

Analysis of the Variation in Office and Apartment Market Rents with Respect to Commuter Rail Transit Station Distance in Metropolitan San Diego and Salt Lake City

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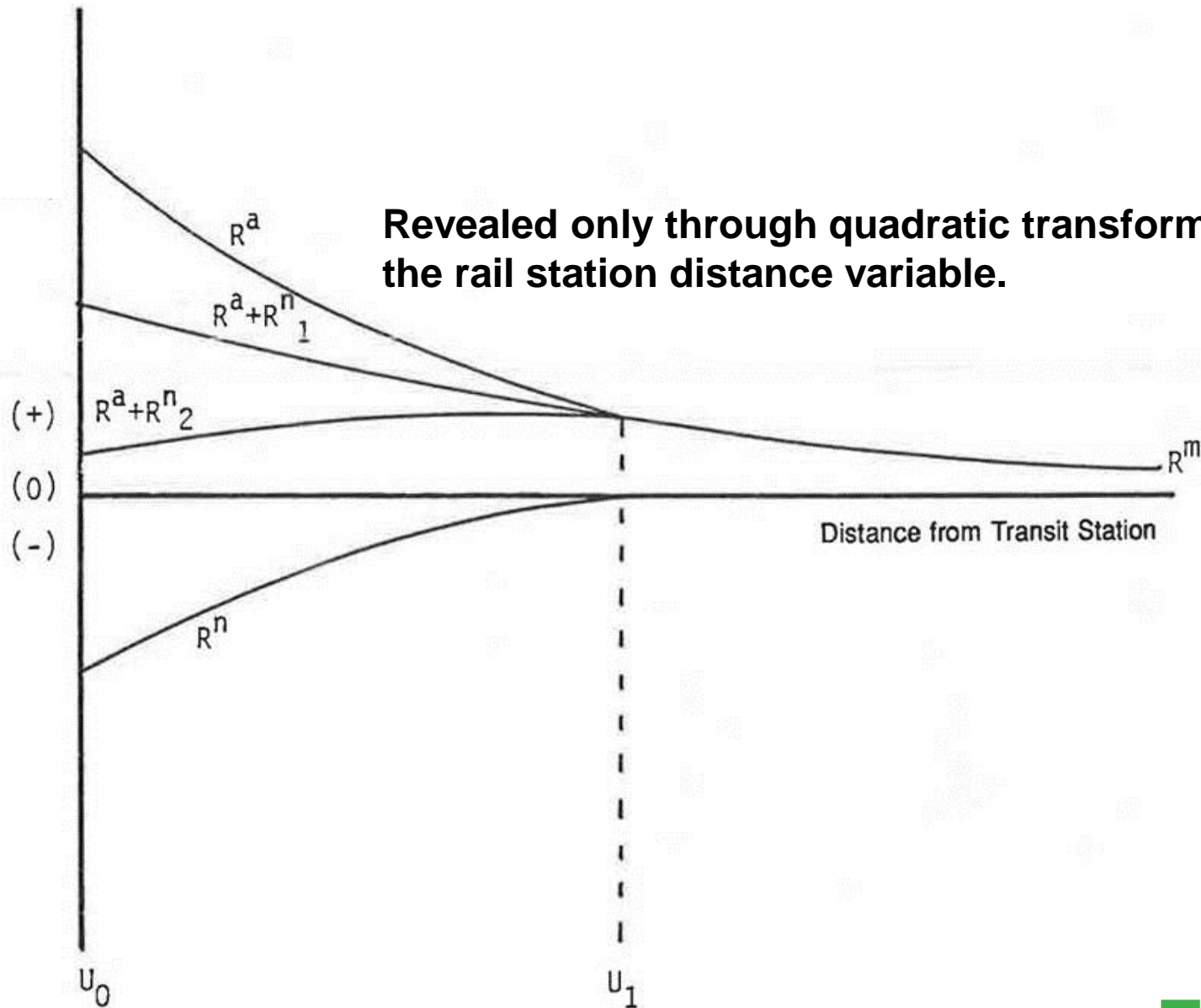


Outline

- Commuter rail transit overview
- Commuter rail transit and real estate values
- Case study area descriptions
- Model
- Results
- Implications

Theory

- Commuter rail connects remote locations to centers
- If they reduce the time-cost of commuting, proximity will be valued
- Commuter rail stations often in freight rail and industrial areas
- Positive proximity effects may be offset by negative location externalities



Source: Nelson & McClesky 1991.

Literature Review

- ❑ Most studies show negative or ambiguous values with respect to commuter rail station proximity
- ❑ All studies are limited to simple ½-mile bands or linear distance from CRT stations.
- ❑ No studies use a functional form that is designed to reveal both positive and negative influences.
- ❑ Our research helps close these gaps.

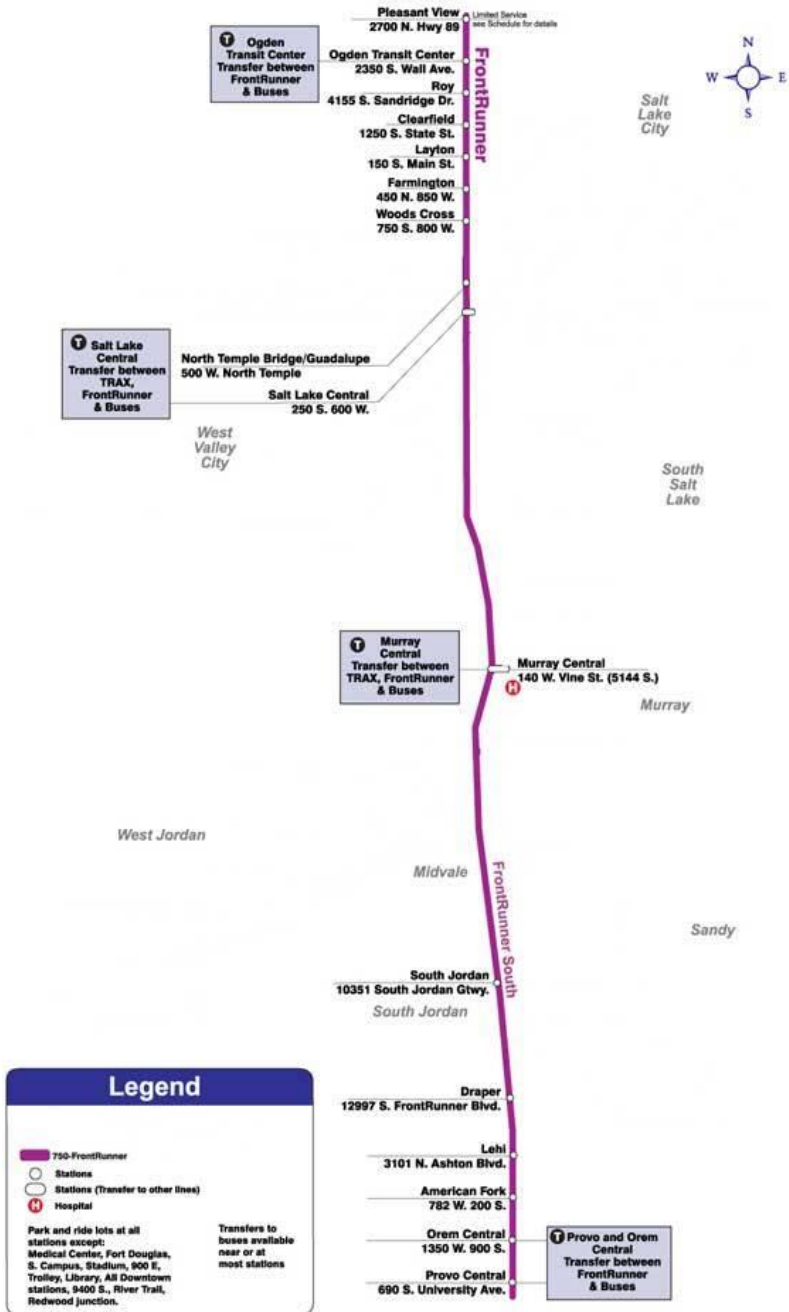


San Diego Coaster

- 1995
- 62 miles
- 8 stations
- Weekday peak and occasional weekend service

Salt Lake City FrontRunner

- 2008
- 88 miles
- 17 stations
- Operates throughout weekdays and weekends.



Research Design

- Quasi-experimental
- One time period
- Applied to →
 - **Office rental property**
 - **Multifamily residential rental property**

Model

$$R_i = f(B_i, S_i, L_i)$$

where:

R is the price of rent per square foot for property i ;

B is the set of building attributes of property i ;

S is the set of socioeconomic characteristics of the vicinity of property i ; and

L is a set of location attributes of property i measured by the quadratic transformation of distance to transit stations (DTS), the functional form of which is:

$$L_i = DTS_i + DTS_i^2$$

Office

Variable	Specification, Predicted Sign	Data Source
<i>Dependent Variable</i>		
Asking rent per square foot	Continuous, logged	CoStar
<i>Building Attributes</i>		
Gross Leasable Square Feet	Continuous -	CoStar
Class A	Binary (Class C is referent) +	CoStar
Class B	Binary (Class C is referent) +	CoStar
Effective Year Built	Continuous +	CoStar
<i>Socioeconomic Characteristics</i>		
Percent White Non-Hispanic	Percent x 100 +	American Community Survey 2015
Median Household Tract Income	Continuous x 1,000 +	American Community Survey 2015
<i>Location</i>		
County location, Salt Lake City metro only	Binary for Davis, Salt Lake, Utah counties (referent is Weber County) Not predicted	GIS
Distance to CBD, miles	Continuous -	GIS measure from parcel centroid to CBD centroid
Experimental		
Distance to Nearest CRT Station	Continuous -	GIS measure from parcel centroid to station centroid
Distance to Nearest CRT Station Squared	Continuous +	Square of Distance from station

Office Results

Variable	Metro Salt Lake Coefficient	p	Metro San Diego Coefficient	p
Constant	6.290E-001		0.330	
Gross Leasable Area	6.664E-007*		-0.000	
Class A	0.151*		0.216*	
Class B	0.07*		0.105*	
Effective Year Built	0.000E+000*		0.000	
White Percent	0.000E+000		0.098*	
Median Household Income	9.918E-004*		0.001*	
Davis Co	0.01		na	
Salt Lake Co	2.800E-002		na	
Utah Co	7.000E-002		na	
Distance CBD, miles	-4.000E-003*		-1.000E-003*	
Distance CRT, miles	-0.015*		-1.600E-002*	
Distance CRT Squared	0.001		1.000E-003*	
Cases	618		811	
Adjusted R-Square	0.306		0.311	
F-Ratio	23.643		41.533	
*p < 0.05, one-tailed test				

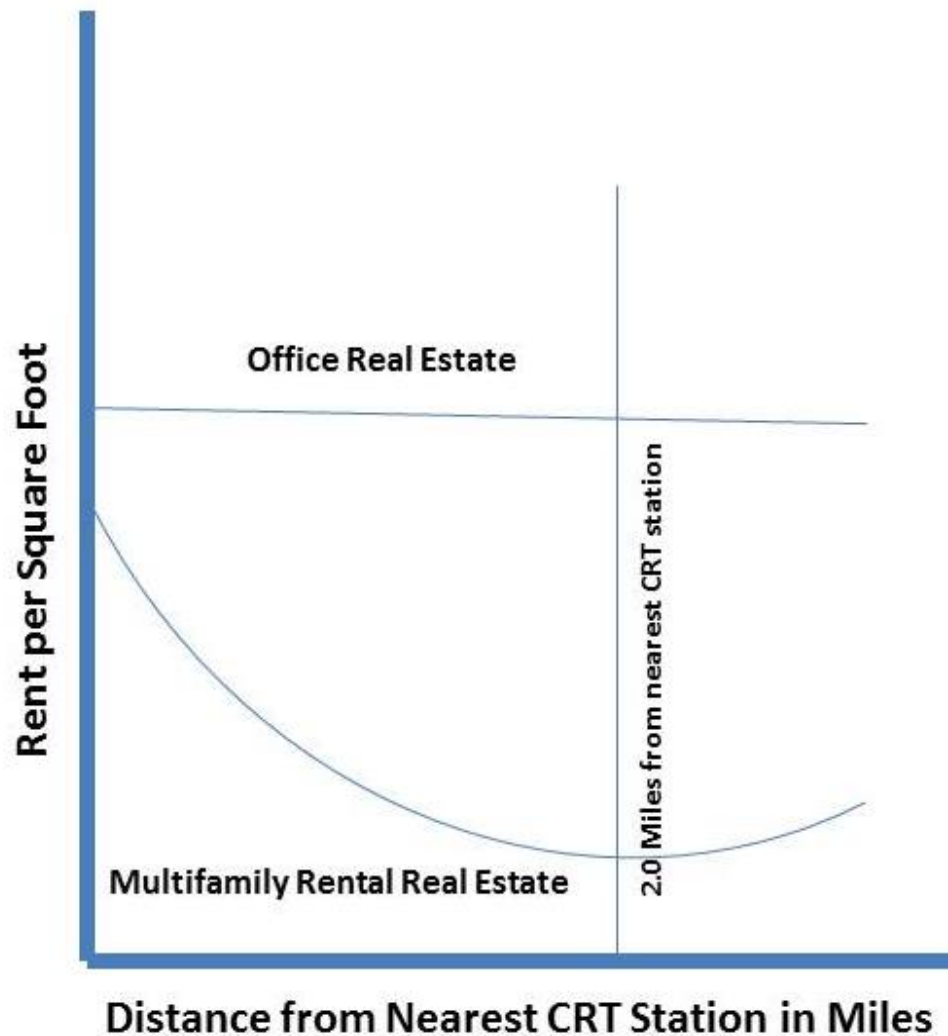
Variable	Specification, Predicted Sign	Data Source
<i>Dependent Variable</i>		
Asking rent per square foot	Continuous, logged	CoStar
<i>Building Attributes</i>		
Gross Leasable Square Feet	Continuous -	CoStar
Effective Year Built	Continuous +	CoStar
Market Rent	Binary (rent restriction is the referent) +	CoStar
<i>Socioeconomic Characteristics</i>		
Percent White Non-Hispanic	Percent x 100 +	American Community Survey 2015
Median Household Tract Income	Continuous x 1,000 +	American Community Survey 2015
<i>Location</i>		
County location, Salt Lake City metro only	Binary for Davis, Salt Lake, Utah counties (referent is Weber County) Not predicted	GIS
Distance to CBD, miles	Continuous -	GIS measure from parcel centroid to CBD centroid
Experimental		
Distance to Nearest CRT Station	Continuous -	GIS measure from parcel centroid to station centroid
Distance to Nearest CRT Station Squared	Continuous +	Square of Distance from station

Multifamily Results

Variable	Metro Salt Lake Coefficient/p	Metro San Diego Coefficient/p
Constant	-4.484	-0.349
Gross Leasable Area	3.657E-007 *	2.155E-007 *
Effective Year Built	0.002 *	0.000 *
Market Rent	0.132 *	0.082 *
White Percent	-0.001	0.137 *
Median Household Income	-2.606E-005	8.186E-004 *
Davis County	-0.084	na
Salt Lake County	-0.038	na
Utah County	0.157	na
Distance CBD, miles	-2.017E-006 *	-1.000E-003 *
Distance CRT, miles	-7.215E-006 *	-1.400E-002 *
Distance CRT Squared	1.171E-010 *	0.000E+000 *
Cases	618	3608
Adjusted R-Square	0.306	0.205
F-Ratio	23.643	94.047
*p < 0.05, one-tailed test		

Distance Thresholds

Metro Area	Office Distance	MF Distance
San Diego	30 miles	2 miles
Salt lake City	32 miles	2 miles



Illustrative relationships between office and multifamily rental real estate rents with respect to distance from the nearest CRT station in the Salt Lake City and San Diego metropolitan areas. Office real estate gradient slopes slightly downward, while multifamily gradient has a steep declining slope as distance from the transit station increases.

Limitations

- ❑ Not area (such as downtown) or station-specific (such as stations accessing recreation venues)
- ❑ Only 2 western CRT systems evaluated
 - ❑ **Results for Northeast/Midwest systems may be quite different**
- ❑ Limited to rental properties in the CoStar database (though 80%+)
 - ❑ **Excludes owner-tenant properties**
- ❑ Based on rents and not value; no estimate made of value based on capitalization of rents.

Implications

- Office is not impacted much, though a positive distance association is estimated
- MR rental is a surprise for its relatively steep downward slope to 2 miles
 - But MF properties are found several hundred feet away from stations
- Modern CRT station areas have mixed-use master plans that may be effective in neutralizing adverse effects.
- More detailed station-area research needed.