0.062	0.024	0.018	0.013

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

# Results: Predicted Probabilities from M2

Student Archetype	Commute Distance	Predicted *p* of graduating in 6 years or less
Female, first-generation, Pell at entry, needing additional preparation	5 miles	0.548
	15 miles	0.524
	30 miles	0.509
Male, first-generation, Pell at entry, needing additional preparation	5 miles	0.454
	15 miles	0.430
	30 miles	0.415
Female, first-generation, Pell at entry, fully prepared	5 miles	0.690
	15 miles	0.668
	30 miles	0.655
Male, first-generation, Pell at entry, fully prepared	5 miles	0.604
	15 miles	0.581
	30 miles	0.566

Results: Predicted Probabilities from M2

Student Archetype	Commute Distance	Predicted *p* of graduating in 6 years or less	Δ in *p*
Female, first-generation, Pell at entry, needing additional preparation	5 miles	0.548	.040
	15 miles	0.524	
	30 miles	0.509	
Male, first-generation, Pell at entry, needing additional preparation	5 miles	0.454	.039
	15 miles	0.430	
	30 miles	0.415	
Female, first-generation, Pell at entry, fully prepared	5 miles	0.690	.035
	15 miles	0.668	
	30 miles	0.655	
Male, first-generation, Pell at entry, fully prepared	5 miles	0.604	.038
	15 miles	0.581	
	30 miles	0.566	

How Far is "Too Far"?

Student Archetype	Commute Distance	Predicted p of graduating in 6 years or less	$p < .5$
Female, first-generation, Pell at entry, needing additional preparation	5 miles	0.548	45 miles
	15 miles	0.524	
	30 miles	0.509	
Male, first-generation, Pell at entry, needing additional preparation	5 miles	0.454	<1 mile
	15 miles	0.430	
	30 miles	0.415	
Female, first-generation, Pell at entry, fully prepared	5 miles	0.690	>199 miles
	15 miles	0.668	
	30 miles	0.655	
Male, first-generation, Pell at entry, fully prepared	5 miles	0.604	>199 miles
	15 miles	0.581	
	30 miles	0.566	
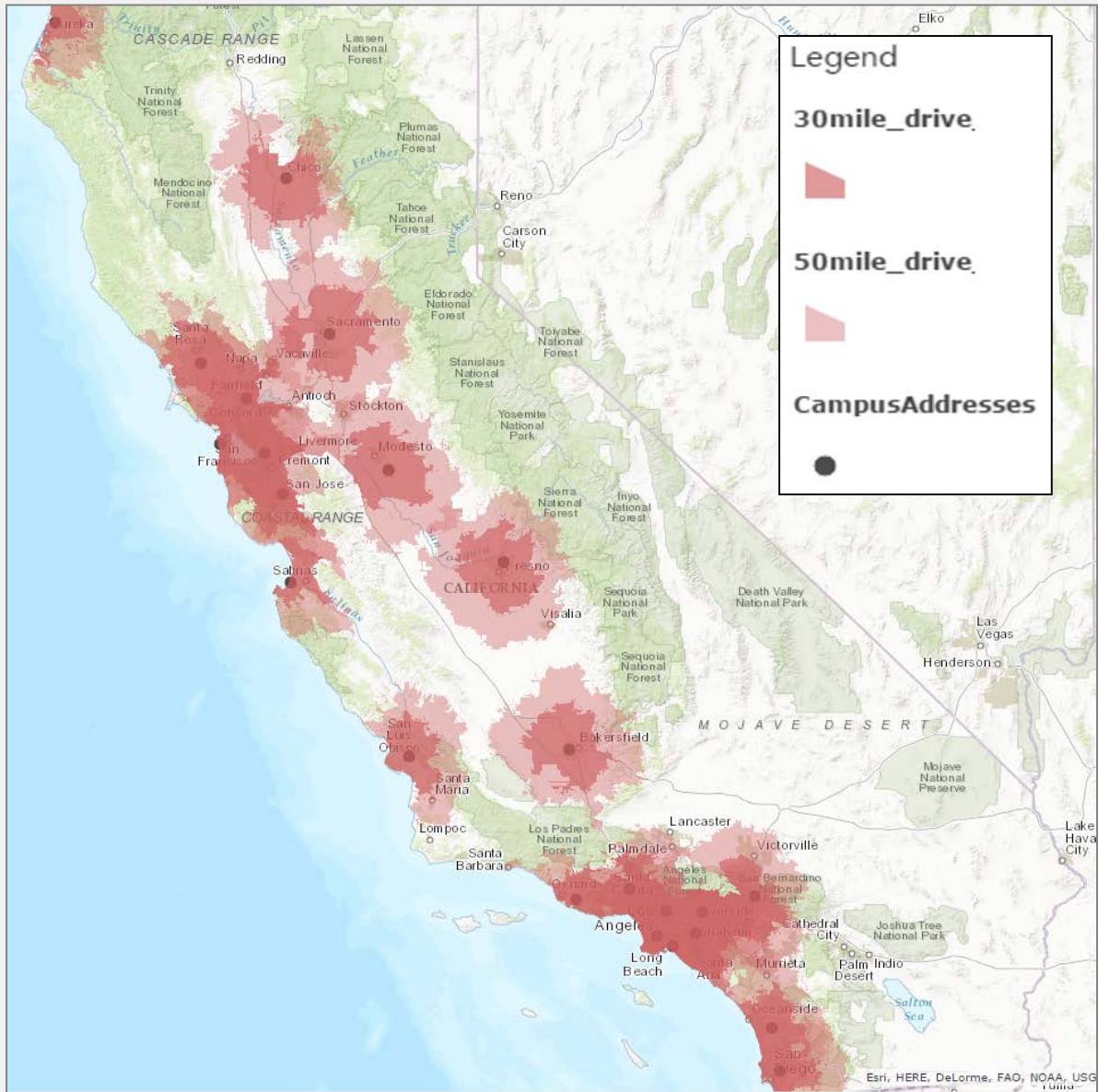
Implications: Where to Target Efforts?

Target commuter resources and outreach efforts to:

- Those who need additional preparation
- Those who have a long commute
- Male students

Limitations

- Commuter status variable
  - Simply the intended commuter status at the time of Financial Aid application (Feb.-Mar.)
  - Commuter Status can change from term to term
- Systemwide results driven by large campuses?
- Most results were highly significant ($p<.001$)

    → might be overpowered w/ large N

Future Research

- The effect of distance on enrolling in the first place (or not going to college at all)
- Similar study for Upper-Div. Transfer students

Questions?

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