



Gentrification and Residential Mobility in Philadelphia

Preliminary, Please Do Not Cite Without Authors' Permission

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Disclaimer

The views expressed here are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.



Motivation

The timing to study gentrification could not be better:

- Urban neighborhoods have started to rebound
- More attention paid to urban issues and place-based strategies
- Population had started to increase after decades of decline in Philadelphia
- Increased concern on gentrification and displacement of poor residents



Literature

Gentrification raises concerns surrounding the displacement of poor households, but empirical evidence is mixed:

- Neighborhood-level demographics and qualitative evidence suggest changing populations (Hartman, 1979).
- Early individual-level quantitative studies did not have data for the proper comparison group — neighborhoods that did not gentrify (e.g., Henig, 1980; Schill and Nathan, 1983).
- Recent quantitative studies do not find evidence of displacement:
 - Poor, minority, renting, or less well-educated households in “gentrifying” neighborhoods are no more likely to move than similar households in other neighborhoods (Vigdor, 2002; Freeman and Braconi, 2004; Freeman, 2005) or other households that move out of the neighborhood (McKinnish et al., 2010; Ellen and O’Regan, 2011)



Literature

- Studies assessing displacement using individual-level data to compare in-migrants and out-migrants face other shortcomings:
 - Large spatial aggregations as “neighborhoods” (100K–200K population) (Vigdor, 2002; Freeman and Braconi, 2004)
 - “Gentrification” measures:
 - overly inclusive (Freeman, 2005)
 - income-based only (McKinnish et al., 2010; Ellen and O’Regan, 2011)
 - Individual outcome measures:
 - cannot stratify households within neighborhoods (PSID, AHS) (Freeman, 2005; Ellen and O’Regan, 2011)
 - decennial measures for individuals within tracts (U.S. Census) (McKinnish et al., 2010)
- These studies do not cover the housing boom and bust of the 2000s; do not examine the types of neighborhoods to which out-migrants relocate; and do not examine movers’ experience after they relocate.



This Study

To shed light on the relationship between gentrification and residential mobility in Philadelphia, this study:

- compares the mobility patterns in gentrifying/nongentrifying neighborhoods;
- examines the experience of out-movers from gentrifying/nongentrifying neighborhoods: quality of destination neighborhoods, changes in their financial well-being (inspired by Hartley, 2013); and
- focuses on gentrification and the experience of more vulnerable population.



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Data and Methodology



Data: FRBNY Consumer Credit Panel (CCP)

- FRBNY Consumer Credit Panel/Equifax (FRBNY CCP), a 5 percent, nationally representative random sample of individuals in the U.S. with an SSN and a credit report.
- FRBNY CCP follows the same individuals over time and reports the updated census geography identifier for sample members each quarter beginning in 1999. A “mover” is defined as one who lives in a census tract different from where he/she lived one year ago.
- CCP reports extensive info on consumers’ credit characteristics; risk scores have been used to stratify individuals and serve as an indicator of individuals’ financial well-being (Hartley, 2013).



Data: FRBNY CCP

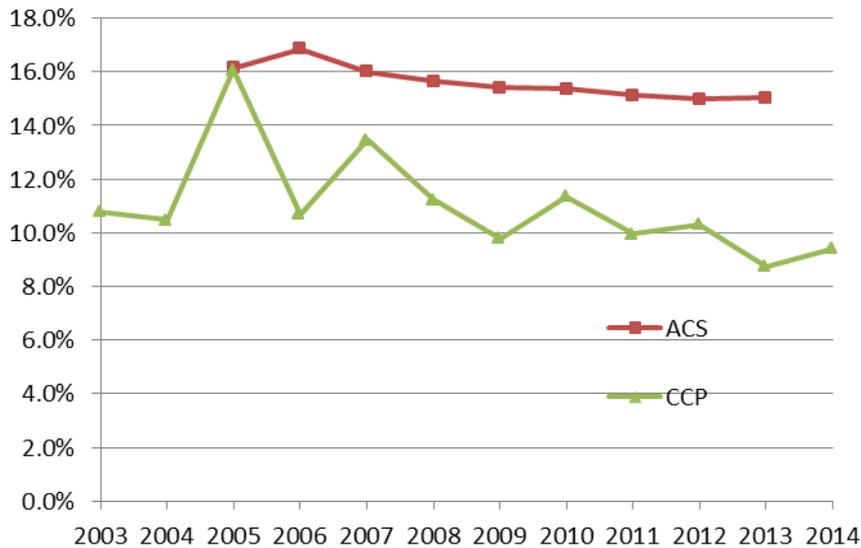
- The age distribution and total population estimates of the CCP sample are quite similar to the ACS data, especially for individuals 25 years of age or older.
- CCP has a lower proportion of individuals 18–24 years old, and the mobility rates for young adults were slightly lower than the ACS data.
 - Young adults are less likely to have a credit report.
 - Young college students are more likely to use their parents' home address so CCP may underestimate their mobility rates.
 - Young adults may be more likely to make intraneighborhood (tract) moves; not captured by our definition of movers.



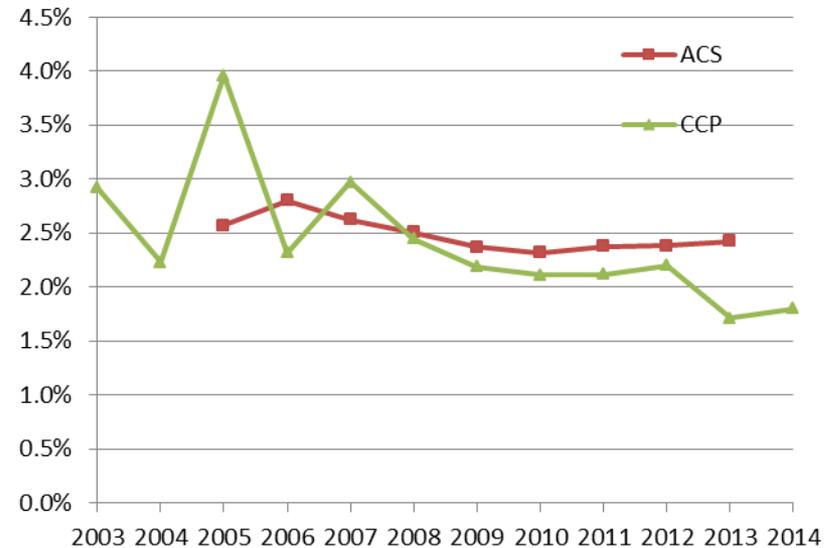
CCP Annual Mobility Rates Versus ACS Measures, U.S.



Mobility Rate, 18-84 Years Old Only



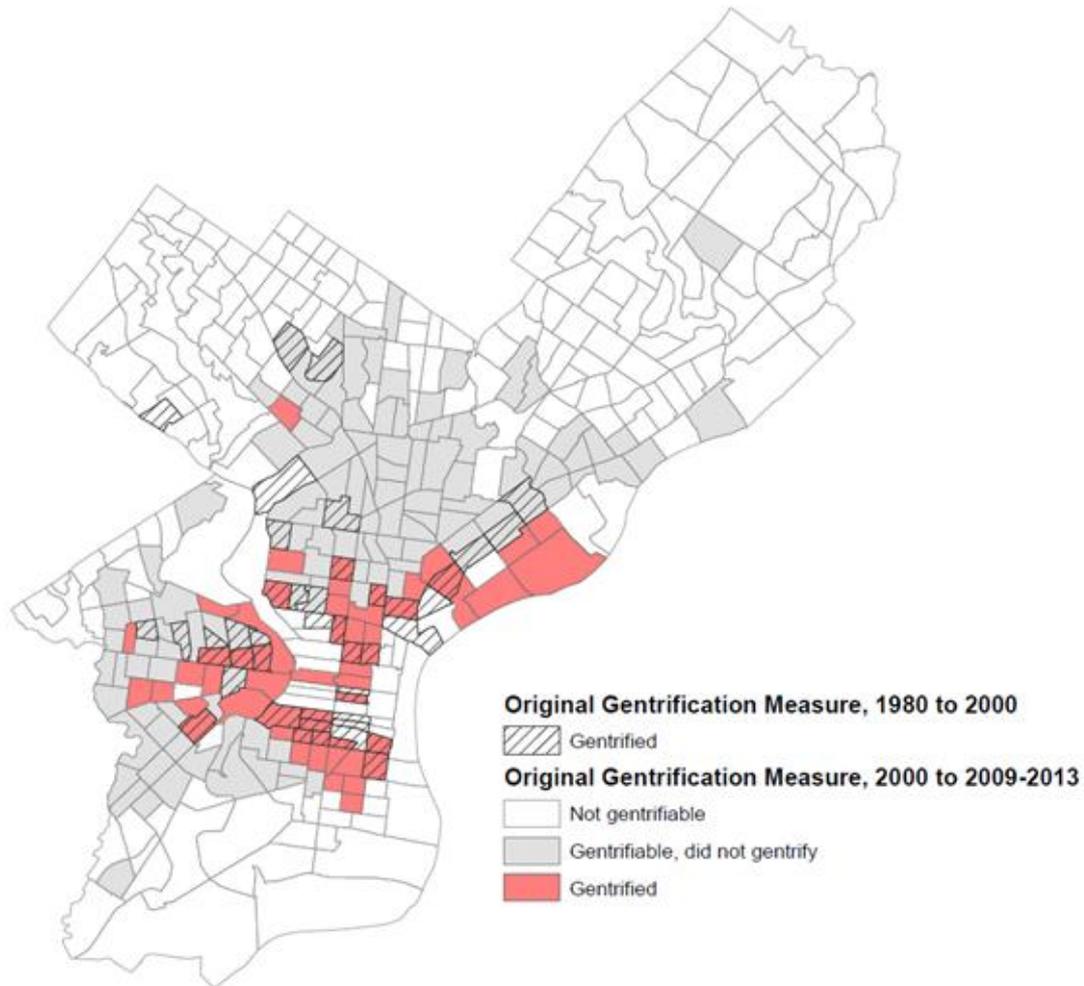
Inter-State Mobility Rate, 18-84 Years Old Only



Note: Individuals who were recorded as “deceased,” or with very short observation periods, were dropped; based on ACS and authors’ calculations using data from the FRBNY Consumer Credit Panel/Equifax.



Data: Gentrification Measure (Binary)



Neighborhoods considered “gentrifying” during 2000–2013 if:

- Initial income below the *citywide* median (gentrifiable) in 2000
- % change in median rent or home value during 2000–2013 above citywide median

AND

- % change in college-educated residents during 2000–2013 above citywide median



Neighborhood Characteristics by Gentrification Status, Philadelphia

<i>Initial Neighborhood Condition, 2000</i>	Nongentrifying	Gentrifying	Nongentrifiable
% non-Hispanic whites in 2000	16.0%	33.8%	64.8%
% renters in 2000	42.7%	53.5%	33.6%
<i>Population Change, 2000-2013</i>			
% change in total population	-1.9%	2.3%	3.5%
% change in non-Hispanic whites	-31.7%	22.8%	-14.5%
<i>Change in Neighborhood Indicators, 2000–2013</i>			
Average % change in median household income	-18.2%	41.9%	-7.2%
Average change in % college-educated	1.5%	16.4%	6.3%
Average change in poverty rate (%)	4.8%	-4.3%	3.8%
Number of Tracts	128	56	181

Source: Authors' calculations use data from 2000 Census and 2009-2013 American Community Survey (ACS).



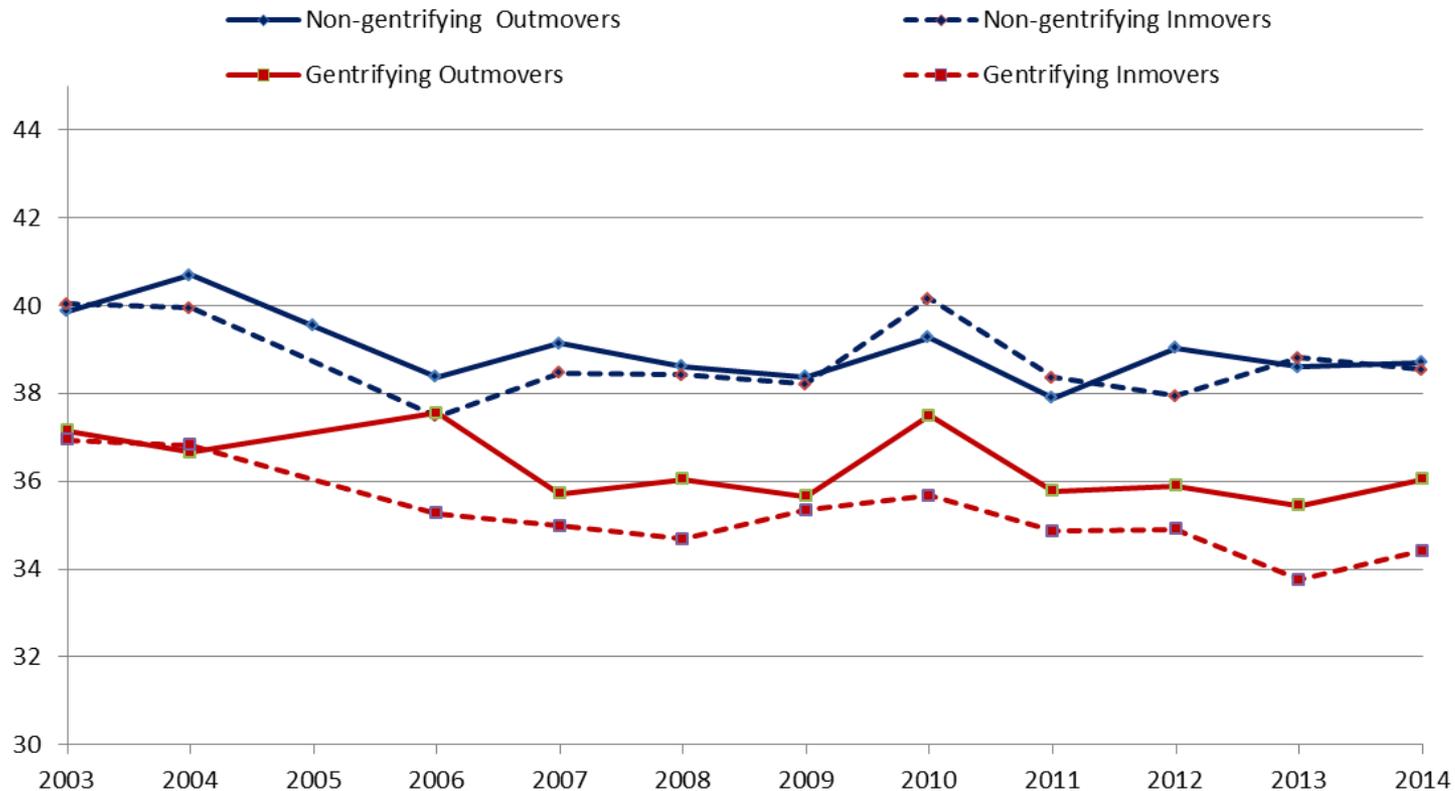
Data: Gentrification Measure (Categorical, by Stage of Gentrification)



	Categories	Explanation
	Nongentrifiable	nongentrifiable in 1980, 1990, and 2000
Nongentrifiable	Old gentrification	pre-2000 gentrification (1980-2000 or 1990-2000) and no longer gentrifiable in 2000
Nongentrifying	Nongentrifying	nongentrifying, pre-2000 and 2000-2013
	Stalled gentrification	pre-2000 gentrification and not gentrifying 2000-2013
	Continued gentrification	pre-2000 gentrification and gentrifying 2000-2013
	Early gentrification	gentrifying but in the bottom quartile of gentrifying tracts for rent and value in 2009–2013
Gentrifying	Middle-stage gentrification	gentrifying and in the 2nd or 3rd quartile for either rent or value in 2009–2013
	High gentrification	gentrifying and in the top quartile for rent or value in 2009–2013



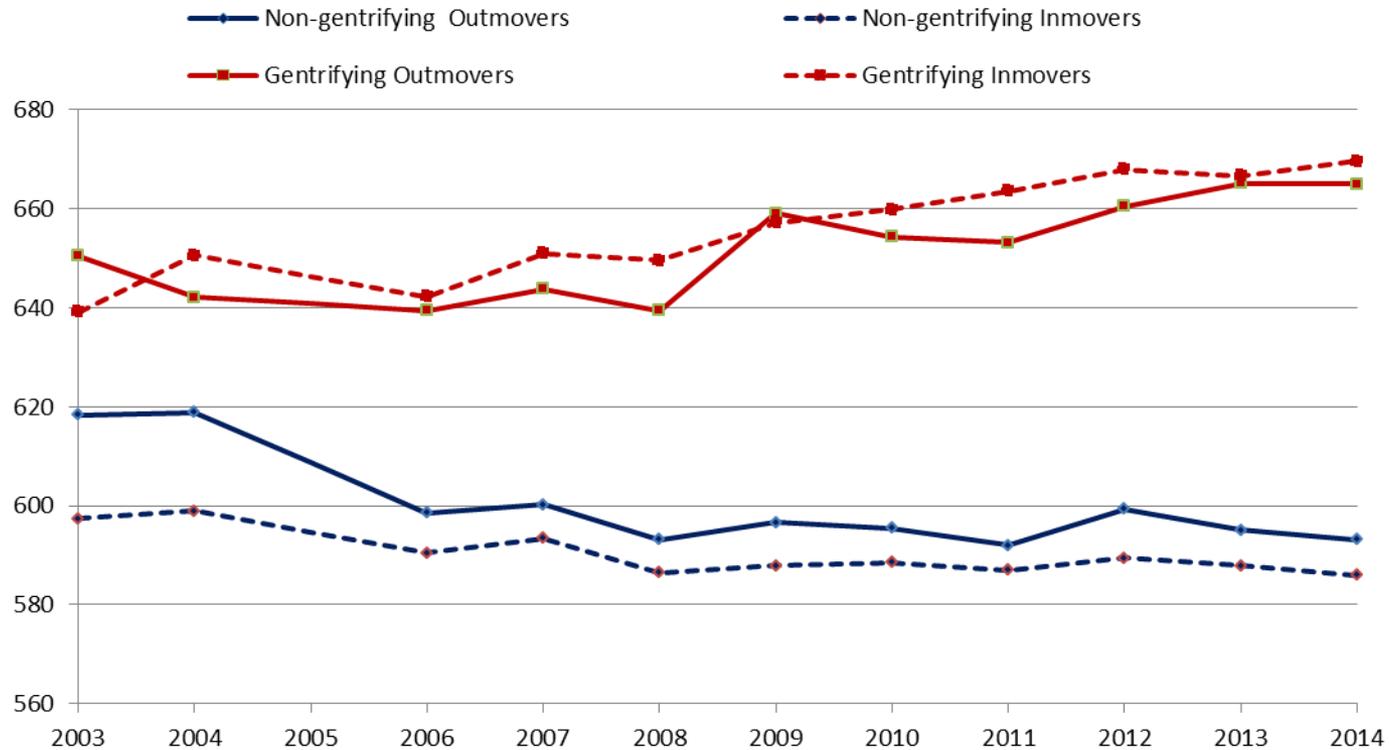
Mean Age of Movers in Gentrifying and Nongentrifying Neighborhoods, 2003-2014, Philadelphia



Note: A “mover” is defined as one who lives in a census tract different from where he/she lived one year ago; individuals 18–84 years old only; authors’ calculations using data from the FRBNY Consumer Credit Panel/Equifax.



Mean Risk Score of Movers in Gentrifying and Nongentrifying Neighborhoods, 2013-2014, Philadelphia



Note: A “mover” is defined as one who lives in a census tract different from where he/she lived one year ago; individuals 18–84 years old only; authors’ calculations using data from the FRBNY Consumer Credit Panel/Equifax.



Methodology

$$Pr(MOVE_i) = \alpha + \beta * GENTRIFY_i + \gamma * RISKSCORE_i + \delta * X_i + \varepsilon * NBHD_i$$

where:

- $MOVE_i$: indicator variable=1 if an individual lives in a census tract different from where he/she had lived one year ago.
- $GENTRIFY_i$ is our gentrification measure (binary or categorical).
- $RISKSCORE_i$ is the initial Equifax Risk Score (categorical) of individual i .
- X_i includes a set of individual/household characteristics, including individual's age (categorical), the number of householders with a credit report and SSN, whether the individual (or any householder) has one or more mortgages, and whether the individual (or any householder) has one or more seriously delinquent (90+ days) accounts.
- $NBHD_i$ includes three neighborhood indicators (tract poverty rate, homeownership rate, share of African Americans).

Caveats: There is no perfect control group available; results may not be applicable for individuals without a credit report; and move does not necessarily mean displacement.



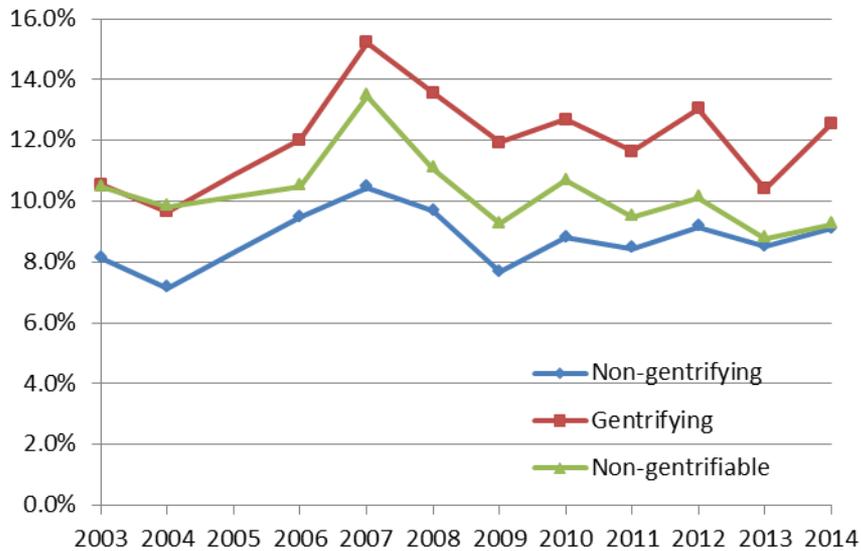
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Empirical Results I: Residential Mobility

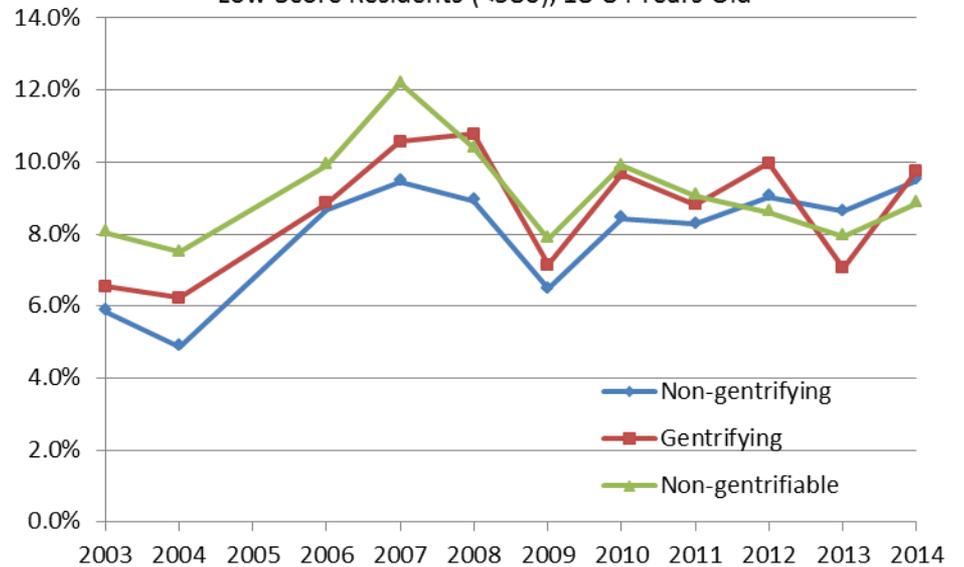


Mobility Rates by Neighborhood Type, Philadelphia

All Residents, 18-84 Years Old



Low-Score Residents (<580), 18-84 Years Old



Note: A “mover” is defined as one who lives in a census tract different from where he/she lived one year ago; low-score residents include individuals with no risk scores or with risk scores below 580; authors’ calculations using data from the FRBNY Consumer Credit Panel/Equifax.



Gentrification and Probability of Move (Relative to Nongentrifying), 2003–2014, Philadelphia

Summary of Coefficients for the Gentrification Variable from Linear Probability Regressions

	All 18–84 yrs old		25–84 yrs old (18–24 yrs old excluded)	
	Coef.	Std. Err.	Coef.	Std. Err.
2003	-0.0124^{***}	0.0042	-0.0119^{***}	0.0043
2004	-0.0063	0.0040	-0.0060	0.0041
2006	0.0030	0.0046	0.0035	0.0047
2007	0.0094^{**}	0.0048	0.0095^{**}	0.0050
2008	0.0118^{**}	0.0048	0.0114^{**}	0.0049
2009	0.0102^{**}	0.0044	0.0087[*]	0.0045
2010	0.0096[*]	0.0052	0.0059	0.0054
2011	0.0117^{**}	0.0050	0.0080	0.0052
2012	0.0104^{**}	0.0053	0.0079	0.0055
2013	-0.0008	0.0051	-0.0014	0.0052
2014	0.0126^{**}	0.0053	0.0109^{**}	0.0054

Note: Authors' calculations using data from the FRBNY Consumer Credit Panel /Equifax; from linear probability regressions by cohort; ^{***}, ^{**}, ^{*} represent significant at 0.01, 0.05, or 0.1 level, respectively; see details of other controls on slide 16.



Stage of Gentrification and Probability of Move (Relative to Nongentrifying), 2003–2014, Philadelphia



Summary of Coefficients for the Gentrification Variables from Linear Probability Regressions

	Stalled Gentrification	Continued Gentrification	Early Gentrification	Middle-stage Gentrification	High Gentrification
2003	0.0009	-0.0076	-0.0152	-0.0198^{***}	0.0048
2004	0.0065	0.0035	-0.0216^{**}	-0.0159^{***}	0.0319^{***}
2006	0.0012	0.0082	-0.0072	-0.0033	0.0291^{***}
2007	0.0087	0.0210^{**}	0.0007	-0.0042	0.0515^{***}
2008	-0.0025	0.0244^{***}	-0.0068	0.0057	0.0049
2009	0.0126^{**}	0.0167^{***}	0.0035	0.0051	0.0392^{***}
2010	0.0010	0.0211^{***}	-0.0032	-0.0031	0.0390^{***}
2011	0.0000	0.0223^{***}	-0.0103	0.0040	0.0408^{***}
2012	-0.0003	0.0321^{***}	-0.0140	-0.0066	0.0306^{***}
2013	0.0048	0.0168^{**}	-0.0151	-0.0183^{***}	0.0297^{***}
2014	-0.0024	0.0170^{**}	0.0014	0.0062	0.0443^{***}

Note: Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax; from linear probability regressions by cohort; ^{***}, ^{**}, ^{*} represent significant at 0.01, 0.05, or 0.1 level, respectively; see details of other controls on slide 16.



Are Disadvantaged Individuals More Likely to Move (Relative to Nongentrifying)? 2003–2014, Philadelphia

Probability of Move, Full Sample

“gentrify” represents gentrifying neighborhoods; older (65–84 yrs old); low_score (<580)

	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014
<i>gentrify</i>	-0.002	0.002	0.023***	0.041***	0.031***	0.036***	0.032***	0.037***	0.037***	0.028***	0.042***
<i>low_score</i>	-0.052***	-0.057***	-0.024***	-0.028***	-0.027***	-0.034***	-0.018***	-0.012***	-0.011**	-0.005	-0.002
<i>older</i>	-0.058***	-0.054***	-0.074***	-0.088***	-0.080***	-0.068***	-0.065***	-0.064***	-0.066***	-0.065***	-0.074***
<i>older&low_score</i>	-0.086***	-0.074***	-0.096***	-0.087***	-0.077***	-0.083***	-0.072***	-0.079***	-0.083***	-0.077***	-0.082***
<i>gentrify&low_score</i>	-0.016*	-0.008	-0.040***	-0.054***	-0.026***	-0.046***	-0.034***	-0.041***	-0.039***	-0.052***	-0.049***
<i>gentrify&older</i>	-0.031***	-0.044***	-0.036***	-0.063***	-0.058***	-0.046***	-0.049***	-0.054***	-0.051***	-0.040***	-0.050***
<i>gentrify&older&low_score</i>	-0.016	-0.023	-0.016	-0.081***	-0.082***	-0.065***	-0.043**	-0.039**	-0.060***	-0.049**	-0.051**

Note: Authors’ calculations using data from the FRBNY Consumer Credit Panel/Equifax; based on linear probability regressions by cohort; ***, **, * represent significant at 0.01, 0.05, or 0.1 level, respectively; see details of other controls on slide 16.





Empirical Results II: The Experience of Movers/Stayers in Gentrifying Neighborhoods



Methodology

We track the change in Equifax risk scores in three years for stayers/movers in gentrifying neighborhoods by:

- comparing the risk score changes of individuals staying in gentrifying neighborhoods with those staying in nongentrifying neighborhoods.
- comparing the risk score changes of individuals who moved out of gentrifying neighborhoods with those who stayed in gentrifying neighborhoods.



Stayers' Risk Score Changes in Three Years by Gentrification Type, 2002–2011, Philadelphia

Risk Score Change in Three Years for Individuals Staying in Gentrifying Neighborhoods by Cohort (Relative to Stayers in Nongentrifying Neighborhoods)

	All Gentrifications ^a	Continued Gentrification	Early Gentrification	Middle-stage Gentrification	High Gentrification	Stalled Gentrification
2002	7.325***	7.176***	-3.712	7.899***	18.936***	1.185
2003	8.945***	7.665***	-0.217	10.081***	15.236***	-2.673
2004	8.343***	8.318***	4.580	8.033***	9.987***	-2.474
2006	7.626***	7.631***	4.944	7.798***	9.579***	-0.192
2007	7.889***	7.726***	1.537	7.713***	14.826***	-0.191
2008	7.159***	8.184***	0.151	4.613**	16.385***	-2.038
2009	7.060***	8.439***	0.418	5.367***	16.079***	1.311
2010	8.069***	7.246***	6.958**	6.719***	18.767***	2.168
2011	8.150***	7.867***	1.967	8.059***	17.297***	1.029

Note: Reference group is stayers in nongentrifying tracts; ***, **, * represent significant at 0.01, 0.05, or 0.1 level, respectively; control variables include individual initial risk score, proxy for household size, age, whether having mortgages, and whether having seriously delinquent accounts; estimation is based on data from the FRBNY Consumer Credit Panel/Equifax.

^a coefficients for this column are from a separate regression.



Risk Score Changes for Stayers in Gentrifying Neighborhoods, 2002–2011, Philadelphia

Risk Score Change in Three Years for Individuals Staying in Gentrifying Neighborhoods
“gentrify” represents gentrifying neighborhoods; older (65–84 yrs old); low_score (<580)

	2002	2003	2004	2006	2007	2008	2009	2010	2011
<i>gentrify</i>	12.2***	13.1***	13.5***	13.4***	11.5***	10.9***	10.2***	10.0***	7.9***
<i>low_score</i>	62.0***	56.4***	46.0***	53.9***	56.8***	55.7***	55.6***	51.1***	46.4***
<i>older</i>	9.4***	7.6***	9.9***	14.2***	11.2***	9.2***	11.7***	12.0***	11.4***
<i>older&low_score</i>	78.0***	74.9***	69.3***	73.7***	69.6***	71.2***	72.9***	71.9***	70.8***
<i>gentrify&low_score</i>	-10.1***	-9.9***	-9.1***	-11.3***	-7.8***	-10.2***	-10.0***	-6.2**	-0.2
<i>gentrify&older</i>	-9.0**	-4.3	-11.7***	-9.7**	-11.2***	-8.6**	-9.5***	-12.0***	-11.2***
<i>gentrify&older&low_score</i>	-7.8	-16.6**	-21.1***	-21.6**	-14.3*	-20.1**	-11.9	-9.0	-10.0

Note: Reference group is stayers in nongentrifying tracts; ***, **, * represent significant at 0.01, 0.05, or 0.1 level, respectively; control variables include individual initial risk score, proxy for household size, age, whether having mortgages, and whether having seriously delinquent accounts; estimation is based on data from the FRBNY Consumer Credit Panel/Equifax.



Risk Score Change for Out-movers from Gentrifying Neighborhoods, 2003–2012, Philadelphia

Risk Score Change in Three Years for Individuals Moved Out of Gentrifying Neighborhoods (Relative to Stayers in Gentrifying Neighborhoods)

	Moved Within the City		Moved Out of the City	
	Coef.	Std. Err.	Coef.	Std. Err.
2003	-4.517	4.258	8.413**	4.078
2004	-4.874	4.222	7.731	4.801
2006	-12.847***	4.111	0.960	4.634
2007	-5.950*	3.474	13.585***	4.049
2008	-11.825***	3.740	6.422	4.188
2009	-3.248	3.774	9.962**	4.126
2010	-5.155	3.425	1.378	4.006
2011	-6.533*	3.604	-1.294	4.085
2012	-4.376	3.566	6.061	3.906

Note: reference group is stayers in gentrifying neighborhoods; ***, **, * represent significant at 0.01, 0.05, or 0.1 level, respectively; control variables include individual initial risk score, stage and intensity of gentrification, proxy for household size, age, whether having mortgages, and whether having seriously delinquent accounts; estimation is based on data from the FRBNY Consumer Credit Panel/Equifax.



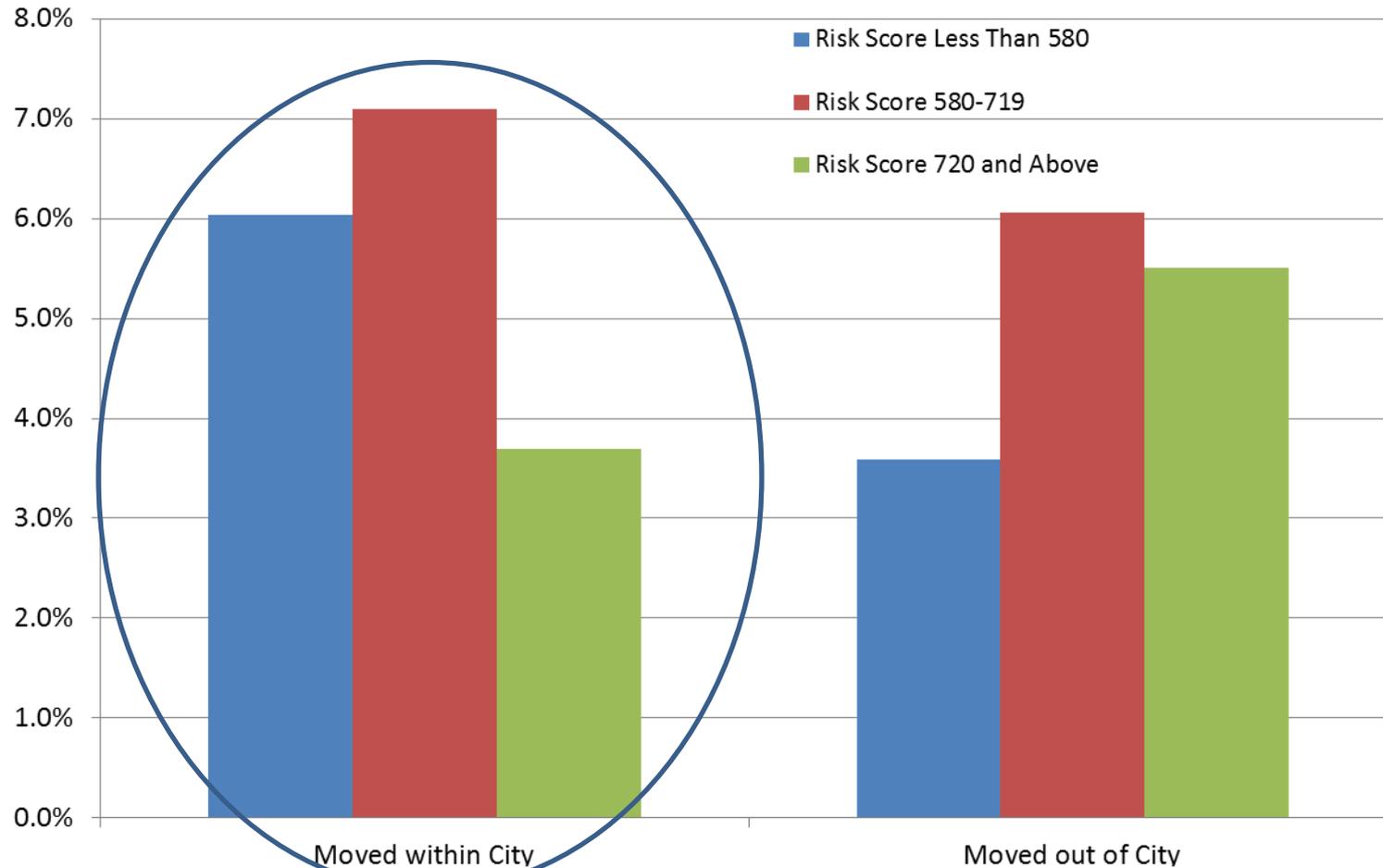
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Quality of the Neighborhoods to Which Out-movers Relocated



Overall Mobility Rates

Residents in Gentrifying Neighborhoods by Risk Scores (2003–2014)



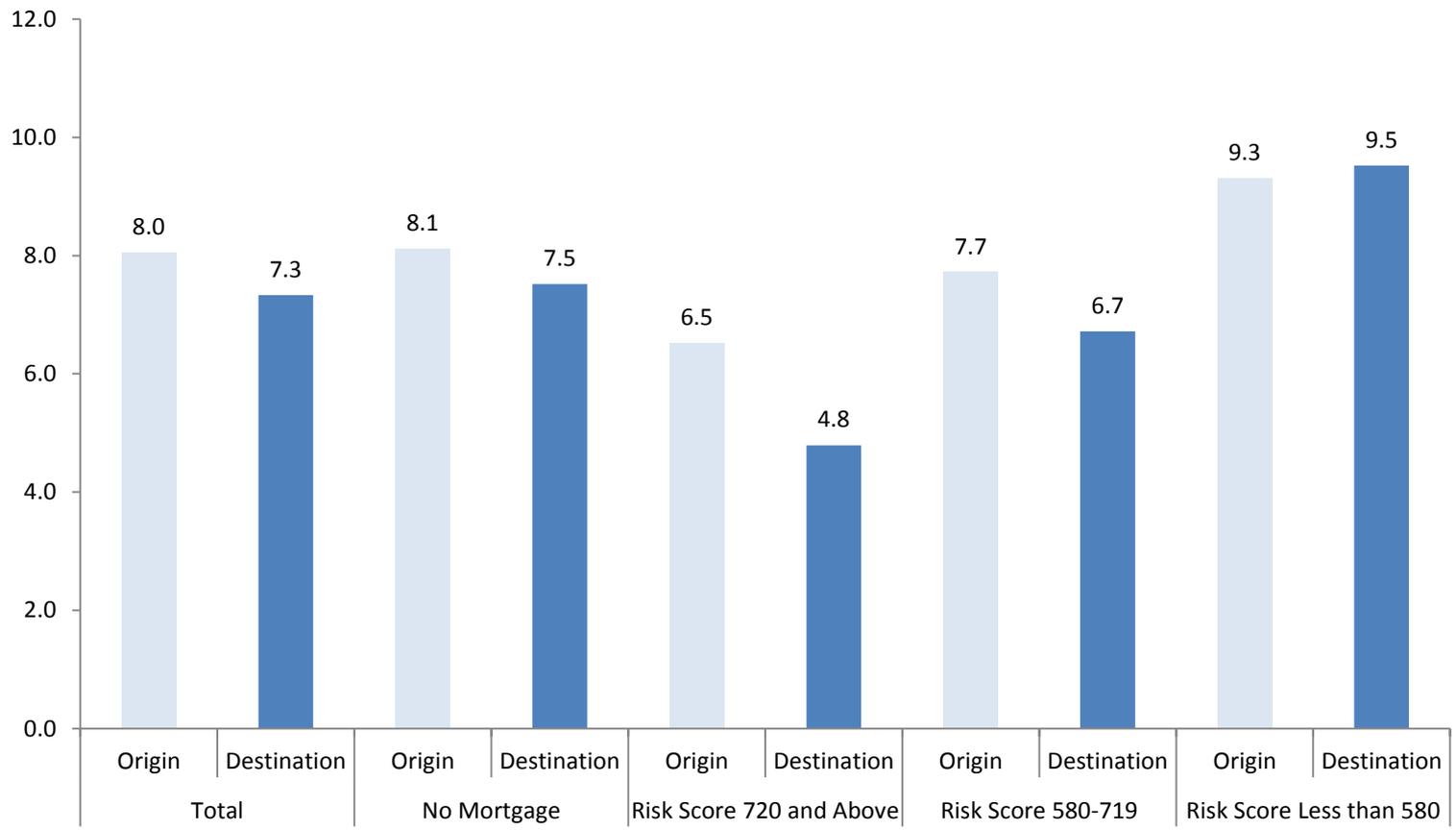
Note: Authors' calculations using data from the FRBNY Consumer Credit Panel / Equifax; 25–84 years old only.



Origin/Destination Neighborhoods: Violent Crime Rate

2003-2014 within-City Movers from Gentrifying Neighborhoods in Philadelphia, by Risk Score

Violent Crime per 1,000 Residents



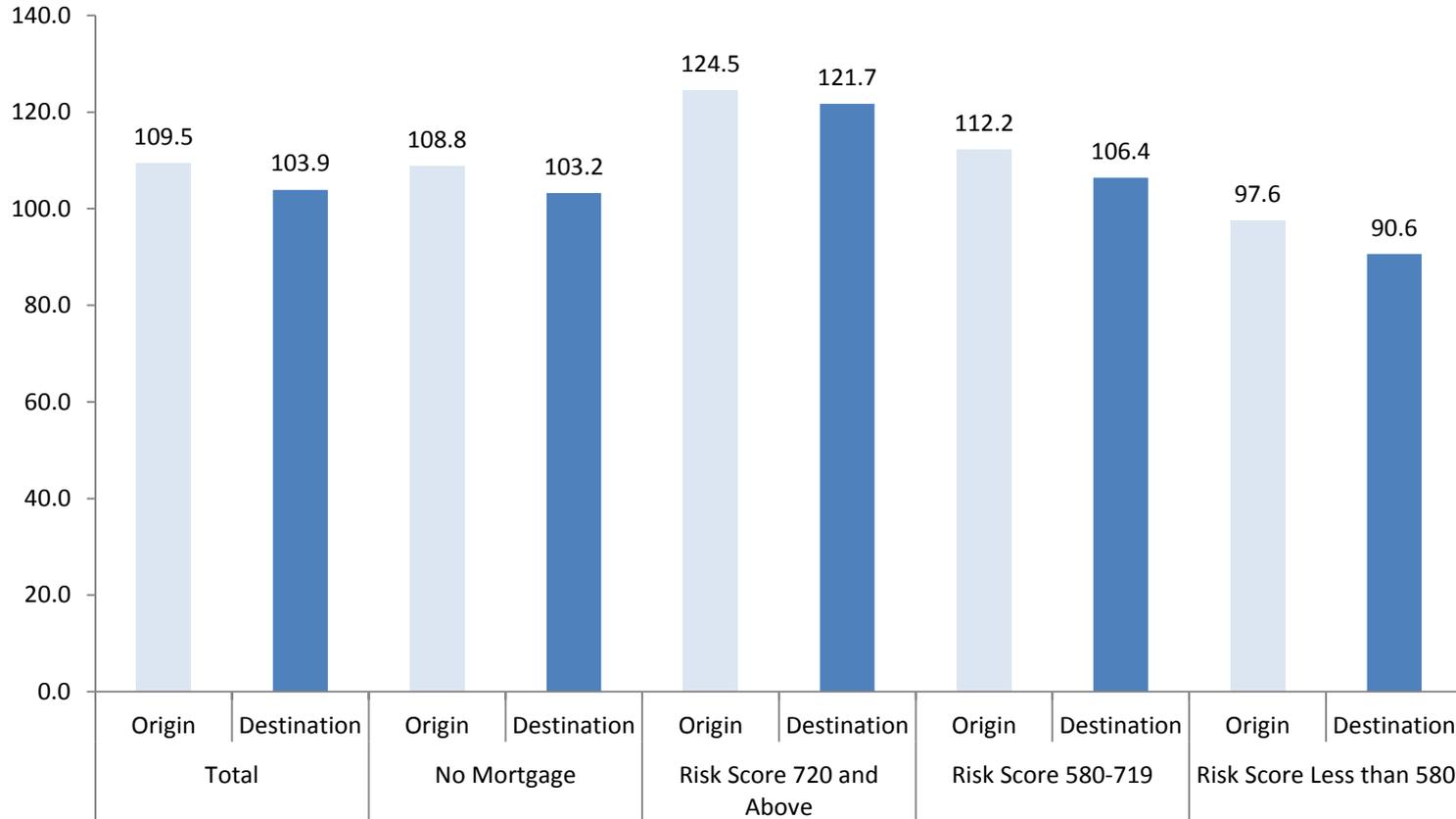
Note: Violent crime rate measures the number of violent crimes per 1,000 residents; authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax, FBI Uniform Crime Reporting (2006–2012), the Philadelphia Police Department (2006–2012), and 2009–2013 ACS.



Origin/Destination Neighborhoods: School Quality

2003-2014 within-City Movers from Gentrifying Neighborhoods in Philadelphia, by Risk Score

Sum of Percent of 4th Grade Students Proficient in Reading and Math



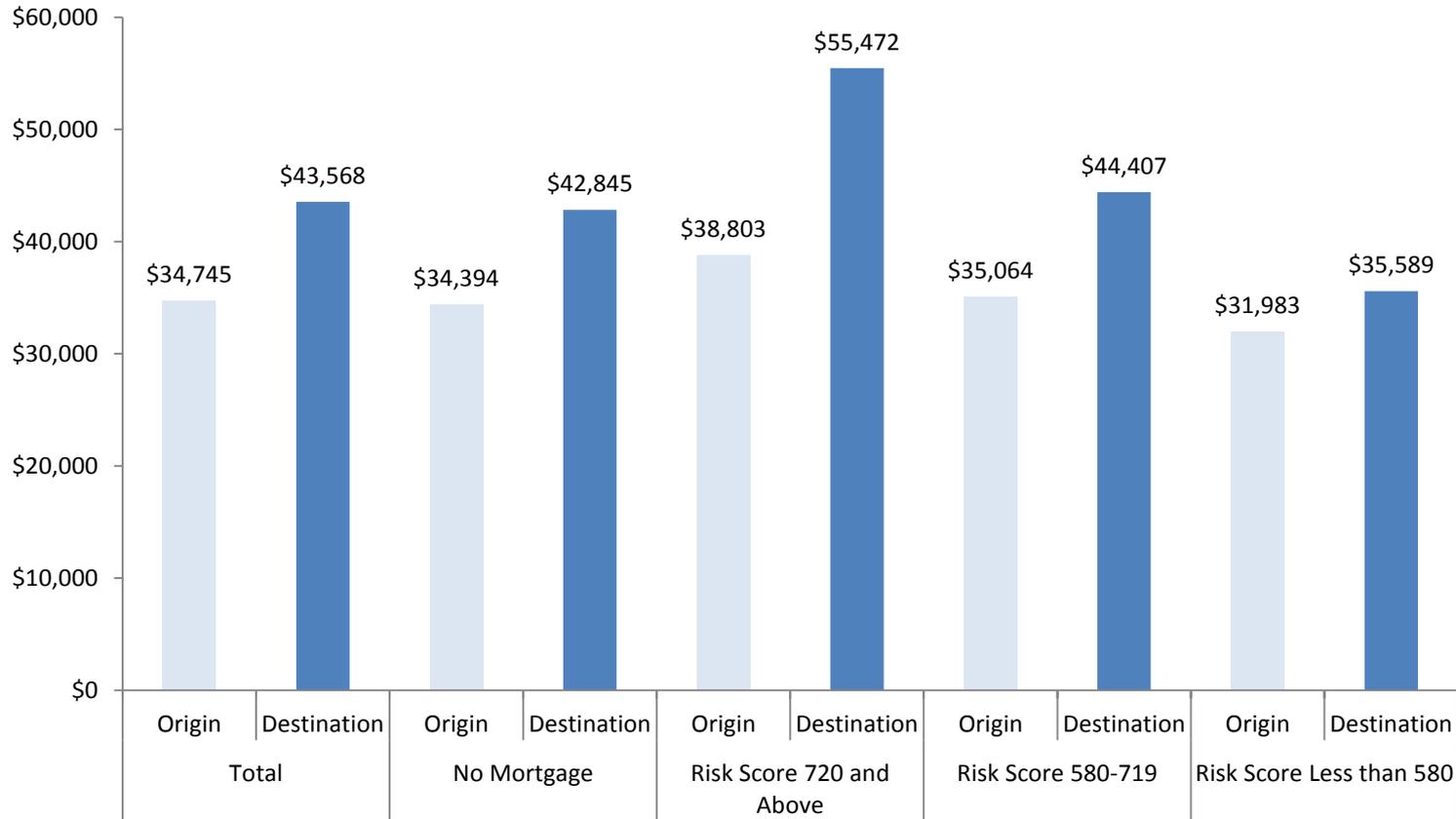
Note: Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax, New America Foundation, and Pennsylvania Department of Education.



Origin/Destination Neighborhoods: Household Income

2003-2014 within-City Movers from Gentrifying Neighborhoods in Philadelphia, by Risk Score

Median Household Income



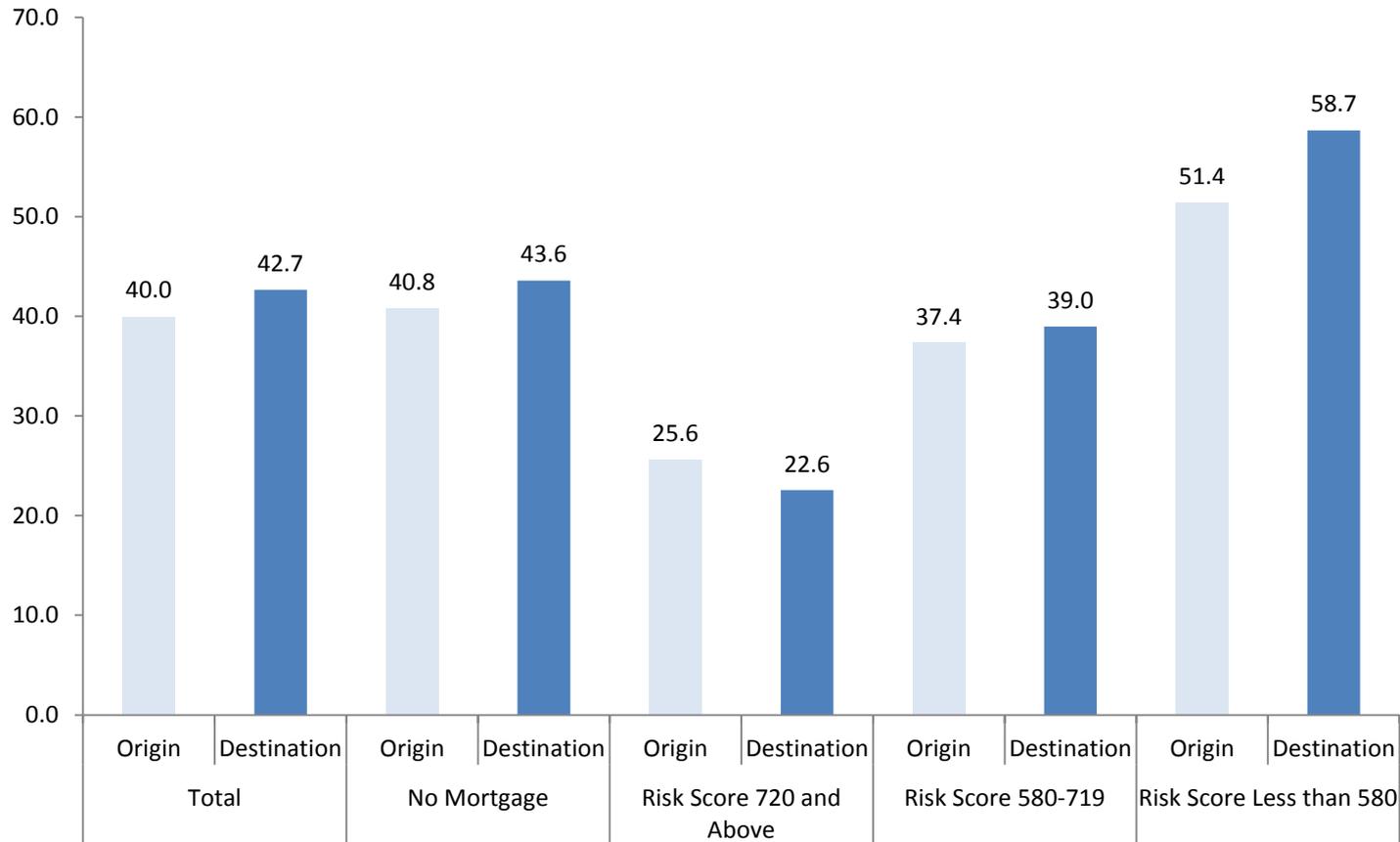
Note: Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax, 2000 Census, and 2009–2013 ACS.



Origin/Destination Neighborhoods: Non-Hispanic Black

2003-2014 within-City Movers from Gentrifying Neighborhoods in Philadelphia, by Risk Score

Percent Non-Hispanic Black



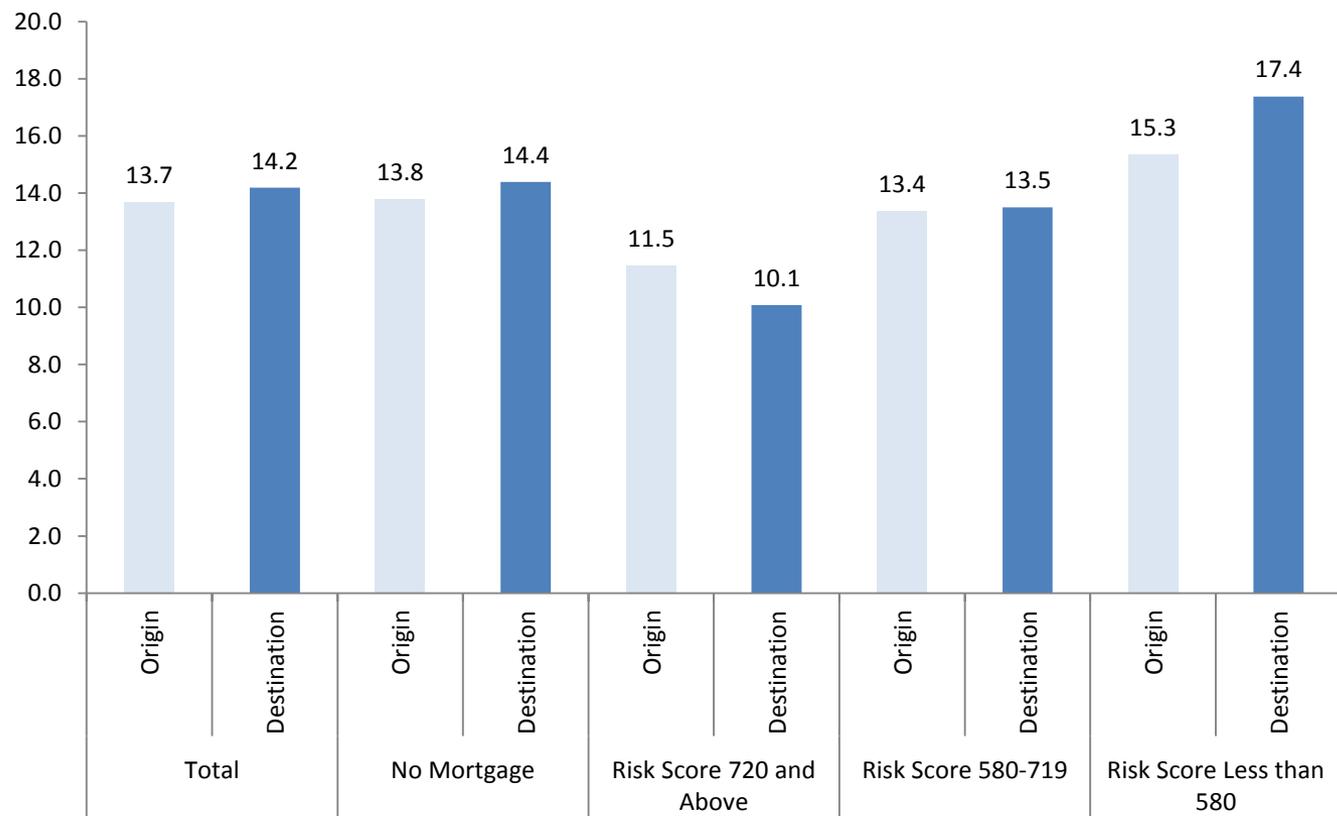
Note: Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax, 2000 Census, and 2009–2013 ACS.



Origin/Destination Neighborhoods: Unemployment Rate

2003-2014 within-City Movers from Gentrifying Neighborhoods in Philadelphia, by Risk Score

Unemployment Rate



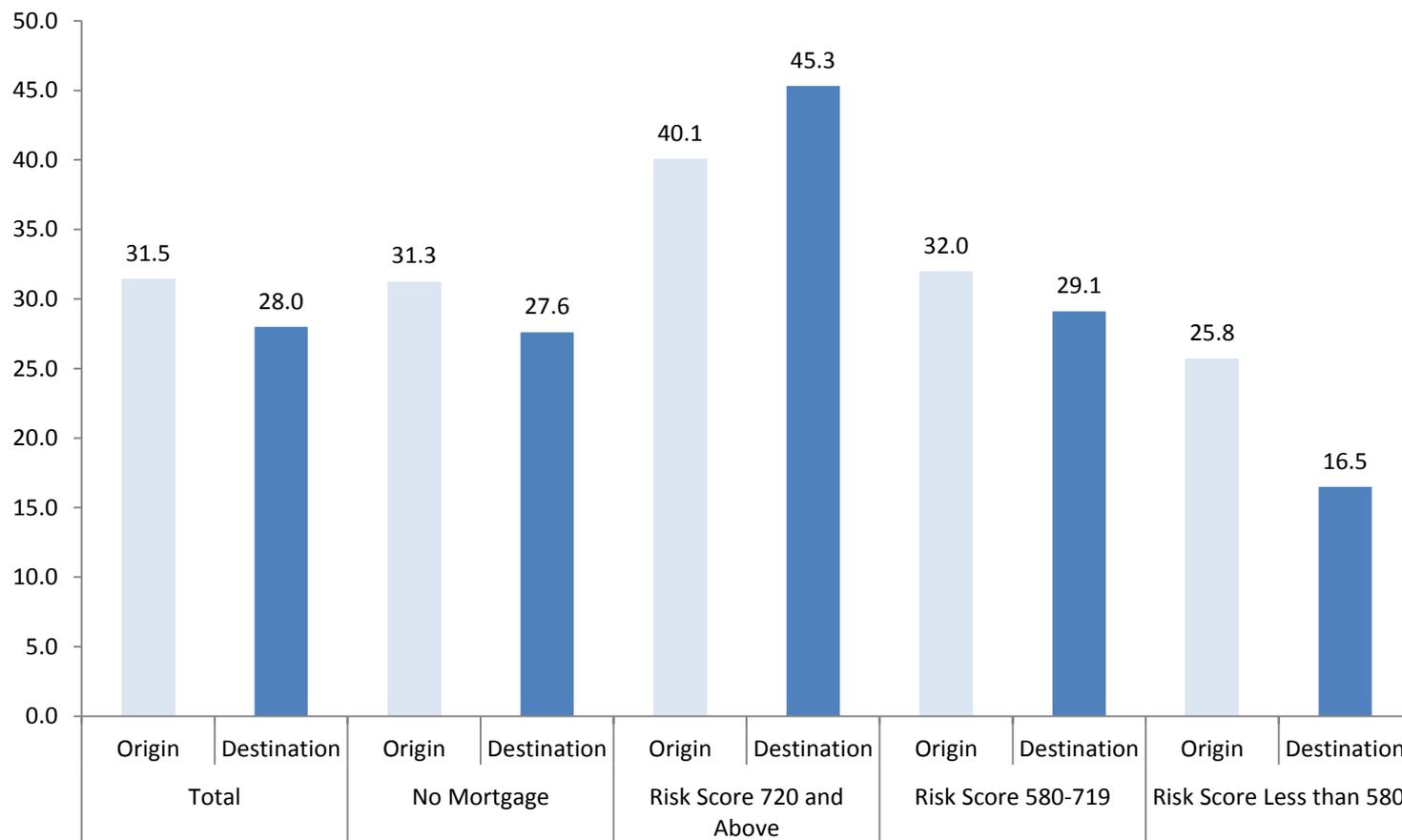
Note: Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax, 2000 Census, and 2009–2013 ACS.



Origin/Destination Neighborhoods: % College Educated

2003-2014 within-City Movers from Gentrifying Neighborhoods in Philadelphia, by Risk Score

Percent College Educated



Note: Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax, 2000 Census, and 2009–2013 ACS.



Summary: Gentrification and Residential Mobility

Are residents in gentrifying neighborhoods are more likely to move?

- Yes, the high mobility rates were largely driven by younger and high-credit score residents, as well as residents in neighborhoods in the more advanced stage of gentrification.
- Mobility rates were generally higher during and after the Great Recession; coincident with the rapid population growth in Philadelphia during that period.
- Movers out of gentrifying neighborhoods generally moved to similar or slightly better neighborhoods.



Summary: Experience of Residents in Gentrifying Neighborhoods

- Gentrification is generally positively associated with stayers' financial well-being (measured by one type of credit score).
- Stayers in neighborhoods in the more advanced stages of gentrification experienced greater improvement in risk scores.



Summary: Gentrification and More Vulnerable Population

- There is no significant evidence that older and low credit score individuals (including those with missing credit scores) are more likely to move.
- Low score out-movers from gentrifying neighborhoods are more likely to move to similar or slightly worse neighborhoods in the city, while high-score movers are more likely to move to better ones (we are underestimating the difference because fewer of them move to the suburbs).
- Older and low credit score individuals gained the least and could be hurt in their financial well-being from gentrification.



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Thanks!

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