Poverty Trap or Housing Trap?
Migration from Appalachia and the Role of Homeownership

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Abstract: The Appalachian region is characterized by low wages, high unemployment, high poverty and few economic opportunities. Theory would suggest that outmigration would be higher in the region. We use decennial census data to document that interstate migration has been lower in this region from 1960-2000 compared to the rest of the country. We also document higher homeownership rates in Appalachia than in the rest of the country. Our models demonstrate that homeownership in general is associated with lower migration, that this effect is stronger in Appalachia than the rest of the country, and that it accounts for a large portion of the differential in migration rates between Appalachia and the rest of the country. We speculate that homeowners in Appalachia experience 'housing lock.' The lower property rates combined with poor ownership documentation make converting the asset costly. The stream of utility from the asset is high. The results suggest that the lower outmigration may not be a problem.

1. Introduction

In 1964, President Johnson launched the "War on Poverty" from Inez, Kentucky, a small town deep within Appalachia. The war on poverty lead to the 1965 Appalachian Regional Development Act which created the Appalachian Regional Commission (ARC). The persistent poverty in the region has been identified and discussed by many anuthors (Caudill, 1962; Harrington, 1962; Duncan, 1999; Easterly, 2001; Eller, 2008). Many of these same authors have posited a 'poverty trap' where culture and a lack of resources combine to prevent individuals in the region from escaping poverty (see also Billings, 1974; Durlauf, 2010). Appalachia as a region contains 116 counties which have poverty rates at least 1.5 times the national average and have had this distinction for decades. Incomes in Appalachia lag behind those of the rest of the country with high school graduates typically earning 10% less than in the rest of the nation. Education rates also lag behind the rest of the country, with higher rates of high school drop outs and lower rates of college completion (Haga, 2004). Unemployment rates in the region are among the highest in the nation and the labor force participation rates are among the lowest.

In spite of the lower earnings, fewer jobs, higher poverty and the general lack of opportunities in the region, migration both within the region and out of the region is demonstrably lower. Using data from the 2000 Decennial Census we find that 65% of residents of Appalachia in 1995 were still in the same house in 2000. In contrast, that rate is 57% for households outside of Appalachia. More tellingly, 5.6% of residents of Appalachia in 1995 moved to a new state by 2000, while 8% of households in the rest of the country made inter-state moves. Economic theory suggests that Appalachian residents, faced with fewer opportunities and lower wages, would migrate out of the region toward areas with better economic conditions.

While populations in Appalachia have declined, the data show that migration rates are lower in Appalachia, rather than higher.

A number of possible explanations for lower migration exists. Certainly the lower educational attainment in Appalachia contributes to the differential. Many authors (See Greenwood, 2001, for a survey) have established that more education reduces costs of migration. However, as we will show below, even in models with controls for education, race, family structure, and age, residents of Appalachia in 1990 and 2000 are 6.8% and 6.3% less likely to move than their non-Appalachian counterparts. The difference in 1970 and 1980 is somewhat smaller at 3% and 1.2% respectively.

One major difference between Appalachia and non-Appalachia which has received little attention is the rate of homeownership. Perhaps surprisingly, homeownership is higher in Appalachia than the rest of the country. Although initially in our 1970, slightly more non-Appalachians owned homes (61.8%) compared to their Appalachian counterparts (59.%), by 1980, a nine percentage point difference had emerged, with 73% of Appalachians owning their own home, while only 64% of non-Appalachians do. This changes little in the following 20 years, where data from the 2000 Decennial Census, show that overall homeownership in Appalachia is 72.4%, while it is only 65.7% in the full sample. More importantly to the results here, only 23% of non-Appalachians own their own home 'free and clear,' while fully 32% of Appalachians report homeownership of this type. Mortgages are only slightly less common in Appalachia with a rate of 43% compared to the rest of the U.S. at a rate of 45%. While 30% of non-Appalachians rent their home, only 22% of Appalachians do.

We use data from the Decennial Censuses of 1970 through 2000 to examine the role of homeownership in migration from Appalachia. The research provides evidence that in general, homeownership reduces the likelihood of moving, and is particularly strong for residents of Appalachia. Indeed, the 5.5% lower migration rates in Appalachia for 2000 drop to 1.7% when homeownership variables are included in the regression. The results are preliminary and substantial econometric issues are still to be resolved. Further, an important question they raise is why? Why do Appalachian residents own their own home at such high rates and why does this homeownership lock them to the region differentially?

2. Data

Our data derive from the Decennial Census data. We use data from 1970 through 2000. We have chosen to focus on historical data during this period, as migration should have been the strongest. We would prefer to include 1960 Decennial data, however these data do not contain information on the state of residence prior to the move. We also note that the period around 2010 (when American Community Survey data could be used) was coincident with the housing bubble collapse, a severe recession and is confounded by important demographic changes including the aging of the population. Future drafts will attempt to address these issues.

We focus on the head of the household as identified in the survey. We recognize this approach ignores the complexity of intra-household bargaining. We also limit the sample to heads of household between ages 18 and 65. For the purposes of this study we define an individual as living in Appalachia using the current county definition of Appalachia as provided by the Appalachian Regional Commission (see http://www.arc.gov/counties). Within our data,

we observe both current (census year) and 5 years prior to current year status (in 1970, we do not observe PUMA for location five years prior and must rely only a state of residence).

Tables one through four present basic sample statistic for each of the four decennial years. We examine the full sample and the sample of individuals living in Appalachia five years prior to the decennial year. Comparison demonstrates some differences between the national sample and the Appalachian sample: Appalachian residents tend to be less likely to be African American, less well educated, and have lower family incomes. All of which have been extensively documented in the literature. The 1970 sample is less clear, with higher rates of African Americans, slightly higher incomes, and other anomalies. This suggests that using state of residence may be cause significant problems. We also note that (again with the exception of 1970), the value of the houses in Appalachia are lower than in the full sample. Indicating lower property values, a result which is unsurprising, but generally not documented in the literature.

Table five presents homeownership rates by year for both the full sample and Appalachia. Prior to 1990, we can only identify homeownership broadly. Beginning in 1990, we can identify whether the home was owned outright, or being purchased with a mortgage. We construct a variable in 1990 and 2000 combining the two in order to compare results to 1970 and 1980. Again, with the exception of 1970, the overall homeownership rate in Appalachia is approximately eight percentage points higher than the full sample. In 1990 and 2000 we can compare mortgage. In both years, the rate at which householders held mortgages on their home was approximately the same between the two samples, but the rate of outright home ownership with no mortgage was approximately eight to ten percentage points higher. At least for the last two decennial years, we see that living in Appalachia is associated with higher outright

homeownership. This is an important point here, by owning the home outright, individuals have

an asset that generates a stream of income in the form of housing but has significantly lower

value than housing elsewhere. This makes this asset non-transportable.

Table six presents our indicators for moving. We focus on two here, any move and a

move out of state. We also present movement out of Appalachia for the Appalachian sample.

In general movement within state is far more common than interstate moves. In both 1970, and

in 1980, we do note that Appalachian residents are slightly more likely to make interstate moves

than the rest of the country, but slightly less likely to make intrastate moves.   By 1990 and 2000,

however, the likelihood of any move for Appalachian residents is consistently lower than the rest

of the country. The move out of Appalachia indicator is slightly higher than the interstate move.

In most states, an intra-state move will accomplish a move out of Appalachia (only West

Virginia requires an interstate move).

3. Empirical Model and Results

We estimate simple linear probability models.   We present results for a number of

different measures of migration. The simplest is any move from the prior residence, the second

is an inter-state move.   Our main variables of interest are coefficients on whether the family

owns their own house. As noted above, in later years, ownership takes two forms: owned free

and clear and being purchased with a mortgage.

We compare models of moving between the two groups using Oaxaca-Blinder

decompositions.   This allows us to break down the differences into differences due to

homeownership rates, and differences due to differential response. While we find evidence that

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the primary difference is due to differences in homeownership rates, Appalachians appear also to be more sensitive to ownership.

We then examine a model for moving out of Appalachia for only those living in Appalachia five years ago. These models cannot answer the question of whether Appalachians are more or less likely to move, but do shed light on a major factor reducing mobility. In particular we note that the largest impact on mobility (as noted in previous literature) is attaining higher education. However, nearly as large, and offsetting, is homeownership.

Finally, in the robustness section we examine the fact that our measure of homeownership is not accurate for those who move as it measures the status in the decennial year. We provide some evidence that homeownership is highly correlated before and after a move, we acknowledge that this is a concern. As is the case in most measurement error models, this should reduce the coefficient (and its explanatory power). In order to address this, we use an IV type approach, predicting homeownership for those who move. Our results are consistent with the previous results, although the IV estimates in general have larger magnitudes and a larger reduction in the coefficient on Appalachia five years ago. However, in the "move out" regressions for Appalachians only, the results are smaller. Most likely due to the fact that the homeownership model was estimated on the full sample.

All regressions include age and age squared, gender, race, education (represented by four indicators for categories less than high school, high school, some college, four year degree, more than a four year degree), number of children, number of children less than five, household size (total number of people), and marital status. The coefficients on most of these variables are qualitatively stable across years and specifications and are available from the author upon

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request. Migration is decreasing (at a decreasing rate) in age of the householder. African American headed households are less likely to migrate than their white counterparts, while other races are more likely to migrate than their white counterparts. As one might expect, migration is positively associated with educational attainment. In some specifications, the coefficient on less than high school was positive, indicating that those with the least education were more likely to move than those with a high school degree. However, the coefficient is small (around 1% differential), and in most specifications has the expected negative sign.

The coefficients on family size and the number of children (both total and less than five) were typically significant, but changed signs between some specifications. Typically, different years had different patterns. In 1990 and 2000, the coefficients on number of children and household size, were both negative, while the coefficient on number of children less than five was positive. In 1980, that pattern held for any move, but the signs on the number of children and number of children less than five flipped for the interstate move model. In 1970, the pattern held for the any move, but coefficients on both number of children and number of children under five were positive for the interstate move specification.

A. Specifications for home ownership.

Table seven presents the coefficients of interest for our specification where the dependent variable indicates that the individual moved within the five years prior to the decennial survey. This would include moves within the same city or county, as well as interstate moves. In the first column only the indicator for living in Appalachia (prior to the move). In all four years, the coefficient is negative, although the magnitude varies. It is the smallest in 1980, at only -1.2% lower migration that period for Appalachia. It in 1970 we find a 3% lower migration rate in

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Appalachia. In both 1990 and 2000, the migration rate is over 6% (6.8 and 6.3) lower in Appalachia than the rest of the country.

In columns two and three we add a simple measure of homeownership and the measure interacted with the Appalachian indicator. In all years except 1970, the magnitude of the negative coefficient on Appalachia drops substantially both economically and statistically. In all specifications, the coefficient on homeownership is negative and statistically significant: homeowners are less likely to move than their renting counterparts. Indeed, in most years, homeownership reduces migration by over 20 percent. In 1980, the coefficient is smaller, at only 9%, but still economically and statistically significant.

When the interaction between Appalachia and homeownership is added, we find that the coefficient on the interaction is negative in all years except 1970. We remind the reader again, that identifying Appalachian residence in the 1970 data was crude and thus, these results are particularly suspect. In other years the interaction term is negative and statistically significant, indicating that the impact of homeownership on migration for Appalachians is higher than on individuals living in the rest of the country. Thus homeownership has double impact in Appalachia, it is higher in Appalachia, reducing the overall rate, and has a higher reduction in the rate itself. Much of the differential in migration is explained by homeownership.

In table eight we present estimates for the model of interstate move. The dependent variable is a 1 only if the family moved between two states. In 1990 and 2000 we see the same pattern emerge as did with the first specification: in general Appalachians are less likely to move than their non-Appalachian counterparts. As before, the inclusion of the homeownership variables reduces the effect. The interaction between Appalachian residence and homeownership

also has a negative coefficient, indicating that homeownership impacts Appalachians differentially. Again, much of the differential in migration rates is explained by homeownership.

In 1980, the initial coefficient on the Appalachian indicator is positive, showing that in that period, Appalachians were more likely to make interstate moves than their non-Appalachian counterparts. Including the homeownership and interaction terms increases that coefficient, which is the same pattern as in 1990 and 2000: failing to include homeownership understates migration rates of Appalachians compared to non-Appalachians. Like 1990 and 2000, the coefficients on homeownership and the interaction are negative, although much smaller in magnitude (echoing the results in table 3).

In 1970, we again find some odd results. The coefficient on Appalachia is positive and represents, similar to 1980, a 2% higher migration rate than the rest of the country.   Like the specifications in other years, the coefficient on homeownership is negative. However, the coefficient on the interaction is slightly positive but both statistically and economically (0.1%) insignificant.

B. Models differentiating types of homeownership

In 1990 and 2000 the decennial census split up homeownership by mortgaged or owned free and clear. Table nine presents results with the more detailed measure of homeownership. We first note that with the exception of the interstate move specification for 1990, the coefficient on ownhome, indicating ownership without any mortgage, is both economically and statistically significantly larger than the coefficient on the ownmort variable indicating home ownership with a mortgage. We interpret this difference to represent a housing lock type situation. In all cases,

homeownership reduces mobility, but the reduction is most pronounced for those who own without debt.

We next note that the coefficient on the interaction between ownership and Appalachia is negative and statistically significant in all specifications. We acknowledge that the small size, particularly in interstate move specification for the year 2000, is less convincing. However, we do point out the lower differentials in general.

C. Oaxaca-Blinder decompositions

We performed an Oaxaca-Blinder decomposition to examine both the role of endowments (levels of X variables) and the differences in coefficients between Appalachia and the rest of the U.S. Because the results were clearer for 1990 and 2000 and because we can separate homeownership free and clear from owned with a mortgage, we focus on these two data sets. Future writing will add additional results. Tables 10 and 11 present the decomposition for the any move variable. We allowed all coefficients to differ between the two models. In general, endowment and coefficient differences were statistically significant. We provide the age differences, as these consistently had the largest differences of all other variables, with the exception of the ownership variables.. For most other variables, the differences were less than .005. As one might expect, education was an important component, but we do not present it for brevity. In table 10, the overall predicted difference was 9.1%. Over half, 5.4%, was attributed to differences in endowments. Endowment in homeownership 4.3% points of the overall 9.1%. The coefficient difference for ownership is 1% point. While much smaller, it is an order of magnitude larger than most other variables' coefficient (with the exception of age), and indicates that it contributes significantly to the overall difference. Similarly, in table 11, the predicted

difference was 7.9%, with homeownership endowment accounting for 3% and the coefficient explaining 0.8% (which is again, larger than nearly all other coefficient differences). We conclude from this that the high homeownership difference between Appalachia and non-Appalachia is responsible for explaining a large portion of the overall difference in migration. However, Appalachians also appear to be more sensitive to homeownership in a statistically and economically significant way. While it only explains about 1 of the 8 to 9 percentage point differences in the rate of moving the coefficient difference alone is responsible for more than education.

Table 12 has a nearly similar pattern for the interstate move models. We note that the overall difference is 2.8% with endowments explaining 2.7% and the home ownership endowment explaining 1.3%. The coefficients explain only 1.6%, but again the ownership coefficient explains more than most others at 0.4% of the total. Table 13 however, has a much less pronounced pattern. While the overall difference is 2.6%, and the endowments explain 2.3%, the home ownership endowment explains only 0.8%. It is still the largest single endowment, but a smaller portion compared to other tables. In the coefficients section, the total remains at 1.6% and the ownership has fallen to .2%. This remains large, but not as large as in other tables. We still conclude that home ownership, in particular when the ownership is "free and clear", is a large contributor to the differences in mobility between Appalachia and the rest of the country. Although the effect is primarily an endowment effect, it is important to note that Appalachians appear more responsive to ownership in their migration decision than non-Appalachians.

D. Models for Moving Out of Appalachia

The important question posed by the poverty trap and wage differential literature is why Appalachians fail to move out of Appalachia. As noted, this generally involves interstate moves, but in many states (for example Kentucky) can involve within state moves. We next turn to models for only those living in Appalachia five years prior to the decennial census, and examine the role of homeownership in moving out of Appalachia. Overall, as we saw in table six, approximately 8% of families exit Appalachia during the five years prior to the census (1980 is the exception with only 4.8%).

Table 14 presents the full set of estimates for the four decennial years, using the composite homeownership measure (owned or mortgaged). In every year, the coefficient was negative and statistically significant. In 1970, the coefficient implies that homeownership reduced movement out by 4.3% points. With a base of only 8% migration, this represents a large difference. Only education and race have a larger impact: Having a college degree raised migration by 8.5%. In 1990 and 2000, the coefficient is even larger at -11.3% and -9.7% respectively. Both of these are large, even relative to education (BA is 13.8% and 12.3%). Both are larger than the overall migration rates.

Table 15 examines 1990 and 2000 more closely, breaking up ownership into free and clear and mortgaged. As we have seen, ownership free and clear has a larger impact than a home being purchased through a mortgage. At -12.6% and -11.1%, this rivals the coefficients on a Bachelor's degree at 13.6% and 12.1%. Nearly offsetting them.

Homeownership clearly plays a crucial role in migration. It significantly reduces the rates of migration, particularly for Appalachian residents, and is a primary factor in migration out of Appalachia.

E. Instrumental Variables Estimation

Concern arises on two fronts for the homeownership variable. The first is that it may be endogenous to the migration decision. Selling a house and purchasing a new one in a different location involves high fixed costs, and these are well known. Individuals may choose to purchase a house when then have also concluded that they are unlikely to need or want to migrate any time soon. We might note, at least anecdotally, that this is less obvious given that many people do buy and sell houses throughout their lives: approximately 50% of the sample move in the five year windows, and that over 63% of the sample own homes (the senior author has witnessed high rates of home purchase among assistant professors, a group who have extremely high mobility within a 10 year window). This would tend to make the coefficient on homeownership larger in magnitude (biased downward). It may also suggest that individuals in Appalachia are less interested in migration.

Secondly, we note there is a mechanical issue in that homeownership can only be measured at the decennial year, and not at the point five years prior. Hence, our variable is measured with error. The error will tend to lead to a downward bias in the coefficient (see for example, Bollinger, 1996). This would offset the bias from preferences discussed above.

One approach to addressing both of these problems is to use instrumental variables. Instruments are typically difficult to find and this case is no exception. We have chosen to use three variables which we argue represent housing market conditions in the region: number of housing units (not apartments), number of realtors, and number of bank branches. We have collected these data for 2000 and 1995 (further data collection is planned). Our approach is the following. First we estimate homeownership regressions using data from the 2000 census and

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the instruments measured in 2000. We then predict homeownership using the data from 1995 for the instruments, and adjust other variables when possible (e.g. age and number of children). For individuals who move, we use the predicted homeownership value, while for those who do not, we use the actual. When interacting the variable with Appalachia, we estimate a separate model on only Appalachians (we have also tried the "forbidden regression" and found the results remarkably stable).

Table 16 presents results comparable to those in tables 7 and 9. We provide the baseline coefficient on Appalachia as reference. The OLS baseline demonstrates that Appalachians are 6% less likely to move than their non-Appalachian counterparts. As in previous results, the magnitude of the coefficient drops dramatically when the homeownership variables (now instrumented) are included. The coefficient on homeownership has risen dramatically. In tables 7 and 9, the coefficient was typically in the range of -23% for ownormort and -35% for owned free and clear. In table 16, the coefficients are -43% and -49% respectively. This suggests that the dominant factor was measurement error. Perhaps most important, the coefficient on the interaction between ownership and living in Appalachia has risen as well and driven the coefficient on Appalachia nearly to zero (-.6% and -.5%). Further testing is necessary, however we conclude that the results do support the conjecture that ownership is causal and that Appalachians are more sensitive to ownership than the rest of the country.

In table 17, we use the IV approach to estimate moving out of Appalachia on the sample of Appalachian residents. Here we find nearly identical results to the OLS results. However this still supports the basic result which is that homeownership reduces mobility.

IV. Conclusions

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The results here of course are preliminary and incomplete. However they paint an interesting picture. Appalachians are more likely to own homes, and particularly to own them free and clear. This fact appears to be a major factor in explaining lower migration (move) rates in the region than the rest of the country. The lower rates are of concern since lower wages and less economic opportunity in the region would predict actually higher rates. Many have argue for a poverty trap. We argue that it is more likely a housing trap.

We point to two additional facts, still needing development. The first is readily apparent in the sample means: the value of housing in Appalachia is much lower than in other parts of the country. This may prevent individuals from moving because the asset is not transportable. The family is receiving utility from the housing good, and potentially would receive comparable utility from a similar unit elsewhere. However, the cost of a similar unit is much higher elsewhere.

The second issue is one which is more difficult to document. Land ownership in Appalachia is legally something of a mess. While we have used the term "free and clear" above, it is a misnomer in many cases in Appalachia. Titles are frequently not clear, and while there are not many disputes, transfer of the title is often a challenge. This is often correlated with land which has been in families for many generations. Individuals who inherit land from parents and grandparents may be locked into staying there because they are "land rich" and "cash poor."

The policy implications are not clear. One possibility is that individuals in Appalachia simply gain high utility for living there and purchase houses. In which case, there is little reason to address this finding. Indeed, this may suggest that attempts to mitigate poverty in Appalachia are misguided, particularly if they are designed to help move people out of the region.

If, however, the "land rich" and "cash poor" situation is preventing full adjustment of labor markets, policies should be developed to reduce these issues.   The most obvious is to address the lack of clear title.   Other policies include loans or subsidized housing outside of the region for those with property in the region.

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Table 1: Descriptive Statistics, 1970 Sample

Variable	Full Sample	Appalachia
age	42.2	42.4
female	0.17	0.18
black	0.10	0.14
native	0.003	0.001
asian	0.01	0.00
otherrace	0.001	0.001
Less than H.S.	0.41	0.44
Some College	0.15	0.12
Bachelors	0.07	0.08
Bachelors plus	0.07	0.07
Number of Children	1.49	1.46
Children Under 5	0.31	0.31
Family Size	3.37	3.36
family Total Income	10511	10624
House Value	20217	20417
Primary Earnings	7006	7146
Married	0.76	0.75
Never Maried	0.08	0.08
n	509795	150796

Table 2: Descriptive Statistics, 1980 Sample

Variable	Full Sample	Appalachia
age	40.7	40.3
female	0.23	0.19
black	0.11	0.06
native	0.01	0.003
asian	0.01	0.01
otherrace	0.003	0.001
Less than H.S.	0.26	0.32
Some College	0.21	0.16
Bachelors	0.10	0.09
Bachelors plus	0.10	0.08
Number of Children	1.15	1.16
Children Under 5	0.23	0.25
Family Size	2.9	3.0
family Total Income	20994	18967
House Value	59156	46169
Primary Earnings	13297	12184
Married	0.66	0.72
Never Maried	0.14	0.11
n	3213524	297271

Table 3: Descriptive Statistics, 1990 Sample

Variable	Full Sample	Appalachia
age	41.5	42.1
female	0.27	0.24
black	0.10	0.06
native	0.01	0.003
asian	0.02	0.003
otherrace	0.03	0.001
Less than H.S.	0.19	0.25
Some College	0.21	0.16
Bachelors	0.15	0.11
Masters	0.06	0.04
Professional	0.03	0.02
Number of Children	1.06	1.04
Children Under 5	0.23	0.20
Family Size	2.81	2.80
family Total Income	105897	63139
House Value	39507	32936
Primary Earnings	23714	19715
Married	0.63	0.67
Never Maried	0.15	0.11
n	3528779	339005

Table 4: Descriptive Statistics, 2000 Sample

Variable	Full Sample	Appalachia
age	42.6	43.1
female	0.31	0.28
black	0.11	0.07
native	0.01	0.003
asian	0.03	0.01
otherrace	0.04	0.004
Less than H.S.	0.15	0.18
Some College	0.23	0.19
Bachelors	0.17	0.12
Masters	0.07	0.05
Professional	0.03	0.02
Number of Children	0.98	0.90
Children Under 5	0.20	0.18
Family Size	2.69	2.59
family Total Income	57274	47298
House Value	151092	99399
Primary Earnings	33804	27615
Married	0.58	0.61
Never Maried	0.19	0.15
n	4094107	386169

Table 5: Homeownership Rates

Sample	1970	1980	1990	2000
Full Sample				
Own or Mortgage	61.8	63.9	65.0	65.7
Own			15.6	13.8
Mortgaged			49.4	51.9
Appalachian Sample				
Own or Mortgage	59.0	73.2	72.0	72.4
Own			25.5	21.2
Mortgaged			46.4	51.2

All values are percentage.

Table 6: Migration Measure

Sample	1970	1980	1990	2000
Full Sample				
Move (any move)	47.9	26.7	50.8	48.8
MoveState (move to another state)	10.0	4.1	9.9	9.2
Appalachian Sample				
Move (any move)	45.3	34.6	42.5	41.6
Movestate (move to another state)	11.4	5.3	7.4	6.8
Moveout (move out of Appalachia)	8.0	4.8	8.5	8.6

Table 7: Any Move Specification

1970	move	move	move
appstate5yrago	-0.030	-0.037	-0.063
	(21.97)**	(27.54)**	(29.63)**
ownormort		-0.227	-0.241
		(155.23)**	(143.48)**
apphomeowner			0.044
			(16.12)**
R^2	0.21	0.25	0.25
N	509,795	509,795	509,795

1980	move	move	move
app5yrago	-0.012	-0.006	0.030
	(14.38)**	(6.96)**	(15.73)**
ownormort		-0.097	-0.093
		(157.04)**	(147.13)**
apphomeowner			-0.049
			(23.49)**
R^2	0.09	0.10	0.10
N	3,171,034	3,171,034	3,171,034

1990	move	move	move
app5yrago	-0.068	-0.056	-0.018
	(86.86)**	(73.83)**	(12.79)**
ownormort		-0.263	-0.258
		(455.66)**	(434.69)**
apphomeowner			-0.054
			(32.71)**
R^2	0.22	0.26	0.26
N	3,528,779	3,528,779	3,528,779

2000	move	move	move
app5yrago	-0.063	-0.051	-0.015
	(83.70)**	(70.28)**	(11.01)**
ownormort		-0.235	-0.230
		(429.95)**	(409.86)**
apphomeowner			-0.050
			(31.57)**
R^2	0.20	0.23	0.23
N	4,094,107	4,094,107	4,094,107

All regressions include age and age squared, gender, race, education (represented by four indicators for categories less than high school, high school, some college, four year degree, more than a four year degree), number of children, number of children less than five, household size (total number of people), and marital status. * $p<0.05$; ** $p<0.01$

Table 8: Interstate Move Specifications

1970	movestate	movestate	movestate
appstate5yrago	0.023	0.020	0.020
	(24.64)**	(22.22)**	(11.49)**
ownormort		-0.076	-0.077
		(75.47)**	(65.13)**
apphomeowner			0.001
			(0.35)
R^2	0.07	0.08	0.08
N	509,795	509,795	509,795

1980	movestate	movestate	movestate
app5yrago	0.017	0.019	0.052
	(37.05)**	(41.26)**	(42.63)**
ownormort		-0.030	-0.026
		(100.81)**	(88.05)**
apphomeowner			-0.046
			(35.40)**
R^2	0.02	0.02	0.02
N	3,171,034	3,171,034	3,171,034

1990	movestate	movestate	movestate
app5yrago	-0.020	-0.016	-0.010
	(43.12)**	(33.56)**	(8.37)**
ownormort		-0.101	-0.100
		(237.89)**	(227.33)**
apphomeowner			-0.008
			(6.04)**
R^2	0.04	0.06	0.06
N	3,528,779	3,528,779	3,528,779

2000	movestate	movestate	movestate
app5yrago	-0.020	-0.016	-0.013
	(46.45)**	(37.59)**	(12.22)**
ownormort		-0.080	-0.080
		(215.19)**	(206.09)**
apphomeowner			-0.004
			(3.33)**
R^2	0.04	0.05	0.05
N	4,094,107	4,094,107	4,094,107

All regressions include age and age squared, gender, race, education (represented by four indicators for categories less than high school, high school, some college, four year degree, more than a four year degree), number of children, number of children less than five, household size (total number of people), and marital status. . * $p<0.05$;   ** $p<0.01$

Table 9: Detailed Home Ownership Specifications

1990	move	move	move
app5yrago	-0.068	-0.047	-0.019
	(86.86)**	(61.86)**	(13.96)**
ownhome		-0.359	-0.355
		(459.59)**	(430.83)**
ownmort		-0.236	-0.232
		(396.85)**	(379.75)**
appown			-0.041
			(21.89)**
appmort			-0.037
			(20.55)**

2000	move	move	move
app5yrago	-0.063	-0.044	-0.016
	(83.70)**	(61.43)**	(11.97)**
ownhome		-0.332	-0.328
		(447.17)**	(419.03)**
ownmort		-0.210	-0.207
		(374.05)**	(357.09)**
appown			-0.039
			(20.57)**
appmort			-0.039
			(23.03)**

1990	movestate	movestate	movestate
app5yrago	-0.020	-0.015	-0.010
	(43.12)**	(32.70)**	(8.41)**
ownhome		-0.104	-0.103
		(220.89)**	(204.50)**
ownmort		-0.100	-0.100
		(227.20)**	(218.10)**
appown			-0.013
			(9.95)**
appmort			-0.004
			(3.17)**

2000	movestate	movestate	movestate
app5yrago	-0.020	-0.016	-0.013
	(46.45)**	(36.44)**	(12.30)**
ownhome		-0.087	-0.086
		(201.92)**	(188.49)**
ownmort		-0.078	-0.078
		(203.95)**	(195.74)**
appown			-0.005
			(3.96)**
appmort			-0.002
			(2.02)*

All regressions include age and age squared, gender, race, education (represented by four indicators for categories less than high school, high school, some college, four year degree, more than a four year degree), number of children, number of children less than five, household size (total number of people), and marital status. . * $p<0.05$; ** $p<0.01$

Table 10: Oaxaca-Blinder Decomposition (selected variables) 1990 Any Move

Differential	Prediction_US	0.516	1,845.21**
	Prediction_APP	0.425	500.77**
	Difference	0.091	101.89**
Endowments	age	0.030	29.52**
	age2	-0.022	28.81**
	ownhome	0.043	110.95**
	ownmort	-0.008	35.38**
	Total	0.054	57.57**
Coefficients	age	0.449	18.82**
	age2	-0.254	19.87**
	ownhome	0.010	16.00**
	ownmort	0.009	9.74**
	_cons	-0.164	13.93**
	Total	0.047	62.69**
Interaction	Total	-0.011	12.98**

Table 11: Oaxaca-Blinder Decomposition (selected variables) 2000 Any Move

Differential	Prediction_US	0.496	1,908.84**
	Prediction_APP	0.416	524.89**
	Difference	0.079	94.93**
Endowments	Age	0.023	25.97**
	age2	-0.017	26.69**
	ownhome	0.030	97.96**
	ownmort	-0.002	9.00**
	Total	0.046	60.51**
Coefficients	age	0.308	13.29**
	age2	-0.186	14.86**
	ownhome	0.008	15.91**
	ownmort	0.015	15.51**
	_cons	-0.087	7.64**
	Total	0.045	62.38**
Interaction	Total	-0.012	18.36**

Table 12: Oaxaca-Blinder Decomposition (selected variables) 1990 Interstate move

Differential	Prediction_US	0.102	601.83**
	Prediction_APP	0.074	164.41**
	Difference	0.028	58.57**
Endowments	age	0.007	21.50**
	age2	-0.006	19.04**
	ownhome	0.013	74.11**
	ownmort	-0.003	33.87**
	Total	0.027	52.86**
Coefficients	age	0.012	0.78
	age2	-0.020	2.57*
	ownhome	0.004	9.65**
	ownmort	0.001	1.62
	_cons	0.039	5.28**
	Total	0.016	34.20**
Interaction	Total	-0.015	29.65**

Table 13: Oaxaca-Blinder Decomposition (selected variables) 1990 Interstate move

Differential	Prediction_US	0.094	620.64**
	Prediction_APP	0.068	167.62**
	Difference	0.026	60.82**
Endowments	age	0.004	19.28**
	age2	-0.004	16.68**
	ownhome	0.008	64.07**
	ownmort	-0.001	8.97**
	Total	0.023	60.78**
Coefficients	age	-0.084	6.19**
	age2	0.025	3.41**
	ownhome	0.002	6.37**
	ownmort	0.002	3.53**
	_cons	0.088	13.26**
	Total	0.016	37.83**
Interaction	Total	-0.012	34.22**

Table 14: Moving Out of Appalachia (for only Appalachia 5 years ago sample)

coeff	1970	1980	1990	2000
age	-0.009	-0.002	-0.012	-0.012
	(18.10)**	(5.19)**	(35.80)**	(37.04)**
age2	0.000	0.000	0.000	0.000
	(11.92)**	(1.89)	(27.85)**	(27.41)**
retire	0.011	0.009	-0.007	0.004
	(2.55)*	(3.65)**	(2.56)*	(1.36)
female	-0.006	-0.004	-0.014	-0.006
	(2.27)*	(2.59)**	(10.11)**	(5.21)**
black	-0.024	0.055	-0.009	-0.004
	(11.27)**	(28.52)**	(4.24)**	(2.09)*
native	0.008	0.052	0.050	0.143
	(0.42)	(5.55)**	(5.91)**	(18.42)**
asian	0.011	0.159	0.183	0.231
	(0.81)	(19.19)**	(22.67)**	(40.16)**
otherrace	-0.034	0.068	0.142	0.149
	(1.33)	(3.48)**	(10.72)**	(21.23)**
lessthanhs	-0.015	-0.014	-0.016	-0.018
	(8.67)**	(14.41)**	(13.93)**	(14.55)**
somecoll	0.044	0.033	0.041	0.032
	(18.99)**	(25.96)**	(31.30)**	(27.80)**
college4yrs	0.085	0.084		
	(30.52)**	(50.55)**		
college5plus	0.105	0.106		
	(36.54)**	(60.65)**		
nchild	0.001	0.002	-0.011	-0.007
	(1.00)	(1.87)	(8.93)**	(5.99)**
NCHLT5	0.002	-0.004	-0.012	-0.008
	(1.37)	(3.96)**	(11.51)**	(7.70)**
famsize	-0.004	-0.007	-0.000	-0.004
	(3.45)**	(7.46)**	(0.13)	(3.46)**
married	0.014	0.006	0.010	0.012
	(4.42)**	(3.58)**	(5.76)**	(7.62)**
nevermarried	-0.004	0.026	0.021	0.018
	(1.13)	(13.78)**	(11.53)**	(11.44)**
bachelor			0.138	0.123
			(88.79)**	(88.89)**
master			0.123	0.127
			(51.17)**	(60.18)**
prof			0.134	0.140
			(42.79)**	(49.37)**
ownormort	**-0.043**	**-0.055**	**-0.113**	**-0.097**
	(27.46)**	**(53.31)****	**(98.69)****	**(88.67)****
_cons	0.340	0.138	0.450	0.441
	(33.43)**	(22.58)**	(63.28)**	(65.03)**

Table 15: Moving Out of Appalachia (for only Appalachia 5 years ago sample)

coef	1990	2000
age	-0.013	-0.012
	(37.20)**	(38.33)**
age2	0.000	0.000
	(29.70)**	(29.12)**
retire	-0.007	0.004
	(2.67)**	(1.46)
female	-0.013	-0.006
	(9.77)**	(5.05)**
black	-0.010	-0.005
	(4.75)**	(2.64)**
native	0.050	0.143
	(5.93)**	(18.45)**
asian	0.182	0.231
	(22.59)**	(40.12)**
otherrace	0.141	0.149
	(10.65)**	(21.17)**
lessthanhs	-0.015	-0.017
	(13.20)**	(13.90)**
somecoll	0.040	0.031
	(30.38)**	(26.91)**
bachelor	0.136	0.121
	(87.13)**	(87.41)**
master	0.120	0.125
	(50.11)**	(59.18)**
prof	0.132	0.138
	(41.82)**	(48.55)**
nchild	-0.011	-0.007
	(9.08)**	(6.05)**
NCHLT5	-0.012	-0.008
	(11.51)**	(7.74)**
famsize	-0.000	-0.004
	(0.26)	(3.74)**
married	0.010	0.011
	(5.67)**	(7.32)**
nevermarried	0.022	0.019
	(12.27)**	(12.21)**
ownhome	**-0.126**	**-0.111**
	(89.78)**	**(81.57)****
ownmort	**-0.107**	**-0.091**
	(88.40)**	**(79.63)****
_cons	0.458	0.448
	(64.24)**	(65.95)**

Table 16: Instrumental Variables Specifications Full Sample (2000 only)

	baseline	IV	IV	IV inter	IV inter
app5yrago	-0.061	-0.039	-0.034	-0.006	-0.005
	(79.96)**	(53.33)**	(46.13)**	(3.74)**	(2.96)**
ownormortp		-0.431		-0.427	
		(536.77)**		(519.31)**	
ownp			-0.489		-0.486
			(500.34)**		(477.15)**
mortp			-0.407		-0.404
			(489.09)**		(472.71)**
ownormortpapp				-0.046	
				(21.72)**	
ownpapp					-0.032
					(12.58)**
mortpapp					-0.044
					(19.62)**

All regressions include age and age squared, gender, race, education (represented by four indicators for categories less than high school, high school, some college, four year degree, more than a four year degree), number of children, number of children less than five, household size (total number of people), and marital status. . Ownnership is actual ownership for those who have not moved in the last five years. An ownership model was estimated using 2000 values and number of realtors, housing units, and bank branches as instruments. The status was predicted using 1995 values, and that prediction was used only for those who moved. * $p<0.05$; ** $p<0.01$

Table 17: Instrumental Variables Specifications Move Out Sample (2000 only)

coeff	OLS	IV
ownhome	-0.111	
	(81.20)**	
ownmort	-0.090	
	(79.11)**	
ownpapp		-0.116
		(62.72)**
mortpapp		-0.088
		(50.63)**

All regressions include age and age squared, gender, race, education (represented by four indicators for categories less than high school, high school, some college, four year degree, more than a four year degree), number of children, number of children less than five, household size (total number of people), and marital status. . Ownnership is actual ownership for those who have not moved in the last five years. An ownership model was estimated using 2000 values and number of realtors, housing units, and bank branches as instruments. The status was predicted using 1995 values, and that prediction was used only for those who moved. * $p<0.05$; ** $p<0.01$