HOUSING DEMOLITIONS: AN ANALYSIS OF PERMIT DATA

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HOUSING DEMOLITIONS

A substantial element of the dynamics of change in the housing stock consists of the removal of units through demolition. The Census Bureau's report on Components of Inventory Change (CINCH) over the 1973 to 1983 period[1] shows losses from the 1973 stock due to demolition or disaster of 2,444,000 units. Disaster losses (fire, flood, earthquake, etc.) account for about 15 percent of total demolition/disaster loss.[2]

The reasons why housing units are demolished are not well understood. A demolition could occur because the market or implicit rent falls below the cost of operation and maintenance. Such negative net rents might develop because physical deterioration has increased the cost of operation and maintenance, perhaps because damage from natural disaster or breakdown of a major system has meant that continued operation would require major expenditures. On the other hand, rents could simply be inadequate, particularly if high vacancy rates cut into effective rents. The property may then be abandoned and demolished as a hazard to health and safety. This type of demolition, which is independent of the possible reuse of the land, could be called a depletion demolition.

An alternative scenario for demolition would be where the structure, even though habitable and generating positive net rental income, falls below zero in net value because the value of the property with the structure is less than the value of the land alone. This may occur even for a well-maintained structure if the land becomes valuable for some alternative use, such as for construction of a nonresidential structure, denser housing use, or a more expensive home. A variant of this scenario occurs where a government agency uses the power of eminent domain to purchase and demolish a home in order to build roads or other public facilities. This type of demolition can be called a displacement demolition.

Depletion demolitions and displacement demolitions are not mutually exclusive. For example, a physically deteriorated structure is more likely to have a negative net value. Moreover, an owner who anticipates that the property will be sold for a use requiring demolition will tend to cut back on maintenance and allow the structure to deteriorate.

The relative importance of depletion and displacement as causes of demolitions has implications for future construction

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[1]U.S. Bureau of the Census, Annual Housing Survey Components of Inventory Change: 1973 to 1983 (Current Housing Reports H-151-83, April 1991).

[2]William C. Baer, "Aging of the Housing Stock and Components of Inventory Change" in Dowell Myers, ed., Housing Demography: Linking Demographic Structures and Housing Markets (University of Wisconsin Press, 1990)

activity. Over the next decade it is expected that household formations will be below the average levels of past decades, and the number of new housing units required to accommodate additional households will be reduced. The volume of nonresidential construction is also expected to decline. Depending on the nature of the demolitions process, the volume of demolitions may increase as a result of the larger total size and increased average age of the housing stock, or may decrease because fewer units will need to be removed in order to make land available for new residential and nonresidential construction. The resulting change in the volume of demolitions will, in turn, determine whether changes in the replacement demand for housing will offset or reinforce the reduction in demand from household formations.

Measures of Demolition

The Census Bureau's CINCH report is a by-product of the American Housing Survey. A sample of units is followed over time, and their fate is recorded.

In total, the CINCH 2.4 million estimate of demolition and disaster loss over the 1973 to 1983 period represented 3.1 percent of all 1973 housing units and was equivalent to 15.1 percent of the number of units added by new construction over that period (including mobile homes).

The CINCH estimate understates losses due to demolition somewhat, because it excludes units that had been removed from the habitable inventory and "exposed to the elements" or scheduled for demolition but that were still standing as of 1983. It also excludes demolition of units that were standing in 1973 but that were considered to have already been removed from the housing supply before 1973. Moreover, any units built after 1973 but demolished before 1983 would not be counted.

As of 1983, there were 622,000 units that were in the uninhabitable "exposed, damaged, or condemned" category, but that had been part of the 1973 housing stock. The majority of those probably were later demolished. Many, however, may have been returned to the habitable stock after 1983. The 1983 housing stock included 238,000 habitable units that had been considered in the uninhabitable category in 1973.

In addition to new construction and demolitions, the number of conventional, year-round housing units is affected by the flow of units between residential and nonresidential use, between use as housing units and residential group quarters, and in and out of the habitable stock. According to CINCH, there were 2,606,000 units gained and 1,746,000 units lost over the 1973-1983 decade through those processes, for a net gain of 86,000 units per year. Because the tracking of conversions from nonresidential to residential use is weak, the actual net gain is probably somewhat greater. In addition, shifts between single family and multifamily use (conversions and mergers) produced a net gain of 7,200 per year, and net conversions from seasonal to year-round use added 49,000 conventional units per year to the year-round stock. (See table 1.)

Another possible measure of demolitions is the volume of permits for demolitions issued by local officials. Reports of demolition permits are collected by the Census Bureau's Construction Statistics Division along with permits for new residential and nonresidential construction and for additions and alterations.

There are some weaknesses in the data on demolition permits. Many localities do not require permits for demolitions, or demolition permits may not fall under the jurisdiction of the same agency that issues permits for new construction. In either of those cases, permits reported to the Census Bureau will not show demolitions activity. Moreover, the permit data do not include publicly-owned units. For new construction, that is not a major factor, because few publicly-owned units are built. But publicly owned units are a much larger share of demolitions. In addition to public housing projects, housing units fall into public ownership due to purchases under the power of eminent domain and as a result of tax delinquency or abandonment.

Table 2 shows the national total for demolition permits, measured in terms of housing units and sorted according to the number of units in each structure. The table also shows the total number of units, including public units, authorized for demolition for the period 1979 to 1984, from a data set that is no longer maintained by Census. The difference between that total and the number of private units is a measure of demolitions of publicly-owned units. That difference ranged from 9,000 to 17,000 over the 1979 to 1984 period.

CINCH indicates total demolition/disaster losses over the three-year period from autumn of 1980 to autumn of 1983 of 544,000 units, or 181,000 per year. Private permits over those three years averaged about 40 percent of the CINCH estimate. That contrasts with a ratio of housing permits to housing starts of over 90 percent.

Table 3, based on CINCH, shows that renter-occupied or vacant units were far more likely to be demolished than owner-occupied units, but among renter-occupied and vacant units single family detached units were more likely to be demolished than multifamily units. Among owner-occupied units, single family units are demolished with about the same frequency as all units. On net, single family detached units are shown as accounting for 59.5 percent of all 1973 year round units that were demolished by 1983, slightly below the 63.8 percent share that single family detached units represented among the total 1973 stock.

The permit data indicate that during the 1980-1983 period single family units accounted for a 61% share of total demolitions.

More recently, single family units have accounted for up to three-fourths of private demolition permits. It's hard to imagine that permit requirements are being enforced more stringently for single family demolitions than for multifamily demolitions. Thus, it appears that in recent years the overall proportion of single family homes demolished has been greater than the share of multifamily units.

Characteristics of Demolished Units

The data on the characteristics of units lost to demolition or disaster reported in CINCH appear to support the hypothesis that physical deterioration rather than a demand for alternative use of the land is the primary path leading to demolitions. The share of housing units lost to demolitions over the 1973-83 period was much lower in the fast-growing suburbs than in the central cities or in non-metropolitan areas, with the rate of demolitions especially high in the rural South. Although displacement demolitions are likely in central cities because of the limited supply of vacant land, the large number of rural demolitions look like depletion.

The share demolished was also much higher for older units. Among all units that were reported in 1973 as having been built in 1960 or later, less than 1 percent were demolished, but among units that were reported in 1973 to have been built before 1940, about 6 percent were demolished over the ensuing decade. This is consistent with the idea that the loss rates, like death rates for the population, follow an accelerated path after a time.[3]

About 1 in 6 of the 1973 units without complete plumbing or without complete kitchens were demolished. Nearly 11 percent of units that in 1973 were on the same street with abandoned buildings were demolished over the decade.

Distinguishing Displacement Demolitions

In an attempt to distinguish depletion demolitions from displacement demolitions, demolition permits for a number of metropolitan areas were analyzed over time. Construction variables and other factors were used to try to explain changes in demolitions in the different areas.

A number of factors could produce a correlation between new housing construction and demolitions. If new housing construction occurs on land where older housing is standing, the new construction will cause displacement demolitions, with the demolition occurring shortly before construction. This creates a positive correlation between construction and demolition. A positive correlation could also occur if new construction exceeds the growth in demand, driving down occupancy rates and rents. In

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[3]See Michael E. Gleeson, "Estimating Housing Mortality", Journal of the American Planning Association, April 1981.

that case, construction will precede demolition. Finally, a positive relationship could occur because demolitions create a demand for replacement housing, a readily apparent phenomenon following natural disasters. Where demolitions are the cause of new construction, the demolitions will occur first and there may be some lag before construction occurs.

Because both demolitions and new construction will be affected by housing demand, a <u>negative</u> correlation could occur as increases in demand raise construction and reduce demolitions, or as decreases in demand reduce construction and increase demolitions. If weak demand results in an increase in demolitions, however, rather than simply an increase in vacancies, then subsequent increases in demand will require additional construction.

Because of the numerous possible causes of a positive correlation between housing construction and demolitions, the existence of a positive relationship does not demonstrate either the predominance of displacement demolitions or of depletion demolitions. It may be possible to make a distinction based on the lead-lag relationship, but with annual data that could be difficult. In the absence of data on individual land parcels, it would be hard to distinguish whether there was a causal relationship based on competition for the available land, or simply an influence through the market for housing services.

A negative relationship, on the other hand, would suggest that demolitions did not occur because of competition for land, but because the demand for services from the demolished structures was insufficient to support the cost of operation and maintenance. If so, the correlation would be incidental rather than causal, and including the determinants of housing demand in the regression analysis should reduce the apparent effect of construction on demolitions.

Growth in exogenous local factors that explain demand for housing, such as growth in population, employment, or income, would be expected to increase occupancy rates and market or implicit rents, thereby deferring depletion demolitions while stimulating displacement demolitions. Thus, if measures of economic growth or rents have a significant positive impact on demolitions, it would suggest displacement demolitions, while a significant negative impact suggests depletion demolitions.

Demolition of a home shouldn't cause construction of a nonresidential structure, and nonresidential structures don't compete with homes for tenants. A strong positive relationship between nonresidential construction and housing demolitions thus would be evidence of displacement. A strong negative relationship, once the effect of overall economic growth is accounted for, would be hard to interpret.

The relationship of demolitions to construction and growth variables was estimated using pooled cross-sectional and time series regression analysis. Annual data for the period 1981 to 1990 for a set of metropolitan areas were used. Three criteria were initially used to select the sample: no change in the definition of the MSA, at least 50 single family demolition permits in each year, and availability of a CPI rent measure. Only 15 MSA and PMSA areas met all three criteria. An additional set of areas was later created: a group of 11 MSAs that have data for consistent boundaries only from 1984.

Equations were estimated using various combinations of the construction and demand variables. In the most general form: $DSF_{it} = f(CSF_{it}, CMF_{it}, KOB_{it}, KRT_{it}, EMP_{it}, POP_{it}, YPK_{it}, REN_{it}, DUMMY_i)$

Where :

DSF_{it} = Number of single family units authorized for demolitions in metro area $\underline{i}$ during year $\underline{t}$.

CSF_{it} = Single family units authorized for construction

CMF_{it} = Multifamily units authorized for construction

KOB_{it} = Real value (nominal value deflated by national implicit deflator for construction put in place) of office buildings authorized for construction

KRT_{it} = Real value of retail structures authorized for construction

REN_{it} = CPI for residential rent for MSA or CMSA, relative to CPI for all items

EMP_{it} = Nonagricultural payroll employment

POP_{it} = Resident Population

YPK_{it} = Personal income per capita, deflated by local CPI for all items

$DUMMY_i$ = Dummy variable equal to 1 in all years for area $\underline{i}$, 0 otherwise.

The dummy variable serves as a unique constant term for each area and should incorporate the effects of the age and condition of the stock, past density of development, and other factors unique to an area but relatively unchanged over the decade, including the extent and stringency of requirements for demolition permits. It is tempting to consider the dummy variables as measures of depletion demolitions, but that is not entirely appropriate.

Only single family demolitions were considered at this point. Permits for multifamily demolitions are lumpy, and many areas had one or more years where no permits for multifamily demolitions were issued.

The actual regressions used variables expressed in per capita terms or as logarithms. These were simple expedients to deal with heteroscedasticity. The use of logarithms made the effects of the dummies multiplicative, which may be appropriate, although it also meant that the effects of each type of construction are assumed to be multiplicative, which isn't so appropriate.

Regressions against demand variables generally showed significant positive impacts of the detemrinants of housing demand on the number of single family demolitions. For the group of 15, population growth, employment growth, real income, and real rents all had positive, highly-significant coefficients, individually or in combination. For the group of 11, the change in employment had the wrong (i.e., negative) sign with marginal significance, but population growth, income, and rents were all strongly positive.

These results would all seem to contradict ideas of urban decline causing demolitions, but the data are at a metropolitan area level, and the dynamics of the central cities may be different.

The coefficients on permits for new construction are erratic. For the group of 15 areas, the per capita regressions show a negative coefficient for single family construction and a positive coefficient for multifamily construction, while the log form equations show both single family and multifamily positive but insignificant. We expected that the addition of demand variables would make the coefficients on construction more positive, but that doesn't always happen with this group.

Among the second group of 11 MSAs, single family construction has a positive sign, but multifamily is negative. The coefficients are significant in the per capita equations, but insignificant in the log equations. The addition of demand variables generally makes the coefficients more positive (with multifamily changing sign in the log form but remaining insignificant).

Permits for office building consistently were accorded negative coefficients, with t ratios often greater than 2.0. There is no readily available explanation for this pattern, which showed up with both sets of MSAs. The negative coefficients for office building permits fail to support the hypothesis that houses were torn down in order to build offices. Whether they demonstrate that a slowdown in office construction, at given levels of employment and population growth, will increase demolitions of homes is problematical.

In contrast to the results for office buildings, there was typically a positive relationship shown between permits for retail buildings and permits for demolitions, suggesting displacement.

To summarize, the results for the estimates using demand variables such as growth, income, and rents show that demolitions occur when demand is strong, not when the area is experiencing population outflow and economic decline. The results for the construction variables do not provide compelling evidence that demolitions are occurring primarily to accommodate new construction, but if not, then why would demolitions be associated with growth? The problem may be one of timing. Demolitions may occur because of anticipated construction, but the lag between demolition and construction may be substantial.

This analysis was concerned only with demolitions, not with all removals from the housing stock, including abandonment of structures that remain standing. Also, because it was based on permits for private activity, it excludes demolitions carried out by public agencies.

The data that were used here were from MSAs, and generally large MSAs at that. The demolitions process may be different in nonmetropolitan areas, but since one difference is likely to be an absence of permit requirements, the methodology used here is not readily applicable.

To determine whether demolitions actually occurred in order to clear the land for new construction, the ideal situation would be to have data for individual parcels. Even though that may not be possible, it should be possible to go below the metropolitan area level. In particular, an important step beyond what was done here would be to separate construction and demolitions in central cities from such activity in suburban areas. Because permit data are collected from thousands of individual permit-issuing jurisdictions, the data on demolition permits represent a unique data source.

While permits are a unique data source, they are also flawed. One of the advantages of going below the metropolitan area level would be the opportunity to better assess whether demolition permit requirements are in place, enforced, and accurately reported. This may involve contacting the permit-issuing agencies.

Table 1
CINCH 1973-1983 Net Changes

	Year-round Conventional	Year-round Total	All Units
1973 Stock	73444	76650	78484
Plus New Construction	14722	15938	16171
minus DEMOLITION/DISASTER	-2328	-2382	-2444
plus Other Adds	2606	4956	5801
minus Other Loss	-1746	-3545	-3653
plus Conversion Gain	1090	1094	1108
minus Conversion loss	-493	-495	-499
plus Merger Gain	594	599	602
minus Merger Loss	-1119	-1136	-1149
plus net from Seasonal	490	186	0
equals 1983 Stock	87261	91866	94421
Net from Other Gain/Loss	860	1411	2148
Net from Conversion/Merge	72	62	62

Table2
Demolitions from 1973 Stock

	1973 Total	Demolition /Disaster	Percent
Total Units	78,484	2,444	3.11%
Year-round Units	76,650	2,382	3.11%
1 Detached	48,896	1,417	2.90%
1 Attached	3,430	74	2.16%
2 to 4	9,814	407	4.15%
5+	11,304	429	3.80%
Mobile	3,206	54	1.68%
Owner	45,828	651	1.42%
1 Detached	39,063	551	1.41%
1 Attached	1,658	15	0.90%
2 to 4	2,205	37	1.68%
5+	588	3	0.51%
Mobile	2,314	45	1.94%
Renter	25,332	1,332	5.26%
1 Detached	7,245	632	8.72%
1 Attached	1,548	52	3.36%
2 to 4	6,728	303	4.50%
5+	9,379	344	3.67%
Mobile	434	0	0.00%
Vacant	5,490	399	7.27%
1 Detached	2,588	234	9.04%
1 Attached	224	7	3.13%
2 to 4	881	67	7.60%
5+	1,337	82	6.13%
Mobile	458	9	1.97%
Year Built:			
April 1970 or Later	7,572	45	0.59%
1965 to March 1970	10,330	101	0.98%
1960 to 1964	8,238	75	0.91%
1950 to 1959	13,832	185	1.34%
1940 to 1949	8,257	286	3.46%
1939 or earlier	28,421	1,690	5.95%

130,108	1969
122,773	1970
137,426	1971
141,915	1972
149 141	1973
139450	1974
121972	1975
114449	1976
108727	1977
102895	1978

Table 3
Demolition Permits Authorized

	Single Family	2-4 Units	5+ Units	Total	Total incl. Public
1979	49,370	16,694	14,736	80,800	98,037
1980	47,684	15,705	18,949	82,338	91,786
1981	43,867	16,120	12,494	72,481	86,731
1982	37,714	11,414	10,317	59,445	69,281
1983	38,509	11,799	14,172	64,480	74,511
1984	39,556	10,903	11,260	61,719	70,687
1985	45,161	10,531	12,439	68,131	
1986	51,323	11,944	10,478	73,745	
1987	55,189	11,429	10,749	77,367	
1988	54,156	11,309	13,007	78,472	
1989	55,225	10,462	8,720	~~74~~,40~~7~~	
1990	55,880	10,673	10,575	~~77~~,128	
1991	49064	9349	9294	67707	
1992	49608	10063	8804	66475	
1993	49025	9402	6267	64694	
1994	51228	10334	11761	73323	
1995	51530	11192	12764	75486 (Preliminary)	

Source: U.S. Bureau of the Census, unpublished data from series C-40 for private permits and Series C-45 for total including public

Dependent Variable: Per Capita Single Family Demolitions
Fifteen cities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%chg POP(−1)	0.0241			0.0089			0.0008	
	(3.00)			*(1.14)*			*0.89*	
%chg EMP(−1)		0.0091						
		(4.11)						
Per Cap EMP								0.0522
								(0.20)
REN			0.4748	0.3920		0.4824	0.4584	0.3447
			(5.26)	*(2.94)*		*(2.85)*	*(2.67)*	*(2.82)*
YPK(−1)/1000				0.0142		0.0078	0.0070	
				(2.28)		*(1.03)*	*(0.92)*	
Per Cap CSF					−0.0052	−0.0080	0.0086	
					(1.25)	*(1.75)*	*(1.86)*	
Per Cap CMF					0.0092	0.0089	0.0096	
					(2.66)	*(2.61)*	*(2.74)*	
Per Cap KOB					−0.0003	−0.0003	−0.0003	−0.0003
					(2.40)	*(2.29)*	*(2.28)*	*(2.17)*
Per Cap KRT					0.0012	0.0006	0.0006	0.0008
					(3.87)	*(1.76)*	*(1.71)*	*(2.38)*
Anaheim	0.1991	0.2117	−0.2544	−0.4333	0.1998	−0.3980	−0.3751	−0.1420
	(7.61)	*(9.78)*	*(2.62)*	*(3.58)*	*(6.16)*	*(2.53)*	*(2.35)*	*(1.08)*
Cincinnati	0.1521	0.1416	−0.3337	−0.4371	0.1239	−0.4460	−0.4125	−0.2408
	(7.40)	*(6.98)*	*(3.49)*	*(3.70)*	*(5.60)*	*(2.95)*	*(2.65)*	*(1.85)*
Cleveland	0.2174	0.2044	−0.2784	−0.3930	0.2058	−0.3778	−0.3385	−0.1640
	(10.59)	*(10.34)*	*(2.96)*	*(3.31)*	*(9.39)*	*(2.43)*	*(2.09)*	*(1.20)*
Fort Lauderdale	0.1092	0.1182	−0.3003	−0.4700	−0.0173	−0.5427	−0.5236	−0.2790
	(4.24)	*(5.42)*	*(3.34)*	*(4.25)*	*(0.46)*	*(3.20)*	*(3.73)*	*(2.62)*
Los Angeles	0.5104	0.5351	0.0344	−0.0906	0.4913	−0.0885	−0.0662	0.1438
	(20.86)	*(26.60)*	*(0.35)*	*(0.76)*	*(17.91)*	*(0.56)*	*(0.41)*	*(1.08)*
Miami	0.2112	0.2291	−0.2015	−0.3330	0.1958	−0.3445	−0.3240	−0.1148
	(8.94)	*(11.33)*	*(2.24)*	*(3.08)*	*(7.70)*	*(2.45)*	*(2.27)*	*(0.92)*
Milwaukee	0.1105	0.1034	−0.3781	−0.5000	0.0840	−0.5089	−0.4738	−0.2788
	(5.43)	*(5.20)*	*(3.96)*	*(4.17)*	*(4.10)*	*(3.23)*	*(2.92)*	*(2.02)*
Nassau–Suffolk	0.0737	0.0533	−0.4121	−0.5711	0.0423	−0.5500	−0.5121	−0.3215
	(3.62)	*(2.60)*	*(4.37)*	*(4.69)*	*(1.86)*	*(3.51)*	*(3.15)*	*(2.61)*
Oxnard	0.1102	0.1263	−0.3392	−0.4790	0.1231	−0.4524	−0.4341	−0.2344
	(3.94)	*(5.70)*	*(3.50)*	*(4.07)*	*(4.77)*	*(2.96)*	*(2.81)*	*(2.02)*
Philadelphia	0.1013	0.0964	−0.3852	−0.5110	0.1083	−0.4948	−0.4598	−0.2753
	(4.92)	*(4.81)*	*(3.97)*	*(4.21)*	*(5.02)*	*(3.11)*	*(2.80)*	*(2.10)*
Riverside–S.B.	0.0870	0.1584	−0.2886	−0.4314	0.0850	−0.4283	−0.4251	−0.2472
	(1.94)	*(6.89)*	*(2.98)*	*(3.74)*	*(2.02)*	*(3.20)*	*(3.18)*	*(2.34)*
San Diego	0.1048	0.1346	−0.3342	−0.4663	0.1040	−0.4684	−0.4569	−0.2265
	(3.36)	*(6.09)*	*(3.42)*	*(3.97)*	*(3.54)*	*(3.10)*	*(3.01)*	*(1.88)*
Seattle	0.1210	0.1355	−0.3272	−0.4813	0.1188	−0.4447	−0.4237	−0.2141
	(4.74)	*(6.39)*	*(3.44)*	*(4.14)*	*(3.49)*	*(2.94)*	*(2.77)*	*(1.57)*
St. Louis	0.2060	0.1997	−0.2782	−0.3959	0.1892	−0.3877	−0.3535	−0.1753
	(10.03)	*(9.96)*	*(2.93)*	*(3.35)*	*(8.35)*	*(2.55)*	*(2.25)*	*(1.34)*
Wilmington	0.1044	0.1037	−0.3714	−0.5000	0.1193	−0.4655	−0.4361	−0.2564
	(4.73)	*(5.00)*	*(3.83)*	*(4.17)*	*(4.49)*	*(3.03)*	*(2.77)*	*(1.90)*
R Squared	0.7791	0.7920	0.7929	0.8235	0.8113	0.8497	0.8508	0.8155
R Bar Squared	0.7815	0.7658	0.7697	0.7979	0.7828	0.8202	0.8198	0.7876
Observations	135	135	150	135	138	138	123	138

t values in parentheses, italics

Dependent Variable: Per Capita Single Family Demolitions
Eleven cities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%chg POP(-1)	0.0166			0.0253			0.0326	
	(1.63)			*(2.28)*			*(3.14)*	
%chg EMP(-1)		-0.0087						
		(2.61)						
Per Cap EMP								1.6197
								(4.17)
REN			0.5503	-0.1394		0.2428	0.0552	0.0715
			(3.26)	*(0.64)*		*(0.88)*	*(0.21)*	*(0.32)*
YPK(-1)/1000				0.0245		0.0197	0.0216	
				(3.30)		*(2.14)*	*(2.53)*	
Per Cap CSF					0.0165	0.0164	0.0154	
					(2.33)	*(2.65)*	*(2.71)*	
Per Cap CMF					-0.0125	-0.0151	-0.0191	
					(2.22)	*(2.72)*	*(3.62)*	
Per Cap KOB					-0.0003	-0.0001	-0.0001	0.0001
					(2.32)	*(0.60)*	*(0.74)*	*(0.90)*
Per Cap KRT					0.0004	0.0000	0.0000	0.0003
					(1.41)	*(0.12)*	*(0.06)*	*(0.80)*
Atlanta	0.1136	0.2083	-0.4324	-0.1221	0.0458	-0.4764	-0.3688	-0.7675
	(3.08)	*(8.92)*	*(2.37)*	*(0.57)*	*(0.80)*	*(1.84)*	*(1.53)*	*(3.49)*
Baltimore	0.0596	0.1023	-0.5245	-0.1699	-0.0021	-0.5527	-0.3963	-0.7718
	(2.93)	*(5.21)*	*(2.88)*	*(0.76)*	*(0.06)*	*(2.05)*	*(1.57)*	*(3.51)*
Chicago	0.1258	0.1524	-0.4696	-0.1028	0.1150	-0.4460	-0.2634	-3.7542
	(7.17)	*(7.78)*	*(2.59)*	*(0.45)*	*(5.07)*	*(1.68)*	*(1.05)*	*(3.38)*
Denver	0.0783	0.1015	-0.4417	-0.1790	0.0406	-0.4848	-0.3428	-0.8013
	(4.11)	*(5.81)*	*(2.68)*	*(0.88)*	*(1.34)*	*(2.07)*	*(1.56)*	*(3.90)*
Detroit	0.5594	0.5909	-0.0551	-0.3360	0.5087	-0.0138	0.1655	-0.2390
	(31.76)	*(29.20)*	*(0.31)*	*(1.50)*	*(22.26)*	*(0.05)*	*(0.67)*	*(1.13)*
Kansas City	0.3575	0.4070	-0.2174	0.1453	0.3156	-0.1853	-0.0354	-0.5023
	(16.60)	*(20.06)*	*(1.22)*	*(0.67)*	*(10.66)*	*(0.73)*	*(0.15)*	*(2.36)*
Minneapolis	0.1427	0.1999	-0.4155	-0.1146	0.1159	-0.4424	-0.3052	-0.8002
	(5.98)	*(9.68)*	*(2.34)*	*(0.53)*	*(3.51)*	*(1.71)*	*(1.26)*	*(3.53)*
New York	0.0460	0.0636	-0.5371	-0.1983	0.0655	-0.5118	-0.3456	-0.7973
	(2.57)	*(3.63)*	*(2.98)*	*(0.88)*	*(3.35)*	*(1.91)*	*(1.37)*	*(3.57)*
Portland(OR)	0.2502	0.3068	-0.3000	0.0381	0.2404	-0.2578	-0.1118	-0.5927
	(11.49)	*(14.10)*	*(1.73)*	*(0.18)*	*(9.11)*	*(1.05)*	*(0.48)*	*(2.80)*
San Francisco	0.1012	0.1261	-0.5088	-0.2612	0.1417	-0.5616	-0.3982	-0.9214
	(5.38)	*(7.10)*	*(2.67)*	*(1.07)*	*(5.67)*	*(1.94)*	*(1.46)*	*(3.69)*
Washington	0.0647	0.1402	-0.5058	-0.2439	0.0429	-0.5920	-0.4649	-0.8894
	(2.32)	*(6.11)*	*(2.72)*	*(1.06)*	*(0.98)*	*(2.11)*	*(1.78)*	*(3.73)*
R Squared	0.9358	0.9402	0.9072	0.9471	0.9123	0.9534	0.9614	0.9293
R Bar Squared	0.9227	0.9280	0.8915	0.9338	0.8925	0.9382	0.9477	0.9134
Observations	66	66	77	66	77	66	66	77

t values in parentheses, italics

Dependent Variable: Log, Single Family Demolitions
Fifteen cities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%chg POP(-1)	0.1795			0.0784			0.8807	
	(4.17)			*(2.03)*			*(2.14)*	
%chg EMP(-1)		0.0554						
		(4.62)						
Log Emp								1.2816
								(4.29)
Log REN			2.9195	1.8712		2.0881		0.8577
			(5.98)	*(2.72)*		*(2.43)*		*(1.40)*
Log YPK(-1)				1.9558		1.5481	1.2874	
				(4.22)		*(2.75)*	*(2.28)*	
Log CSF					0.1506	0.0835	0.0964	
					(1.79)	*(0.90)*	*(1.06)*	
Log CMF					0.0095	0.0153	0.0083	
					(0.15)	*(0.23)*	*(0.13)*	
Log KOB					-0.1828	-0.1412	-0.1530	-0.1279
					(3.28)	*(2.38)*	*(2.61)*	*(2.49)*
Log KRT					0.2635	0.0588	0.0690	0.1071
					(4.20)	*(0.75)*	*(0.90)*	*(1.71)*
Anaheim	5.8944	6.0375	6.0974	-13.0990	4.0917	-8.7559	-6.3972	-2.2900
	(42.17)	*(51.34)*	*(61.76)*	*(2.92)*	*(5.17)*	*(1.60)*	*(1.17)*	*(1.10)*
Cincinnati	5.3442	5.2927	5.2935	-13.2435	3.2364	-9.2444	-6.8287	-2.6629
	(48.63)	*(48.02)*	*(54.33)*	*(3.02)*	*(4.52)*	*(1.75)*	*(1.29)*	*(1.38)*
Cleveland	6.0091	5.9180	5.8752	-12.7981	4.0284	-8.6650	-6.1540	-2.3992
	(54.75)	*(55.12)*	*(61.18)*	*(2.88)*	*(5.55)*	*(1.61)*	*(1.14)*	*(1.17)*
Fort Lauderdale	4.7173	4.8360	5.1807	-13.9734	2.6780	-9.8186	-7.5116	-2.4801
	(34.28)	*(40.81)*	*(53.85)*	*(3.01)*	*(3.57)*	*(1.81)*	*(1.39)*	*(1.35)*
Los Angeles	8.0832	8.2887	8.1971	-10.6305	5.9446	-6.3634	-4.0155	-1.9069
	(61.78)	*(75.85)*	*(83.03)*	*(2.41)*	*(6.82)*	*(1.18)*	*(0.75)*	*(0.77)*
Miami	5.8149	5.9723	6.1990	-12.5283	3.8442	-8.4442	-6.1428	-2.1633
	(46.02)	*(54.36)*	*(64.43)*	*(2.85)*	*(5.11)*	*(1.58)*	*(1.15)*	*(1.07)*
Milwaukee	5.0284	4.9893	4.9565	-13.7507	3.0197	9.6998	-7.2318	-3.0690
	(46.18)	*(46.16)*	*(51.04)*	*(3.11)*	*(4.30)*	*(1.82)*	*(1.35)*	*(1.58)*
Nassau-Suffolk	5.2273	5.1050	5.1667	-13.8801	2.8030	-9.9054	-7.4192	-3.5631
	(48.06)	*(45.92)*	*(53.69)*	*(3.08)*	*(3.91)*	*(1.84)*	*(1.38)*	*(1.73)*
Oxnard	4.1396	4.3150	4.3695	-14.4890	2.4941	-10.3062	8.0320	-2.0145
	(27.72)	*(35.88)*	*(44.26)*	*(3.29)*	*(3.73)*	*(1.93)*	*(1.51)*	*(1.27)*
Philadelphia	6.1772	6.1598	6.1357	-12.5833	3.9531	-8.5247	-6.0897	-3.2131
	(56.16)	*(56.60)*	*(62.16)*	*(2.86)*	*(5.06)*	*(1.60)*	*(1.16)*	*(1.42)*
Riverside-S.B.	5.1254	5.7229	5.8715	-12.9232	3.2761	-8.7947	-6.8185	-1.9519
	(21.34)	*(45.82)*	*(59.47)*	*(2.99)*	*(4.22)*	*(1.69)*	*(1.31)*	*(1.04)*
San Diego	5.3296	5.6070	5.6498	-13.1334	3.5174	-8.8961	-6.6816	-2.4687
	(31.96)	*(46.70)*	*(56.64)*	*(3.00)*	*(4.44)*	*(1.67)*	*(1.26)*	*(1.23)*
Seattle	5.3275	5.4783	5.5479	-13.4673	3.4277	-9.1770	-6.8380	-2.7239
	(39.03)	*(47.60)*	*(57.27)*	*(3.02)*	*(4.33)*	*(1.69)*	*(1.26)*	*(1.33)*
St. Louis	6.1705	6.1436	6.1309	-12.5520	3.9887	-8.4957	6.0597	-2.4477
	(56.21)	*(56.39)*	*(63.46)*	*(2.84)*	*(5.26)*	*(1.59)*	*(1.13)*	*(1.17)*
Wilmington	4.0666	4.0966	4.1005	-14.6488	2.3768	-10.5182	-8.1283	-2.6137
	(34.49)	*(36.36)*	*(41.54)*	*(3.33)*	*(3.60)*	*(1.98)*	*(1.53)*	*(1.56)*
R Squared	0.9030	0.9057	0.9149	0.9932	0.9216	0.9346	0.9376	0.9352
R Bar Squared	0.8907	0.8938	0.9054	0.9235	0.9108	0.9232	0.9260	0.9263
Observations	135	135	150	135	150	135	135	150

t values in parentheses, italics

Dependent Variable: Log, Single Family Demolitions
Eleven cities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%chg POP(−1)	0.1595			0.1729			0.1644	
	(2.12)			*(2.22)*			*(1.86)*	
%chg EMP(−1)		−0.0464						
		(1.79)						
Log EMP								2.8272
								(3.09)
Log REN			6.1112	1.1183		2.9295	2.2862	3.2665
			(4.63)	*(0.71)*		*(1.19)*	*(0.99)*	*(1.81)*
Log YPK(−1)				3.0818		2.5835	2.7752	
				(3.76)		*(2.11)*	*(2.41)*	
Log CSF					0.2136	0.2688	0.0241	
					(0.80)	*(1.23)*	*(0.10)*	
Log CMF					−0.0050	0.0393	−0.0887	
					(0.05)	*(0.36)*	*(0.76)*	
Log KOB					−0.2286	−0.0702	−0.0358	−0.0693
					(2.15)	*(0.75)*	*(0.35)*	*(0.89)*
Log KRT					0.2840	−0.1520	0.1033	0.0825
					(1.86)	*(1.04)*	*(0.74)*	*(0.62)*
Atlanta	5.5824	6.3133	5.5839	−24.1166	3.2430	−19.2102	−21.4729	−14.7470
	(20.53)	*(35.01)*	*(33.06)*	*(3.05)*	*(1.43)*	*(1.44)*	*(1.74)*	*(2.01)*
Baltimore	4.7827	5.0815	4.1916	−24.9898	2.1590	−20.4433	−22.5984	−15.4613
	(31.93)	*(33.48)*	*(24.98)*	*(3.17)*	*(1.02)*	*(1.55)*	*(1.84)*	*(2.19)*
Chicago	6.6302	6.7757	6.1533	−23.1820	4.0888	−18.6032	−20.5584	−16.4200
	(51.24)	*(44.81)*	*(37.30)*	*(2.94)*	*(1.89)*	*(1.39)*	*(1.65)*	*(2.05)*
Denver	4.8458	5.0211	5.1727	−24.9065	2.4052	−20.0113	−22.2249	−14.0426
	(34.52)	*(37.22)*	*(35.61)*	*(3.13)*	*(1.20)*	*(1.50)*	*(1.79)*	*(2.04)*
Detroit	7.7745	7.9526	7.3607	−21.9743	5.2016	−17.4400	−19.3012	−13.8639
	(59.87)	*(50.88)*	*(46.03)*	*(2.79)*	*(2.47)*	*(1.31)*	*(1.56)*	*(1.83)*
Kansas City	6.1349	6.4851	5.9889	−23.4083	3.7194	−18.7055	−20.7866	−12.7151
	(38.65)	*(41.39)*	*(39.45)*	*(2.98)*	*(1.87)*	*(1.43)*	*(1.71)*	*(1.90)*
Minneapolis	5.7256	6.1434	5.6313	−24.1765	3.3830	−19.4001	−21.4630	−14.5744
	(32.49)	*(38.54)*	*(36.95)*	*(3.04)*	*(1.60)*	*(1.45)*	*(1.73)*	*(2.01)*
New York	6.0156	6.1349	5.6058	−23.8961	3.9850	−19.2191	−21.1171	−17.7436
	(45.54)	*(45.34)*	*(34.73)*	*(3.02)*	*(2.10)*	*(1.45)*	*(1.71)*	*(2.15)*
Portland(OR)	5.5064	5.9514	5.5947	−23.9164	3.4040	−19.1216	−21.1765	−12.3814
	(34.65)	*(35.42)*	*(39.45)*	*(3.05)*	*(1.80)*	*(1.46)*	*(1.74)*	*(1.92)*
San Francisco	5.0542	5.2343	4.4242	−25.7748	3.2925	−20.8405	−22.9881	−14.6224
	(36.44)	*(38.18)*	*(21.41)*	*(3.17)*	*(1.83)*	*(1.56)*	*(1.84)*	*(2.14)*
Washington	5.5705	6.1230	5.3135	−24.7937	3.2564	−19.9329	−22.0912	−16.0935
	(27.15)	*(34.58)*	*(29.08)*	*(3.08)*	*(1.42)*	*(1.47)*	*(1.76)*	*(2.09)*
R Squared	0.8827	0.8801	0.8548	0.9123	0.8379	0.9081	0.8914	0.8819
R Bar Squared	0.8588	0.8556	0.8302	0.8904	0.8012	0.8782	0.8601	0.8852
Observations	66	66	77	66	77	66	77	77

t values in parentheses, italics