

Where is Pollution Moving? Environmental Markets and Environmental Justice

Joseph Shapiro and Reed Walker

Online Appendix

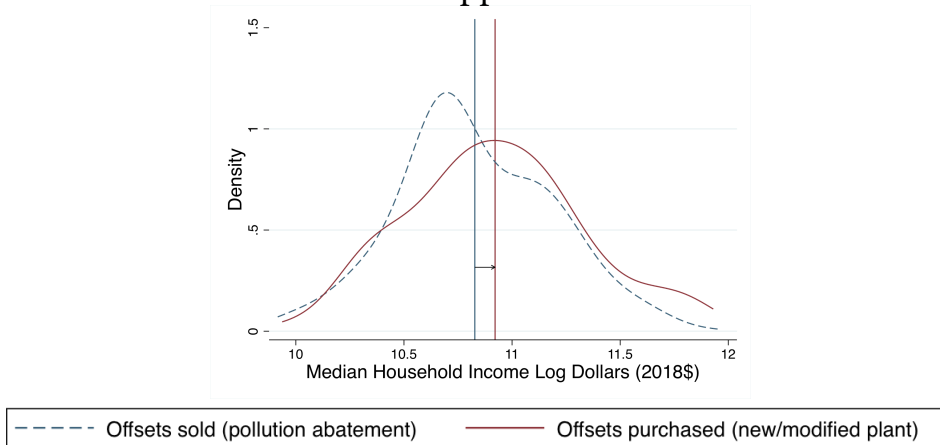


Figure A1. : Densities of Median Household Income: Offset Origins Versus Destinations

Note: This figure plots kernel density of community median household income where offsets are sold (due to pollution abatement) and purchased (for a new or expanding source). The vertical lines represent the respective means of each distribution, and the arrow points in the direction household income has moved due to trading of offsets. An observation is an offset that is either sold or purchased. Median household income represents a population-weighted average of census block group income in all block groups within 1 mile of the corresponding pollution source using demographic characteristics from the 2006-2010 American Community Survey 5 Year Estimates.

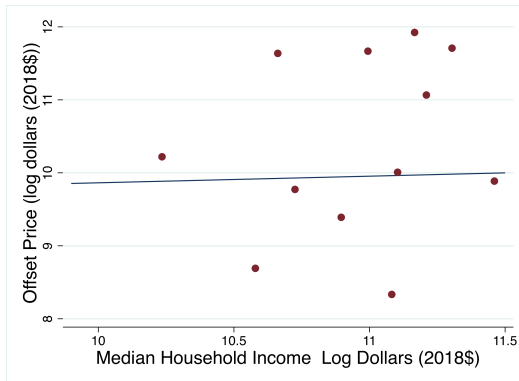


Figure A2. : Offset Prices Versus Community Characteristics

Note: This figure plots the relationship between offset transaction prices and median household income of the communities within 1 mile of a facility. The solid line represents a linear fit from a regression of offset prices on median household income, after controlling for year, market, and pollutant fixed effects. The points represent the conditional mean offset price for the various quantiles of community median household income. Median household income represents a population-weighted mean of census block group characteristics in all block groups within 1 mile of the corresponding pollution source using demographic characteristics from the 2006-2010 American Community Survey 5 Year Estimates.

Table A1—: Neighborhood Demographics in Communities where Offsets Increase and Decrease Pollution

Dependent Variable	Black or African American Population %	Hispanic Population %	Median Household Income
	(1)	(2)	(4)
All Counties	13.6%	34.1%	\$10.28
<i>Panel A. All pollutants</i>			
Origin of pollution decrease	15.6%	35.2%	\$10.83
Destination of pollution increase	15.2%	36.7%	\$10.92
Difference	-0.4%	1.5%	\$0.09
p-val	[0.91]	[0.66]	[0.07]
N		1,448	
<i>Panel B. Nitrogen oxides (NO_x)</i>			
Origin of pollution decrease	16.7%	29.2%	\$10.83
Destination of pollution increase	18.5%	35.9%	\$10.93
Difference	1.8%	6.7%	\$0.10
p-val	[0.73]	[0.15]	[0.19]
N		548	
<i>Panel C. Volatile organic compounds (VOCs)</i>			
Origin of pollution decrease	14.3%	44.3%	\$10.82
Destination of pollution increase	9.8%	37.8%	\$10.91
Difference	-4.5%	-6.5%	\$0.08
p-val	[0.12]	[0.09]	[0.09]
N		794	

Note: This table compares mean neighborhood characteristics of locations where offsets sold and purchased. An observation is a single offset generation or offset use. Offset data comes from years 1993 to 2020 for the nonattainment areas in Beaumont, Dallas, Houston, and San Antonio, Texas and San Joaquin Valley, California. “All pollutants” include nitrogen oxides (NO_x), volatile organic compounds (VOCs), particulate matter of diameter 10 micrometers or less (PM₁₀), and sulfur oxides (SO_x). Mean of demographics and income are weighted by amount of offset generated or used. Neighborhood are defined as census blockgroups that intersect within the 1-mile radius of plants. In the case that the 1-mile radius around plant intersected multiple census block groups, the characteristics are taken as the average of characteristics of all intersected block groups, weighted by the population of intersection between the block group and the 1-mile-radius circle around the facility. Block group level neighborhood characteristics comes from the American Community Survey 2006-2010.