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MEMORANDUM

Subject: Appendix F for Cambridge Housing Study

Date: July 30, 1987

In response to questions raised regarding the Cambridge Housing Study we have conducted additional analysis of the Housing Survey data. The results are reported in the enclosed Appendix F which is to be added to the Final Report from June 1987.

The topics covered include:

- I. The distribution of occupation by housing categories. (Note that people can have multiple occupations such as full time student and part time employee etc.) Exhibits F-1 through F-6.
- II. The number of adults by the number of occupations reported. Exhibits F-7 and F-8.
- III. The distribution of income by household size, by housing category. Exhibits F-9 through F-12.
- IV. The distribution of income for households with and without students by housing category. (Note that households with full time students may also have employed people.) Exhibits F-13 and F-14.
- V. The distribution of income for households with and without roommates by housing category. Exhibits F-15 and F-16.
- VI. Regression analysis. Exhibits F-17 through F-20.

Appendix F

Supplementary Analysis for the Cambridge Housing Study

The supplementary analysis presented here contains two sections. First are supplementary tables providing additional comparisons of household characteristics for the housing categories in Cambridge. The characteristics detailed here include employment characteristics of household members and income distribution for households consisting of roommates compared with other households.

In addition, regression results are presented. The regressions predict rent (contract or gross) as a function of housing characteristics and rent control status and permit estimates of the effect of rent control, accounting for housing characteristics.

SUPPLEMENTARY TABLES ON HOUSEHOLD CHARACTERISTICS

Distribution of Occupations

Exhibits F-1 through F-6 show the distribution of occupations for each type of housing. Exhibit F-1 shows that 53 percent of households in subsidized units have no fully employed members, compared with under 26 percent of households in all other types of units.

Exhibit F-3 shows the distribution of number of students per household across housing categories. Among households in non-controlled units, 34 percent had at least one student, as did 23 percent of households in rent controlled units. Approximately 14 percent of subsidized and owner occupied units had members who were full time students.

Because people could be classified as having more than one occupation (e.g., homemaker or student and part-time employed), Exhibits F-7 and F-8 compare the number of adults per household with the number of occupation reported per household. (Exhibit F-8 excludes part time employment, since that is the most likely double counted occupation). The tables show that while there are cases where more or fewer occupations than people are

reported, the majority of cases have the same number of occupations as people (79 percent in Exhibit F-7 and 78 percent in Exhibit F-8).

Distribution of Income by Household Size

The following exhibits provide further details on income distributions for specific groups of people. Exhibit 3-4 in the report expressed income as percent of median by type of housing, controlling for household size. Exhibits F-9 through F-12 provide further details. Income as a percent of median is broken down by household size for each housing category. Thus, for example, while Exhibit 3-4 shows that overall 70 percent of households in rent controlled units had incomes less than the median for their household size, Exhibit F-9 shows that the percentages are 68 percent for one person households, 67 percent for two person households and 79 percent for households in rent controlled units with three to five members.

Distribution of Income for Specific Sub-Groups

Income distributions of two specific household types are presented in Exhibits F-13 through F-16. Exhibits F-13 and F-14 present the income distribution of households with and without students. The exhibits show that households with students generally have lower incomes than households without students. (Note that households with students may have other members with other occupations.)

Exhibits F-15 and F-16 show the distribution of income for households with and without roommates. The exhibits show that among households in both rent controlled and non-controlled units, households with roommates tend to have higher incomes than households with no roommates. Income reported in households with roommates might be less accurate than in households where all members are part of one family. Among rent controlled households 13 percent included roommates compared with 23 percent among non-controlled, 3 percent among subsidized, and 7 percent among owner-occupant households.

REGRESSION RESULTS

The main body of the report in Section 3.0 presented differences in mean rents for controlled and non-controlled units. However, the report also notes systematic differences in housing attributes such as number of rooms which

might account for part of the observed differences in rents. A regression analysis offers a statistical approach to this problem by systematically taking account of differences in housing attributes between controlled and non-controlled housing units in estimating differences in rent. This analysis was performed on the combined sample of controlled and non-controlled units.

By accounting for the relationship of housing characteristics to rents, differences in rent levels associated with rent control per se can be isolated from differences in rent associated with differences in the types of housing in the rent controlled and non-controlled stock. Exhibit F-17 provides definition of the regression equation variables, and their expected signs, or direction of influence on rents. The expected signs are based on a priori, intuitive expectations. For example, we expect that the rent for a controlled unit will be lower than for a non-controlled unit or that a unit with a large number of rooms will rent for more than a unit with a small number of rooms. The influence of the excluded category for each of the variables, for example, ZIPCODE 02138, is reflected in the intercept term.

The regressions attempt to explain rent levels as a function of housing characteristics and rent control status. Exhibit F-18 shows the results of a regression which uses the natural logarithm of gross rent as the dependent variable and Exhibit F-19 presents results of the regression which uses the natural log of contract rent as the dependent variable.

The coefficient for each of the dependent variables reflects the estimated effect of the independent variable on the dependent variable. For example, in Exhibit F-18 the coefficient of OWNERREL is -0.279798, so that the log of rent for a household where the occupant is related to the landlord is 0.279798 lower than the log of rent in a "similar" unit where the tenants are not related to the landlord (if all other characteristics are the same). The rent for occupant-related-to-landlord relates to the rent for occupant-not-related-to-landlord as follows.

$$\frac{R_{\text{related}}}{R_{\text{not related}}} = \exp (-0.279798) = 0.756$$

meaning that rents of units where the tenant is related to the landlord are estimated to be 75.6 percent of the rents of similar units where the tenant is not related to the landlord.

The R-Square statistic measures of percentage of the variance in the dependent variable that is explained by the model; it is a measure of how well the model performs in explaining the dependent variable. If, as in Exhibit F-19, we have an R-Square of 0.55 or an R-Square adjusted for degrees of freedom of 0.54, it means that approximately 55 percent of the variance is explained by the model. We do not expect that all the variance will be explained by the regression model. The variables are not precisely defined, and not all explanatory variables are included. (For example, location is proxied by zipcode, and building quality by occupant perception of quality, etc.) Furthermore, rents appear to vary for reasons apart from differences in unit quality (reflecting, for example, differences in individual tenant and landlord bargaining ability).

The coefficient of the variable RNTN reflects the difference in rent associated with rent control per se. The variable RNTN=1 for a controlled unit and =0 for a non-controlled unit. The coefficient for RNTN in the regression for log contract rent (Exhibit F-18) is -0.406255.

Thus, to relate controlled and non-controlled rents for a given unit,

$$\frac{\ln R_{\text{controlled}}}{\ln R_{\text{non-controlled}}} = -0.406255$$

or

$$\frac{R_{\text{controlled}}}{R_{\text{non-controlled}}} = \exp(-0.406255)$$

$$= 0.666.$$

This estimate indicates that the contract rent of a controlled unit is typically about two-thirds (67 percent) of what the non-controlled rent would be for the same unit. Alternatively, the ratio of non-controlled to controlled

rents (contract) is 1.5, meaning that a controlled unit would be estimated to have a non-controlled rent 50 percent higher than the controlled rent.

The importance of using the regression analysis to account for differences in housing characteristics in comparing controlled and non-controlled rents can be seen in Exhibit F-20.

As reported in the main text the mean contract rent for non-controlled units was \$622 per month compared with \$383 for controlled units, indicating that non-controlled units are 62 percent more expensive to rent. Once differences in types of unit are accounted for in the regression analysis, however, the estimated difference in rent for rent control alone is that these units, uncontrolled, would typically rent for 50 percent more. In other words, we would estimate that, on average, controlled units would rent for \$575 per month if not controlled (not the \$622 for which current non-controlled units rent). The regression estimate based on gross rent indicates that, accounting for housing unit characteristics, the non-controlled rent would be 43 percent higher than the controlled rent.

Exhibit F-20 also shows the mean rents for the sample of observations used in the regression analysis. The regression sample is smaller because cases were not used if any one of the values needed to estimate the regression was missing. Even though the means are different from those in the full sample, the ratios of these rents for non-controlled to controlled units are quite similar.

Exhibit F-1

Fully Employed Adults per Household by Housing Category

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SIDIZED	OWNER OCCUPIED	TOTAL
NO FULLY EMPLOYED	130.5 24.68	89 25.87	93.3333 52.98	73.3333 23.05	386.167
1 FULLY EMPLOYED	279.833 52.92	142.333 41.38	58.8333 33.40	139.833 43.95	620.833
2 FULLY EMPLOYED	104.5 19.76	92.6667 26.94	20 11.35	88.1667 27.71	305.333
3 FULLY EMPLOYED	7 1.32	14.5 4.22	2 1.14	11.5 3.61	35
4 FULLY EMPLOYED	6 1.13	3.5 1.02	1 0.57	3 0.94	13.5
5 FULLY EMPLOYED	1 0.19	0 0.00	1 0.57	2 0.63	4
6 FULLY EMPLOYED	0 0.00	1 0.29	0 0.00	.333333 0.10	1.33333
7 FULLY EMPLOYED	0 0.00	1 0.29	0 0.00	0 0.00	1
TOTAL	528.833	344	176.167	318.167	1367.17
FREQUENCY MISSING = 49					

Exhibit F-2

Part-Time Employed Adults per Household by Housing Category

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SIDIZED	OWNER OCCUPIED	TOTAL
NO P/T EMPLOYED	444.333 84.02	274.667 79.61	153.333 87.04	244 76.61	1116.33
1 P/T EMPLOYED	73.8333 13.96	57.3333 16.62	21.3333 12.11	63.3333 19.88	215.833
2 P/T EMPLOYED	8.33333 1.58	12 3.48	1.5 0.85	9.33333 2.93	31.1667
3 P/T EMPLOYED	2.33333 0.44	1 0.29	0 0.00	1.5 0.47	4.83333
4 P/T EMPLOYED	0 0.00	0 0.00	0 0.00	.333333 0.10	.333333
TOTAL	528.833	345	176.167	318.5	1368.5
FREQUENCY MISSING = 47					

Exhibit F-3

Full-Time Students per Household by Housing Category

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SIDIZED	OWNER OCCUPIED	TOTAL
NO F/T STUDENTS	408 77.15	227.833 66.04	154.5 87.70	271.5 85.24	1061.83
1 F/T STUDENT	92.1667 17.43	77.1667 22.37	15.3333 8.70	30.8333 9.68	215.5
2 F/T STUDENTS	24.6667 4.66	26 7.54	4 2.27	12.6667 3.98	67.3333
3 F/T STUDENTS	3 0.57	11.5 3.33	2 1.14	1.5 0.47	18
4 F/T STUDENTS	1 0.19	1.5 0.43	.333333 0.19	2 0.63	4.83333
5 F/T STUDENTS	0 0.00	1 0.29	0 0.00	0 0.00	1
TOTAL	528.833	345	176.167	318.5	1368.5
FREQUENCY MISSING = 47					

Exhibit F-4

Retired Adults per Household by Housing Category

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SIDIZED	OWNER OCCUPIED	TOTAL
NONE RETIRED	484.833 91.68	315.5 91.45	118.167 67.08	250.5 78.65	1169
1 PERSON RETIRED	36 6.81	21.5 6.23	48 27.25	42.5 13.34	148
2 PEOPLE RETIRED	8 1.51	8 2.32	10 5.68	22.5 7.06	48.5
3 PEOPLE RETIRED	0 0.00	0 0.00	0 0.00	2 0.63	2
4 PEOPLE RETIRED	0 0.00	0 0.00	0 0.00	1 0.31	1
TOTAL	528.833	345	176.167	318.5	1368.5
FREQUENCY MISSING = 47					

Exhibit F-5

Homemakers per Household by Housing Category

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SIDIZED	OWNER OCCUPIED	TOTAL
NO HOMEMAKERS	484.333 91.59	312 90.43	137.167 77.86	258.833 81.27	1192.33
1 HOMEMAKER	43.5 8.23	33 9.57	39 22.14	55.8333 17.53	171.333
2 HOMEMAKERS	1 0.19	0 0.00	0 0.00	1.83333 0.58	2.83333
3 HOMEMAKERS	0 0.00	0 0.00	0 0.00	2 0.63	2
TOTAL	528.833	345	176.167	318.5	1368.5
FREQUENCY MISSING = 47					

Exhibit F-6

Unemployed Adults per Household by Housing Category

FREQUENCY COL PCT	RENT CONTROL	NON -CONTROL	SUB- SIDIZED	OWNER OCCUPIED	TOTAL
NONE UNEMPLOYED	512.333 96.88	334.5 96.96	157.667 89.50	311.5 97.80	1316
1 UNEMPLOYED	16.5 3.12	10.5 3.04	17.5 9.93	4.5 1.41	49
2 UNEMPLOYED	0 0.00	0 0.00	1 0.57	2.5 0.78	3.5
TOTAL	528.833	345	176.167	318.5	1368.5
FREQUENCY MISSING = 47					

Exhibit F-7

Adults per Household by Occupations per Household
(Including Part-Time Employed)

FREQUENCY COL PCT	0	1	2	3	4	5	6	7	8	9	12	TOTAL
NO ADULTS	2 11.43	7 1.28	9 1.57	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	18
1 ADULT	6.5 37.14	508.25 92.58	55 9.62	2.5 1.59	3 3.94	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	575.25
2 ADULTS	7 40.00	31.75 5.78	497.833 87.08	76.5 48.73	20.3333 26.70	2 9.60	1 11.11	2 25.00	0 0.00	0 0.00	0 0.00	638.417
3 ADULTS	1 5.71	1 0.18	8.5 1.49	72 45.86	19 24.95	6 28.80	2 22.22	0 0.00	0 0.00	0 0.00	.333333 100.00	109.833
4 ADULTS	1 5.71	1 0.18	1 0.17	5 3.18	32.8333 43.11	5.5 26.40	1.5 16.67	3 37.50	.5 14.29	.5 100.00	0 0.00	51.8333
5 ADULTS	0 0.00	0 0.00	0 0.00	1 0.64	1 1.31	7 33.60	1.5 16.67	1 12.50	3 85.71	0 0.00	0 0.00	14.5
6 ADULTS	0 0.00	0 0.00	.333333 0.06	0 0.00	0 0.00	.333333 1.60	3 33.33	2 25.00	0 0.00	0 0.00	0 0.00	5.66667
TOTAL FREQUENCY MISSING = 2	17.5	549	571.667	157	76.1667	20.8333	9	8	3.5	.5	.333333	1413.5

Exhibit F-8

Adults per Household by Occupations Per Household
(Excluding Part-Time Employed)

FREQUENCY COL PCT	0	1	2	3	4	5	6	7	8	TOTAL
NO ADULTS	3 6.12	7 1.11	8 1.47	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	18
1 ADULT	34.5 70.41	509.75 81.06	28.5 5.24	1.5 1.34	1 1.93	0 0.00	0 0.00	0 0.00	0 0.00	575.25
2 ADULTS	9.5 19.39	105.083 16.71	479.833 88.18	32 28.49	8 15.43	3 20.00	1 13.33	0 0.00	0 0.00	638.417
3 ADULTS	1 2.04	4 0.64	24.1667 4.44	70.8333 63.06	8.5 16.40	1 6.67	0 0.00	0 0.00	.333333 14.29	109.833
4 ADULTS	1 2.04	3 0.48	3 0.55	7 6.23	31.3333 60.45	3 20.00	2 26.67	1.5 60.00	0 0.00	51.8333
5 ADULTS	0 0.00	0 0.00	0 0.00	1 0.89	2 3.86	7 46.67	2.5 33.33	0 0.00	2 85.71	14.5
6 ADULTS	0 0.00	0 0.00	.666667 0.12	0 0.00	1 1.93	1 6.67	2 26.67	1 40.00	0 0.00	5.66667
TOTAL FREQUENCY MISSING = 2	49	628.833	544.167	112.333	51.8333	15	7.5	2.5	2.33333	1413.5

Exhibit F-9

Income Expressed as Percent of Median by Household Size For Rent Controlled Units

FREQUENCY COL PCT	1 PERSON	2 PEOPLE	3 - 5 PEOPLE	6 - 9 PEOPLE	TOTAL
< 25% MED INCOME	26.5 11.79	14.8333 10.09	6.5 9.24	0 0.00	47.8333
25-50% M. INCOME	30.3333 13.49	32 21.77	15 21.33	2 66.67	79.3333
50-80% M. INCOME	61.5 27.35	28.3333 19.27	26 36.97	1 33.33	116.833
80-100% M. INCOM	35 15.57	23.5 15.99	8 11.37	0 0.00	66.5
100-120% M. INCO	27.5 12.23	14 9.52	6.33333 9.00	0 0.00	47.8333
120-150% M. INCO	26 11.56	20.8333 14.17	2 2.84	0 0.00	48.8333
150-200% M. INCO	12 5.34	7.5 5.10	4 5.69	0 0.00	23.5
>200% MED INCOME	6 2.67	6 4.08	2.5 3.55	0 0.00	14.5
TOTAL	224.833	147	70.3333	3	445.167
FREQUENCY MISSING = 84					

Exhibit F-10

Income Expressed as Percent of Median by Household Size For Non-Controlled Units

FREQUENCY COL PCT	1 PERSON	2 PEOPLE	3 - 5 PEOPLE	6 - 9 PEOPLE	TOTAL
< 25% MED INCOME	9 11.20	5 4.67	9.5 10.58	0 0.00	23.5
25-50% M. INCOME	7 8.71	20 18.69	15.8333 17.63	4.5 47.37	47.3333
50-80% M. INCOME	16.5 20.54	17 15.89	24.5 27.27	2 21.05	60
80-100% M. INCOM	10 12.45	11.5 10.75	12.5 13.91	1 10.53	35
100-120% M. INCO	9.5 11.83	20 18.69	10.5 11.69	0 0.00	40
120-150% M. INCO	12 14.94	16 14.95	3 3.34	1 10.53	32
150-200% M. INCO	4 4.98	10 9.35	8 8.91	1 10.53	23
>200% MED INCOME	12.3333 15.35	7.5 7.01	6 6.68	0 0.00	25.8333
TOTAL	80.3333	107	89.8333	9.5	286.667
FREQUENCY MISSING = 58					

Exhibit F-11

Income Expressed as Percent of Median by Household Size for Subsidized Units

FREQUENCY COL PCT	1 PERSON	2 PEOPLE	3 - 5 PEOPLE	6 - 9 PEOPLE	TOTAL
< 25% MED INCOME	30 63.83	12 35.29	25 43.35	1.5 20.00	68.5
25-50% M. INCOME	11 23.40	15 44.12	21.8333 37.86	5 66.67	52.8333
50-80% M. INCOME	5 10.64	4 11.76	10 17.34	1 13.33	20
80-100% M. INCOM	0 0.00	0 0.00	.333333 0.58	0 0.00	.333333
120-150% M. INCO	1 2.13	2 5.88	.5 0.87	0 0.00	3.5
150-200% M. INCO	0 0.00	1 2.94	0 0.00	0 0.00	1
TOTAL	47	34	57.6667	7.5	146.167
FREQUENCY MISSING = 30					

Exhibit F-12

Income Expressed as Percent of Median by Household Size
for Owner-Occupied Units

FREQUENCY COL PCT	1 PERSON	2 PEOPLE	3 - 5 PEOPLE	6 - 9 PEOPLE	>= 10 PEOPLE	TOTAL
< 25% MED INCOME	8 13.68	3.33333 3.99	4 3.86	0 0.00	.333333 50.00	15.6667
25-50% M. INCOME	2 3.42	9.5 11.37	9.5 9.18	0 0.00	0 0.00	21
50-80% M. INCOME	8.5 14.53	8 9.57	13 12.56	4 50.00	0 0.00	33.5
80-100% M. INCOM	7 11.97	4 4.79	12 11.59	1 12.50	0 0.00	24
100-120% M. INCO	4.5 7.69	6.5 7.78	13 12.56	0 0.00	0 0.00	24
120-150% M. INCO	9.5 16.24	4 4.79	10.5 10.14	1 12.50	0 0.00	25
150-200% M. INCO	9 15.38	21 25.12	15.6667 15.14	1 12.50	0 0.00	46.6667
>200% MED INCOME	10 17.09	27.25 32.60	25.8333 24.96	1 12.50	.333333 50.00	64.4167
TOTAL	58.5	83.5833	103.5	8	.666667	254.25

FREQUENCY MISSING = 64

Exhibit F-13

Income as a Percent of Median by Housing Category Households with at Least One Student

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SID CONTROL IZED	OWNER OC CUPIED	TOTAL
< 25% MED INCOME	20.3333 18.74	12.5 12.10	9 45.76	4.66667 12.12	46.5
25-50% M. INCOME	25.3333 23.35	21.5 20.81	6.33333 32.20	6.5 16.88	59.6667
50-80% M. INCOME	31.5 29.03	21.5 20.81	3 15.25	6 15.58	62
80-100% M. INCOM	13.5 12.44	11 10.65	.333333 1.69	2.5 6.49	27.3333
100-120% M. INCO	5.33333 4.92	21.3333 20.65	0 0.00	2 5.19	28.6667
120-150% M. INCO	6 5.53	6 5.81	1 5.08	3.5 9.09	16.5
150-200% M. INCO	3.5 3.23	4.5 4.35	0 0.00	4.5 11.69	12.5
>200% MED INCOME	3 2.76	5 4.84	0 0.00	8.83333 22.94	16.8333
TOTAL	108.5	103.333	19.6667	38.5	270
FREQUENCY MISSING = 51					

Exhibit F-14

Income as a Percent of Median by Housing Category Households with no Students

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SID IZED	OWNER OC UPIED	TOTAL
< 25% MED INCOME	27.5 8.17	11 6.00	59.5 47.04	11 5.10	109
25-50% M. INCOME	54 16.04	25.8333 14.09	46.5 36.76	14.5 6.72	140.833
50-80% M. INCOME	85.3333 25.35	38.5 21.00	17 13.44	27.5 12.75	168.333
80-100% M. INCOM	53 15.74	24 13.09	0 0.00	21.5 9.97	98.5
100-120% M. INCO	42.5 12.62	18.6667 10.18	0 0.00	22 10.20	83.1667
120-150% M. INCO	42.8333 12.72	26 14.18	2.5 1.98	21.5 9.97	92.8333
150-200% M. INCO	20 5.94	18.5 10.09	1 0.79	42.1667 19.54	81.6667
>200% MED INCOME	11.5 3.42	20.8333 11.36	0 0.00	55.5833 25.76	87.9167
TOTAL	336.667	183.333	126.5	215.75	862.25
FREQUENCY MISSING = 232					

Exhibit F-15

Income Expressed as Percent of Median by Type of Housing
Households with Roommates

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SID IZED	OWNER OC UPIED	TOTAL
< 25% MED INCOME	4.33333 7.51	6.5 9.80	1 23.08	3 16.22	14.8333
25-50% M. INCOME	10 17.34	6 9.05	0 0.00	6 32.43	22
50-80% M. INCOME	13 22.54	10 15.08	2 46.15	2 10.81	27
80-100% M. INCOM	8.5 14.74	10.5 15.83	.333333 7.69	0 0.00	19.3333
100-120% M. INCO	7.33333 12.72	15.8333 23.87	0 0.00	1 5.41	24.1667
120-150% M. INCO	8 13.87	4 6.03	1 23.08	1 5.41	14
150-200% M. INCO	3.5 6.07	9 13.57	0 0.00	4 21.62	16.5
>200% MED INCOME	3 5.20	4.5 6.78	0 0.00	1.5 8.11	9
TOTAL	57.6667	66.3333	4.33333	18.5	146.833
FREQUENCY MISSING = 43					

Exhibit F-16

Income Expressed as Percent of Median by Type of Housing

No Roommates

FREQUENCY COL PCT	RENT CONTROL	NON- CONTROL	SUB- SID IZED	OWNER OC UPIED	TOTAL
< 25% MED INCOME	43.5 11.23	17 7.72	67.5 47.59	12.6667 5.37	140.667
25-50% M. INCOME	69.3333 17.89	41.3333 18.76	52.8333 37.25	15 6.36	178.5
50-80% M. INCOME	103.833 26.80	50 22.69	18 12.69	31.5 13.36	203.333
80-100% M. INCOM	58 14.97	24.5 11.12	0 0.00	24 10.18	106.5
100-120% M. INCO	40.5 10.45	24.1667 10.97	0 0.00	23 9.76	87.6667
120-150% M. INCO	40.8333 10.54	28 12.71	2.5 1.76	24 10.18	95.3333
150-200% M. INCO	20 5.16	14 6.35	1 0.71	42.6667 18.10	77.6667
>200% MED INCOME	11.5 2.97	21.3333 9.68	0 0.00	62.9167 26.69	95.75
TOTAL	387.5	220.333	141.833	235.75	985.417
FREQUENCY MISSING = 240					

Exhibit F-17

Variable Definition and Expected Signs

<u>SYMBOL</u>	<u>DEFINITION</u>	<u>EXPECTED SIGN</u>
BLDGS	= 1 for buildings with 5 or more units 0 otherwise	-
BATHS	= number of full plus half baths	+
ROOMS	= number of rooms	+
BDRMS	= number of bedrooms	+
FURNISH	= 1 if the unit is rented furnished 0 otherwise	+
NEIGHBOR	= 1 if neighborhood has rundown housing 0 if otherwise	-
OWNEROC	= 1 if the building is owner occupied 0 if otherwise	-
OWNERREL	= 1 if the tenant is related to the owner 0 if otherwise	-
RNTN	= 1 if the unit is under rent control 0 if otherwise	-
ZIP39	= 1 if the zipcode is 02139 0 if otherwise	-
ZIP40	= 1 if the zipcode is 02140 0 if otherwise	-
ZIP41	= 1 if zipcode is 02141 0 if otherwise	-
ZIPMIS	= 1 if zipcode is missing 0 if otherwise	-
KNOWRC	= 1 if the unit is under rent control, but the tenant is unaware of that status 0 if otherwise	+
ELEVTR	= 1 if the building has an elevator 0 if otherwise	+
EXCCOND	= 1 if the tenant rates the building quality as excellent 0 if otherwise	+
POORCOND	= 1 if the tenant rates the building quality as poor 0 if otherwise	-

Exhibit F-17 (continued)

Variable Definition and Expected Signs

<u>SYMBOL</u>	<u>DEFINITION</u>	<u>EXPECTED SIGN</u>
PRE69	= 1 if the building was built before 1969 0 if otherwise	-
TENURE	= number of years a member of the household has lived in the unit	-

For Contract Rent Equation:

HEATING	= 1 if rent includes heat 0 if otherwise	+
WTRINC	= 1 if rent includes water 0 if otherwise	+
ELECTINC	= 1 if rent includes electricity 0 if otherwise	+

Exhibit F-18

Model I, Regression Results Using Logarithm of Household Rent (Contract)

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	22	102.8163	4.673469	36.733	0.0001
ERROR	681	86.64172	0.1272272		
C TOTAL	703	189.458			
ROOT MSE		0.3566892	R-SQUARE	0.5427	
DEP MEAN		6.035635	ADJ R-SQ	0.5279	
C.V.		5.909721			

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0	PROB > T	TOLERANCE
INTERCEP	1	5.69526	0.08321347	68.442	0.0001	.
BLDG5	1	-0.018084	0.04127929	-0.438	0.6615	0.4648059
BATHS	1	0.1316179	0.03574666	3.682	0.0002	0.8030948
ROOMS	1	0.1037305	0.01361141	7.621	0.0001	0.3882164
BDRMS	1	0.07881803	0.02379901	3.312	0.0010	0.380527
FURNISH	1	0.09171097	0.05962424	1.538	0.1245	0.8864148
NEIGHBOR	1	-0.0234438	0.03186866	-0.736	0.4622	0.9153396
OWNEROC	1	-0.013572	0.03874523	-0.350	0.7262	0.6049756
OWNERREL	1	-0.279798	0.05461219	-5.123	0.0001	0.9017581
RNTN	1	-0.406255	0.03884076	-10.459	0.0001	0.5118973
ZIP39	1	-0.13423	0.0335558	-4.000	0.0001	0.7296444
ZIP40	1	-0.144219	0.041568	-3.469	0.0006	0.8053124
ZIP41	1	-0.229592	0.05394756	-4.256	0.0001	0.8213882
ZIPMIS	1	-0.0722011	0.0914955	-0.789	0.4303	0.9161097
KNOWRC	1	0.3153879	0.07173327	4.397	0.0001	0.9522672
ELEVTR	1	0.1958191	0.03892405	5.031	0.0001	0.7220112
EXCCOND	1	0.08443746	0.03827225	2.206	0.0277	0.8783786
POORCOND	1	-0.196047	0.0521172	-3.762	0.0002	0.8800959
PRE69	1	-0.036545	0.04674405	-0.782	0.4346	0.7561999
TENURE	1	-0.0152461	0.002095664	-7.275	0.0001	0.9004838
HEATING	1	0.1324947	0.04568551	2.900	0.0039	0.3642307
WTRINC	1	0.01319428	0.04412743	0.299	0.7650	0.4458515
ELECTINC	1	-0.111121	0.04299301	-2.585	0.0100	0.7704434

Exhibit F-19

Model II, Regression Results Using Logarithm of Cross Household Rent

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	19	95.16242	5.008548	44.188	0.0001
ERROR	684	77.52922	0.1133468		
C TOTAL	703	172.6916			
ROOT MSE		0.3366702	R-SQUARE	0.5511	
DEP MEAN		6.116812	ADJ R-SQ	0.5386	
C.V.		5.504014			

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0	PROB > T	TOLERANCE
INTERCEP	1	5.819111	0.07391363	78.729	0.0001	.
BLDG5	1	-0.0502977	0.03760308	-1.338	0.1815	0.4990206
BATHS	1	0.1168205	0.03369631	3.467	0.0006	0.8051978
ROOMS	1	0.1085533	0.01265202	8.580	0.0001	0.4003039
BDRMS	1	0.08229301	0.02227807	3.694	0.0002	0.386881
FURNISH	1	0.06033433	0.05578386	1.082	0.2798	0.9021836
NEIGHBOR	1	-0.0229332	0.03005729	-0.763	0.4457	0.9167261
OWNEROC	1	-0.0182573	0.03640259	-0.502	0.6162	0.6105753
OWNERREL	1	-0.250305	0.05145715	-4.864	0.0001	0.9049137
RNTN	1	-0.355155	0.03624097	-9.800	0.0001	0.523827
ZIP39	1	-0.107288	0.03150189	-3.406	0.0007	0.7375688
ZIP40	1	-0.157033	0.03898585	-4.028	0.0001	0.8156391
ZIP41	1	-0.208846	0.05032397	-4.150	0.0001	0.8409527
ZIPMIS	1	-0.033251	0.08619527	-0.386	0.6998	0.9196223
KNOWRC	1	0.2817657	0.06765359	4.165	0.0001	0.9537792
ELEVTR	1	0.1764609	0.03652263	4.832	0.0001	0.7306095
EXCCOND	1	0.06319984	0.03597544	1.757	0.0794	0.8856598
POORCOND	1	-0.118754	0.04849418	-2.449	0.0146	0.9056121
PRE69	1	-0.0433492	0.04396403	-0.986	0.3245	0.7615943
TENURE	1	-0.013281	0.001974598	-6.726	0.0001	0.9036314

Exhibit F-20

Comparison of Raw Rent Ratios with Regression Estimates

	<u>Non-Controlled</u>	<u>Rent Control</u>	<u>Non-Controlled/</u>
	<u>Rent (# cases)</u>	<u>Rent (# cases)</u>	<u>Rent Controlled</u>
<u>Means for Full Sample</u>			
Contract Rent	\$622 (306)	\$383 (488)	1.62
Gross Rent	\$674 (291)	\$413 (472)	1.63
<u>Means for Regression Sample</u>			
Contract Rent	\$635 (263)	\$388 (441)	1.64
Gross Rent	\$684 (263)	\$416 (441)	1.64
<u>Regression Estimate of Ratio of</u>			
<u>Non-Controlled to Controlled Rent</u>			
Contract Rent			1.50
Gross Rent			1.43



CITY OF CAMBRIDGE

CAMBRIDGE, MASSACHUSETTS 02139

TEL. 498-9011

EXECUTIVE DEPARTMENT
ROBERT W. HEALY
City Manager

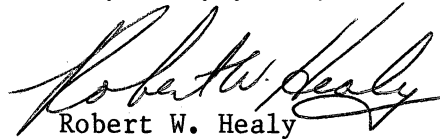
RICHARD C. ROSSI
Deputy City Manager

August 3, 1987

To the Honorable, the City Council:

Enclosed please find copy of a supplement to the Cambridge Rent
Control Study prepared by Abt Associates Inc.

Very truly yours,


Robert W. Healy
CityManager

RWH/mbf
Enc.

Agenda Item No. 16 *S-494*

Re: enclosed copy of a supplement to the
Cambridge Rent Control Study prepared by
Abt Associates, Inc.

In City Council,

August 3, 1987

*Referred to the Rent
Control Comm. Hce*

*Copy sent to Councilor Walsh,
Chairman, Committee on Rent
Control 9/11/87 (in his pkg.
for the Sept. 14 '87 meeting) mh*