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Why Are Power Couples Increasingly Concentrated in Large Metropolitan Areas?
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ABSTRACT

Using census data, Costa and Kahn (QJE, 2000) find that power couples - couples in which both spouses have college degrees - are increasingly likely to be located in the largest metropolitan areas. One explanation for this trend is that college educated couples are more likely to face a co-location problem - the desire to satisfy the career aspirations of both spouses - and therefore are more attracted to large labor markets than are other couples. An alternative explanation is that all college educated individuals, married and unmarried, are attracted to the amenities and high returns to education found in large cities and that as a result, the formation of power couples through marriage of educated singles and additional education is more likely to occur in larger than smaller metropolitan areas. Using the Panel Study of Income Dynamics (PSID), we analyze the dynamic patterns of migration, marriage, divorce and education in relation to city size and find that power couples are not more likely to migrate to the largest cities than part-power couples or power singles. Instead, the location trends are better explained by the higher rate of power couple formation in larger metropolitan areas. Regression analysis suggests that it is only the education of the husband and not the joint education profile of the couple that affects the propensity to migrate to large metropolitan areas.

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1. Introduction

Couples in which both husband and wife have college degrees are increasingly likely to be located in large metropolitan areas. Using census data, Costa and Kahn (2000) find that the proportion of these couples - Costa and Kahn call them "power couples" - that live in metropolitan areas of at least two million jumped from 39 percent in 1970 to 50 percent in 1990. By comparison, among couples in which only one spouse has a college education - "part-power couples" - the proportion living in large metropolitan areas increased more slowly, growing from 36 percent to 42 percent over the two decades. Couples in which neither spouse has a college degree - "low-power couples" - have the lowest probability of living in a large city and the lowest rate of increase, growing from 30 percent to 34 percent in twenty years.

Costa and Kahn consider two main explanations for the increasing concentration of power couples in large metropolitan statistical areas (MSAs). First, large metropolitan areas may be increasingly attractive to the college educated, regardless of their marital status. An increase in the urbanization of the college educated may reflect the higher returns to education in larger MSAs or the urban amenities more commonly found there. The observed trends may be the result of college educated singles moving to large urban areas and then marrying. Second, the labor markets found in large metropolitan areas may hold particular attraction for power couples. All married couples potentially face the possibility that their location preferences will differ. This 'co-location problem' may arise from different preferences for amenities or proximity to family, but economists emphasize job opportunities. If husband and wife work in the paid labor market and if they live together, then they must both find acceptable employment in the same location. With the rise in married women's labor force participation, the potential for co-location conflict has increased for all couples, but Costa and Kahn argue that it is most acute for the college educated because they tend to have more specialized careers. Solving this type of co-location problem may be easier in the labor markets of large metropolitan areas, and thus these areas should be magnets for power couples.

Costa and Kahn conclude that the ability of large MSAs to solve the co-location problem explains most of the observed increase in the concentration of power couples in large MSAs. Although the data used in their analysis is cross-sectional, they suggest that the migration of power couples is the principal mechanism underlying the changes in observed location patterns.

In this paper we investigate the dynamic processes underlying the changes in location patterns documented by Costa and Kahn. We address two questions. First, what are the dynamic processes that account for the increased concentration of power couples in large MSAs between 1970 and 1990? Second, does the co-location problem explain these dynamic processes? Following Costa and Kahn, we focus on the co-location problem that arises from job choice and assume that this type of preference mismatch is more acute for power couples than for other couples.

To address the first question, we examine the patterns of migration, marriage, divorce and educational attainment by city size using panel data from 1970 to 1996. The dynamic patterns are not consistent with the hypothesis that the migration of power couples could explain the observed changes in location patterns. Power couples are no more likely to migrate to large MSAs and no less likely to leave large MSAs than part-power couples or power singles, suggesting that changes in location patterns are unlikely to have been produced by the migration of power couples. The dynamic patterns are consistent with the hypothesis that the formation of power couples occurs at a higher rate in large MSAs than small MSAs. The differences across large and small MSAs in the migration rates of power singles, in assortative mating patterns, and in college enrollment rates provide a more convincing explanation of the increasing concentration of power couples in large MSAs. Our argument is strengthened by the 2000 census data, data unavailable to Costa and Kahn. Between 1990 and 2000 the proportion of power couples living in large MSAs fell while the proportion of low-power couples in large MSAs increased. These reversals of the earlier trend are difficult to explain in terms of power couple migration rates, which show no significant variation across the decades, but are easy to explain in terms of changes in marriage and educational attainment patterns observed in the data.

The second question - does the co-location problem explain the dynamic processes - is more complex. We first argue that the aggregate trends in location are difficult to explain with the co-location hypothesis. Next using regression analysis, we consider the effect of co-location on migration. Evidence supporting the co-location hypothesis would be a finding that power couples are more likely than part-power couples and low-power couples to migrate to large MSAs. Regression analyses suggests that holding all else equal, power couples are more likely to migrate and more likely to migrate to large urban areas than low-power couples. We find, however, that the factor determining couple migration is not the couple's joint education profile but the husband's education. More specifically, we find that the migration behavior of couples in which only the husband is a college graduate is indistinguishable from that of power couples, while the migration behavior of couples in which only the wife is a college graduate is indistinguishable from that of low-power couples. This result may arise from a higher correlation between education and occupational specialization for men than for women. That is, college educated wives may tend to choose more portable careers than their husbands. The conclusion that migration of power couples is affected by the husband's education rather than the couple's joint educational profile is unaltered when we include controls for post-graduate education and occupation to identify those couples most likely to have specialized careers.

The paper proceeds as follows. In section 2, we discuss the dynamic processes that may have caused the observed changes in location patterns. We describe the data in section 3. In section 4 we use the data to assess the importance of the dynamic mechanisms discussed in section 2. The data suggest that power couples are not migrating to large MSAs at a disproportionately high rate but that the formation of power couples is more likely in larger urban areas, through marriage and increased educational attainment. In section 5 we use regression analysis to investigate the determinants of migration. We find that holding all else constant, power couples are more likely to migrate to large urban areas than are low-power couples, but the migration behavior of power couples is indistinguishable from that of part-power couples in which the husband has a college education. Section 6 is a brief conclusion.

2. Migration, Marriage and Education

Logic suggests that the observed location of power couples must be the resultant of four dynamic processes: migration, marriage, divorce, and the accumulation of human capital. Looking at the stock of power couples living in large metropolitan areas we can conclude only that each spouse must have earned a college degree, married a spouse who earns/earned a college degree, remained married, and migrated to and/or chosen to remain in a large metropolitan area.[1] Cross-section data cannot reveal the order in which these processes occurred, but the literature provides some clues.

2.1 Migration

Economists tend to frame individual migration behavior as a human capital decision. A person will migrate if the expected benefit of living in another location less migration costs exceeds the expected benefit of remaining in the current location. The main statistical trends of migration are consistent

[1] We ignore the dynamics of employment, although these are likely to differ by education and occupation. Basker (2003) presents a model of job search and migration that highlights the distinction between highly educated individuals, who tend to search first and then migrate, and less educated individuals, who tend to migrate without a job and then search.

with this model - younger individuals are more mobile than older individuals, educated persons are more mobile than those with less education, rural to urban migration is more common than the converse, and the longer individuals have resided in an area the less likely they are to migrate. (For a review of the migration literature, see Greenwood, 1997).

Polachek and Horvath (1977), Sandell (1977) and Mincer (1978) were among the first to explicitly frame the migration decision in terms of maximizing net family gain rather than net individual gain. These researchers abstract away from decision making within the family and assume that families migrate if the net cost of migrating is less than the sum of net returns for each family member. Family migration is less likely than individual migration since the costs of migrating increase with the number of family members while the benefits may not. The model suggests that one spouse, typically the husband, is often a 'tied-stayer' while the wife is often a 'tied-mover'. Tied-stayers forgo moves that would result in positive net returns for the individual, but would be exceeded by the expected losses of other family members. Tied-movers participate in moves that result in a loss for themselves, but their loss is exceeded by the family gain.

A number of studies consider the outcomes of migration on the tied-mover (see for example Shihadeh (1991), Morrison and Lichter (1988), Spitze (1984), Bird and Bird (1985), Cooke and Bailey (1996), Jacobsen and Levin (1997), Krieg (1992)). With few exceptions these studies find that migration worsens employment conditions of migrant wives, but that this result may be due to previous selection into transportable occupations with flat wage profiles.

Frank (1978) suggests that migration based on the maximization of net family welfare limits geographic mobility for married women and helps to explain the male-female wage gap. Individuals are less likely to invest in their own human capital when their opportunity set is limited by their spouse's location. Similarly, employers are less likely to invest in human capital for workers who are not thought to be strongly attached to the firm. Robst and McGoldrick (1996) link this finding to location size. They argue that while a trailing spouse has a job search limited to the location that the leading spouse chooses, if the location is a large MSA and this in turn reflects higher job vacancies, the trailing spouse may find a wage offer near the maximum that could be obtained in a nationwide search. This hypothesis was not supported by empirical tests which found that the size of the local labor market had no significant impact on the likelihood of women being "overeducated", i.e., having a higher level of education than the average within their occupation. The authors suggest that it is not the market's size that is important, but its job composition: a small local labor market with a relatively larger concentration of white-collar employment is as beneficial to women as a large labor market without such a concentration.

2.2 Marriage and Divorce

The relationship between city size and marriage is not straightforward. Edlund (2003) suggests that since large cities attract highly skilled individuals they also attract individuals (i.e., women) who seek to marry highly skilled individuals. Drewianka (2003) argues that marriage rates are affected not by the size of the city itself, but by the percentage of the adult population that is single. The effect is two-fold. With a relatively large single population, the probability of meeting a potential spouse whose quality exceeds a specified level in a given period of time is higher because people meet potential matches at a faster rate. But the large pool of potential matches also causes marriage market participants to increase their reservation quality level. Drewianka's empirical results, which are derived from an indirect procedure that avoids the obvious endogeniety problem, suggest that the reservation quality effect dominates such that a 10 per cent increase in the single population lowers the hazard rate for entering marriage by 7-10 per cent.[2] Put together, the two papers suggest a finding similar to the Robst and McGoldrick (1996) finding above – it is not the size of the market that is important, but its composition.

The human capital model of migration suggests a link between migration, city size and marital instability. Increased labor force attachment of wives makes it more likely that the location preferences of spouses will differ which increases marital instability. This creates two hypotheses: first, since power couples are more likely to experience co-location problems, they may be more likely to experience marital instability than part-power and low-power couples; and second, since co-location problems are less likely to occur in large labor markets, power couples living in small areas may have more marital breakups than those living in larger areas. Co-location may affect the location patterns observable in census data by increasing the relative stability of marriages in larger employment markets rather than by inducing migration.

Mincer (1978) notes that expectations of marital instability reduce the incentives for either spouse to become a tied-mover or tied-stayer, further amplifying marital instability. If we allow for expectations of marital instability, modeling migration as a response to maximizing net family benefits may be less

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[2] Drewianka refers to the reservation quality effect as the opportunity cost of forming any particular match.

satisfactory than modeling migration as a potentially inefficient bargaining solution to the co-location problem; these issues are more fully explored in Lundberg and Pollak (2003).

2.3 Education

The proportion of power couples in large MSAs may have increased simply because individuals living in large MSAs have a greater incentive to invest in human capital than those living in small MSAs. Urban density may increase interactions with highly skilled role models, broaden one's experiences and facilitate coordination, increasing the demand for human capital (Glaeser, 1999).

The wage premium that is earned by workers in large urban areas may be a compensating differential to offset higher living costs and urban disamenities but must also be due in part to higher productivity of workers in MSAs. Without higher productivity, it is difficult to explain why firms are willing to locate in these high-wage areas. The causes of this higher productivity may lie in the ability of MSAs to attract more able workers, or because MSAs create more productive workers by inducing human capital accumulation and labor-market matching. Glaeser and Maré (2001) investigate this question using a variety of data sources and argue that the urban wage premium is due to a combination of wage-level effects and wage-growth effects. They find that recent migrants to MSAs do experience real wage gains, but that the wage premium is highest for long-term residents of MSAs. Thus many of the urban wage gains accrue to city workers over time as they accumulate more human capital and benefit from the better coordination of urban labor markets.

3. Data

We use two data sources in this analysis - the integrated public use samples (IPUMS) of the U.S. Census for the years 1970, 1980, 1990 and 2000 and the 1970-1996 waves of the Panel Study of Income Dynamics (PSID).

The IPUMS samples are 1-in-100 national random samples of the U.S. population created by the Census Bureau as part of each decennial enumeration (Ruggles and Sobeck, 1997). The individual level records of each cross-section include information on age, location, marital status, education and current education enrolment. The samples also allow the linkage of spousal records enabling us to determine the joint profile of married couples.

The PSID is a longitudinal survey of a representative sample of American individuals and families. The original sample included members of 4800 families. All individuals from the original families are followed as they move to form new family units. For this study we have included all individuals and married couples who were either heads of households or spouses at some point during this time period. Since the full range of questions was answered only by the head and spouse, we excluded those individuals who are always residing in another's household. Following Costa and Kahn, we limit the sample to men aged 25-39 and women aged 23-37.[3, 4]

The Geocode Match Supplement to the PSID provides detailed geographic identifiers necessary for a migration study. Building up from the county of residence, we sorted observations into Metropolitan Statistical Areas (MSAs). The U.S. Census Bureau defines MSAs as agglomerations of counties that include a large population nucleus and adjacent communities that share a high degree of social and economic integration. We define a migration as a move between MSAs, between an MSA and a non-MSA county, or between two non-MSA counties. Moves within an MSA are not defined as migrations. The changing definition of MSAs poses a problem for migration analysis. For example, according to the 1990 MSA definitions, Baltimore MD and Washington DC were distinct MSAs but according to the 2000 definitions they are part of a single MSA. To prevent changing MSA definitions from creating the appearance of changes in migration rates, we apply the 1990 MSA definitions consistently throughout the sample.[5] In the analysis that follows, large metropolitan areas include MSAs with more than two million in population, midsize metropolitan areas include MSAs with a population between 250,000 and two million, and small metropolitan areas include both MSAs with populations less than 250,000 and non-metropolitan areas. These categories are consistent with those used by Costa and Kahn. Appendix A lists the large MSAs for the years considered.

Following Costa and Kahn, when using census data we define individuals as college educated if they have four or more years of college. For the PSID data, individuals are defined as college educated if they hold a bachelor's degree.[6] In all that follows, we define 'power couples' as those in which both

[3] Similar trends in location are found with expanded age categories.
[4] In the PSID sample, we define married couples as those legally married and those who have lived together for a year or more. The IPUMS sample includes only legally married couples. Using the broader definition of couples for the PSID sample does not substantially alter the results but provides a larger sample.
[5] Costa and Kahn, whose focus is not dynamic, use the current year MSA definition for each census year that they consider but note that their results do not change substantially under alternative (stable) definitions.
[6] Some imputation was required for the PSID data. Education is only asked of respondents when they enter the household. In 1985, the education questions were re-asked of all individuals in the sample. Since year of graduation was asked, it was possible to work backwards from 1985 to code the education attainment for previous years. For years after 1985, only new heads/spouses were asked the education questions. For those already in the sample, if they were enrolled in school in 1985,

husband and wife are college educated; 'part-power couples' as those in which only one spouse is college educated and 'low-power couples' as those in which neither spouse is college educated.

Appendix B provides a comparison of the location statistics from PSID and the census data reported by Costa and Kahn. In all categories the PSID sample overestimates the proportions residing in midsized metropolitan areas and underestimated the numbers living in large MSAs. However, the increasing trend toward the large MSAs is also evident in the PSID sample. We now turn to the dynamic processes that lie behind the location trends.

4. Location Stock and Flows

We extend the Costa and Kahn analysis in two ways. We first update the figures on location with the 2000 census data and then use longitudinal PSID data to analyze the dynamic processes underlying the observed location trends.

Table 1 shows the proportions of power, part-power and low-power couples living in large MSAs in each of the four census years (1970, 1980, 1990, 2000), using the 1990 MSA definitions for all years. Unlike Costa and Kahn, we separate part-power couples into categories that describe which spouse holds a college degree. The data show that the proportions living in large MSAs are lower when the wife is more highly educated than when the husband is more highly educated. The data also show that between 1970 and 1990, the proportion of power couples living in large MSAs increased dramatically, as noted by Costa and Kahn. However, the rising trend did not continue to 2000. Over the last decade the proportion of power couples and part-power couples living in large MSAs declined while the proportion of low-power couples living in large MSAs increased.

The observed location trends may arise through differential rates of migration of power couples or formation of power couples, either through marriage or increased educational attainment, or differential rates of dissolution of power couples. Using the PSID we are able to investigate these dynamic processes.[7]

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they were assumed to have finished their program and so a degree was imputed to them in following years. If individuals were not enrolled in school in 1985, their education level observed in 1985 was simply carried forward. The resulting imputations look reasonable in comparison to average education of the individual's occupation. A robustness test was performed in which education was raised to be at least the minimum level of education that individuals holding the same occupation deemed necessary to perform the job. The results are not substantially different.

[7] Recent immigrants are under-represented in the PSID sample. However, the location patterns that we seek to explain - a substantial increase in power couple concentration until 1990 followed by a decline in 2000 remain when immigrants are excluded from the Census sample. The calculations excluding immigrants are not shown but are available from the authors.

First consider the migration patterns of couples and unmarried individuals reported in Table 2. Overall, the trends are consistent with the human capital theory of migration. Highly skilled individuals are more mobile than low skilled individuals, power couples are more likely to migrate than are low- and part-power couples, and power singles are more likely to migrate than are low-power singles. The trends are not consistent with Mincer's hypothesis that dual-career couples are less mobile than single-career couples.

There is some evidence of a revealed preference for large MSAs among power couples: the migration rates of those living in large MSAs is lower than the rates of those living in medium and small MSAs and, among migrants, power couples are more likely to migrate to medium and large MSAs than to small MSAs. However, this trend is not limited to power couples and may simply reflect a general preference for large urban areas. For every group considered, migration rates of those in the large areas are significantly lower than the rates of those in small areas and this difference is much larger for single power men and women than for couples. An unmarried man or woman with a college degree is much more likely to migrate from a small MSA than a power couple. Conditional on migration, single power men and women are also more likely to migrate to large MSAs than smaller MSAs, as are part-power couples in which the husband has a college degree. Low-power couples are more likely to migrate to smaller areas than larger and there is no statistically significant difference among the destination choices of part-power couples in which the wife has a college degree. The trends suggest that there is a revealed preference for large urban areas among college educated singles and among all couples in which the husband is college educated. By distinguishing part-power couples by who holds the college degree, we find that the migration behavior of couples in which only the husband holds a college degree is similar to power couples, while the migration behavior of couples in which only the wife has a college degree is similar to low-power couples. The regression analysis in section 5 confirms the need to distinguish between two types of part-power couples: those in which the husband is college educated and those in which the wife is college educated. The PSID transition data suggest that the migration of power couples is not the primary explanation for the increasing concentration of power couples in large MSAs found by Costa and Kahn – the patterns of migration of power couples are not substantially different from power singles or part-power couples in which the husband has a college degree. We next turn to the formation of power couples through education and marriage as a possible explanation for the location trends.

We noted above that higher returns to education and the greater availability of educational opportunities in larger metropolitan areas may increase human capital investment. Table 3, which shows the proportion of high school graduates without college degrees currently enrolled in higher education, is consistent with this hypothesis. With a few minor exceptions, the probability of being enrolled in education increases with population size for all groups in each year.[8] For example in 1990, among married men with high-school diplomas, 6.3 percent of those living in small MSAs were enrolled in credit courses compared to 9.0% of those living in the largest metropolitan areas, those with populations over five million.

The differences across city size suggest that the formation of power couples and power singles through educational attainment is more likely in larger MSAs than in smaller MSAs. Holding marriage and migration constant, an increasing concentration of power couples in large MSAs would occur if the proportion of married individuals in large MSAs who are enrolled in credit education is higher than the proportion of married individuals in smaller areas enrolled in credit education. For both married men and married women, the gap in enrollment rates between the large and small MSAs grew or remained constant 1980 and 1990 and then fell between 1990 and 2000. These changing enrollment patterns are consistent with the changing location patterns observed in the census – a rising concentration of power couples in large MSAs until 1990 and then a decline over the next decade.

Next, consider the likelihood of creating a power couple by the marriage of two power singles. Table 4 shows the probability that an unmarried individual in year one will be married in year two, conditional on the size of year two location.[9] The results do suggest that the formation of power and part-power couples through marriage is more likely to occur in large urban areas compared to smaller urban areas. Marriages in general are less likely to occur as we increase location size but this effect is stronger for low-power than power singles. Unmarried low-power men living in large MSAs are less likely to marry than their counterparts living in small MSAs whereas there are no significant differences in marriage rates of single power men by location size. Both single power women and single low-power women are less likely to marry if they live in large MSAs compared to those living in small MSAs, but the drop in women's marriage rates as we increase city size is much larger for those without a college degree. The patterns of assortative mating also suggest that power couples are

[8] The categories of small, midsize and large MSAs are different for this table than for the rest of the analyses because the public use files for 2000 do not identify places with populations less than 400,000.
[9] These are higher than might be expected for the total population because individuals in the sample must have been the head or spouse of a household at some point during the survey years, but this should not bias the comparison across city size.

more likely to be created in large MSAs than in small MSAs. College educated singles living in small and midsize MSAs are just as likely to marry a college educated spouse as a non-college educated spouse, i.e., those that marry are equally likely to create a part-power couple as a power couple. College educated single men living in large MSAs, however, are more likely to marry a college educated women than a non-college educated woman.

While there is little change in the marriage rates by city size over time, one pattern that emerged as statistically significant is the decline in marriage rates of low-power men living in large and medium sized MSAs. With all else held constant, this decline would reduce the proportion of low-power couples in large and medium sized MSAs.

Finally, we look at the probability that a couple will divorce by city size. As shown in Table 5, power couples are least likely to divorce, compared with part-power couples and low-power couples. Low-power couples are more likely to divorce if they live in large metropolitan areas than in small MSAs. This relationship with area of residence is reversed for power couples, who are more likely to divorce if they live in a small city, although these are not precise estimates due to small sample size in this category. These estimates suggest that the stability of power couple marriages is higher in large MSAs.

Overall, it is difficult to conclude that the migration of power couples into large urban areas can explain the observed location trends documented by Costa and Kahn. The marriage patterns, educational attainment trends, and relatively higher migration rates among unmarried individuals from small and midsize MSAs appear more likely to have caused the increased concentration of power couples in large cities.

Are these dynamic trends influenced by co-location pressure? The ability of larger labor markets to solve the co-location problem may affect the concentration of power couples in larger MSAs through its effect on the stability of marriage and through migration. In the next section, we argue that co-location pressure does not affect the migration behavior of couples. We cannot examine the effects of co-location on marriage and divorce directly but we do note that the fall in power couple concentration in 2000 is difficult to explain by a weakening of the co-location pressure. Labor force participation of married women remained steady over the decade while the proportion of women in specialized professional occupations increased.[10]

5. Determinants of Migration

In this section we use the PSID to investigate the individual and couple level determinants of migration. More specifically, we investigate how the joint education profile of couples affects its propensity to migrate to large MSAs.

5.1 Econometric Specification

We focus on couples' joint education profile as a determinant of migration, controlling for other factors such as family, location amenities, employment and occupation. We run each regression separately on the sample of married couples and on the sample of unmarried men and women, covering the 1980-1993 period.[11] The dependent variable in each regression captures the migration behavior that is observed in year two while all independent variables are measured in year one to avoid endogeneity problems.

Two selection issues require consideration. The first is attrition: the requirement that migration variables be defined in year two results in the loss of observations. The second is change in marital status: because our observations are at the household level – unmarried individual heads of households and married couples – and are defined over a two-year period, the marital status must be constant over the two years. Hence, the location in year two is defined only for those couples that remain married and unmarried individuals who remain unmarried. As a result, our samples are doubly selected to include only those observations that (i) have not been lost to attrition and (ii) have the same marital status in year two as in year one.[12] To adjust for this, we use the inverse Mills ratio calculated from a first step probit regression on the probability of observing the migration variables.[13]

[10] Census figures indicate that the proportion of women among the employed population aged 23-39 was 45.2 percent in 1990 and 45.8 percent in 2000. In 1990, women comprised 39.9 percent of individuals aged 23-39 in specialized professional occupations; in 2000 the proportion of women among professionals increased to 44.8. Calculations by authors.

[11] The shorter time span was chosen for the availability of all relevant variables.

[12] In the married sample, 3708 observations were lost to attrition and 2718 were lost to divorce leaving a sample of 16044. In the unmarried sample, 4022 observations were lost to attrition and 3148 were lost to marriage leaving a sample of 17730.

[13] These regressions are not shown here, but are available on request. We employed two methods to correct for selection bias. The first model calculates the IMR by defining the dependent variable in the probit selection equation as being equal to one if both selection criteria were met. In the second, we calculate the IMR by defining the dependent variable as being equal to one if only the marital status stability criterion was met. In the second case, observations with missing data are

We estimate two econometric models of the migration decision. The first, a binary logit, estimates the probability of migrating without consideration of the destination:

$$Y_i = f(A_i, X_i) + u_i$$

$$Y_i^* = \begin{cases} 1 & \text{if } Y_i \geq 0 \quad \text{Migration} \\ 0 & \text{if } Y_i < 0 \quad \text{No Migration} \end{cases}$$

where X_i are individual or couples characteristics and A_i are attributes of the origin location. The second, a multinomial logit, distinguishes among destination by size. Here, the individual or couple chooses among four alternatives: staying in the current location, migrating to a small MSA, migrating to a midsize MSA and migrating to a large MSA. In the multinomial logit whether to migrate and size of destination are determined simultaneously. Individuals or couples are assumed to have preferences over a set of alternative size locations. The observed outcome is that which yields the highest utility for the individual or couple:

$$U_i(\text{alternative } 0 - \text{not migrating}) = B_0 X_i + \varepsilon_{i,0}$$
$$U_i(\text{alternative } 1 - \text{migrating to small}) = B_1 X_i + \varepsilon_{i,1}$$
$$U_i(\text{alternative } 2 - \text{migrating to med}) = B_2 X_i + \varepsilon_{i,2}$$
$$U_i(\text{alternative } 3 - \text{migrating to large}) = B_3 X_i + \varepsilon_{i,3}$$

$$\text{Observed } Y_i^* = \text{Alternative } j \text{ if } U(\text{Alternative } j) > U(\text{Alternative } k), \forall k \neq j;$$

$$\Pr ob(\text{Alternative } j) = \frac{\exp(B_j X_i)}{\sum_{m=0}^{3} \exp(B_m X_i)}, \; j = 0,\ldots 3$$

Migration and education may be endogenous if individuals have unobservable characteristics that are reflected in a higher propensity to invest in human capital through both education and migration. To

simply dropped. The results are robust across the different selection assumptions. Results are shown using the first selection criteria.

correct for unobserved heterogeneity in the propensity to invest in human capital, we control for whether the current state is the home state of the individual (or either spouse in the married sample) and whether or not the individual (or husband in the married sample) has previously moved in order to take a job.[14]

5.2 Regression Results

The regression results show that it is not the joint educational profile of a couple but only the husband's education that affects the decision to migrate. Table 6 and table 7 provide the regression coefficients on the relevant education variables, using four specifications.[15]

The analysis hinges on how we treat couples in which one spouse has a college degree and the other does not (i.e., the part-power couples).[16] If we pool the part-power couples in which the husband is a college graduate with the part-power couples in which the wife is a college graduate, we find that power couples are more likely to migrate than both part-power couples and low-power couples, although there is no statistically significant difference between the coefficients on power couples and part-power couples. When we split the part-power couples into those in which the husband is a college graduate and those in which the wife is a college graduate (column B), we find that the migration propensities of power couples and part-power couples where the husband has a college degree are the same. We also find that the migration propensities of low-power couples and part-power couples in which the wife has a college degree are the same. When we ignore joint education specifications and control for the husband's education, we find no statistically significant effect of the wife's education on the probability of migration (column C). Wald tests on the coefficients confirm that the effects of husband's and wife's education on the propensity to migrate are statistically different. These results suggest that it is not the joint education profile of a couple that affects migration, but only the husband's education. Finally, we find no evidence that power couples are less likely to migrate from large MSAs than other couples (column D).

The regression results for unmarried individuals show that college education has a strong positive effect on the probability of migrating. We also find that, unlike the married sample, there is no

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[14] Hausmann tests confirm that with the inclusion of these variables, we can reject the null hypothesis of endogeneity at the 5% confidence level for both the married and singles sample.
[15] Full Regression results are available from authors.
[16] Of the 16,458 couple observations, 2011 are couples in which both have a college degree and 2603 are couples in which only one spouse has a college degree. Of the latter, 1663 are couples in which only the husband has a college degree and 940 are couples in which only the wife has a college degree.

significant difference between the effect of education for males and females, as shown by the insignificant coefficient on the interaction variable signifying women with a college degree. Finally, we find that unmarried individuals are less likely to migrate from a midsize or large MSA than a small MSA and that this result is strengthened for power singles.

The multinomial logit regressions (Table 8) confirm the crucial role of husband's education in migration, especially migration to large MSAs. The estimates in these regressions are less precise than those in the logit regressions due to the smaller sample sizes in each regression. Wald tests on the coefficients show that the differences between the effects of husband's and wife's education on the propensity to migrate to small and medium MSAs are not statistically significant. However, the effects of husband's and wife's education on the propensity to migrate to large MSAs are statistically significant. We find a strong, positive effect of power couple status on migration to midsize and large MSAs; but when we distinguish between husband's education and wife's education, we again find that only the husband's education positively affects migration to large areas. The coefficient is large and significant. Part-power couples in which the husbands are college educated are five times more likely to migrate to large cities than low-power couples while part-power couples in which the wife has a college degree are not statistically different from low-power couples. Holding constant the husband's education, we find that a wife's college education actually decreases the probability of migrating to a large city (column C). This final result, however, is not robust across specifications. Adding interaction terms designed to capture whether power couples are less likely than other couples to leave large MSAs, we find that all couples living in medium and large MSAs are more likely to migrate to large MSAs than stay in their current location, but no differential effect for power couples (column D).

5.3 Post-Graduate Degrees and Urban Occupations

Costa and Kahn assume that occupational specialization makes the co-location problem more acute for couples with college degrees and thus far we have made the same assumption. But many college educated individuals, women especially, are in occupations that are relatively portable and are not concentrated in large urban areas - the occupational specialization story is more plausible for an economist married to a lawyer than for a high-school teacher married to a registered nurse.[17] The migration behavior of couples in which both spouses have post-graduate degrees or both spouses have

[17] Thirty-six percent of all couples and 43% of all singles lived in large urban areas in 1990. Economists and lawyers tend to have advanced degrees and are relatively concentrated in large areas – 59% of economists and 55% of lawyers lived in large MSAs in 1990. In contrast, teachers and nurses are less likely to have advanced degrees and are not concentrated in large areas - 33% of teachers and 38% of registered nurses live in large MSAs in 1990 (See Appendix D).

urban occupations might be very different from the behavior of power couples without advanced degrees or urban occupations.

Table 9 expands table 1 by identifying couples and singles who hold post-graduate degrees. The same patterns are observed for these couples over the four decades – an increase in the proportion living in large cities until 1990 and then a drop in 2000. A gender split is again observed. Couples in which only the husband has a post-graduate degree are more likely to live in large MSAs than are couples in which only the wife has a post-graduate degree.

We apply the same regression analyses as above to investigate whether co-location effects can be found for couples in which both spouses have occupations that are concentrated in large MSAs or both spouses have advanced degrees (Tables 10-12).[18] We first include a measure of the urbanization of occupation – the percent of all individuals in one's occupation that reside in MSAs greater than 2 million.[19] This variable is added as a continuous variable (column E) and as a dichotomous variable (column F) that defines urban occupations as those where at least forty percent of individuals in the occupation live in large MSAs.[20] We create categories to describe 'urban' and 'part-urban' couples in the same way we describe power and part-power couples by education - controlling for couples in which both spouses have urban occupations, where only the husband has an urban occupation and t where only the wife has an urban occupation. We then add indicators for post-graduate college degrees, again creating categories to describe the joint profile of the couple (Columns G and H). We do not find significant effects of either urban occupation or advanced education in any specification. A co-location effect is not evident even under a more stringent definition of who is most affected by occupation specialization. For the unmarried sample, we again find no gender differences in the effects of advanced education or urban occupation on the propensity to migrate.

In short, the regression results do not provide support for the assumption that power couples face a more severe co-location problem than other couples and that this problem would be better solved in

[18] There are 1505 couples in which at least one spouse has an advanced degree. These include 227 couples in which both spouses have advanced degrees, 854 couples in which only the husband has an advanced degree and 424 couples in which only the wife has an advanced degree. Likewise, there are 1118 observations of couples in which both have urban occupations; 3699 observations of couples in which only the husband has an urban occupation and 936 observations of couples in which only the wife has an urban occupation.

[19] Rates of occupation urbanization are calculated from the 1990 public use files of the Census (Ruggles and Sobeck, 1997). Results are shown in Appendix D.

[20] This cutoff was chosen to correspond roughly to the proportion of all individuals living in large MSAs. In 1990, approximately 36 per cent of all couples and 43 per cent of singles lived in large urban areas (see table 1). Urban occupations then are those that are more than proportionately located in large MSAs. The regression results are robust to alternative percentages used to define urban occupations.

large urban areas. We do find evidence that college educated individuals and couples are more likely to migrate to large MSAs, holding all else constant, including the concentration of occupation in large urban areas. The consistency of the college education variables after controlling for occupation suggests that in addition to employment opportunities, amenities and/or returns to education are pulling college graduates to large MSAs.[21] For couples, however, it is not the joint education profile that affects the migration patterns, it is the husband's education.

6. Conclusion

Between 1970 and 1990, power couples were increasingly likely to be located in the largest urban areas. In this paper we investigate the dynamic processes that underlie these changes in location patterns. Using data from the Panel Study of Income Dynamics we find that the migration of power couples into large metropolitan areas cannot explain the changes in location patterns. Instead, we find that the increased concentration of power couples in large MSAs was caused by other factors: an influx of educated unmarried individuals into the large MSAs, increased educational attainment, higher probability of marrying a college educated spouse and relatively low divorce rates among power couples in large urban areas. To the extent that co-location problems have influenced the changes in the location patterns of power couples, they appear to have done so primarily through their effect on marriage patterns and marriage stability rather than through their effect on power couples' migration patterns. The decline in power couple concentration in the largest cities revealed by the 2000 census reinforces the inference that the co-location problem is not the driving force underlying these location trends. The regression analyses support this conclusion: husband's education, not the joint education profile of husband and wife, determine

[21] This suggestion depends on the assumption that individuals do not change occupations: the insignificance of the urban occupation indicators may be caused by individuals changing occupations following migration so that their occupation prior to migration is not indicative of their occupation post-migration.

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Table 1 – Proportion of Household Groups Living in MSAs Greater Than 2 Million

	1970	1980	1990	2000
Power Couple	40.1	43.3	49.7	46.9
Part-Power Couple	37.1	37.3	40.1	38.2
Part-Power - Wife has college degree	35.3	34.9	37.9	37.1
Part-Power - Husband has college degree	38.6	40.1	42.6	41.1
Low Power Couple	31.2	32.3	31.3	33.5
Single power men	51.3	53.4	55.1	55.5
Single power women	48.5	53.4	54.2	54.6
Single low-power men	38.7	42.3	39.8	40.2
Single low-power women	39.9	44.2	40.8	41.1
All Couples in age range	32.9	35.0	35.7	37.3
All Single Men in age range	40.8	45.4	43.2	44.0
All Single Women in age range	41.1	46.3	43.9	44.9

Power couples are those in which both spouses have completed at least four years of college or hold college degrees, part-power couples include those couples in which only one spouse has completed at least four years of college or holds a college degree, low-power couples are those in which neither spouse has four years of college or a college degree. Couples are limited to legally married couples residing in the same household. For married couples, the sample is limited to those in which the wife was 23 to 37 years of age and the husband was 25 to 39 years of age. Singles fall into the same age categories. Calculations by authors using the census integrated public use census samples (Ruggles and Sobeck 1997).

Table 2 – Migration Patterns, by Household Type

	Probability of Migrating			Destination, Conditional on Migrating		
	Mean	95% Confidence Interval		Mean	95% Confidence Interval	
Power Couple		***Lower***	***Upper***		***Lower***	***Upper***
Small metropolitan area	7.34	*5.06*	*9.62*	23.3	*17.0*	*29.6*
Midsize metropolitan area	8.01	*6.12*	*9.90*	36.4	*29.2*	*43.5*
Large metropolitan area	6.20	*4.86*	*7.54*	40.3	*33.0*	*47.7*
Part-Power Couple: Husband has BA						
Small metropolitan area	5.67	*3.79*	*7.55*	20.0	*13.2*	*26.8*
Midsize metropolitan area	9.61	*7.23*	*11.99*	39.3	*30.9*	*47.6*
Large metropolitan area	4.83	*3.45*	*6.21*	40.7	*32.3*	*49.1*
Part-Power Couple: Wife has BA						
Small metropolitan area	4.34	*2.31*	*6.36*	25.5	*12.6*	*38.5*
Midsize metropolitan area	4.24	*2.20*	*6.29*	42.6	*27.9*	*57.2*
Large metropolitan area	3.20	*1.70*	*4.69*	31.9	*18.1*	*45.7*
Low-Power Couple						
Small metropolitan area	3.22	*2.74*	*3.71*	36.9	*32.7*	*41.2*
Midsize metropolitan area	4.29	*3.70*	*4.89*	37.7	*33.5*	*42.0*
Large metropolitan area	2.69	*2.26*	*3.11*	25.3	*21.5*	*29.2*
Single Power Men						
Small metropolitan area	17.43	*12.36*	*22.51*	23.7	*16.3*	*31.0*
Midsize metropolitan area	12.35	*9.13*	*15.56*	33.6	*25.4*	*41.8*
Large metropolitan area	5.66	*4.09*	*7.24*	42.7	*34.2*	*51.3*
Single Power Women						
Small metropolitan area	16.85	*12.43*	*21.26*	22.2	*15.9*	*28.5*
Midsize metropolitan area	10.55	*8.08*	*13.02*	38.0	*30.7*	*45.4*
Large metropolitan area	6.24	*4.80*	*7.68*	39.8	*32.4*	*47.2*
Single Low-Power Men						
Small metropolitan area	8.14	*6.88*	*9.41*	33.2	*28.4*	*37.9*
Midsize metropolitan area	5.27	*4.34*	*6.20*	31.1	*26.4*	*35.7*
Large metropolitan area	4.65	*4.01*	*5.30*	35.8	*30.9*	*40.6*
Single Low-Power Women						
Small metropolitan area	6.32	*5.37*	*7.28*	28.0	*23.9*	*32.1*
Midsize metropolitan area	3.96	*3.37*	*4.54*	35.7	*31.6*	*40.1*
Large metropolitan area	2.59	*2.25*	*2.93*	36.3	*31.9*	*40.7*

Annual migration rates from 1970 to 1996 estimated from PSID sample. The estimates assume that the migration rates for each category remain constant for 1970-1996, but when we split the PSID sample into the three decades, we find no significant differences in the migration rates of power couples between the 1970s and 1980s nor between the 1970s and 1990s. Couples include those who are observed married or cohabiting in year one and year two. Singles are also limited to those who did not change marital status during the year. Large metropolitan areas are those with at least 2M population, midsize metropolitan areas have populations between 250,000 to 2M, smaller metropolitan areas and counties that are not contained in a metropolitan area are included in the final category. Power couples are those in which both spouses have completed at least four years of college or hold college degrees, part-power couples include only one spouse with a college education, low-power couples are those in which neither spouse has a college degree. Couples are limited to those in which the wife was 23 to 37 years of age and the husband was 25 to 39 years of age. Singles fall into the same age categories.

Table 3 – Percent of Population Who Have a High School Diploma but Not a College Degree Who Are Enrolled in Credit Education

	1980	1990	2000	% Change 80-90	% Change 90-00
Married Men					
Non-MSA or MSA fewer than 1M	5.6	6.3	6.6	11.8	5.4
MSA Population between 1-2M	8.5	8.3	8.9	-2.1	6.6
MSA Population over 2M	8.2	9.0	8.2	9.8	-8.6
Married Women					
Non-MSA or MSA fewer than 1M	5.0	8.0	7.8	58.8	-2.6
MSA Population between 1-2M	6.8	9.1	8.5	34.1	-6.8
MSA Population over 2M	7.1	10.0	9.5	40.5	-4.9
Unmarried Men					
Non-MSA or MSA fewer than 1M	10.0	9.7	12.2	-2.9	25.4
MSA Population between 1-2M	12.2	11.4	14.3	-6.3	25.1
MSA Population over 2M	12.9	13.3	16.1	3.3	20.5
Unmarried Women					
Non-MSA or MSA fewer than 1M	11.5	13.9	15.3	21.5	9.7
MSA Population between 1-2M	14.6	14.9	16.7	1.8	12.6
MSA population over 2M	14.7	16.8	19.1	13.9	13.6

Calculated by authors using the Census Integrated public use census samples (Ruggles and Sobeck 1997).

Table 4 – Marriage Patterns, by Size of Area

	Probability of Marrying			Conditional on Marrying, % with College educated Spouse		
		95% Confidence Interval			95% Confidence Interval	
	Mean	Lower	Upper	Mean	Lower	Upper
Unmarred Men with less than BA						
Small metropolitan area	14.0	*12.5*	*15.5*	9.9	*6.3*	*13.6*
Midsize metropolitan area	12.8	*11.5*	*14.1*	7.9	*4.8*	*10.9*
Large metropolitan area	11.5	*10.6*	*12.4*	10.9	*8.1*	*13.8*
Unmarried Men with BA or more						
Small metropolitan area	14.2	*9.9*	*18.5*	48.8	*32.8*	*64.8*
Midsize metropolitan area	14.0	*10.9*	*17.2*	51.4	*39.4*	*63.4*
Large metropolitan area	12.6	*10.5*	*14.7*	61.1	*52.7*	*69.3*
Unmarried Women with less than BA						
Small metropolitan area	11.8	*10.6*	*13.0*	7.6	*4.6*	*10.7*
Midsize metropolitan area	8.6	*7.8*	*9.4*	11.8	*8.4*	*15.2*
Large metropolitan area	7.6	*7.1*	*8.2*	11.7	*9.1*	*14.4*
Unmarried Women with BA or more						
Small metropolitan area	11.4	*7.9*	*15.0*	61.0	*45.4*	*76.6*
Midsize metropolitan area	10.9	*8.5*	*13.3*	59.3	*48.7*	*69.9*
Large metropolitan area	10.8	*9.1*	*12.5*	64.1	*56.5*	*71.7*

Annual rates from 1970-1996 PSID Data. Unmarried individuals are defined as becoming married if they are observed to be legally married or living common-law in year two.

Table 5 - Probability of Marriage Breakup, by Size of Area

	Means	**95% Confidence Interval**	
		Lower	*Upper*
Power Couple			
Small metropolitan area	1.95	*0.75*	*3.14*
Midsize metropolitan area	1.60	*0.74*	*2.47*
Large metropolitan area	1.27	*0.65*	*1.89*
Part-Power Couple			
Small metropolitan area	2.50	*1.53*	*3.47*
Midsize metropolitan area	2.61	*1.62*	*3.60*
Large metropolitan area	1.81	*1.13*	*2.49*
Low-Power Couple			
Small metropolitan area	3.14	*2.67*	*3.62*
Midsize metropolitan area	3.77	*3.22*	*4.32*
Large metropolitan area	4.01	*3.50*	*4.52*

Annual rates calculated from 1970-1996 PSID. Couples are defined as having a marriage breakup if they are no longer married or cohabiting in the second year.

Table 6 – Effect of Power Status on Probability of Migrating (Married Sample)

	A	B	C	D
Both spouses have college degree	**1.912**	**1.925**		**2.061**
	(0.000)	**(0.000)**		**(0.001)**
Only one spouse has a college degree	**1.664**			
	(0.000)			
Only husband has a college degree		**1.955**		**1.948**
		(0.000)		**(0.000)**
Only wife has a college degree		1.032		1.030
		(0.904)		(0.911)
Husband has a college degree			**1.935**	
			(0.000)	
Wife has a college degree			0.998	
			(0.991)	
Origin - Midsize MSA	1.090	1.099	1.099	1.111
	(0.463)	(0.425)	(0.422)	(0.429)
Origin - Large MSA	0.945	0.943	0.945	0.977
	(0.737)	(0.732)	(0.741)	(0.897)
Power Couple in Midsize MSA				0.940
				(0.818)
Power Couple in Large MSA				0.845
				(0.595)
Sample Size	16458	16458	16458	16458
Wald Chi2	625.07	644.31	641.58	647.52
Pseudo R2	0.134	0.1356	0.1356	0.1357
Wald Coefficient Tests (Prob>χ^2)				
Var(1) = Var(2)	0.4078			
Var(1) = Var(3)		0.9309		0.8101
Var(1) = Var(4)		0.0272		0.0327
Var(3) = Var(4)		0.0248		0.0253
Var(5) = Var(6)			0.0071	

Coefficients are presented as odds ratios. P>|z| in parentheses. Bold coefficients are significant at the 5% confidence level. Standard Errors adjusted for clustering on household identifier. Regressions include controls for either spouse living in home state, whether the head moved previously for a job, average growth rate of origin MSA, average housing value in origin MSA, distance to nearest large MSA, husband aged 25-29, husband aged 30-34, wife aged 23-27, wife aged 28-32, children aged 0-5, school aged children, home owner, number of months duration husband's job, number of months duration wife's job, husband unemployed, wife unemployed, husband not in the labor force, wife not in the labor force, either of spouses non-white, total family income, inverse mills ratio.

Table 7 – Effect of Power Status on Probability of Migrating (Unmarried Sample)

	A	B	D
Has a College Degree	**1.426**	**1.590**	**2.045**
	(0.040)	**(0.001)**	**(0.001)**
Woman, Has a College Degree	1.210		
	(0.385)		
Origin - Midsize MSA	**0.566**	**0.566**	**0.582**
	(0.000)	**(0.000)**	**(0.000)**
Origin - Large MSA	**0.422**	**0.422**	**0.501**
	(0.000)	**(0.000)**	**(0.000)**
Power Individual in Midsize MSA			0.862
			(0.535)
Power Individual in Large MSA			**0.501**
			(0.010)
Sample Size	17730	17730	17730
Wald Chi2	554.250	555.470	560.600
Pseudo R2	0.101	0.101	0.103

Coefficients are presented as odds ratios. P>|z| in parentheses. Bold coefficients are significant at the 5% confidence level. Standard Errors adjusted for clustering on household identifier. Regressions include controls for living in home state, whether moved previously for a job, average growth rate of origin MSA, average housing value in origin MSA, distance to nearest large MSA, young age group (25-29 for men, 23-27 for women), middle age group (30-34 for men, 28-32 for women) children aged 0-5, school aged children, home owner, number of months duration current job, unemployed, not in the labor force, non-white, total family income, inverse mills ratio.

Table 8 – Effect of Power Status, Multinomial Logit Regressions (Married Sample)

	A			B			C			D		
	Small	Med	Large	Small	Med	Large	Small	Med	Large	Small	Med	Large
Both spouses have college degree	1.458	**2.253**	**2.317**	1.464	**2.261**	**2.385**						
	(0.172)	**(0.000)**	**(0.011)**	(0.168)	**(0.000)**	**(0.009)**						
Only one spouse has a college degree	1.134	**1.545**	**3.555**									
	(0.596)	**(0.035)**	**(0.000)**									
Only husband has a college degree				1.290	**1.677**	**5.115**						
				(0.323)	**(0.030)**	**(0.000)**						
Only wife has a college degree				0.752	1.256	1.133						
				(0.547)	(0.494)	(0.815)						
Husband has a college degree							1.404	**1.709**	**4.519**	1.444	**1.686**	**4.677**
							(0.124)	**(0.008)**	**(0.000)**	(0.099)	**(0.015)**	**(0.000)**
Wife has a college degree							1.006	1.318	**0.550**	1.094	1.274	0.760
							(0.982)	(0.171)	**(0.045)**	(0.738)	(0.336)	(0.539)
Origin - Midsize MSA	0.713	1.194	**2.411**	0.718	1.199	**2.449**	0.713	1.198	**2.462**	0.752	1.174	**2.575**
	(0.106)	(0.309)	**(0.007)**	(0.115)	(0.298)	**(0.006)**	(0.109)	(0.301)	**(0.006)**	(0.199)	(0.411)	**(0.008)**
Origin - Large MSA	0.661	1.075	1.882	0.660	1.075	1.877	0.652	1.072	1.911	0.636	1.070	**2.285**
	(0.148)	(0.771)	(0.127)	(0.146)	(0.771)	(0.122)	(0.137)	(0.782)	(0.107)	(0.145)	(0.798)	**(0.048)**
Power Couple in Midsize MSA										0.727	1.089	0.773
										(0.471)	(0.800)	(0.637)
Power Couple in Large MSA										1.055	1.021	0.352
										(0.916)	(0.960)	(0.143)
Sample Size		16458			16458			16458			16458	
Wald Chi2		870.27			912.04			902.33			934.56	
Pseudo R2		0.1279			0.1302			0.1297			0.1303	
Wald Coefficient Tests (Prob>χ^2)												
Var(1) = Var(2)	0.3155	0.1024	0.1577									
Var(1) = Var(3)				0.6730	0.2409	0.0137						
Var(1) = Var(4)				0.1788	0.0992	0.1793						
Var(3) = Var(4)				0.2847	0.4475	0.0051						
Var(5) = Var(6)							0.3709	0.4569	0.0000	0.4538	0.4401	0.0006

Coefficients are presented as odds ratios. P>|z| in parentheses. Bold coefficients are significant at the 5% confidence level. Standard Errors adjusted for clustering on household identifier. Married regressions include controls for origin is midsize MSA, origin is large MSA, either spouse living in home state, whether the head moved previously for a job, average growth rate of origin MSA, average housing value in origin MSA, distance to nearest large MSA, husband aged 25-29, husband aged 30-34, wife aged 23-27, wife aged 28-32, children aged 0-5, school aged children, home owner, number of months duration husband's job, number of months duration wife's job, husband unemployed, wife unemployed, husband not in the labor force, wife not in the labor force, either of spouses non-white, total family income, inverse mills ratio.

Table 9 – Proportion of Household Group Living in MSAs Greater Than 2Million

	1970	1980	1990	2000
Power Couple (both with at least a college degree)	40.1	43.3	49.7	46.9
Both have only college degree	35.8	38.9	47.6	43.8
Wife only has post-graduate degree	42.9	42.3	47.7	45.9
Husband only has post-graduate degree	40.1	42.9	50.7	49.6
Both have post-graduate degrees	46.0	48.7	56.9	54.5
Part-Power Couple (only one spouse has a college degree)	37.1	37.3	40.1	38.2
Part-Power Wife (Husband has less than college)				
Wife has only college degree	34.2	33.6	38.1	36.8
Wife has post-graduate degree	40.3	38.2	36.5	38.6
Part-Power Husband (Husband has less than college)				
Husband has only college degree	38.2	39.0	41.6	39.7
Husband has post-graduate degree	39.0	41.6	46.1	46.3
Single power men	51.3	53.4	55.1	55.5
College only	50.5	52.2	53.4	53.9
Advanced degree	51.9	54.4	58.7	59.3
Single power women	48.5	53.4	54.2	54.6
College only	46.9	52.5	54.2	53.5
Advanced degree	50.3	54.3	54.3	57.0

Power couples are those in which both spouses have completed at least four years of college or hold college degrees, part-power couples include those couples in which only one spouse has completed at least four years of college or holds a college degree, low-power couples are those in which neither spouse has four years of college or a college degree. Couples are limited to legally married couples residing in the same household. For married couples, the sample is limited to those in which the wife was 23 to 37 years of age and the husband was 25 to 39 years of age. Singles fall into the same age categories. Calculations by author using the census integrated public use census samples (Ruggles and Sobeck 1997).

Table 10 – Effect of Occupation and Advanced Degrees on Probability of Migrating (Married Sample)

	E	F	F-Large	F-Small	G	H
Both spouses have college degree	**1.921**	**1.874**	1.820	**1.918**	**1.831**	**1.833**
	(0.000)	**(0.000)**	(0.067)	**(0.013)**	**(0.001)**	**(0.001)**
Only husband has a college degree	**1.984**	**1.896**	1.847	0.985	**1.915**	**1.917**
	(0.000)	**(0.000)**	(0.052)	(0.961)	**(0.000)**	**(0.000)**
Only wife has a college degree	0.944	1.038	2.637	0.887	1.025	1.017
	(0.830)	(0.887)	(0.021)	(0.797)	(0.926)	(0.947)
At least one spouse has advanced degree					1.109	
					(0.585)	
Both spouses have advanced degrees						1.009
						(0.981)
Only husband has an advanced degree						1.102
						(0.637)
Only wife has an advanced degree						1.189
						(0.581)
Percent of Husband's occupation	1.025					
located in Large MSAs	(0.965)					
Percent of Wife's occupation	0.395					
located in large MSA	(0.306)					
Both have Urban Occupation		1.067	0.809	0.882		
		(0.770)	(0.629)	(0.829)		
Only Husband in urban occupation		1.194	0.961	1.409		
		(0.185)	(0.885)	(0.137)		
Only Wife in urban occupation		0.975	1.028	1.141		
		(0.914)	(0.951)	(0.792)		
Sample Size	16458	16458	3974	5477	16458	16458
Wald Chi2	644.100	656.840	125.860	267.490	647.900	652.170
PseudoR2	0.136	0.136	0.109	0.189	0.136	0.136

Coefficients are presented as odds ratios. P>|z| in parentheses. Bold coefficients are significant at the 5% confidence level. Standard Errors adjusted for clustering on household identifier. Regressions include controls for either spouse living in home state, whether the head moved previously for a job, average growth rate of origin MSA, average housing value in origin MSA, distance to nearest large MSA, husband aged 25-29, husband aged 30-34, wife aged 23-27, wife aged 28-32, children aged 0-5, school aged children, home owner, number of months duration husband's job, number of months duration wife's job, husband unemployed, wife unemployed, husband not in the labor force, wife not in the labor force, either of spouses non-white, total family income, inverse mills ratio.

Table 11 – Effect of Occupation and Advanced Degrees on Probability of Migrating (Unmarried Sample)

	E	F	F-Large	F-Small	G	H
Has a College Degree	**1.543**	**1.559**	1.089	**2.633**		**1.674**
	(0.003)	**(0.002)**	(0.727)	**(0.000)**		**(0.000)**
Has an advanced degree						0.705
						(0.349)
Woman, has an advanced degree						1.174
(332 observations)						(0.719)
Percent of occupation in large MSA	1.514					
	(0.579)					
Woman, percent of occupation in large MSA	2.286					
	(0.347)					
Has an urban occupation		1.159	0.595	1.278		
		(0.372)	(0.082)	(0.472)		
Woman, has an urban occupation		0.980	1.380	1.017		
		(0.925)	(0.412)	(0.968)		
Sample Size	17322	17322	5442	3570	17730	17730
Wald Chi2	553.900	559.320	129.850	187.330	563.240	590.790
Pseudo R2	0.103	0.101	0.082	0.120	0.101	0.104

Coefficients are presented as odds ratios. P>|z| in parentheses. Bold coefficients are significant at the 5% confidence level. Standard Errors adjusted for clustering on household identifier. Regressions include controls for living in home state, whether moved previously for a job, average growth rate of origin MSA, average housing value in origin MSA, distance to nearest large MSA, young age group (25-29 for men, 23-27 for women), middle age group (30-34 for men, 28-32 for women) children aged 0-5, school aged children, home owner, number of months duration current job, unemployed, not in the labor force, non-white, total family income, inverse mills ratio.

Table 12 – Effect of Occupation and advanced degrees in Multinomial Logit Regressions

	E			F			G		
	Small	Med	Large	Small	Med	Large	Small	Med	Large
Husband has a college degree	**1.543**	**1.703**	**4.480**	1.395	**1.599**	**4.543**	1.219	**1.797**	**4.297**
	(0.046)	**(0.009)**	**(0.000)**	(0.139)	**(0.020)**	**(0.000)**	(0.426)	**(0.007)**	**(0.000)**
Wife has a college degree	0.884	1.312	**0.545**	1.005	1.336	**0.545**	0.899	1.373	**0.515**
	(0.618)	(0.183)	**(0.040)**	(0.984)	(0.151)	**(0.042)**	(0.667)	(0.104)	**(0.039)**
At least one spouse has advanced degree							1.699	0.815	1.256
							(0.072)	(0.430)	(0.510)
Percent of Husband's occupation	0.503	1.521	1.354						
located in Large MSAs	(0.413)	(0.582)	(0.819)						
Percent of Wife's occupation	1.566	**0.079**	2.634						
located in large MSA	(0.769)	**(0.021)**	(0.693)						
Both have Urban Occupation				1.123	0.998	1.188			
				(0.748)	(0.995)	(0.697)			
Only Husband in urban occupation				1.031	**1.470**	0.925			
				(0.898)	**(0.026)**	(0.784)			
Only Wife in urban occupation				1.039	0.813	1.347			
				(0.934)	(0.543)	(0.436)			
Sample Size		16458			16458			16458	
Wald Chi2		907.380			922.300			919.49	
Pseudo R2		0.131			0.131			0.131	

Coefficients are presented as odds ratios. P>|z| in parentheses. Bold coefficients are significant at the 5% confidence level. Standard Errors adjusted for clustering on household identifier. Regressions include controls for origin is midsize MSA, origin is large MSA, spouse living in home state, whether the head moved previously for a job, average growth rate of origin MSA, average housing value in origin MSA, distance to nearest large MSA, husband aged 25-29, husband aged 30-34, wife aged 23-27, wife aged 28-32, children aged 0-5, school aged children, home owner, number of months duration husband's job, number of months duration wife's job, husband unemployed, wife unemployed, husband not in the labor force, wife not in the labor force, either of spouses non-white, total family income, inverse mills ratio.

Appendix A– Large MSAs (Population over 2M)

	1970	1980	1990	2000
New York-Northern New Jersey-Long Island, NY-NJ-CT-PA	18,071,522	17,412,203	17,953,372	19,451,757
Los Angeles-Anaheim-Riverside, CA	9,980,859	11,497,549	14,531,529	16,036,587
Chicago-Gary-Lake County, IL-IN-WI	7,778,948	7,937,290	8,065,633	8,783,199
San Francisco-Oakland-San Jose, CA	4,754,366	5,367,900	6,253,311	6,873,645
Philadelphia-Wilmington-Trenton, PA-NJ-DE-MD	5,749,093	5,680,509	5,899,345	5,661,399
Detroit-Ann Arbor, MI	4,788,369	4,752,764	4,665,236	5,031,963
Washington, DC-MD-VA-WV	3,040,307	3,250,921	3,923,574	4,739,999
Dallas-Fort Worth, TX	2,351,568	2,930,568	3,885,415	4,909,523
Boston-Lawrence-Salem-Lowell-Brocton, MA-NH-ME-CT	3,709,642	3,662,888	3,783,817	4,440,881
Houston-Galveston-Brazoria, TX	2,169,128	3,099,942	3,711,043	4,493,741
Miami-Fort Lauderdale, FL	1,887,892	2,643,766	3,192,582	3,711,102
Atlanta, GA	1,684,200	2,138,136	2,833,511	3,857,097
Cleveland-Akron-Lorain, OH	2,999,811	2,834,062	2,759,823	2,910,616
Seattle-Tacoma, WA	1,836,949	2,093,285	2,559,164	3,023,741
San Diego, CA	1,357,854	1,861,846	2,498,016	2,820,844
Minneapolis-St. Paul, MN-WI	1,981,951	2,137,133	2,464,124	2,872,109
St. Louis, MO-IL	2,429,376	2,376,968	2,444,099	2,569,029
Baltimore, MD	2,089,438	2,199,497	2,382,172	2,491,254
Pittsburgh-Beaver Valley, PA	2,556,029	2,423,311	2,242,798	2,331,336
Phoenix, AZ	971,228	1,509,175	2,122,101	3,013,696
Tampa-St. Petersburg-Clearwater, FL	1,105,553	1,613,600	2,067,959	2,278,169
Denver-Boulder, CO	1,238,273	1,618,461	1,848,319	2,252,103

MSAs are defined as ‘large’ if their population is greater than 2M. MSA definitions, i.e., county components, are the 1990 definitions.

Appendix B – Probability of Location Size, by Household Type

	PSID		Costa & Kahn (2000)		
	1980	1990	1970	1980	1990
Power couple					
Small metropolitan area	0.306	0.155	0.426	0.261	0.210
Midsize metropolitan area	0.404	0.422	0.254	0.325	0.295
Large metropolitan area	0.291	0.423	0.321	0.414	0.495
Part-power couple (Husband with College)					
Small metropolitan area	0.297	0.269			
Midsize metropolitan area	0.375	0.383			
Large metropolitan area	0.329	0.348			
Part-power couple (Wife with College)					
Small metropolitan area	0.286	0.334			
Midsize metropolitan area	0.391	0.353			
Large metropolitan area	0.323	0.313			
Part-power couple					
Small metropolitan area	0.306	0.268	0.312	0.295	0.271
Midsize metropolitan area	0.365	0.389	0.326	0.334	0.308
Large metropolitan area	0.329	0.343	0.362	0.371	0.421
Low-power couple					
Small metropolitan area	0.418	0.418	0.399	0.380	0.369
Midsize metropolitan area	0.359	0.363	0.299	0.312	0.292
Large metropolitan area	0.223	0.219	0.301	0.308	0.339
Single, power man					
Small metropolitan area	0.213	0.169	0.186	0.193	0.165
Midsize metropolitan area	0.394	0.347	0.291	0.295	0.266
Large metropolitan area	0.393	0.484	0.523	0.512	0.569
Single, power woman					
Small metropolitan area	0.221	0.159	0.184	0.193	0.164
Midsize metropolitan area	0.421	0.429	0.309	0.308	0.281
Large metropolitan area	0.359	0.412	0.507	0.499	0.555
Single, low-power man					
Small metropolitan area	0.314	0.326	0.260	0.280	0.281
Midsize metropolitan area	0.423	0.381	0.297	0.305	0.278
Large metropolitan area	0.263	0.293	0.442	0.415	0.441
Single, low-power woman					
Small metropolitan area	0.341	0.246	0.240	0.257	0.260
Midsize metropolitan area	0.418	0.432	0.305	0.313	0.297
Large metropolitan area	0.241	0.321	0.455	0.430	0.444

Large metropolitan areas are those with at least 2M population, midsize metropolitan areas have populations between 250,000 to 2M, smaller metropolitan areas and counties that are not contained in a metropolitan area are included in the final category. Power couples are those in which both spouses have completed at least four years of college or hold college degrees, part-power couples include only one spouse with a college education, low-power couples are those in which neither spouse has a college degree. For the Census samples, couples are limited to legally married couples residing in the same household. This is to be consistent with the Costa/Kahn definition. With the PSID, we use a slightly more expansive definition of married couples, including all married and common-law couples. For married couples, the sample is limited to those in which the wife was 23 to 37 years of age and the husband was 25 to 39 years of age. Singles fall into the same age categories.

Appendix C(i) – Variable Means, Married Sample

	Non-Migrants		Migrants		Full Sample	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Education Variables						
Both spouses have college degree	0.109	0.312	0.207	0.405	0.112	0.316
Only one spouse has a college degree	0.151	0.358	0.211	0.408	0.153	0.360
Only husband has a college degree	0.089	0.285	0.161	0.368	0.091	0.288
Only wife has a college degree	0.062	0.241	0.050	0.219	0.061	0.240
Husband has a college degree	0.198	0.399	0.368	0.483	0.203	0.403
Wife has a college degree	0.171	0.376	0.257	0.437	0.174	0.379
At least one spouse has advanced degree	0.057	0.232	0.098	0.297	0.058	0.234
Both spouses have advanced degrees	0.008	0.089	0.011	0.103	0.008	0.090
Only husband has an advanced degree	0.030	0.169	0.063	0.243	0.031	0.172
Only wife has an advanced degree	0.017	0.129	0.021	0.145	0.017	0.130
Occupation Variables						
Percent of Husband's occupation in large MSA	0.346	0.101	0.339	0.117	0.345	0.101
Percent of Wife's occupation in large MSA	0.318	0.104	0.306	0.109	0.318	0.104
Both have Urban Occupation	0.085	0.279	0.085	0.280	0.085	0.279
Only Husband in urban occupation	0.206	0.404	0.251	0.434	0.207	0.405
Only Wife in urban occupation	0.062	0.240	0.075	0.263	0.062	0.241
Husband - Management	0.118	0.323	0.117	0.322	0.118	0.323
Husband - Professional	0.215	0.411	0.300	0.459	0.217	0.412
Husband - Sales	0.034	0.182	0.041	0.198	0.035	0.183
Husband - Teacher	0.015	0.122	0.010	0.098	0.015	0.122
Wife - Management	0.048	0.213	0.046	0.210	0.048	0.213
Wife - Professional	0.155	0.362	0.167	0.373	0.156	0.363
Wife - Sales	0.028	0.165	0.013	0.115	0.028	0.164
Wife - Teacher	0.036	0.187	0.032	0.176	0.036	0.186
Size of Origin Variables						
Origin - Midsize MSA	0.426	0.494	0.460	0.499	0.427	0.495
Origin - Large MSA	0.254	0.435	0.214	0.410	0.253	0.435
Power Couple in Midsize MSA	0.051	0.219	0.113	0.317	0.052	0.223
Power Couple in Large MSA	0.033	0.179	0.043	0.204	0.033	0.180
Propensity to Migrate Variables						
Either spouse living in home state	0.842	0.365	0.449	0.498	0.831	0.375
Head moved previously for a job	0.270	0.444	0.376	0.485	0.274	0.446
Labor Force Attachment						
Number of months duration, husband's job	58.62	59.49	48.87	56.12	58.30	59.41
Number of months duration, wife's job	30.47	44.52	15.29	27.33	29.98	44.16
Husband unemployed	0.051	0.221	0.058	0.233	0.052	0.221
Wife unemployed	0.034	0.181	0.053	0.225	0.035	0.183
Husband not in the labor force	0.024	0.154	0.048	0.214	0.025	0.157
Wife not in the labor force	0.318	0.466	0.383	0.486	0.321	0.467
Total family income	43157.0	29686.6	41425.3	27239.3	43101.4	29612.4

	Non-Migrants		Migrants		Full Sample	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Basic Demographics						
Husband aged 25-29	0.300	0.458	0.402	0.490	0.304	0.460
Husband aged 30-34	0.390	0.488	0.358	0.480	0.389	0.487
Wife aged 23-27	0.300	0.458	0.368	0.482	0.302	0.459
Wife aged 28-32	0.401	0.490	0.380	0.486	0.400	0.490
Child aged 0-5 present in household	0.539	0.498	0.507	0.500	0.538	0.499
School aged child present in household	0.288	0.453	0.309	0.462	0.289	0.453
Home owner	0.624	0.484	0.436	0.496	0.618	0.486
Either of spouses non-white	0.345	0.476	0.283	0.450	0.344	0.475
Origin MSA Attributes						
Average growth rate of origin MSA	-0.076	0.124	-0.106	0.129	-0.077	0.124
Average housing value in origin MSA	109.9	76.1	117.8	79.1	110.2	76.2
Distance to nearest MSA greater than 2M	147.6	168.3	202.8	334.6	149.3	176.4

Appendix C(ii) – Variable Means, Unmarried Sample

	Non-Migrants		Migrants		Full Sample	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Education Variables						
Has a College Degree	0.139	0.346	0.289	0.454	0.145	0.352
Woman, Has a College Degree	0.078	0.269	0.160	0.367	0.081	0.273
Has an advanced degree	0.025	0.156	0.045	0.207	0.026	0.158
Woman, Has an advanced degree	0.014	0.117	0.028	0.165	0.014	0.119
Occupation Variables						
Percent of occupation in large MSA	0.316	0.098	0.333	0.102	0.316	0.098
Woman, percent of occupation in large MSA	0.220	0.163	0.218	0.174	0.220	0.163
Has an urban occupation	0.159	0.366	0.234	0.423	0.162	0.368
Woman, has an urban occupation	0.099	0.298	0.141	0.348	0.100	0.300
Management	0.059	0.236	0.111	0.314	0.061	0.240
Professional	0.130	0.337	0.161	0.368	0.132	0.338
Sales	0.028	0.164	0.045	0.207	0.028	0.166
Teacher	0.024	0.152	0.030	0.171	0.024	0.153
Size of Origin Variables						
Origin - Midsize MSA	0.481	0.500	0.436	0.496	0.479	0.500
Origin - Large MSA	0.315	0.464	0.253	0.435	0.312	0.463
Power Individual in Midsize MSA	0.064	0.245	0.132	0.338	0.067	0.249
Power Individual in Large MSA	0.054	0.225	0.072	0.259	0.054	0.227
Propensity to Migrate Variables						
Lives in home state	0.792	0.406	0.498	0.500	0.781	0.414
Has moved previously for a job	0.164	0.370	0.347	0.476	0.171	0.377
Labor Force Attachment						
Months of duration, current job	32.456	45.495	23.788	35.267	32.121	45.173
Unemployed	0.132	0.338	0.116	0.321	0.131	0.338
Not in the labor force	0.161	0.367	0.145	0.353	0.160	0.367
Total family income	21504.6	19649.0	24400.3	21131.3	21616.4	19715.7
Basic Demographics						
Young age group	0.379	0.485	0.539	0.499	0.385	0.487
Middle age group	0.337	0.473	0.279	0.449	0.335	0.472
Female	0.713	0.452	0.672	0.470	0.712	0.453
Child aged 0-5 present in household	0.253	0.435	0.158	0.365	0.249	0.433
School aged child present in household	0.155	0.361	0.136	0.343	0.154	0.361
Home owner	0.172	0.377	0.125	0.331	0.170	0.375
Non-White	0.577	0.494	0.381	0.486	0.570	0.495
Origin MSA Attributes						
Average growth rate of origin MSA	-0.061	0.116	-0.093	0.122	-0.062	0.117
Average housing value in origin MSA	117.7	85.9	127.7	93.6	118.1	86.2
Distance to nearest MSA greater than 2M	127.7	153.1	150.5	207.5	128.6	155.6

Appendix D – Urban/Non-Urban Occupations

URBAN OCCUPATIONS	% Living in large MSAs	% with college degree
Actuaries	0.64	0.88
Aeronautical and astronautical engineers	0.64	0.75
Stock and bond salesmen	0.62	0.63
Podiatrists	0.61	0.99
Economists	0.59	0.77
Taxicab drivers and chauffeurs	0.59	0.10
Mathematicians	0.58	0.76
Computer systems analysts	0.57	0.68
Office managers, nec	0.56	0.65
Physicists and astronomers	0.55	0.86
Sociologists	0.55	0.80
Lawyers	0.55	1.00
Architects	0.55	0.82
Parking attendants	0.54	0.04
Operations researchers and analysts	0.53	0.53
Sales engineers	0.52	0.62
Computer programmers	0.52	0.56
Statisticians	0.52	0.70
Life and physical scientists, nec	0.50	0.96
Electrical and electronic engineers	0.50	0.69
Accountants	0.49	0.64
Civil engineers	0.49	0.74
Writers, artists and entertainers	0.48	0.46
Physicians, medical and osteopathic	0.48	0.99
Psychologists	0.48	0.93
Chemists	0.48	0.82
Money Men	0.47	0.50
Engineers, nec	0.47	0.69
Sales managers/department heads, retail trade	0.47	0.50
Buyers, wholesale and retail trade	0.46	0.28
Salesmen and sales clerks, nec	0.46	0.31
Managers and administrators, nec	0.46	0.39
Chemical engineers	0.46	0.84
Real estate agents and brokers	0.45	0.37
Biological scientists	0.45	0.89
Managers and superintendents, building	0.45	0.33
Dentists	0.44	0.99
Urban and regional planners	0.44	0.77
Health practitioners, nec	0.43	0.81

Con't

URBAN OCCUPATIONS (Con't)	**% Living in large MSAs**	**% with college degree**
Personnel and labor relations workers	0.43	0.39
Advertising agents and salesmen	0.43	0.40
Archivists and curators	0.42	0.70
Mechanical engineers	0.42	0.60
Geologists	0.41	0.84
Purchasing agents and buyers, nec	0.41	0.29
Computer specialists, nec	0.41	0.14
Optometrists	0.41	0.99
Demonstrators	0.40	0.12

NON-URBAN OCCUPATIONS	**% Living in large MSAs**	**% with college degree**
Clerical and kindred workers	0.39	0.11
Clinical laboratory technologists,technicians	0.39	0.43
Officials of lodges, societies, and unions	0.39	0.47
Therapists	0.39	0.67
Health administrators	0.39	0.47
Hucksters and peddlers	0.39	0.24
Industrial engineers	0.39	0.53
Technicians, not health/engineering/science	0.39	0.29
Protective service workers	0.39	0.15
Salesmen	0.39	0.19
Librarians	0.39	0.62
Private household workers	0.38	0.04
Social workers	0.38	0.64
Public administrators, nec	0.38	0.44
Insurance agents, brokers, and underwriters	0.38	0.38
Registered nurses	0.38	0.45
Petroleum engineers	0.37	0.77
Inspectors, not construction/pubadmin	0.37	0.26
Engineering and science technicians	0.37	0.21
Restaurant, cafeteria, and bar managers	0.37	0.09
Health technologists/technicians, nec	0.37	0.16
Religious workers, nec	0.37	0.56
Conductors and motormen, urban rail transit	0.37	0.14
School administrators, elem and sec	0.37	0.69
Construction inspectors, pub admin	0.36	0.17
Sales managers, except retail trade	0.36	0.23
Judges	0.36	0.68
Dental hygienists	0.36	0.33
Pharmacists	0.35	0.88
Social scientists, nec	0.35	0.55

Con't

NON-URBAN OCCUPATIONS	% Living in large MSAs	% with college degree
Metallurgical and materials engineers	0.34	0.68
Bus drivers	0.34	0.05
Teachers, college and university	0.34	0.88
Air traffic controllers, flight engineers	0.34	0.20
Atmospheric and space scientists	0.33	0.46
Teachers, except college and university	0.33	0.79
Postmasters and mail superintendents	0.33	0.18
Railroad brakemen	0.33	0.06
Craftsmen and kindred workers	0.33	0.05
Service Workers	0.32	0.05
Dietitians	0.32	0.52
Railroad conductors, Airplane pilots	0.32	0.53
Recreation workers	0.32	0.28
Newsboys	0.31	0.08
Radiologic technologists and technicians	0.31	0.13
Labourers, except farm	0.31	0.04
Deliverymen and routemen	0.31	0.07
Health record technologists and technicians	0.30	0.12
Health service workers	0.30	0.07
Truck drivers	0.28	0.03
Operatives, except transport	0.28	0.04
Veterinarians	0.27	0.98
Clergymen	0.26	0.74
Officers, pilots, and pursers; ship	0.26	0.16
Agricultural scientists	0.25	0.63
Funeral directors, embalmers	0.23	0.29
Fork lift and tow motor operatives, motermen	0.23	0.02
Boatmen and canalmen	0.22	0.07
None	0.20	0.21
Railroad switchmen	0.19	0.04
Buyers and shippers, farm products	0.17	0.14
Auctioneers	0.15	0.20
Mining engineers	0.10	0.62
Foresters and conservationists	0.09	0.66
Labourers, natural resources	0.09	0.05
Service workers, except private household	0.08	0.09

Figures are calculated from the 1990 public use files of the Census (Ruggles and Sobeck, 1997). Urban occupations are defined as those for which at least 40% of individuals in the occupation live in MSAs of at least 2million.