Are Demographic Forces Generating an Urban Revival?: American Cities, 1950-2006

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Abstract: The share of metropolitan residents living in the central city has declined continuously since 1950. We show that, if not for a series of demographic factors – notably renewed immigration, a falling share of households with children and a reduction in the number of veterans, many of whom have access to housing benefits – cities would have contracted even further. We provide causal estimates of the relationship between the presence of children or veteran status and living in the central city, relying variously on the occurrence of twins or comparisons between birth cohorts coming of age during and after the mass mobilization for World War II. We conclude that demographic trends were only strong enough to stanch the flow of population from cities, not to generate an urban revival.

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I. Introduction

Over the past decade, the popular press has declared that, after fifty years of suburbanization, Americans are returning to central cities. This urban revival is often attributed to demographic forces, principally the delay of marriage and child rearing and the aging of the baby boom generation. The proposed connection between demographic patterns and urban revival, while frequently offered as conventional wisdom, has yet to be scrutinized by scholars. This paper asks whether Americans have indeed been eschewing suburbs for urban living and, if so, whether this shift was driven in part by demography. We consider the role of immigration, changes in household structure, the lifecycle of the Baby Boom cohort, and the aging out of the Greatest Generation, many of whom had access to veterans' benefits that favored suburban home ownership. To place these demographic trends into historical context, we use decadal Census data from 1950 to 2000, supplemented with the 2006 American Community Survey.

A typical example of the journalistic emphasis on urban revival is Christopher Leinberger's (2008) statement in *The Atlantic Monthly*: "For 60 years, Americans have pushed steadily into the suburbs, transforming the landscape and (until recently) leaving cities behind. But today the pendulum is swinging back toward urban living." This return to the city is frequently ascribed to demography. Writing in *The New Republic*, Alan Ehrenhalt (2008) lists the "increased propensity to remain single, the rise of cohabitation, the much later age at first marriage for those who do marry, the smaller size of families for those who have children, and at the other end, the rapidly growing number of healthy and active adults in their sixties, seventies and eighties" as forces that pull the population toward "central cities over distant suburbs."

Unlike the popular accounts, we find no evidence of a recent urban revival. Outside of a few large coastal areas, the outflow from cities and the corresponding growth of the suburbs has

continued through 2006 (see also Rappaport, 2003). Indeed, the share of metropolitan residents living in the central city declined at a similar pace in every decade since 1950. However, we do find that, if not for a series of demographic factors, the number of city residents *would have declined even further*. Together, these forces were only strong enough to stanch the flow of population out of cities, not to reverse it.

Our analysis proceeds in two steps. First, we model the determinants of living in the central city, conditional on residing in a metropolitan area. The foreign born are more likely to live in central cities, as are households without children, while veterans are more likely to live in the suburbs, perhaps because of access to housing benefits in the form of favorable mortgage terms. The relationship between city residence and the number of children in a household is not linear; rather, the probability of living in the city declines with the first child and again with the second but does not respond to adding subsequent children to the household.

Both having children and being a veteran may be associated with individual characteristics – for example, family income – that may otherwise be correlated with the probability of living in the suburbs. We employ instrumental variables to estimate the causal effect of having an additional child or serving in the military on place of residence. In particular, we instrument for family size with the occurrence of twins on either the first or the second birth (Angrist and Evans, 1998). To instrument for military service, we compare birth cohorts who came of age during and just after the mass mobilization for World War II (Page, 2008). For example, white, native-born men who were born in 1927 had an 83 percent chance of being a veteran and a 79 percent chance of having served in World War II, whereas men who were born two years later had only a 70 percent of being a veteran and a 16 percent chance of participating in World War II.

Our IV estimates suggest that the causal effect of military service or having a second child is larger than the basic correlations would suggest. In other words, in comparing our OLS and IV estimates, it appears that both veterans and large families are selected on attributes, such as low socio-economic status, that are positively correlated with living in the central city. This pattern is consistent with the availability of draft deferments for the highly-skilled who were attending college or were employed in essential war industry.

In our second step, we use the estimated determinants of living in the central city to consider a series of demographic counterfactuals. Between 1950 and 2000, the share of metropolitan residents who lived in the central city declined from 51 percent to 34 percent. Overall, we find that, absent these demographic forces, the city share would have declined by an additional 6 percentage points (8 percentage points if we use our IV estimates instead). In order of quantitative importance, city population was bolstered by a growth in immigration, the aging out of cohorts who served in World War II, and an increase in childless households. The increase in the share of household heads who were born abroad added 3 percentage points to the city share of metropolitan residents. A reduction in the share of household heads who had served in the military contributed another 1.5 points to the city share. Finally, a reduction in the share of households with at least one child under the age of 18 added 1.2 points to the city share.

Interestingly, we find little evidence that life-cycle mobility of the large Baby Boom cohort from the city to the suburb (and back again) has had a quantitatively meaningful effect on residential patterns. Boomers moved to cities in their twenties and retreated to suburbs in their thirties and forties, but despite the cohort's size, these swings were only large enough to shift the urban share by a few tenths of a percentage point. This finding reinforces Nelson (1988) and

Frey (1993)'s conclusion that hopes for "boomer-initiated 'gentrification'" in the 1970s – and today – are misplaced.

II. Is there a "return to the city"?

Figure 1 documents trends in city and suburban growth from 1950 to 2006. Over the second half of the twentieth century, the share of metropolitan residents who lived in the central city fell from 56 percent to 32 percent. In the 1950s and 1960s, the relative decline in city population was driven by high suburban growth rates. While total city population grew a respectable 8-10 percent each decade, the suburbs grew at the phenomenal rate of 35-50 percent.

The aggregate patterns show no evidence of an urban revival in the 1990s or 2000s. With the exception of the 1970s, an outlier decade in which cities actually lost population, cities have experienced steady population growth of between four and eight percent in each decade since the 1960s. If urban revival is defined not only as high population growth in central cities, but as faster growth in cities *relative* to suburbs, we still little evidence of this trend in the recent data. Cities continue to grow slower than their surrounding suburbs in the early 2000s.

We are not the first scholars to point out that there is little empirical basis for the notion of a recent urban revival. Rappaport (2003) documents that, with the exception of a few large, coastal cities such as New York, Boston and San Francisco, urban areas did not experience a reversal of fortunes in the past decade; rather, most cities either grew continuously or declined continuously since 1950. Mirroring broader regional trends, cities in the North and East have declined since 1950, while cities in the South and West have expanded. However, even in the boomtowns of the South and West, central cities lagged behind their suburbs throughout the period.

Birch (2005) qualifies these findings by noting that many downtown areas, which historically have been centers of employment with little residential development, experienced population growth in the 1990s. She reports that the average downtown grew by 13 percent in the 1990s – faster than the rest of the central city and the typical suburban area. However, by Birch's definition, the downtown core consists of a few Census tracts in each metropolitan area and, therefore, cannot be taken as a bellwether of general urban health.

While we find no evidence of a recent urban revival, we argue in this paper that demographic forces have prevented cities from declining more than they otherwise would have. There is a small literature on the relationship between demographic trends and residential location. Many scholars have noted the connection between immigration and city growth. The foreign born are more likely to live in central cities and have arrived in large enough numbers since 1965 to replace much native out-migration from central cities, thereby buttressing city population (Martin and Midgley, 2003; Singer, 2004; Frey, 2005).

While journalists have speculated that the aging of the baby boom generation will lead masses of retired couples to return to cities, demographers have been more skeptical. Frey (2007), for example, argues that seniors are more likely to "age in place." Mobility rates among the elderly are very low; less than five percent of Americans older than 65 move in a given year, compared to nearly 30 percent of those in their early twenties. As a result, there is little increase in the probability of living in the central city after either age 55 or age 65.

A related literature points out that the elderly have high rates of home ownership; in 2003, 78 percent of Americans over the age of 75 owned their own home. Contrary to the life-cycle savings model, there is no empirical evidence that seniors sell their home in order to dis-save as they enter old age. Rather, home sales among the elderly are prompted by life transitions,

including the death of a spouse or a change in health status (Jones, 1997; Myers and Ryu, 2008; Painter and Lee, 2009).

To the best of our knowledge, the possible effect of the declining veteran share of the population on residential locations has gone unnoticed by scholars and urban policy makers. The Servicemen's Readjustment Act of 1944, commonly known as the GI Bill, included a mortgage program that allowed veterans to purchase a home with little or no down payment. The Veterans' Administration assisted 2.1 million veterans in purchasing a home between 1946 and 1950 alone (Bennett, 1996, p. 24).

While veterans were able to borrow money on particularly good terms, the mortgage market was changing dramatically in the civilian sector as well. The Federal Housing Administration (FHA) began insuring mortgages initiated by private lenders in the mid-1930s. As a result, mortgage rates fell from 6-8 percent in the 1920s to 2-3 percent in the 1940s and the average down payment fell from around half of the value of the house to around 10 percent (Jackson, 1985, p. 205). Despite the general easing of credit, Vigdor (2006) finds that eligible veterans were seven percentage points more likely than non-veterans to own a home in 1970. He argues that this gap is due to differential access to credit, rather than stronger preferences for homeownership among veterans. In particular, he shows that the homeownership gap between veterans and non-veterans was not present in 1940 before the establishment of the GI Bill.

The consensus in the existing literature is clear that the foreign born are more likely to live in cities and the elderly are not mobile enough to return to cities *en masse*. Furthermore, there is some evidence that World War II veterans are more likely to live in owner-occupied housing, which is more plentiful in the suburbs. The goal of this paper is to examine these trends

collectively to ascertain whether they are quantitatively large enough to generate an urban revival.

III. The demographic correlates of living in the central city

In this section, we study the demographic correlates of living in the central city. Our analysis is based on individual records from the 1960 to 1980 Censuses compiled by the Integrated Public Use Micro-data Series or IPUMS (Ruggles, et al., 2008). We focus on the 75 percent of the population who reside in metropolitan areas. Our sample includes all metropolitan individuals for whom place of residence (central city versus suburbs) is reported.[1] We can identify place of residence for 76 percent of the metropolitan sample in 1960 and 83 percent of the sample in 1980.[2] This restriction becomes less binding over time both because cities get larger and because the Census privacy requirements were relaxed.

Our dependent variable is an indicator equal to one if the respondent lives in a central city. We pool individual records from 1960 to 1980 and estimate:

$$=1 \text{ if central city}_{iact} = \alpha + \Gamma' X_i + \nu_t + \mu_a + \theta_c + \varepsilon_{iact} \qquad \textbf{(1)}$$

for individual *i* who is *a* years old in Census year *t* and belongs to one of four aggregate birth cohorts (indexed by *c*).[3] The regression includes fixed effects for Census years (ν_t), birth cohorts (θ_c) and individual years of age (μ_a). X_i is a vector of characteristics for the household in which individual *i* resides. X_i contains indicators for the household head being black, foreign born or a

[1] IPUMS does not report central city status if so doing would allow users to identify geographic areas with fewer than 250,000 residents in 1960 and 1970 or 100,000 residents in 1980. In 1960, this restriction precludes the use of observations from 14 states with primarily rural populations (for example, North Dakota and Utah).
[2] Ideally, we would build a consistent sample of large metropolitan areas for which place of residence is reported in all years. However, in 1960, IPUMS does not report metropolitan area of residence and, in 1970, either metropolitan area of residence or place of residence (central city versus suburb) is known.
[3] The birth cohorts are 1900-1920, 1920-1940 and 1940-1960, with the omitted category being those born before 1900.

veteran of any war and various measures of the presence of children. We define a child as anyone who is 18 years of age or younger regardless of his or her relationship to the household head.

The regression produces two main sets of results: the age profile of city residence over the life cycle and estimates of the relationship between the other demographic factors in the vector X and the probability of living in the central city. Our paper is the first to estimate the age profile of city residence within birth cohorts over time. Vigdor (2006) and others report age profiles of city residence constructed from a single cross-section. These profiles likely overstate the probability that the elderly will "return" to the central city. Individuals who were 70 years old in 1970, for instance, were born in 1900 and came of age before the diffusion of the automobile and the large-scale suburban growth of the post World War II period. Therefore, the elderly in 1970 may have been more likely to live in central cities both for life-cycle and cohort-specific reasons.

We estimate the age profile of city residence within (broad) birth cohorts over time. Each coefficient on the vector of age effects (μ_a) is identified by variation from within up to three birth cohorts. For illustration, consider the probability of living in the city at age 70. This parameter is identified from members of the oldest birth cohort (born before 1900) who were 70 years old in 1960, 80 years old in 1970, and 90 years old in 1980 and from two groups of the 1900-1920 birth cohort, those who were 60 years old in 1960 and those who were 60 years old in 1970.

We report the resulting age profile of city residence in Figure 2. The probability of living in the city peaks between the ages of 21 and 25, when 56 percent of the population lives in the central city. Individuals leave the central city at a rapid pace through their late twenties and thirties. Forty-two year olds exhibit the lowest probability of city residence (50 percent),

presumably an age at which households are most likely to have children and be able to afford the schools and the open space offered by the suburbs. After that point, individuals do slowly return to the city; by age 75, 54 percent of individuals live in the central city again. The probability of city residence is also locally minimized at age 10 when children are most likely to live in the suburbs with their parents.

The rapid swings in the age profile of city residence explains why we find little effect of the baby boom cohort on city growth. There has been no decade (yet) in which the baby boom generation has been clustered in either a peak or a valley of the city residence profile. In 1970, for example, many of the baby boomers were living in the central city in their early twenties. However, others of the cohort were still in their teenage years and therefore were more likely to be living in the suburbs. Similar patterns hold in 1980, 1990 and 2000. By 2010, the last of the baby boomers will have left their forties and the entire generation will have entered the "return to the city" phase of the age profile.

Table 1 presents the coefficients relating the other demographic characteristics to the probability of living in the central city. In the first column, we include a dummy variable for the presence of any child in the household. Households with at least one child are 8.1 percentage points less likely to live in the central city. The second column replaces the indicator variable with a linear measure of the number of children in the household. Each child appears to depress the likelihood of living in the central city by 1.4 percentage points. In other words, if the relationship between children and living in the suburbs were truly linear, a household would need to contain six children before it reached the 8.1 percentage point decline in city living associated with having at least one child, a number that seems implausibly large. Together, these estimates suggest that the relationship between the presence of children and residential location

is non-linear and that, in particular, the first few children are most strongly associated with leaving the central city.

The final specification (column 3) adds dummy variables for having exactly one child and for having two or more children in the household. Relative to households with no children, households with one child are 6.1 percentage points less likely to live in the central city and households with two or more children are 9.6 percentage points less likely to live in the central city. We experimented with adding a richer set of dummy variables and found no statistical difference between having two versus three children, three versus four children, etc.

The remainder of the table considers the effect of immigrant status, race, and veteran status on residential location. Members of households whose head is foreign born are 16.7 percentage points more likely to live in the central city. Having a black household head makes an individual even more likely to live in the central city (38.6 percentage points). Consistent with Vigdor (2006), who finds that veterans are more likely to own their own home, we find that members of households whose head is a veteran of the US Armed Forces are 4.1 percentage points less likely to live in a central city.

The importance of each of these determinants for city growth and urban revival depends firstly on the causal nature of the documented relationship with place of residence and secondly on whether the variable in question has been trending the right direction over time. For example, we emphasize the effect of immigration, rather than race, because the percentage of the population that is foreign born has been increasing since 1970 whereas the percentage of the population that is African-American has remained flat over time. The next section will assess whether being a veteran and having children are causally related to leaving the central city. We

will then present the trends for each of these variables over the past fifty years and consider their importance in bolstering city population from 1950 to 2000.

IV. Causal estimates: The effect of children and veteran status on city residence

A. Veteran status

In our OLS estimation, we find that veterans are less likely than non-veterans to live in the central city. This relationship could be driven by the fact that veterans were offered generous housing benefits, providing the resources necessary to buy single-family housing in the suburbs. However, this relationship could also be generated by omitted variables that are correlated with veteran status. Veterans are less likely to have debilitating conditions that render them unfit to serve; this mental and physical fitness may be otherwise associated with higher earnings and a preference for the suburbs, in which case we would overstate the effect of veteran status on place of residence. Alternatively, high-skilled men who were either attending college or who were employed in a war industry may have been exempted from service. In this case, our estimate could understate the relationship between veteran status and living in the suburbs.

We use variation induced by the military draft and the mass mobilization for World War II to create an instrument variable that is correlated with veteran status but, as we argue, is not otherwise associated with earnings or preferences for residential location.[4] The military draft was introduced by the 1940 Selective Service Act and the United States entered the war in earnest after Pearl Harbor (December 1941). This timing generates large differences in the probability of military service on the basis of quarter of birth. Figure 3 reports the share of white, native-born men who served in the Armed Forces by birth cohort. The probability of service increases from

[4] Bound and Turner (2002) and Page (2008) use a similar approach to study the effect of the GI Bill on educational attainment.

50 percent for men born in 1915, who would have been 27 when the US entered the war, to over 80 percent for men born between 1919 and 1927.

Men born after 1927 would have been less than 18 years old when the war ended in 1945. As a result, service in World War II falls off precipitously for men born after the third quarter of 1927. However, due to preparations for the Cold War and the Korean conflict, the probability of military service of any kind declines less dramatically (from 83 to 70 percentage points). While the advent of veterans' mortgage assistance was tied to the GI Bill, the benefits were extended to other cohorts of servicemen and women. Therefore, we rely on the decline in general veteran status, rather than in the sharper decline in service in World War II.

In our first stage equation, we compare the probability of veteran status for men who were born before and after 1927, using different starting and ending points to construct plausible comparison windows. We estimate:

$$=1 \text{ if veteran}_{it} = \alpha + \beta(=1 \text{ if born before } 1928)_{it} + \gamma(\text{quarter of birth})_{it} + \nu_t + \varepsilon_{it} \qquad \textbf{(2)}$$

We include a linear trend in quarter of birth to account for factors that may be associated with rising homeownership over time (such as rising real incomes). The indicator variable (pre-1928) is equal to one for birth cohorts that begin, variously, in either 1919, 1921 or 1923 and end in 1927. The sample includes white, male, native-born heads of household who were born before either 1929, 1932, or 1935.

Table 2 presents the coefficients from our first and second stage equations. For brevity, we report results from regressions that compare men born between 1919 and 1927, who we consider likely veterans, to men born between 1928 and 1929 or 1928 and 1932. Specifications using other comparison windows produce similar results. As is apparent from Figure 3, the first

stage estimates suggest that men born before 1927 are 13 percentage points more likely to have served in the Armed Forces than are men born a few years after.

In the full sample, we find that being a member of a household whose head served in the military reduces the probability of living in the central city by 4.1 percentage points (Table 1). Restricting our attention to white, male, native-born household heads born in the relevant birth cohorts, we find a smaller correlation between veteran status and place of residence; here, being a veteran reduces the probability of living in the city by 2.9 percentage points. When we instrument for veteran status with an indicator for birth before 1927, the relationship between military service and place of residence strengthens, with veterans being 6.7-6.9 percentage points less likely to live in the central city. Comparing the OLS and IV estimates suggest that, during the World War II era, veterans were selected on attributes that are positively correlated with living in the central city. This pattern is consistent with the availability of draft deferments for the highly-skilled who may have otherwise been less likely to live in the central city.

B. The presence of children

In our OLS estimation, we find that households with children are less likely to live in the central city. One explanation for this result is that having children may increase the demand for certain aspects of suburban life, including the larger housing units, presence of open space and higher quality public schools. However, this finding could be contaminated by both omitted variables bias and reverse causality. During this period, rich households had fewer children and were more likely to live in the suburbs. Even though we can control directly for household income, we expect that other omitted aspects of socio-economic status will lead this estimate to be biased downward (in an absolute value sense). On the other hand, residing in the suburbs

could directly influence a households' preferences for optimal family size. Peer effects through friends and neighbors in the suburbs may encourage households to have an additional child. In this case, our estimate overstates the effect of having children on moving to the suburbs.

Giving birth to twins is an unplanned event that increases the number of children in a household. Angrist and Evans (1998) argue that, conditional on the age and race of the mother, twinning is an exogenous event,. We use the birth of twins as an instrument for the number of children in a household. Our data, which covers years between 1960 and 1980, pre-dates the advent of infertility treatments that increase the probability of multiple births in the non-random sample of mothers that seek medical intervention. A large literature uses twinning to study the effect of family size on women's and children's outcomes (Bronars and Grogger, 1994; Rosenzweig and Wolpin, 1980a, b; Angrist and Evans, 1998; Black, Devereaux and Salvanes, 2005).

One limitation of this approach in this context is that households must have at least one birth event in order to be at risk for having twins. While Table 1 suggests that the distinction between no children and one child is an important determinant of leaving the central city, twinning cannot be used as an instrument for the first child in a household. Instead, we use samples of households with at least one (two) births and consider the effect of having a twin on the first (second) birth on the number of children in the household. By restricting the sample to households with at least *X* number of birth events, we create comparison groups with similar preferences for family size.

We detect pairs of twins by looking for two children in the same household with the same quarter and year of birth. 0.5 percent of households with at least one birth have twins on the first birth. Our first stage equations relate the presence of twins to either the total number of children

in the household or to an indicator equal to one if the household has at least two (or at least three) children. For example, for household with at least one birth, we estimate:

$$\text{Number of children}_{it} = \alpha + \beta(=1 \text{ if twin on first birth})_{it} + \nu_t + \varepsilon_{it} \qquad \textbf{(3)}$$

Alongside the standard controls included in equation one, we also control for the race and age of the mother.

Table 3 presents the coefficients from our first and second stage equations. The raw data indicates that, among households with at least one birth, those with a singleton on the first birth have an average of 2.58 children, whereas those with a twin on the first birth have 3.34 children. Accordingly, we estimate that having a set of twins on the first birth event increases household size by 0.7 children. Much of the difference in completed family size arises from the (obvious) fact that all households with twins on the first birth have at least two children, while only 73.4 percent of households with a singleton first birth have an additional child. Consistent with this fact, we estimate that having twins increases the probability of having two children by 25.6 percentage points ($73.4 + 25.6 \approx 100$). Similarly, we find that, among households with two or more births, having twins on the second birth increases total household size by 0.9 children and increases the likelihood of having at least three children by 41 percentage points to 100 percent.

In full sample, we found that each additional child in the household reduces the likelihood of living in central city by 1.4 percentage points. When we restrict our attention to households with at least one child, each additional child reduces the likelihood of living in the central city by only 0.5 percentage points. For households with at least two children, there is no incremental effect of adding a third or higher order child.

When we instrument for the number of children in the household with the occurrence of twins on first birth, the effect of family size on residential location more than doubles. Each

additional child reducing the probability of living in the central city by 1.9 percentage points. The same pattern holds if instead we include an indicator variable capturing the effect of moving from one child to two or more children. The larger IV estimates suggest that households with many children have unobserved characteristics that are otherwise positively associated with living in the central city (for example, these households may have a lower socio-economic status). As in the OLS specification, though, we continue to find that the effect of family size on residential location is not linear. Moving from one child to two children encourages households to move to the suburbs, while moving from two children to three or more has little effect on place of residence.

IV. A counterfactual exercise

In this section, we document that the share of households headed by an immigrant or a veteran and the share of households with children have changed substantially from 1950 to 2006. We then assess how important each of these demographic trends have been for the maintenance of city population over time.

Figure 4 depicts the share of households headed by an immigrant or a veteran and the share of households with a child present from 1950 to 2006. Because immigration to the United States was severely restricted in the mid-twentieth century, the share of households with a foreign-born household head fell from nearly 30 percent in 1940 to a nadir of 10 percent in 1970. With the abolition of immigration quotas in 1965, the share of household heads who were foreign born climbed back to 30 percent by 2000. Given that the foreign born are more likely to live in central cities, this pattern would have moderated the flow of population out of cities.

With the return of servicemen from World War II, the share of households headed by a veteran spiked from less than five percent in 1940 to nearly 50 percent in 1960 and 1970. Since 1970, the veteran share has declined to just over 10 percent in 2006. Because veterans are more likely to live in the suburbs, the reduction in the number of veterans in the population favors the city relative to the suburbs. The share of households with a child present has also declined substantially since mid-century. While nearly 80 percent of households had at least one child in 1950, this share has declined to 50 percent in 2006. Again, because households with children are more likely to live in the suburbs, the growth of childless households (representing both young singles and couples and the elderly) favors the city.

Table 4 uses the coefficient estimates relating these demographic trends to city residence to provide a counterfactual statement of how the share of metropolitan residents living in central cities would have changed between 1960 and 2000 if not for these demographic moderators. The table begins by reporting the actual change in the share of metropolitan residents living in central cities over this period. In 1960, 51.3 percent of metropolitan residents lived in the city. This figure declined to 33.5 percent by 2000, a drop of 17.8 percentage points.

The second row of Table 4 uses the coefficient estimates from equation 1 to imagine how the share of residents living in central cities *would have changed* if the only relevant shifts (demographic or otherwise) were heightened immigration, a reduction in the number of veterans and the number of households with children and a change in the age distribution. That is, we suppose that there were no other economic, political or sociological factors that increased the attraction of the suburbs or reduced the value of the city. Given that the demographic variables under consideration all support city growth, it is not surprising that the share of metropolitan residents would have increased under this scenario by 5.9 percentage points. Phrased differently,

we can say that absent these demographic forces, city population would have declined even faster over the past forty years.

The last column of Table 4 uses our IV estimates to compute the counterfactual city growth. Because our IV regressions are estimated on selected samples, we use the ratio between the OLS and IV estimates in Tables 2 and 3 to scale the OLS coefficients estimated from the whole population. Specifically, we augment the veterans coefficient by 2.3 (= -0.067/-0.029 from Table 2, columns 1 and 2) and we augment the any child coefficient by 1.6 (= -0.052/-0.032 from Table 3, columns 3 and 4). These larger estimates suggest that these selected demographic trends served to increase the share of the metropolitan population living in the central city by 8.2 percentage points.

The remainder of the table divides the total increase in city population share into the components due to heightened immigration and declines in both the number of veterans and the number of households with children. For example, the share of households headed by an immigrant increased by 18 percentage points from 1970 to 2000. As a result, the share of metropolitan residents who lived in the central city expanded by 3.0 points (= 18 · 0.167, coefficient estimate in Table 1). From this exercise, it is clear that the most important demographic trends in moderating the loss of city population are renewed immigration, followed by the shrinking number of veterans and the declining share of households with children.

Notable in this exercise is the fact that the aging of the Baby Boom cohort plays no role in moderating the loss of population from central cities. The explanation for this finding lies in part in the rapid swings in the age profile of city residence (Figure 2). Thus far, there have been no decades in which the baby boom generation has been clustered in either a peak or a valley of

the city residence profile, though this pattern may change as boomers enter the (modest) "return to the city" portion of the age profile (after age 65).

V. Conclusions

[Working on this section]

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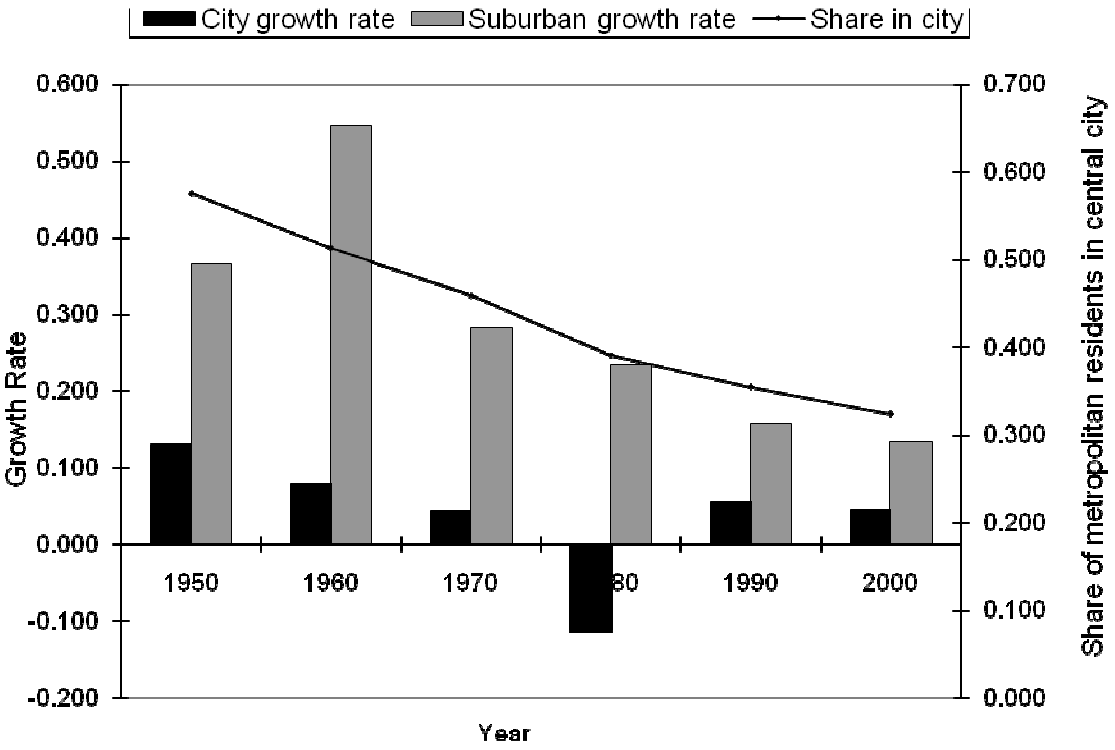
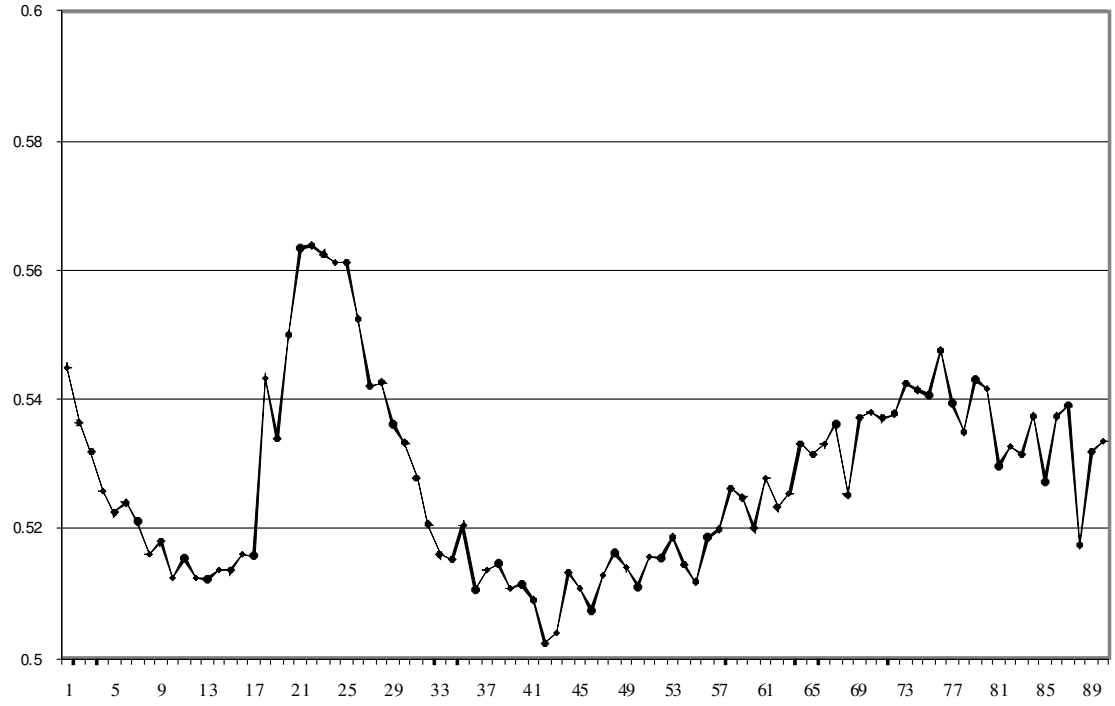
Figure 1. Decline in Central City Residence, 1950-2006



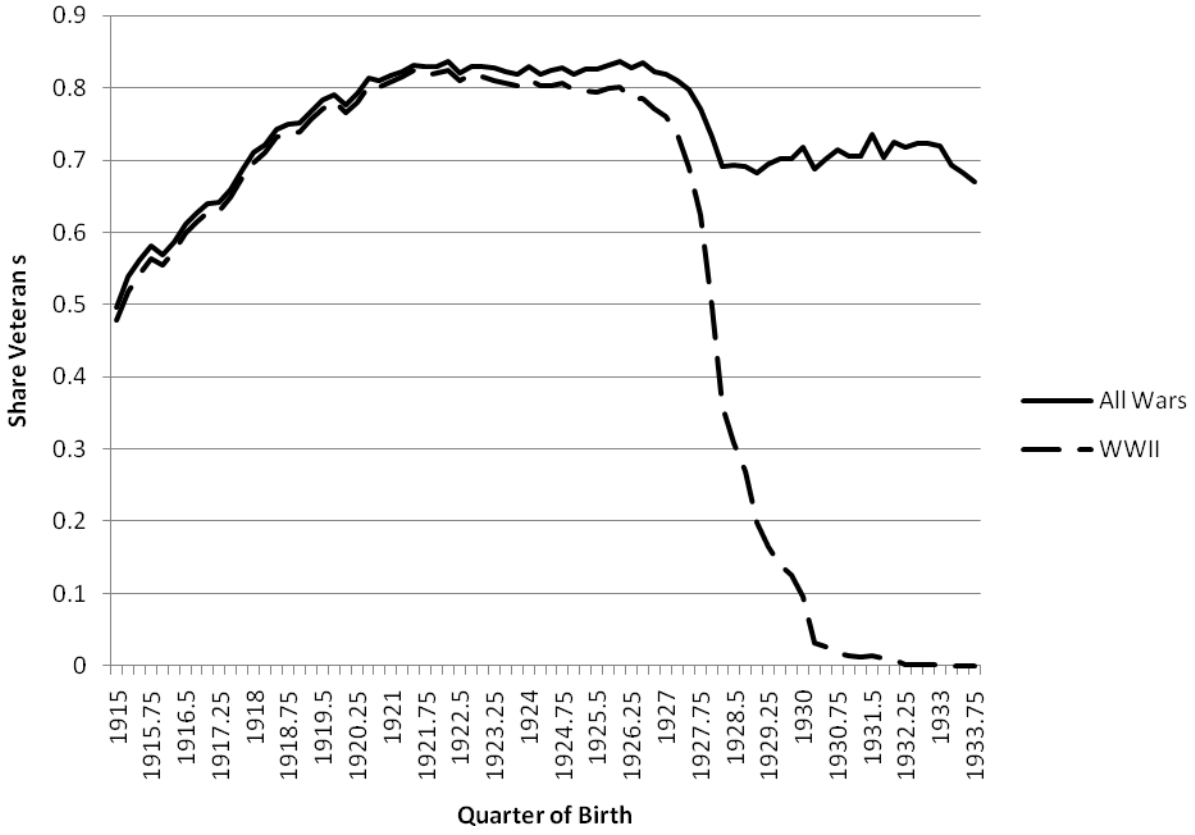
Notes: N=93 metropolitan areas. City and county population come from various City and County Data Books. Total metropolitan area population is computed from the county components of metro areas from IPUMS. Suburban population is computed as the metropolitan area population minus the city population (1940 borders). The county definition of metropolitan areas was allowed to change over time.

Figure 2. Probability of living in city conditional on being in metropolitan area by age
1960-80, Net of cohort effects



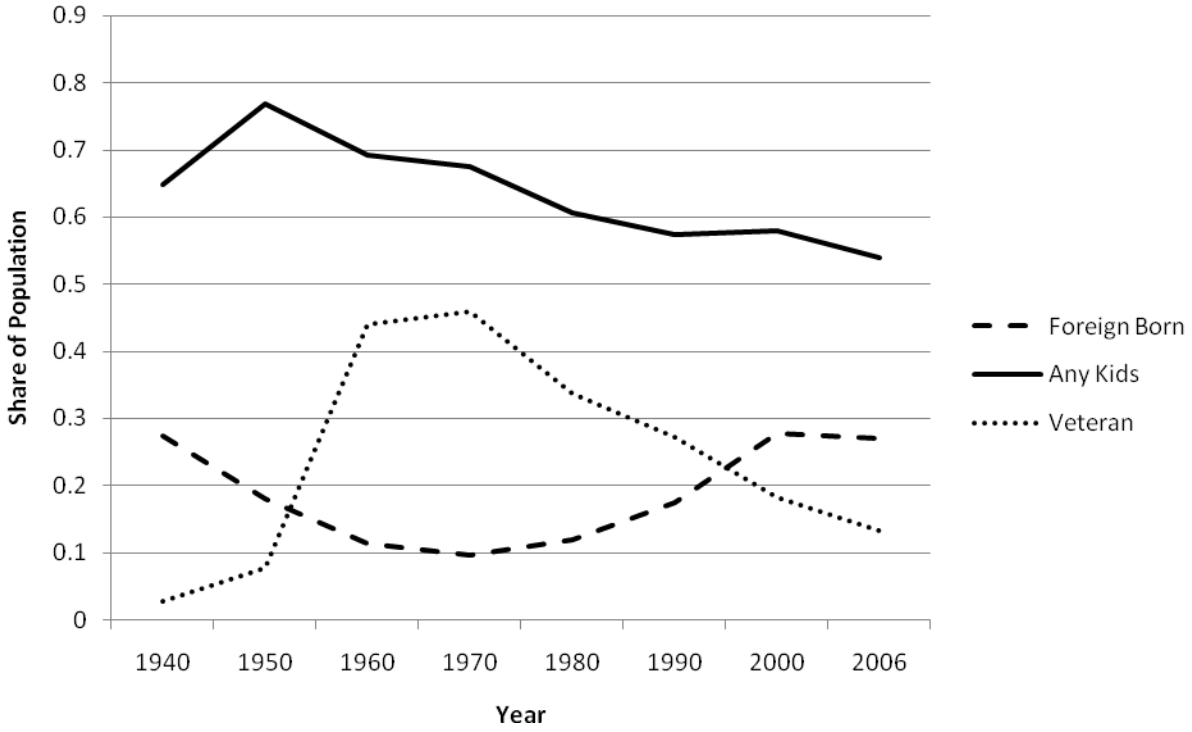
Notes: Data come from IPUMS 1% samples. The cohort effects are dummy variables for year of birth intervals (1869-1910, 1911-1930, 1931-1950, and 1951-1980). The regression also contains two census year dummies, an indicator variable for children under the age of 19 present, and indicators for whether the head of household is a veteran, black, or foreign-born. The sample contains all metro area residents who report living either in the central city or the suburbs. That is, anyone whose place of residence is unknown is omitted.

Figure 3. Share of white men serving in armed forces by year and quarter of birth



Notes: Sample includes all white, native-born men from the 1960-1980 1% IPUMS samples.

Figure 4. Household Structure, Immigration, and Veteran Status, 1940-2006



Notes: Sample contains all metro area residents who report living either in the central city or the suburbs. Household members are assigned the characteristics of the household head. Any kids is a variable equal to one if a child 18 or younger is present in the household.

Table 1: Demographic factors predicting probability of living in the central city, 1960-1980

Dependent variable = 1 if live in central city

RHS variable	(1)	(2)	(3)
Any children in household	-0.081		
	(0.001)		
Number children in household		-0.014	
		(0.000)	
=1 if one child in household			-0.061
			(0.001)
=1 if two or more children in household			-0.096
			(0.001)
=1 if household head is foreign born	0.167	0.167	0.167
	(0.001)	(0.001)	(0.001)
=1 if household head is black	0.385	0.389	0.386
	(0.001)	(0.001)	(0.001)
=1 if household head is veteran	-0.042	-0.045	-0.041
	(0.001)	(0.001)	(0.001)
Constant	0.575	0.521	0.577
	(0.003)	(0.003)	(0.003)
N	3,631,502	3,631,502	3,631,502

Notes: Regression also contains three cohort dummies (as in Figure 2.), two census year dummies and age dummies between 1 and 90+. These coefficients (+ constant) are graphed in Figure 2. Sample contains all metro area residents who report living either in the central city or the suburbs. Household members are assigned the characteristics of the household head.

Table 2: IV estimates of the effect of veteran status on place of residence

Dependent variable = 1 if live in central city

	Birth cohorts: 1919-1929		Birth cohorts: 1919-1932	
	OLS	IV	OLS	IV
A. First stage				
=1 if born between 1919-1927		0.132		0.130
		(0.003)		(0.003)
B. Second stage				
=1 if veteran	-0.029	-0.067	-0.029	-0.069
	(0.003)	(0.029)	(0.002)	(0.028)
N	188,734	188,734	237,968	237,968

Notes: Regressions include linear age trend in quarters, an indicator for children present in household, and dummies for 1970 and 1980 Census years. The sample is restricted to white, native-born male metro area residents who report living either in the central city or the suburbs.

Table 3: IV estimates of the presence of children in the household on place of residence

	Households with at least one birth				Households with at least two births			
Dependent variables	OLS	IV	OLS	IV	OLS	IV	OLS	IV
A. First Stage								
=1 if twins on first (second) birth		0.705		0.256		0.924		0.408
		(0.012)		(0.004)		(0.010)		(0.004)
B. Second stage								
Number of children	-0.005	-0.019			0.000	0.004		
	(0.000)	(0.006)			0.000	(0.004)		
=1 if 2+ children			-0.032	-0.052				
			(0.001)	(0.015)				
=1 if 3+ children							-0.006	0.008
							(0.001)	(0.009)

Notes: *N* = 2,372,595 for one birth and 1,746,963 for two births. Twins are defined as two children having the same year and quarter of birth in the household. The sample selection and other control variables are the same as in Figure 2.

Table 4. Demographic Moderators of Suburban Inflows

Share of metropolitan population living in central cities

	Level in 1960	Level in 2000	Change (OLS)	Change (IV)
Actual trend	51.3	33.5	-17.8	-17.8
Counterfactual trend allowing for change only in key demographic variables	53.4	59.3	5.9	8.2
1. Immigration	*Increased by 18.0 points since 1970; Foreign born HH head increases probability of living in city by 16.7 percentage points (Table 1)*		*3.0*	*3.0*
2. Veterans	*Declined by 27.8 points since 1970; Veteran HH head reduces probability of living in the city by 4.1 percentage points (Table 1)*		*1.5*	*2.7*
3. Children in HH	*Declined by 18.8 points since 1950; Any child in household reduces probability of living in the city by 8.1 percentage points (Table 1)*		*1.2*	*2.5*

Notes: The sample contains all metro area residents who report living either in the central city or the suburbs in the 1950-2000 IPUMS 1% samples. The counterfactual specification is the same as Figure 2. The change in share of metropolitan population living in central cities due to demographic variables is relative to the counterfactual trend.