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Household Energy Bills and Subsidized Housing

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Question

- What incentives do federal housing assistance programs create for whether tenants or landlords pay utility bills and for subsequent energy consumption?
- Do utility billing arrangements and expenditures reported in the American Housing Survey (AHS) reflect these incentives?

Motivation

- Federal housing policy emphasizes both sustainability and affordability – residential energy consumption is key to environmental sustainability
- Household spending on utilities interacts closely with housing affordability; energy costs can represent a significant share of low-income household budgets
- HUD spends \$5 billion annually for energy in public and subsidized housing with rules affecting over 6 million units
- Energy efficiency and conservation gains may present a significant opportunity for savings or the redirection of resources

Context

- There is variation in whether landlords or tenants pay utilities in private and subsidized rental contracts
 - Levinson and Niemann (2004) show that in the private market, rents and consumption vary across billing arrangements in ways consistent with “landlord side” explanations
 - Davis (2010) demonstrates that billing arrangements influence economically inefficient energy conservation investments

Context

- There is variation in whether landlords or tenants pay utilities in private and subsidized rental contracts
- Federal and local housing subsidy program regulations can alter incentives that affect utility billing arrangements and consumption
- There is a possible tension between conservation, efficiency, and policy objectives

Federal housing assistance programs

- Public housing - over 1.1 million units
- Project-Based Section 8 - over 1.2 million units
- Section 8 Vouchers - over 2 million units
- Low Income Housing Tax Credits – over 1.7 million units

Utility costs and housing assistance (abbreviated)

- Programs target tenant rent + utilities to be 30% of income
- When landlord pays utility bill(s)
 - Tenant pays 30% of income in rent
 - Landlord receives remainder of rent plus “utility allowance” from HUD
- When tenant pays utility bill(s)
 - Tenant pays 30% of income less utility allowance in rent
 - Landlord receives remainder of rent from HUD

Utility costs and housing assistance (abbreviated)

- Tenants
 - Unlike private market (Levinson and Niemann), amount of rent paid does not increase with average utility costs
 - Have a higher well-being when landlord pays bills unless tenant utility allowance is higher than tenant utility spending
 - Expect that consumption when paying bills should be close to similar non-assisted households

Utility costs and housing assistance (abbreviated)

- Landlords
 - Exposure to tenant nonpayment risk lowered by utility allowance when tenant pays bills
 - Can profit from utility allowance system if increases are more likely than decreases when paying bills
 - Don't have direct incentive to make energy efficiency upgrades when utility allowances reflect observed expenditure

Utility costs and housing assistance (abbreviated)

- Policy maker
 - Cost of ensuring tenant spends only 30% of income on housing and utility costs and consume adequate amounts of utilities is lower if landlords pay the bills and adequacy of utility consumption is in question

Predictions

- Higher incidence of landlords paying utility bills in subsidized programs
 - Less so for landlords with less experience with assistance programs – voucher holder landlords
- Similar expenditure when tenants pay bills
 - Differ only in disposable income due to housing assistance

The American Housing Survey

- Follows units over time
- Includes self-reported
 - Billing arrangement
 - Energy expenditure
 - Energy sources for appliances
 - Housing assistance
 - Demographics

Data Limitations

- A full analysis would rely on administrative data on program participation, billing arrangements, energy consumption under both billing arrangements, household and building characteristics, and energy efficiency investments
- Errors in the self-report of housing assistance in the AHS is well documented (Shroder 2002), so we will not be able to examine a particular program in this study
 - Public housing is particularly over-reported
 - Our results remain informative

Selected means – AHS `03, `05, `07, `09

	All non-assisted renters	Non-assisted low income renters	Receive Assistance	Public	Voucher	Other
<i>Pay Electric</i>	0.92	0.89*	0.77*‡	0.65*‡‡	0.90*†	0.80*‡‡
<i>Pay Gas</i>	0.48	0.47*	0.37*‡	0.32*‡‡	0.49†	0.32*‡‡
<i>Square Feet</i>	1,191	1,097*	1,045*‡	1,019*‡	1,114*†	1,010*‡
<i>Persons</i>	2.38	2.40	2.33*‡	2.21*‡‡	2.64*‡‡	2.16*‡‡
<i>Income (\$1k)</i>	43.13	14.99*	16.52*‡	15.43*‡‡	16.81*‡‡	17.69*‡
<i>N</i>	32,601	12,565	4,118	1,654	1,242	1,222

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Conditional Means

- We control for
 - Fuel and appliance variables
 - Unit and building characteristics
 - Occupant characteristics
 - Geography

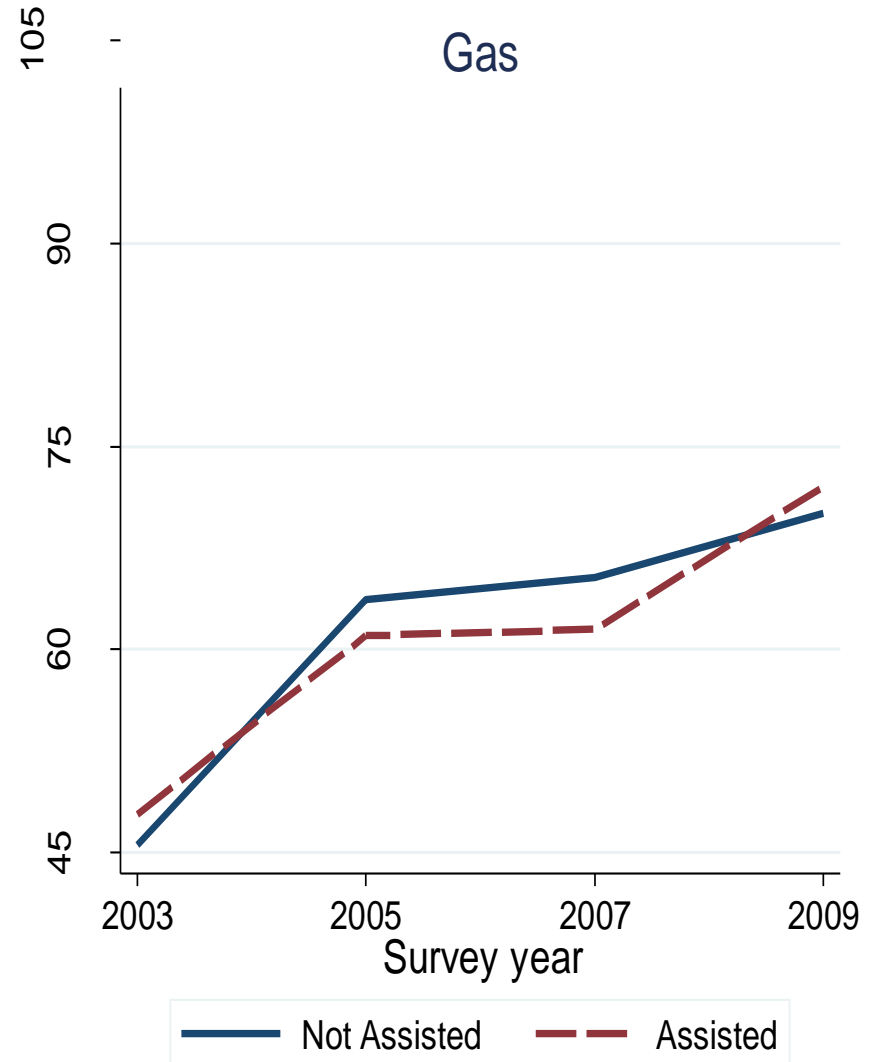
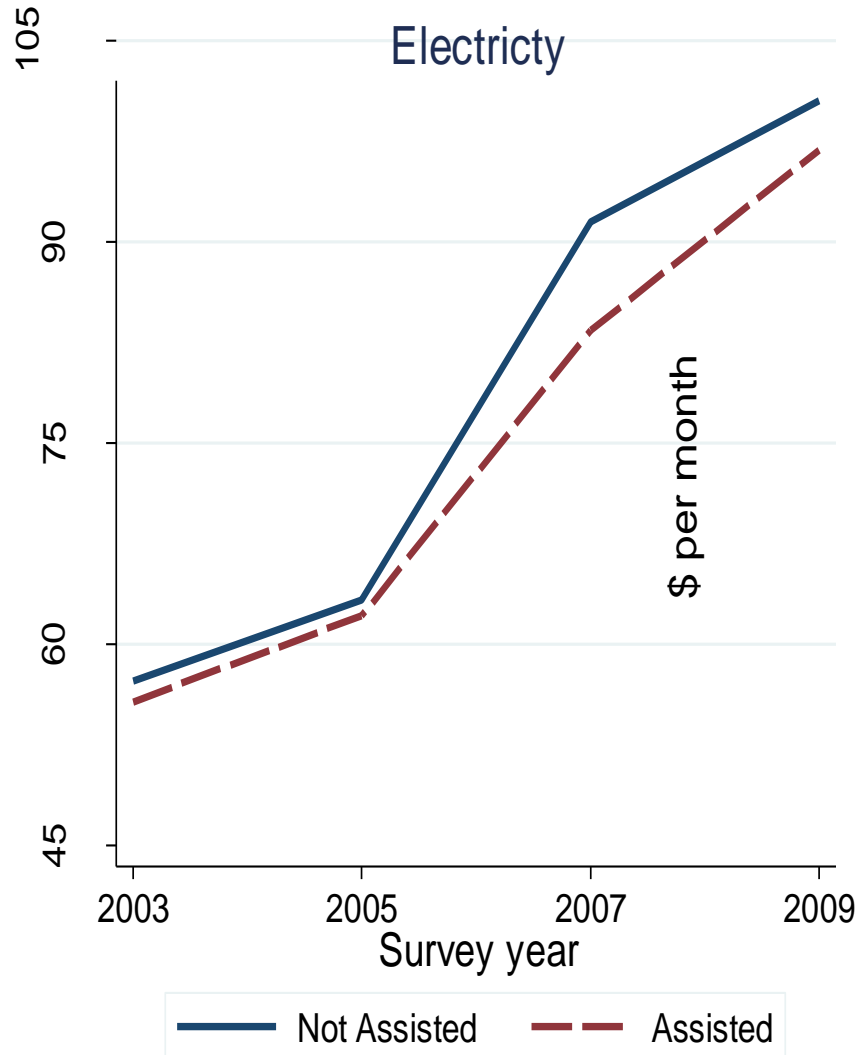
Conditional Means – *Tenant pays electricity*

	All renters	All renters	<80% LMI
GovAssit	-0.107*** (0.018)		
Public		-0.206*** (0.030)	-0.198*** (0.029)
OtherAssist		-0.074*** (0.018)	-0.054*** (0.016)
Voucher		-0.020* (0.012)	-0.014 (0.013)
Qualified	-0.014** (0.006)	-0.015** (0.006)	-0.010* (0.006)

Conditional Means – *Tenant pays gas*

	All renters	All renters	<80% LMI
GovAssit	-0.064*** (0.014)		
Public		-0.097*** (0.027)	-0.101*** (0.027)
OtherAssist		-0.054*** (0.014)	-0.051*** (0.016)
Voucher		-0.034** (0.015)	-0.041** (0.016)
Qualified	-0.009 (0.006)	-0.009 (0.006)	-0.010 (0.007)

Average monthly electricity bills of renters by government assistance



Selected means – AHS `03, `05, `07, `09

	All non-assisted renters	Non-assisted low income renters	Receive Assistance	Public	Voucher	Other
<i>Monthly Electric</i>	77.7	74.5*	76.1	68.8*††	86.9*††	71.9*‡
<i>N</i>	29,866	11,210	3,175	1,081	1,114	980
<i>Pay Gas</i>	61.1	61.8	61.3	57.5	69.9*††	53.7*††
<i>N</i>	15,387	5,799	1,487	518	586	383

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Conditional Means – *Tenant expenditures (logs) on electricity*

	All renters	All renters	<80% LMI
GovAssit	-0.005		
	(0.013)		
Public		-0.031	-0.030
		(0.021)	(0.023)
OtherAssist		-0.014	-0.006
		(0.020)	(0.020)
Voucher		0.028	0.033*
		(0.017)	(0.018)
Qualified	-0.010	-0.010	-0.006
	(0.008)	(0.009)	(0.008)

Conditional Means – *Tenant expenditures (logs) on gas*

	All renters	All renters	<80% LMI
GovAssit	-0.018		
	(0.022)		
Public		-0.045	-0.070
		(0.035)	(0.037)
OtherAssist		-0.015	-0.011
		(0.033)	(0.040)
Voucher		0.003	0.009
		(0.027)	(0.029)
Qualified	-0.004	0.004	-0.001
	(0.014)	(0.014)	(0.014)

Summary

- Under federal housing assistance programs
 - ❑ Tenants prefer landlord pays utilities unless utility allowance sufficiently exceeds utility expenditures
 - ❑ Landlords prefer to pay utilities if allowances are more likely to be adjusted up than down – have little direct incentive for energy efficiency investments
 - ❑ Policy goals of adequate utility consumption and limited housing costs may be met less expensively when landlords pay

Summary

- Using the *American Housing Survey* we found that
 - Differences in proportions of households paying for electricity and gas separately persisted at 10, 4, and 5 percent lower for public, voucher, and other assisted households after controlling for unit, building, household and geographic differences
 - Unadjusted differences in monthly electricity and gas bills (for households paying bills) were explained by differences in characteristics rather than receipt of government assistance

Future Research

- Analysis of building-level utility costs for each of these portfolios would provide a clearer and likely more nuanced picture of the differences in energy use and costs across the assisted housing programs and across local implementations of program guidelines
- This analysis would generate suggestions for program design adjustments to improve energy and economic efficiency in federal housing assistance programs