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Abstract

Many theories either implicitly or explicitly assume that individuals readily move to places that improve their financial well-being. Other forces, however, offset these tendencies; for example, people often wish to remain close to family and friends. We introduce a methodology for determining how individuals weight these countervailing forces, and estimate how both financial and social factors influence geographic mobility in the Danish population. Our results suggest that individuals respond to opportunities for higher pay elsewhere, but that their sensitivity to this factor pales in comparison to their preferences for living near family and friends.

INTRODUCTION

Social scientists have long been studying the movement of people both from one country to another and from one place to another within countries.[1] In part, migration is simply an interesting social phenomenon. But our preoccupation with it reflects also the fact that a person's place has many important consequences. Even within countries, for example, regions differ in their average wages (Hicks, 1932; Scully, 1969), in their degrees of inequality (Nielsen and Alderson, 1997; Sørensen and Sorenson, 2007), in their levels of crime (Sampson and Raudenbush, 1999), in the quality of and returns to education available in them (Card and Krueger, 1992), and in their local cultures (Griswold and Wright, 2004; Reed, 1986). Understanding geographic mobility, therefore, matters to a wide range of topics, including (but not limited to) inequality and stratification, identity and culture, and the evolution of ethnicities, industries and economies.

Perhaps the most commonly proposed driver of migration is the search for better jobs. Of course, this motivation sits at the heart of economic analyses of both international and within-country migration. Hicks (1932), for example, asserted that the majority of all relocations stemmed from individuals moving from lower- to higher-wage regions. But it also serves as an important component of many sociological accounts. Consistent with this idea that employment opportunities attract migrants, research has found that movers most frequently cite the acceptance of and search for jobs as the reasons behind their relocations (Lansing and Mueller, 1967), and that relative differences in average incomes can account for a substantial portion of interregional population flows (Davies et al., 2001).

The counterpoint to the search for better economic circumstances is the desire to remain close to family and friends. Fewer people move than one would expect if individuals considered nothing but their financial well-being (Sjaastad, 1962), and substantial migration flows exist not simply from lower income regions to higher ones but also in the opposite direction (Ravenstein, 1885). Connections to family and friends can explain both of these regularities: If people value their interactions with and propinquity to loved ones, then they should only move for financial gains that far exceed the direct costs of moving, as the loss of time with family and friends imposes an additional (opportunity) cost. Some, having moved, moreover may deem this opportunity cost too high and return home.

Both of these countervailing forces clearly operate, but as yet, social scientists have little understanding of how individuals weigh these tradeoffs. These weightings nevertheless have important consequences for both regions and individuals. With respect to regions, they influence the persistence of regional differences in culture and economic well-being. Migrants contribute importantly to both the diffusion of ideas and the movement of resources from one place to another. Meanwhile, with respect to individuals, those that place the greatest weight on remaining near to family and friends, and hence that prove least sensitive to economic opportunities elsewhere, may find themselves marooned in impoverished places.

We believe that three issues have stymied a deeper understanding of how individuals trade off the economic and the social in location choice. First, the data appropriate to answering the question have been scarce. Understanding these processes requires data with information not only on individuals and the locations they might choose, but also on where their loved ones reside.

Perhaps as a result of these data requirements, the research programs on economics and social factors have involved disparate designs. Whereas much of the evidence on the importance of economic factors has come from research on within-country moves across states, a focus on family and friends has been more prevalent in studies of out-migration (e.g. Speare et al., 1982) and international migration (e.g. Fussell, 2004). Though the relative importance of economic and social factors may vary across settings or with distance (an issue revisited below), this impression might also stem from the incomparability of the research designs used to study these issues. Research on (legal) international migration flows, moreover, has the additional problem of untangling individual preferences from the effects of immigration policies.

Finally, researchers lack a methodology for addressing these issues simultaneously. Of particular importance is the need for a counterfactual income. Even with information on individual wages, it is

difficult to determine what that same person might earn in another place. Some have tried to address this problem using information on the average wages in regions (e.g., Davies et al., 2001), but wages vary greatly across individuals and compositional differences from one region to the next – in terms of both human capital and the industries represented (Todaro, 1969) – raise serious questions about the usefulness of the mean wage as a measure of the expected income for any particular person.

We address the data limitations by drawing on unusually rich Danish registers. These databases contain economic and socio-demographic information for all residents from 1980 to 2003, including information on the location of individuals and of their relatives over time. On the methodological side, we introduce a novel approach for estimating the degree to which people weigh non-economic factors against potential economic gain in their location choices. Using the fact that wages for a set of observable individual characteristics vary from region to region (i.e. the returns to attributes differ across regions), we construct earnings counterfactuals for each individual. We can then observe how people trade social considerations off against the potential income gains to moving.

Our analyses focus on the 2003 location choices of two samples of blue-collar employees: (i) a random sample of those employed in 2002, and (ii) all those working at establishments that closed sometime in 2002. We consider the latter sample more informative because it addresses the fact that individuals may vary (endogenously) in their propensities to consider changes in employment; indeed, our results suggest that failure to account for this fact leads to substantial *underestimation* of the degree to which people value social factors relative to economic ones. We find that Danes value (in order of importance from most to least): (i) proximity to their hometowns, (ii) proximity to their current homes, (iii) proximity to other places they have lived in the past 22 years, (iv) proximity to high school classmates, (v) income, (vi) proximity to parents and (vii) proximity to siblings. In terms of magnitudes, the average Danish blue collar employee appears happy to accept as much as a 45% lower wage to halve the distance between his future location and his current home and a 3% lower wage to halve the distance between his location and the homes of either his parents or his siblings. Individuals, moreover, vary systematically in their preferences.

DETERMINANTS OF MOBILITY

Our analyses assume that individuals compare the pros and cons of being in one region against those of other regions and then choose the one that they perceive as offering the largest net benefit. It further assumes that one can decompose these pros and cons into an additive set of salient regional characteristics. For example, one region might offer a high salary while another offers proximity to one's parents. One nevertheless need not believe that people consciously evaluate all of this information. Individuals, for example, might encode these complex calculations into "feelings" about choices (Mellers et al., 1999).

Given these assumptions, we can write the satisfaction that an individual i would receive from living and working in a particular region, j, as:

$$u_{ij} = \beta' x_{ij} + \varepsilon_{ij},$$

where x_{ij} represents a vector of region-specific attributes for individual i (e.g., wage or distance to parents), β denotes a vector of weights assigned to each of those attributes, and ϵ_{ij} allows for error in individuals' expectations of the satisfaction that they would receive from being in region j.

If individuals choose locations to maximize their satisfaction and if we assume that the errors (ϵ_{ij}) arise from independent and identically distributed draws from an extreme value distribution (Type 1), then individual i chooses region j with probability:

$$P(y_i = j) = \frac{e^{\beta' x_{ij}}}{\sum_j e^{\beta' x_{ij}}}.$$

We can estimate this probability with the conditional logit (McFadden, 1974).

Economic factors

As noted above, the availability of better employment opportunities elsewhere has been the most commonly cited driver of migration. Researchers have found support for this idea using a variety of methods. Some have used surveys to assess the reasons that people move. In a representative sample of the United States, for example, Lansing and Mueller (1967) reported that 58% of movers claimed that economic reasons alone accounted for their decisions. But, of course, respondents may engage in *post hoc* rationalization and the attitudes of movers may not reflect those of the population at large.

Others have observed patterns of migration, using the average wage in a region as a proxy for its economic attractiveness (e.g., Davies et al., 2001; Scott et al., 2005). But relying on mean wages as a proxy raises a number of issues. Regions differ in human capital and in the industries represented in them, and therefore also in what any particular person might gain by moving there. Todaro (1969), for instance, discusses the fact that, though urban areas have much higher average wages than rural ones, an experienced farmhand might nonetheless earn *lower* wages in a city, given the mismatch of his skills to the needs of local employers. The use of mean wages also becomes particularly problematic in analyses that explore variation in the propensity to move across individuals. For example, does the decline in migration with age reflect the diminishing potential economic gains – or the rising social costs – to moving?

To understand how employment opportunities vary across individuals and regions, one would want a person-specific measure of them. But because the typical individual only works in one region, one cannot easily say what a person might earn elsewhere. One approach to addressing this issue, which we explore here, is to decompose the individual into a set of observable attributes. If we assume that employers would pay (roughly) equivalent wages to those with identical observable characteristics, the income of similar others in another region can provide an estimate what an individual might expect to earn by moving there.

Social factors

One commonly cited reason for why people do not move more often is that they value being near family and friends, or at least the more frequent and more extended interactions that propinquity allows. Though researchers have generally not had systematic data on the locations of loved ones, three lines of evidence appear consistent with this proposition. First, studies uniformly find that people move far less (and far shorter distances) than one would expect on purely economic grounds. Davies et al. (2001), for example, estimated that the average American would only consider a move to another state attractive if it had a mean income of $170,820 to $238,659 more than his or her home state. Since these differences far exceed the financial cost of moving – particularly as the migrant pays the moving cost once but potentially receives higher income for many years – these estimates have been assumed to reflect the happiness lost by moving away from family and friends.

Second, mobility declines with social attachment. Studies of out-migration, for example, have found negative relationships between the odds of moving and whether an individual's parents and friends live in the region (Speare et al., 1982). Research also finds that the probability of migration declines with a person's tenure in the region, presumably because social attachment grows with time (Goldstein, 1964).

Evidence of this social dimension also appears in the long-lasting links between places. Patterns of migration between regions persist over time, even after controlling for their populations, proximity, and prosperity (Herting et al., 1997). Several mechanisms might support these flows. Friends and relatives that have previously moved to a region and established themselves can provide support to those that follow. These connections might also help potential migrants to assess the employment opportunities available in other places. Two issues, however, arise in interpreting these results. First, prior movers offer, at best, a crude measure of the number of friends and relatives at a potential destination. The magnitude of this measurement problem moreover grows with the population of the origin region. Someone from a small town might know most of those that had moved from there to other places, but the probability that

someone would know any given mover from one country to another approaches zero. Second, one worries about endogeneity. Prior migration flows capture any factor that predicts migration and therefore one cannot really say whether a preference for moving to these regions reflects the desire to follow family and friends or some other (potentially non-social) factor.

Choice Interdependencies

Another important social consideration arises from the fact that households jointly choose locations. Although parents and children can commute to work and school, they usually prefer to limit their travel. However, the expected effect of these interdependencies is not clear. Mobility could decline when the decision affects multiple individuals. Each member of the household bears the social costs of moving but only one may gain in terms of expected income, and if both spouses work, then both may need jobs in the new location (Mincer, 1978). But, one could also imagine the opposite. By moving as a unit, households experience less disruption. The nuclear family itself can provide social support in the new place, and family members can share some of the responsibilities for integrating into the new community.

In terms of the empirical literature, children in a household have consistently been found to dampen the propensity to move (Long, 1972; Nivalainen, 2004). With respect to marriage, however, the evidence has been mixed. Using U.S. census data from 1955-1960, Bogue (1969) found that married couples moved more frequently than single individuals. Long (1974), however, reported the opposite tendency in a study using the 1965-1970 panel. These contradictory findings held even after accounting for differences in the employment status of wives. These studies may nonetheless confound interdependencies with variation in the potential economic returns to moving at different stages of the life course.

DATA

We analyzed data from government registers collected in the Integrated Database for Labor Market Research (referred to by its Danish acronym, IDA) maintained by Statistics Denmark. IDA holds comprehensive, annual data on every person residing in Denmark. It also links individuals to information about their respective employers, including their locations and industry classifications. Most importantly for our analyses, the data allowed us to track the movements of people and to connect them to their relatives.

Although we have panel data, our estimation focused on where individuals located in 2003 on the basis of the attributes of those individuals and of regions in 2002. Two factors motivated our focus on this single year. First, it allowed us to minimize unobserved heterogeneity. By focusing on a single year, we eliminated the influence of regional and national macroeconomic trends. Second, using a recent year allowed us to track as many individuals as possible to their hometowns.

We estimated our models on three samples. In all three cases, we excluded individuals under 19 and over 39. Those under 19 often move with their parents, and we could not track those over 39 to their hometowns because they left secondary school before the beginning of the IDA data. Next, we eliminated all employees of the public sector, as their expected wages do not vary meaningfully across regions in Denmark.

We also restricted our analyses to those employed in blue-collar occupations in 2002 and 2003. Although blue-collar workers only represent about half of the labor force in most modern economies, they nonetheless have two advantages for the purposes of our analysis. First, wages do not vary much across industries for blue-collar workers in Denmark, simplifying the creation of counterfactual wages. Second, our analyses assume that each individual could potentially find employment in any region. For more specialized jobs, that assumption would almost certainly not hold. But blue-collar workers have more fungible skills and therefore can find employment in most regions.[2]

From the 284,882 individuals that met these criteria in 2002, we extracted three samples (all of identical size to ease comparisons): (1) a simple random sample of 5,627 individuals; (2) a random sample of 5,627 individuals that changed employers from 2002 to 2003 (roughly 13% of the 44,809 eligible); and (3) 5,627 individuals employed at establishments that closed in 2002. Although the simple random sample may appear the obvious one for understanding the importance of economic and social factors across the population as a whole, we nonetheless explored these two other samples for a variety of reasons. Most importantly, our methodological approach assumes that individuals consider the available alternatives each year and decide whether to continue in their current jobs and regions. But many with jobs may not consider alternatives unless they become dissatisfied with those jobs (Vroom, 1964). As a result, the simple random sample may provide biased estimates of the weightings that individuals place on economic and social factors.

A logical alternative would be to examine only those who changed employers, but not necessarily their regions of employment (our second sample). These individuals almost certainly considered some alternatives when changing jobs and therefore the assumption that they actively made a choice seems more plausible. This sample nevertheless has its own drawbacks. To some extent, it selects on the dependent variable. A whole host of people may have considered alternatives to their current employers and decided not to switch. The movers represent only those cases in which the benefits to moving exceeded the costs, either because they had much to gain by moving or because they placed unusually high or low weights on the social side of the equation.

To address this potential endogeneity in the decision to change employers, we considered a (third) sample of individuals that had to find new jobs (for reasons unrelated to their personal performance): those employed at establishments that closed in 2002. Because the closure of these places of business did not stem from the turnover of any one blue-collar employee, we can consider the decision to move in this sample as exogenous to the attributes of the individuals and their preferences across regions. Consistent with this assumption, comparisons of the demographics of the third sample to the blue-collar workforce as a whole did not reveal any significant differences between the two. Though one might worry that these closings themselves would have forced individuals to relocate, the median closing affected only 0.1% of the local labor force, so their local economies should have been able to absorb them.[3] This third sample should therefore offer the most accurate estimates of the weights that individuals place on various factors when choosing a location.

Since our analyses use the conditional logit to model location decisions, we structured each sample with one observation per person per region—in this case, per township. In choosing an areal unit for analysis, we opted for the smallest unit available to provide the finest grain variation possible in our measures of economic and social attributes. However, since we weight nearly all variables by distance, the choice of areal unit has little influence on our estimates. In 2002 and 2003, Denmark comprised 271 administrative townships ("kommune" in Danish).[4] We therefore have 271 observations for each of the 5,627 blue collar workers in each of our samples (i.e. 1,524,917 individual-township observations per sample). Figure 1 depicts the distribution of these townships and their populations (with darker shadings representing more populous regions).

INSERT FIGURE 1 ABOUT HERE

Dependent variable

Individuals choose a location in which to work in 2003. The variable is set to one in the township chosen and to zero in the other 270 townships. Our models, therefore, estimate the determinants of the choice of where to work. Alternatively, one might imagine estimating the choice of a place of residence. Such an approach, however, would largely preclude the comparison of economic and social factors. Because individuals might commute varying distances from their homes, one cannot meaningfully assign counterfactual wages to the choice of residential location. The only way, then, to investigate residential

location choice while incorporating economic considerations would involve aggregating to a geographic scale at which home and work locations always co-occur, such as in the choice of country.

That said, the focus on the choice of where to work should not bias our results against the importance of social factors. Blue-collar workers in Denmark rarely commute long distances; the majority lives within three miles of their jobs, and less than 5% commute more than ten miles. Moving to a job in another township therefore generally involves moving households as well.

Expected wages

As a measure of the potential economic gains to moving, we calculated a person-specific expected wage in each township in two stages. In the first stage, we estimated a standard wage equation separately for each township (to allow the values of attributes to vary across regions), regressing the logged income of each employee in the region in 2002 on gender, marital status, the interaction between marital status and gender, number of children under the age of two, education, age, number of years in the labor force, number of years in the labor force squared, tenure at the current firm, and indicator variables for occupation level, moving to a new region, and changing employers. Overall, these coefficients appeared stable and consistent with prior research. Table 1 reports summary statistics for the coefficients from these 271 regressions (one for each township). In the second stage, we used those coefficients with the actual characteristics of each person to construct individual-specific *expected wages* for each township.[5]

INSERT TABLE 1 ABOUT HERE

We also used the estimated coefficients to compute the income an individual could expect in their current region. Alternatively, one might use actual 2002 income as the expected wage for the township where the person worked in 2002. But that raises a potential problem: Actual income captures returns to both observed and unobserved characteristics, while the predicted wage depends only on observables; mixing the two could bias the comparisons of the current place of employment relative to opportunities elsewhere. However, in practice, this choice has no meaningful effect on the point estimates.

Though this construct provides a useful counterfactual for what an individual might earn in another region, one might nevertheless question whether movers could really expect the same returns to their attributes as locals. Those with deep connections in a region might find themselves better positioned in the search for employment and, consequently, might find jobs better fit to their abilities. To check this possibility, we re-estimated the wage equations using only those employees that moved (from working in one kommune in 2001 to working in another in 2002). The right-most column reports t-tests of whether movers had different returns to their attributes than the population. Since the two groups differ significantly only on firm tenure (possibly an artifact of the attenuated tenure distribution of movers), we only report estimates using the population coefficients.

Family and friends

We constructed several variables to capture the draw of family and friends. First, we calculated the logged distance in kilometers between each person's home address in 2002 and the centroid of each township to which the individual might move in 2003 (*distance to home*). Although this variable, in part, captures an individual's interest in staying close to extended family, friends and colleagues, we refrain from interpreting it primarily as a social preference because this measure also captures a number of non-social factors, such as the direct costs of moving.

To assess the pull of family more specifically, we developed two measures: First, we located both parents of each individual and included an indicator variable denoting their location(s) in 2002. We then calculated the logged distance in kilometers from each township to these locations, creating a *distance to parents* measure. If the parents lived at different addresses, we averaged the distance from the township to each parent. Next, we constructed a parallel measure for siblings and half-siblings (those that shared at

least one parent with the focal subject). Once again, our measure, *distance to siblings*, averaged the logged distance in kilometers from these individuals' home addresses in 2002 to the centroid of each township in cases with more than one sibling.

We also developed three measures to assess the importance of friends. First, we identified each individual's hometown-ship. People often maintain particularly strong connections with their hometowns and continue to identify with them even years after moving elsewhere. Although we could not follow subjects for their entire childhoods, we know the secondary schools from which they graduated. We therefore calculated *distance to hometown* as the logged distance in kilometers from the location of their secondary school to the centroid of each township. Since people also probably form relationships in every place in which they have lived, we next constructed a second measure: *distance to prior residences*. We first identified every place that the individual had lived since 1980 (including his or her hometown). We then calculated and averaged the logged distance between each of these locations and every township.[6]

Finally, we developed a measure of the density of probable *friends*, by determining the current locations of each individual's high school classmates. Since friendships sort strongly on age and common membership in organizations (Feld, 1981; McPherson et al., 2001), classmates represent a set likely to include friends. However, as noted above, measures of prior mobility confound social forces with other factors affecting migration (including those with no social component). We therefore normalized these numbers using the movements of individuals from *other* cohorts between the two townships. If cohorts face a stable set of unobserved influences on their location choices, then this adjustment should net out any unobserved heterogeneity. For each individual *i* then, we calculated the proportion of former classmates from the same graduating year and secondary school living in each township *j* in 2002, and divided this proportion by the proportion of individuals from the same school in each township that graduated either one year before or after the focal individual:

$$Friends_{ij} = \frac{p_{j\tau}}{(p_{j,\tau-1} + p_{j,\tau+1})/2},$$

where $p_{j\tau}$ denotes the proportion of former students of a high school that graduated in year τ currently employed in region *j*.

Controls

We also controlled for two other features of regions that may influence location choice. First, we included an indicator variable for the township of an individual's employment in 2002. This variable, *work region*, helps to account for the fact that many people may not actively consider other jobs each year and therefore remain employed in the same township. Second, we included the *region size*, measured in terms of the logged number of employees in the township. More populous regions offer a wider range of amenities and potential employers, but people may also prefer the lower cost of living and social integration of small towns. Descriptive statistics for these variables appear in Table 2.

INSERT TABLE 2 ABOUT HERE

RESULTS

Table 3 reports the results of our first set of analyses, comparing the three samples. Across all three samples, both economic and social factors influence individuals' choices of where to work. The results also change quite substantially from the simple random sample (model 1) to the samples of those changing employers (model 2) and of those previously employed at establishments that closed (models 3 and 4). The latter two appear much *less* sensitive to wage differentials across regions and somewhat more concerned with locating near parents and friends. These differences probably stem from selection bias in the random sample. Most of the information in the conditional logit comes from movers (stayers load

heavily on the *work region* variable). We essentially assume that all individuals actively choose each year whether to stay at their jobs. But the random sample almost certainly violates this assumption. Moreover, the odds of engaging in such calculations probably vary across individuals. Those more ambitious and career-oriented more frequently look for and move to new jobs, and the random sample therefore over-represents their preferences.

<p style="text-align:center">INSERT TABLE 3 ABOUT HERE</p>

The samples of job changers provide better information about the valuation of the various factors at the population level. Between the two samples of job changers, the estimates do not differ drastically. We nonetheless focus for the remainder of the paper on the results from the sample of those employed in 2002 at work locations that closed. The second sample, those that changed employers from 2002 to 2003, conflates two groups – those that moved voluntarily and those laid off or fired (potentially for poor performance) – that may differ from each other as well as from the population as a whole. By contrast, the job losses in the third sample stem from factors exogenous to the preferences or abilities of any particular employee.

Although the models include a control for region population (and its positive coefficient suggests that people will accept lower wages to live in urban areas), one might worry that places vary in their attractiveness on other dimensions. Some, for example, have suggested that certain urban centers might attract people because of the amenities that they offer—cultural activities, the variety of shopping and services, and the opportunity to interact with a more creative and cosmopolitan population (Florida, 2002). Others have noted that people may move to places for their natural features, such as a mild climate or proximity to a sandy beach (Graves, 1980). Rather than attempt to code all of the features that workers might value, we addressed this possibility by including fixed effects in the model for the 79 labor market regions in Denmark (Andersen, 2000), treating Copenhagen as the baseline. Though the inclusion of these fixed effects improves the model fit ($\chi^2 = 298$, 78 d.f.; p < .01), their inclusion has little effect on the other coefficients and few regions differ significantly from Copenhagen in their attractiveness. In the interest of simplicity, the remaining models therefore do not include these fixed effects. Figure 2 depicts these effects, with dotted regions denoting those seen as more attractive and dark regions those seen as less attractive than Copenhagen.[7] Although nothing obvious unites the attractor regions, the repeller regions are home to some of Denmark's older manufacturing companies (e.g., Bang & Olufsen and Danfoss).

<p style="text-align:center">INSERT FIGURE 2 ABOUT HERE</p>

In models 3 and 4, all economic and social factors significantly predict choices of where to work. The more interesting information therefore regards their relative magnitudes. For interpretation, we find it useful to convert the coefficients into dollar equivalents (the conversion from Danish kroner to U.S. dollars uses the exchange rate on Jan 1, 2003: 7.0761 DKK = 1 USD). We do so by calculating the point at which the average individual would consider the increased satisfaction due to an expected wage gain (Δ_{wage}) equally attractive to the lost satisfaction from being further from family and friends (Δ_x):

$$\beta_{wage}\Delta_{wage} = \beta_x\Delta_x,$$

where β_{wage} and β_x are the conditional logit coefficients for, respectively, the expected wage and some social factor. For those variables specified in terms of logged distance, the tradeoff expected for a one-unit increase in distance varies as a function of distance. An intuitive way to interpret these logged coefficients is in terms of the effect of a doubling in distance:

$$\Delta_{wage} = \exp^{\frac{\beta_x \ln 2}{\beta_{wage}}}.$$

This equation produces figures in percentage differences in income (due to the logging of expected income), but we can convert them to dollar equivalents by evaluating these percentage changes at the average expected wage. Table 4 reports these values.

INSERT TABLE 4 ABOUT HERE

Consider, for example, the results from model 3 (plant closings). When comparing two potential jobs – one twenty miles from her hometown and the other forty miles from it (i.e. double the distance) – an individual would prefer the closer job unless the more distant job paid at least $11,115 more per year. Note that, in calculating the valuation of proximity to hometowns, we have included the coefficient estimates for proximity to past places. Because all individuals lived in their hometowns at some point, this variable essentially captures the degree to which hometowns attract people *more* than other past places of residence. Imagine that her sister also lived in her hometown; then the more distant job would need to pay at least $12,245 (= $11,115 + 1,130$) more for her to prefer it. These values are large. The average blue-collar worker in Denmark earned roughly $32,000 in 2003, so our calculations imply that the typical individual would need to expect substantial income gains to justify even a short move. Longer moves, which would involve more than a doubling in distance, would require even larger offsetting gains in expected income.

To some, these values might seem too large. But of course if people placed less weight on staying near family and friends then we would expect much higher rates of migration (unless some other factor produced geographic inertia). Moreover, our estimates actually appear modest compared to those of prior studies. For example, using average wages in a state to proxy for expected income, Davies et al. (2001) calculated that the average American in 1996 would only consider another state equally attractive if it had per capita income of at least $170,820 more than his or her current state of residence (more than six times the average income at the time).

Though these dollar equivalents help us to understand how individuals trade off income versus social factors, they do not provide direct intuition regarding the relative importance of various factors in the choice of where to work. To assess this relative importance, in table 5, we report the regression coefficients standardized by normalizing the independent variables to have means equal to zero and standard deviations of one. In other words, this table reports the change in the log odds of choosing a location as one moves from the mean level of some factor to one standard deviation above it.

INSERT TABLE 5 ABOUT HERE

Continuing with our focus on the estimates from the sample employed at workplaces that closed, the most important factor in choosing a job is its proximity to the person's hometown. People probbaly have deep social connections to these places. Next most important is proximity to the person's current home. Though one might consider this factor "social" as well, it captures not only the value of extended family and friends (not observed) but also such non-social factors as the direct costs of commuting or moving households. Following these places, proximity to past places lived (other than one's hometown) weights next most heavily in choices of locations, and then proximity to friends, the potential to earn more, proximity to parents and proximity to siblings. Among all the factors influencing location choice, the potential for income gain actually ranks quite low.

Demographic differences

Although the conditional logit prevents us from entering demographic characteristics directly into the estimation (because they do not vary within individuals across regions and therefore the conditioning purges them from the estimates), we can explore whether the weights assigned to economic and social factors vary within different segments of the population, such as among the married versus among the unmarried.

Table 6 explores how the weights that individuals assign to various factors shift with age. These changes appear quite intuitive. With age, the importance of income relative to other factors increases substantially. Older individuals also appear somewhat more attached to their homes. This second trend may reflect the greater costs to moving that homeowners face, but we cannot test this possibility directly because we do not know whether people rent or own their homes. As individuals mature, the strength of most social factors, however, from the attachment to one's hometown to the importance of living near family and classmates declines relative to income.

INSERT TABLE 6 ABOUT HERE

We also explored whether choice interdependencies influence the weighting of economic and social factors. In particular, do those with children or spouses behave differently in their choices of work locations? Tables 7 and 8 respectively report these analyses and the conversions of these coefficients into dollar values (note that, because the expected wage does not have a significant coefficient in model 16, the corresponding dollar equivalents have wide confidence intervals).[8]

INSERT TABLES 7 AND 8 ABOUT HERE

Comparing the estimates from the random sample to those from the sample employed at plants that closed reveals an interesting fact. In the random sample, those facing choice interdependencies – either because they have spouses or children – appear to place less value on wages. But, in the plant closing sample, the relative weighting reverses for those with spouses: married individuals place more emphasis on income. As noted above, the random sample disproportionately reflects the values of those with stronger career orientations. This selection bias appears even more pronounced among those without independencies—the unmarried and the childless. Indeed, the most career-oriented individuals may even forgo these interdependencies to concentrate on their jobs.

The estimates from the sample of those employed at plants that close therefore suggest an interesting pattern not seen in prior research. Though many have interpreted the fact that the married move less as evidence of the fact that they place greater value on family and friends, when forced to find a job, they actually appear more sensitive to the potential for income gain. Given that others depend on their earnings, it seems sensible that they would care about income. The lesser mobility of married couples instead probably reflects some combination of: (i) a much lower likelihood of looking for a new job, (ii) an increased attachment to home location (perhaps due to home ownership), and (iii) self-selection of the most career-oriented out of marriage.

In addition to some limitations in our ability to measure certain factors, such as home ownership, our analysis has at least two potential weaknesses. First, the conditional logit assumes an equal probability of choosing each region, net of observed characteristics—the irrelevance of independent alternatives (IIA). For example, the addition of a suburb to the choice set should equally draw people from the city adjacent to it as well as from more distant regions. Though such an assumption may seem strong, it only pertains to that portion of the choice probability not captured by the covariates. Hence, in practice, the assumption can hold in a well-specified model. We assessed the importance of this assumption in two ways. First, we tested the sensitivity of our results to the removal of each region from the choice set. Although these tests suggested that our models do not violate the IIA assumption, Monte Carlo simulations have found that such tests can generate false negatives even in large samples (Cheng and Long, 2007). We therefore re-estimated models 1 through 3 using the mixed logit, which does not assume IIA, with random coefficients for each of the independent variables (Train, 2003). Since the mixed logit produced similar average coefficients and the coefficients generally varied little across individuals, we have reasonable confidence that the IIA assumption does not pose a problem.

Second, one might worry that economic and social factors weigh differently in decisions of different distances (e.g., short-range versus medium-range moves). Our data do not allow us to consider long distance moves because we only observe migration within Denmark (a country similar in size to the area

covered by Massachusetts, Connecticut and Rhode Island). We nevertheless investigated whether moves on the order of tens of kilometers depended on different factors from those on the order of hundreds of kilometers. We did so by splitting all of our distance measures into four equal-range pieces (in logged kilometers), and estimating models that would allow the coefficients to vary freely across those pieces. The results reveal some deviations from the models reported. In particular, the values derived from the logged functional form overstate the income required to offset short distances (less than 15 km) from family and friends and understate the income required to offset longer distances (more than 63 km). These deviations nevertheless are modest, less than 20% of the values reported.

DISCUSSION

Numerous studies on within-country and international migration have pointed to both economic and social factors as important determinants of why and where individuals move. Despite this body of research, we have had little sense of the relative importance of these factors for three reasons: First, researchers have generally either not been interested in, or not had data appropriate to testing, both sorts of explanations. Second, perhaps as a result, the research programs investigating these factors have used disparate designs and focused on differing geographic scales. Third, researchers have found it difficult to assess the potential economic gains to an individual of moving to a new location.

We have advanced this body of research by exploiting an unusually rich data source, covering all residents of Denmark, and by developing a methodology for estimating expected wages in each region specific to the individual, on the basis of regional differences in the returns to education, experience and demographic characteristics. We have further refined prior research by identifying a sample of individuals who choose new employers for reasons exogenous to their own preferences and abilities, and consequently where selection bias does not plague the estimates: those employed at workplaces that close.

Our results reveal that Danish blue-collar workers place great importance on social factors when considering where to work and live. From most to least important, Danes care about proximity to their hometowns, proximity to their current residences, proximity to past places they have lived (other than their hometowns), proximity to their high school classmates, income, proximity to their parents, and proximity to their siblings. For the typical Dane, therefore, social factors swamp economic considerations in choosing where to work. Highly educated Danes exhibit similar preferences (see Dahl and Sorenson, 2010).

Although we interpret these findings as reflecting individuals' preferences for being near family and friends, two other factors could contribute to our results. First, family and friends may serve as sources of information on job opportunities and the prevailing wages in other regions. Individuals therefore may move near them because those are the regions in which they have the best information about the available jobs. Second, because individuals know with relative certainty the locations of their loved ones – but not necessarily the prevailing wages in regions – their weights may reflect a discounting of this more noisy information.

Though we believe that the unusual quality of the data justified focusing on the Danish case, one might worry that our results would not extrapolate to other countries. To provide some sense of how Danes compare to others, consider their probability of moving from 2002 to 2003: 94.9% did not move, versus 95.9% of Americans; 4.7% moved less than 50 miles, versus 1.3% for Americans; 0.4% moved 50 to 199 miles, versus 0.9% for Americans; and none moved more than 200 miles, versus 1.8% for Americans.[9] Though Americans clearly move longer distances than Danes (a move equivalent in distance from Boston to Los Angeles would land a Dane in Kuwait or the Canary Islands), they have similar probabilities of moving. Hence, it seems reasonable to expect that Americans might exhibit similar – or possibly weaker, given the long distance moves – preferences for proximity to family and friends.

But both Danes and Americans fall at the extreme end of geographic mobility. In Europe, for example, only Finns and Swedes have similar rates of migration. Though most statistics reveal similar cross-national differences, consider, for example, moving intensity. Nearly half of all Danes move more than four times in their lives, but only about one-third of Brits, Dutch and French, and between one-sixth

and one-seventh of Germans and Belgians, do (Bonin et al., 2008). And other Europeans exhibit even lower levels of mobility; less than 10% of Italians, Portuguese and Spaniards move more than four times in their lives (Bonin et al., 2008).

The lower rates of geographic mobility in some parts of Europe suggest that the average interest in remaining close to loved ones might vary across countries. But these differences could also reflect: (i) lower levels of regional variation in wages in places such as Spain and Italy; or (ii) institutional differences that influence the ease of changing jobs and residences. Which of these factors explains this cross-national variation is an interesting open question.

The fact that individuals weigh social factors much more heavily than economic ones in deciding where to work and live nonetheless has important implications for both research and public policy. Most immediately, it suggests that labor markets operate quite locally. Since even large differences in income are insufficient to entice most to move, the set of jobs of interest to the typical person would include only those in a relatively restricted geographic radius from his or her home.

It further suggests that even very large differences in wages across regions can persist indefinitely. If individuals rarely move to higher paying regions to arbitrage these differentials, then the primary force for equilibration comes from companies moving to regions with cheaper labor. But even from the side of the employer, investments in physical plant and the training of existing employees – who themselves would prefer not to move – strongly anchors firms to their current locations.

Indeed, the importance of social factors to location choice suggests that differences in a wide range of behaviors and outcomes can remain stable across regions, even within countries, over long periods. Most individuals will not move because doing so would distance them from family and friends. Those individuals that do move, moreover, may move precisely because they have been weakly integrated into the local community. When they move then, they may do little to draw others out of the old community and into the new one. As a result, communities remain somewhat isolated through choice. Differences in culture and language persist even to the modern day in the face of rapid communications and relatively cheap and plentiful transportation.

NOTES

[1] Quantitative analyses of the phenomenon began more than 100 years ago (Ravenstein, 1885), and continue to the present day. Greenwood (1997) and Ritchey (1976) summarize the research on geographic mobility within countries, while Borjas (1999) and Peterson (1978) review the literature on international migration.

[2] To determine whether this assumption might influence our results, we split the sample into unskilled and skilled blue-collar occupations. The two subsamples produced substantively equivalent results.

[3] We excluded individuals from one kommune because layoffs in that community accounted for more than 10% of the labor force.

[4] The four townships on the island of Bornholm merged in 2003, so we aggregated them for 2002 as well. We also dropped the island of Christiansø, which has only 55 residents.

[5] We set the firm tenure to zero and mover and job change indicators to one for townships other than the individual's current township of employment.

[6] We experimented with weighting regions according to tenure (and the recency of residency). Both of these adjustments incrementally improved the fit, but we report this simpler measure for ease of interpretation.

[7] The fixed effects coefficients are available from the first author.

[8] For example, the lower bound of a 95 percent confidence interval around the doubling of distance to home would fall at a dollar equivalent of $9,557 (less than one-tenth of the point estimate).

[9] We calculated the United States statistics using data available from the U.S. Census Bureau, accessible at: http://www.census.gov/population/www/socdemo/migrate.html. Non-movers in Denmark include within-kommune moves; non-movers in the United States include within-county moves.

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Table 1: Wage equation coefficients

	All		Movers only		T-Test
	Mean	SE	Mean	SE	
Male	.144	.051	.116	.236	-1.943
Married	-.036	.033	-.071	.328	-1.736
Male × Married	.081	.049	.116	.315	-1.860
Children (0-2 years)	.034	.034	.001	.339	-1.638
Gymnasium	.088	.030	.081	.242	-.506
College	.212	.097	.223	.267	.652
Age	-.001	.002	-.002	.043	-.330
Experience	.044	.009	.048	.088	.705
Experience^2	-.001	.000	-.001	.004	-1.420
Firm tenure	.001	.002	.007	.045	2.323
Skilled occupation	.024	.050	.034	.267	.593
Mover	.002	.060			
Job change	-.113	.074			
Constant	11.830	.122	11.881	1.030	.825
R^2	.338	.055	.367	.180	
N	2379.4	5130.0	178.9	329.4	
Average actual wage	255,151	83,231	243,654	89,612	
Average expected wage	209,417	45,531	202,512	44,765	

Summary of the results of 271 regressions of 2002 wage, one per township.

Table 2: Descriptive statistics

Variable	Random sample Mean	SD	Employer change Mean	SD	Plant closings Mean	SD
Expected wage (kroner)	209,417	45,531	202,512	44,765	208,458	45,147
Ln expected wage	12.228	.222	12.194	.224	12.224	.221
Distance to home (km)	74.196	39.157	74.420	39.683	79.363	44.085
Ln distance to home	4.119	.745	4.115	.758	4.167	.780
Distance to parents (km)	45.410	47.531	51.042	47.714	48.709	50.561
Ln distance to parents	2.517	2.093	2.821	2.014	2.599	2.101
Distance to siblings (km)	60.272	45.497	59.494	45.899	62.305	48.788
Ln distance to siblings	3.349	1.742	3.304	1.770	3.341	1.782
Distance to hometown (km)	71.475	40.882	72.317	41.036	75.355	45.354
Ln distance to hometown	3.967	1.069	3.998	1.020	3.983	1.137
Distance to prior residences (km)	73.316	38.016	73.375	38.279	78.019	42.541
Ln distance to prior residences	4.120	.708	4.119	.712	4.166	.738
Friends	.045	.252	.043	.246	.047	.254
Work region	.004	.061	.004	.061	.004	.061
Region size	6,941	17,419	6,941	17,419	6,941	17,419
Ln region size	8.096	1.049	8.096	1.049	8.096	1.049
N (individuals)	5,627		5,627		5,627	
N (regions)	271		271		271	

Table 3: Conditional logit estimates of work location in 2003

	Model 1 Random sample	Model 2 Employer change	Model 3 Plant closings	Model 4 Plant closings
Ln expected wage	2.678***	.908***	.605**	.717**
	(6.86)	(4.68)	(2.77)	(2.58)
Ln distance to home	-.506***	-.634***	-.563***	-.547***
	(-10.84)	(-27.06)	(-21.50)	(-20.26)
Ln distance to parents	.028	-.017	-.059*	-.065**
	(.61)	(-.80)	(-2.54)	(-2.75)
Ln distance to siblings	-.152***	-.116***	-.060**	-.061**
	(-3.97)	(-6.64)	(-3.08)	(-3.06)
Ln distance to hometown	-.043	-.012	-.067**	-.073**
	(-.95)	(-.52)	(-2.86)	(-3.00)
Ln distance to prior residences	-.456***	-.472***	-.396***	-.410***
	(-6.10)	(-12.63)	(-9.83)	(-9.89)
Friends	0.872***	0.782***	0.783***	0.783***
	(21.90)	(36.61)	(32.12)	(31.95)
Work region	5.020***	1.281***	2.363***	2.353***
	(82.75)	(28.89)	(57.99)	(57.31)
Ln region size	.294***	.575***	.626***	.614***
	(11.79)	(43.89)	(44.07)	(40.36)
Labor market fixed effects	N	N	N	Y
Pseudo-R^2	.87	.50	.61	.62
Log-likelihood	-4,108	-15,633	-12,283	-12,134
N	5,627	5,627	5,627	5,627

Z-scores reported in parentheses.
Significance levels: † : 10%   * : 5%   ** : 1%   *** : 0.1%

Table 4: Tradeoffs for annual income (U.S. dollar equivalents)

	Model 1 Random sample	Model 2 Employer change	Model 3 Plant closings	Model 4 Plant closings (w/ FE)
Doubling distance to home	$2,238	$9,577	$14,392	$11,070
Doubling distance to parents	-$116	$201	$1,111	$1,030
Doubling distance to siblings	$642	$1,424	$1,130	$965
Doubling distance to hometown	$2,205	$6,877	$11,115	$9,453
Doubling distance to prior residences	$2,004	$6,674	$9,120	$7,727
More friends (1 SD)	$2,736	$7,261	$12,365	$10,156
Average wage	$31,993	$30,769	$31,770	$31,770

Table 5: Standardized coefficient estimates

	Model 1 Random sample	Model 2 Employer change	Model 3 Plant closings	Model 4 Plant closings (w/ FE)
Distance to hometown	-.533	-.493	-.526	-.549
Distance to home	-.377	-.481	-.439	-.427
Distance to prior residences	-.323	-.336	-.292	-.303
Friends	.220	.192	.199	.199
Expected wage	.595	.203	.134	.158
Distance to parents	.059	-.034	-.124	-.137
Distance to siblings	-.265	-.205	-.107	-.109

Table 6: Conditional logit estimates of work location in 2003 by age

	Random sample			Plant closings		
	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
	Age 19-25	Age 26-32	Age 33-39	Age 19-25	Age 26-32	Age 33-39
Expected wage	1.963**	3.002***	3.083***	-.356	.948*	.885*
	(2.96)	(4.55)	(4.40)	(-.82)	(2.57)	(2.52)
Distance to home	-.233*	-.455***	-.650***	-.439***	-.551***	-.602***
	(-2.43)	(-5.88)	(-8.31)	(-6.64)	(-12.90)	(-15.33)
Distance to parents	.035	-.067	-.038	-.078	-.081*	0.058
	(.39)	(-.85)	(-.45)	(-1.40)	(-2.06)	(-1.47)
Distance to siblings	-.159*	-.177**	-.119†	-.012	-.077*	-.069*
	(-2.32)	(-2.70)	(-1.79)	(-.28)	(-2.42)	(-2.22)
Distance to hometown	-.177*	.065	.043	-.156**	-.092*	.031
	(-2.28)	(.79)	(.54)	(-3.20)	(-2.24)	0.81)
Distance to prior residences	-.501***	-.592***	-.454***	-.507***	-.333***	-.443***
	(-3.30)	(-4.55)	(-3.68)	(-4.89)	(-4.92)	(-7.34)
Friends	.999***	.898***	.746***	.741***	.855***	.747***
	(14.69)	(12.45)	(10.38)	(15.13)	(20.23)	(19.76)
Work region	4.672***	4.971***	5.273***	1.916***	2.329***	2.592***
	(39.38)	(49.26)	(51.51)	(20.65)	(34.69)	(41.78)
Region size	.368***	.241***	.291***	.711***	.615***	.599***
	(7.58)	(5.75)	(7.01)	(22.64)	(26.30)	(27.04)
Pseudo-R^2	.81	.86	.90	.59	.60	.63
Log-likelihood	-1,204	-1,442	-1,411	-2,752	-4,473	-5,016
N	1,154	1,886	2,587	1,209	2,017	2,401

Z-scores reported in parentheses.
Significance levels: † : 10%   * : 5%   ** : 1%   *** : 0.1%

Table 7: Conditional logit estimates of work location in 2003 by family status

	Random sample				Plant closings			
	Model 11 No children	Model 12 Children	Model 13 Single	Model 14 Married	Model 15 No children	Model 16 Children	Model 17 Single	Model 18 Married
Expected wage	3.109***	1.964**	3.403***	.924	.941**	.192	.604*	.654†
	(6.30)	(3.07)	(7.27)	(1.31)	(3.22)	(.58)	(2.26)	(1.70)
Distance to home	-.482***	-.514***	-.485***	-.502***	-.459***	-.678***	-.476***	-.721***
	(-7.64)	(-7.16)	(-8.25)	(-6.28)	(-12.70)	(-17.52)	(-14.41)	(-16.67)
Distance to parents	-.027	.018	.030	-.067	-.061†	-.076*	-.066*	-.044
	(-.45)	(.24)	(.55)	(-.80)	(-1.91)	(-2.15)	(-2.28)	(-1.08)
Distance to siblings	-0186***	-.089	-.146**	-.171*	-.043†	-.081**	-.081***	-.014
	(-3.80)	(-1.43)	(-3.16)	(-2.44)	(-1.66)	(-2.73)	(-3.43)	(.41)
Distance to hometown	-.091	.049	-.117*	.140†	-.090**	-.024	-.091**	-.018
	(-1.57)	(.68)	(-2.15)	(1.68)	(-2.80)	(-.67)	(-3.10)	(-.44)
Distance to prior residences	-.305**	-.690***	-.370***	-.696***	-.479***	-.316***	-.449***	-.313***
	(-3.03)	(-6.03)	(-3.96)	(-5.36)	(-8.46)	(-5.40)	(-8.76)	(-4.72)
Friends	.912***	0.806***	.889***	.844***	.776***	.787***	.779***	.791***
	(18.26)	(12.16)	(18.37)	(12.00)	(24.14)	(21.15)	(25.91)	(19.04)
Work region	4.887***	5.217***	4.889***	5.336***	2.247***	2.482***	2.284***	2.492***
	(61.99)	(53.38)	(67.21)	(46.87)	(40.49)	(41.22)	(45.02)	(36.36)
Region size	.292***	.306***	.290***	.313***	.629***	.643***	.616***	.671***
	(9.037)	(7.67)	(9.66)	(6.91)	(33.26)	(29.36)	(35.40)	(26.87)
Pseudo-R^2	.85	.89	.86	.89	.60	.63	.60	.62
Log-likelihood	-2,471	-1,617	-2,810	-1,280	-6,909	-5,349	-8,196	-4,060
N	2,929	2,698	3,566	2,061	3,076	2,551	3,700	1,927

Z-scores reported in parentheses.
Significance levels: † : 10%   * : 5%   ** : 1%   *** : 0.1%

Table 8: Tradeoffs for annual income (U.S. dollar equivalents)

	Random sample		Plant closings	
	No children	Children	No children	Children
Doubling distance to home	$1,704	$2,987	$5,988	$157,210
Doubling distance to parents	$91	-$95	$684	$4,699
Doubling distance to siblings	$636	$479	$479	$5,056
Doubling distance to hometown	$1,386	$3,813	$7,750	$31,695
Doubling distance to prior residences	$1,057	$4,141	$6,298	$35,911
More friends (1 SD)	$2,305	$3,273	$6,937	$54,553
Average wage	$30,004	$34,244	$29,771	$34,382

|	Random sample		Plant closings	
	Single	Married	Single	Married
Doubling distance to home	$1,560	$1,617	$10,818	$19,163
Doubling distance to parents	-$92	$206	$1,171	$771
Doubling distance to siblings	$453	$532	$1,450	$241
Doubling distance to hometown	$1,566	$1,801	$12,777	$6,878
Doubling distance to prior residences	$1,176	$2,288	$10,034	$6,433
More friends (1 SD)	$2,044	$7,775	$11,540	$10,706
Average wage	$30,616	$34,519	$30,342	$34,692

Figure 1: Danish townships (kommuner) shaded by population
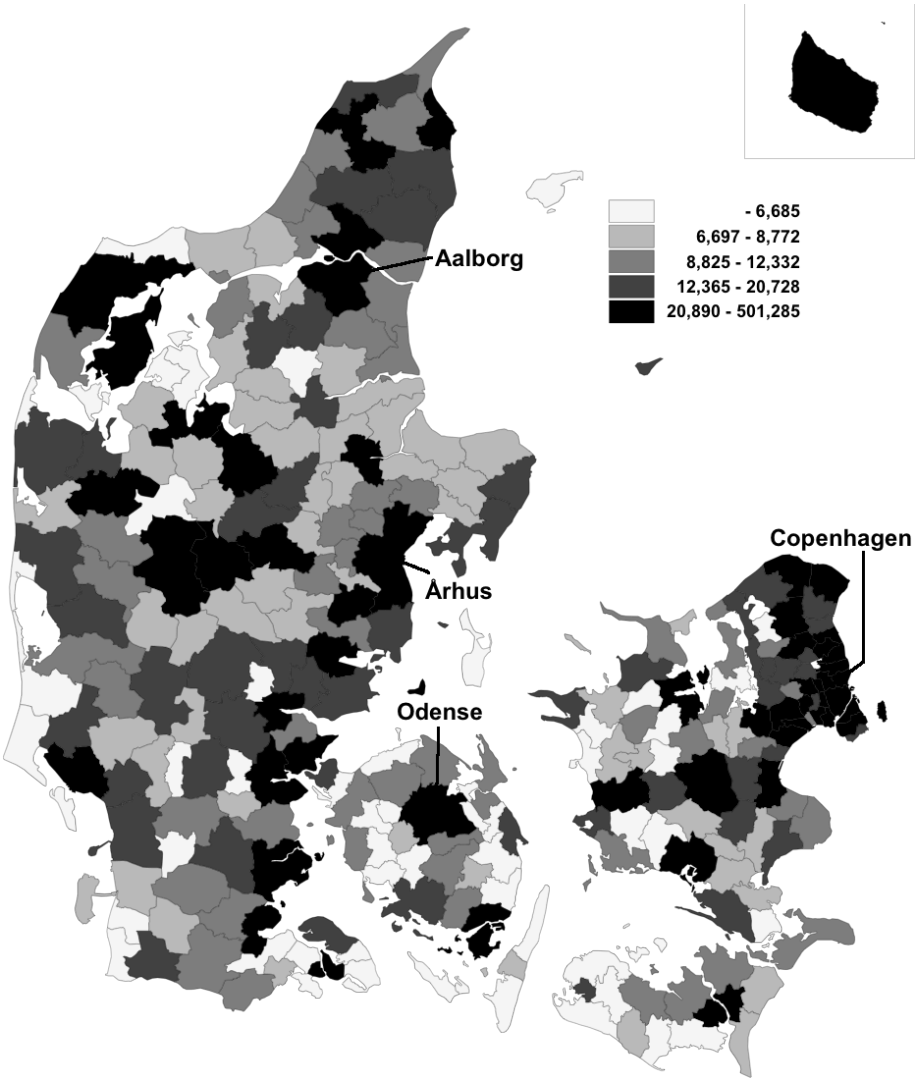
Figure 2: Danish townships (kommuner) shaded by attractiveness (model 4)