

SCENARIO: A city has 30 low-income housing projects. A large number of vacant units in these projects creates a wide variety of problems (reduced revenues, vandalism, lower morale of existing tenants, etc.) There is a wide range of vacancy rates, from less than 10 percent to over 30 percent. The city officials believe that drug trafficking in the housing projects is discouraging people from either moving into or staying in the projects. To prove the key role of drug dealing in shaping housing project vacancy rates, the city releases data showing that vacancy rates in projects with **anti-drug programs (run by the police department)** have a lower vacancy rate:

Vacancy rate (projects with anti-drug programs): 19 percent

Vacancy rate (projects without anti-drug programs): 25 percent

And just to be sure, they ran a difference of means test (see below) to confirm that the results were statistically significant at the 0.05 level.

To further demonstrate the significant role that this policy anti-drug program plays, the city also collects data on (a) housing expenses; (b) family structure (since these two variables also affect vacancy rates). The city then releases the results of their own in-house multiple regression analysis, controlling for these two variables. Even controlling for the other two variables, the police anti-drug program is statistically significant, and seems to reduce the vacancy rate by 6 percentage points (5.93%) -- and then asks for more money for the program. **Question: Is the city correct in its conclusion?**

Hsg Project	Vacancy Rate	Percent of Gross Hhd Income Spent on rent	percent 2-parent families	Police Anti-Drug Program?	Active Tenants Group? (1 = yes; 0 = no)
1	33%	35%	12%	0	0
2	33%	46%	14%	0	0
3	18%	45%	15%	1	1
4	23%	18%	41%	0	0
5	28%	52%	18%	0	0
6	19%	23%	21%	1	1
7	32%	22%	22%	1	0
8	20%	23%	24%	1	1
9	15%	24%	25%	0	1
10	32%	19%	26%	1	0
11	19%	23%	27%	1	1
12	19%	52%	27%	0	1
13	25%	43%	33%	0	0
14	29%	31%	29%	0	0
15	17%	52%	46%	1	1
16	25%	29%	46%	0	0
17	5%	21%	57%	1	1
18	28%	31%	46%	0	0
19	19%	46%	30%	1	1
20	26%	45%	30%	0	0
21	15%	23%	33%	1	1
22	8%	51%	41%	0	1
23	11%	22%	36%	1	1
24	30%	49%	39%	1	0
25	14%	51%	39%	1	1
26	27%	28%	40%	0	0
27	21%	39%	37%	0	1
28	13%	51%	44%	1	1
29	21%	26%	22%	1	1
30	31%	22%	30%	0	0

SUMMARY OUTPUT

Regression Statistics					
Multiple R	0.8067				
R Square	0.6508				
Adjusted R Square	0.6105				
Standard Error	0.0448				
Observations	30				
ANOVA					
	df	SS	MS	F	Significance F
Regression	3	0.0974	0.0325	16.1513	0.0000
Residual	26	0.0523	0.0020		
Total	29	0.1496			
	Coefficients	Standard Error	t Stat	P-value	
Intercept	0.4925	0.0443	11.1171	0.0000	
Percent of Gross Hhd Income Spent on rent	-0.3746	0.0862	-4.3448	0.0002	
percent 2-parent families	-0.3860	0.0776	-4.9768	0.0000	
Police Anti-Drug Program?	-0.0593	0.0166	-3.5711	0.0014	

t-Test: Two-Sample Assuming Equal Variances

	vacancy rate NO drug program	vacancy rate (drug program)
Mean	0.248	0.189
Variance	0.005	0.006
Observations	15.000	15.000
Pooled Variance	0.005	
Hypothesized Mean Difference	0.000	
df	28.000	
t Stat	2.215	
P(T<=t) one-tail	0.018	
t Critical one-tail	1.701	
P(T<=t) two-tail	0.035	
t Critical two-tail	2.048	