Geographical Mobility of Danish Dual-Earner Couples -
The Relationship between Change of Job and Change of Residence

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Abstract:
In this paper, we analyse the empirical relationship between geographical residence mobility and geographical job mobility for Danish dual-earner couples. Based on register data from Statistics Denmark from 1999 and 2000, we estimate three probabilities, taking the interdependence between the relations into account: The probability of moving residence to another commuting area within the country, the probability of the husband changing job to another commuting area, and the probability of the wife changing job to another commuting area. The empirical findings strongly point to the importance of addressing the interrelationship between residence and job as well as the interrelationship between spouses. Especially moving residence makes a simultaneous job change much more likely than the other way around. Thus, region of residence seems to matter more for the determination of the region of work, than the work region matters for the determination of the residence region. Furthermore, although the model stresses the importance of looking at both spouses, we do not find marked differences between the men and the women. Thus, our results do not indicate that one spouse is more important than the other in determining geographical mobility.

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1. Introduction

Geographical job-mobility, defined as moving job to another geographical region within the country, is an important aspect of a flexible labour force. First of all, geographical job-mobility is central for avoiding regional employment inertia. Secondly, the willingness to be geographically mobile may shorten individual unemployment spells considerably.

Although Danish job turnover rates are relatively high, the major share of job changes take place within the current residence region. This is natural for several reasons. Getting a new job far away increases the commuting distance and thus implies reflections about moving residence. Another obstacle is the family, i.e. spouse and children. A requirement for accepting a job in a new geographical region may thus be that the spouse also gets a new job, while children may reduce the probability of moving altogether, because the parents are reluctant to move the children.

The knowledge about the relationship between the change of job and the change of residence is limited, although the theoretical link between the two is well established. Furthermore, the understanding of the empirical relationship between spouses' geographical job-mobility is incomplete. Especially in the Danish context, these issues have not been analysed.

The purpose of this paper is to get new empirical insight about the geographical job and residence mobility of Danish dual-earner couples. Based on register data from Statistics Denmark from 1999 and 2000, we study the geographical job and residence mobility of couples aged 20-59 years, where both spouses are wage earners. We estimate three probabilities: the probability of moving residence to another region, the probability of the husband changing job to a new region, and the probability of the wife changing job to a new region. Furthermore, we take the interdependence between the three decisions into account.

The paper is organised as follows. In the next section, we review some of the previous literature on geographical mobility. In section 3, the econometrical framework and the data are described. Results are found in section 4 and, finally, concluding remarks are found in section 5.

2. Earlier Studies

Internationally, there have been many studies about geographical mobility. OECD presents a cross-country comparison of internal migration rates in 17 countries (OECD, 2000). This cross-country comparison reveals that the level of internal migration is relatively high in the United States, Japan, Canada, Australia, New Zealand, and the United Kingdom, whereas internal migration rates in the European countries are considerably lower (with the exception of the United Kingdom). The general conclusion is that within European countries, regional unemployment and wage differentials persist because of the relatively low geographical mobility.

When studying the determinants of geographical mobility at the micro-level, most analyses are concentrated at the individual level rather than at the household level (for a survey, see Greenwood, 1985). As pointed out, for instance by Greenwood (1985), the determinants of geographic mobility can be placed in two general categories: "life-cycle" determinants and "other personal" determinants. Thus, a large number of moves occur in relation to traditional life-cycle events, such as marriage, birth of children, completion of schooling, career opportunities, or retirement. On the other hand, personal factors such as education, employment status, age, or gender are also of potential importance. Typically, studies of geographic mobility use cross-section data. Sandefur and Scott (1981), however, stress the importance of considering mobility in a life-cycle perspective. Using US data with retrospective migration information, they find that the effect of life-cycle episodes almost completely explains the negative relationship between age and geographic mobility usually found in cross-section data.

Besides the individual characteristics, regional macro conditions are also relevant to consider. For instance, local unemployment rates are typically expected to have a positive effect on migration, such that individuals are more likely to move away from high-unemployment regions. It should be kept in mind, though, that whereas the unemployment rate naturally is important for the unemployed, it is less important for the employed. DaVanzo (1978) thus finds that while higher regionally unemployment rates increase the probability of moving away for the unemployed, the effect on employed individuals is very little. Ahn, de la Rica and Ugidos (1999) study the relationship between the willingness to move and the duration of unemployment in Spain. They find that the willingness to move does not depend on the period of unemployment; but that on the other hand, the job-finding probability depends positively on the willingness to migrate.

Another macro factor that is important for the moving behaviour of individuals is the housing market. Generally, homeownership has a negative effect on mobility. However, Van Leuvensteijn and Koning (2004) have studied the relationship between residential mobility and homeownership in the Netherlands. Contrary to findings in other countries, they do not find Dutch homeowners to be less mobile than Dutch tenants. On the other hand, the decision to buy a home seems to be driven by job commitment. Böheim and Taylor (1999) study the reasons for moving house in Britain using the British Household Panel Survey. Their findings suggest that unemployed are more likely to move than employed and furthermore that employment reasons are the single largest motivation for moving residence between regions.

A facet of internal migration that is of special relevance for this paper is the influence of family ties. Mincer (1978) explores this issue for the US and finds that family ties tend to deter migration. This is especially the case for dual-earner families. The reason for the tie is that the net gain of moving should be positive for the entire family in order for the move to take place. It could thus be the case that a possible gain of moving for one family member is offset by a greater loss for the spouse, thus creating a "tie". The consequence is that families are less mobile than singles.

Sandell (1977) reaches the same conclusion about family mobility. He finds that the probability of moving is significantly lower if the wife is employed, and decreases further with the wife's labour market experience. On the other hand, the family migration probability increases with the husband's education. Overall, the negative effect of a working wife is typically offset by the husband's characteristics. A possible explanation for this is offered by Bielby and Bielby (1992). They find that couples' orientation towards the "provider role" shapes how they respond to job opportunities in other geographical regions. For the typical couple, the wife is thus deterred from moving by the husband's potential loss, while the husband is not deterred by the potential loss of the wife. However, in families where traditional gender roles are rejected, these gender differences disappear. In other words, the finding of the husband being more important for the migration decision than the wife is possibly linked to the fact that men typically are the main breadwinners.

Spilimbergo and Ubeda (2004) extent the concept of family attachment and ask why it is that blacks in the United States move less than whites despite having characteristics typically associated with

higher mobility, such as higher unemployment rates and less homeownership. The answer provided is that the stronger family ties of blacks – for instance the larger frequency of extended families – make them less geographically mobile.

Assuming that the family is the decision-making unit, Nivalainen (2004) finds that Finnish two-earner families migrate less than other families and that migration is mainly due to the husband's career. Furthermore, Gardner, Pierre and Oswald (2001) study the residential mobility of British households. They are especially interested in mobility for job reasons, where they find an asymmetry between men and women. When women are in relationships, they are thus more mobile for partner's job reasons than for own job reasons, while men are more mobile if their partners do not work. In addition, tenants are found to be more mobile than homeowners.

Although the studies mentioned above include job characteristics in various manners, the relationship between job mobility and residence mobility is not addressed explicitly. Van Ommeren, Rietveld and Nijkamp (1999 and 2000) model this interrelation using a search model framework. The hypothesis is that job mobility and residence mobility are related by the commuting distance and so it is found that an increase in commuting distance increases the probability of both residential mobility and job mobility. Van Ommeren (2000) loosens the assumption of the traditional individual search model by analysing job and residential search behaviour of two-earner households. The main finding is that two-earner households search less in the housing market but more in the job market, depending on commuting distance.

In Denmark, studies of geographical mobility are scarce. Newer studies include Norstrand and Andersen (2002) and Munch (2002). Norstrand and Andersen (2002) analyse moves between and within commuting areas. The analysis is based on grouped individual-specific data and shows that people especially moves to areas with attractive living conditions, such as access to recreational areas. In addition, job possibilities play a role, especially for higher educated individuals. Munch (2002) considers residential moves within one commuting area – the Copenhagen region, and investigates the importance of county-taxes and county standards of services (libraries, child care, etc.). Of these factors, especially taxes are found to matter. Other studies have looked at geographical mobility in a narrower sense, such as moving between urban and rural areas

(Graversen, Hummelgaard, Lemmich and Nielsen, 1997) and to/from socially deprived areas (Rasmussen, 2001).

Finally, the link between job and residential moves has been studied by the Danish Economic Council (2002). Looking at transition rates between 1999 and 2000, they find that despite the high job turnover rates in Denmark, the extent of geographical mobility among employed individuals is limited. Furthermore, comparing the level of residential mobility in Denmark to other OECD countries, Danish mobility is found to be on the same level as other continental European countries, but lower than for instance in Sweden. None of the Danish studies, however, explicitly focus on family mobility.

3. Empirical Model and Data

3.1 Empirical model

In the empirical specification, we define job changes (for either the husband or the wife) as well as a residential change as a change from one commuting area to another commuting area. We estimate the probability of the couple changing residence and of the husband or the wife changing job. Thus, we estimate three discrete choice processes, each of which are specified by a probit model. However, as mentioned the changes and the decisions behind the changes are all interrelated. Thus, the probability of changing residence depends on whether one of the spouses have changed job, and vice versa. Furthermore, the probability of a job change may depend on the other spouse's job change. The estimation procedure will take these interdependences into account.

Consider the estimation of the husband changing job, the wife changing job, and the couple changing residence, respectively. A change of job occurs if one spouse changes from a job in one commuting area to a job in another commuting area between period t and period t+1, and a change of residence occurs if the couple changes from a residence in one commuting area to a residence in another commuting area between period t and period t+1. Let y_r be the indicator variable for residence mobility, and y_j^m and y_j^f be the indicator variable for job mobility for the male and the female, respectively. Defining y_r^*, y_j^{m*} and y_j^{f*} as the latent variables corresponding to y_r, y_j^m and y_j^f,

the model is as follows (where x_r, x_j^m and x_j^f are vectors of exogenous variables and γ and β are parameters)

$$
\begin{aligned}
y_r^* &= \gamma_j^m y_j^m + \gamma_j^f y_j^f + \beta_r' x_r + \varepsilon_r \\
y_j^{m*} &= \gamma_r y_r + \gamma_j^f y_j^f + \beta_j^{m'} x_j^m + \varepsilon_j^m \\
y_j^{f*} &= \gamma_r y_r + \gamma_j^m y_j^m + \beta_j^{f'} x_j^f + \varepsilon_j^f
\end{aligned} \tag{1}
$$

and

$$
\begin{aligned}
y_r &= 1 \quad if \quad y_r^* > 0 \\
&= 0 \quad if \quad y_r^* \le 0
\end{aligned}
$$

$$
\begin{aligned}
y_j^m &= 1 \quad if \quad y_j^{m*} > 0 \\
&= 0 \quad if \quad y_j^{m*} \le 0
\end{aligned} \tag{2}
$$

$$
\begin{aligned}
y_j^f &= 1 \quad if \quad y_j^{f*} > 0 \\
&= 0 \quad if \quad y_j^{f*} \le 0
\end{aligned}
$$

In order to take account of the endogeneity of the regressors, we estimate the model by Amemiya's Generalised Least Squares (AGLS) for probit models with endogenous regressors (Amemiya, 1974 and 1979). With the AGLS estimator, the endogenous regressors are treated as linear functions of the instruments and the exogenous variables, while correcting for the truncated distribution of the dependent variable. In essence, the AGLS is thus a variant of the traditional GLS estimator. For details of AGLS, see Maddala (1983).

3.2 Data

The data used for the analysis are merged together from several registers from Statistics Denmark and include information on age, education, family composition, residence and work location, distance between residence and work, and residence and job characteristics. We analyse job changes and residence changes in the year 2000, i.e. between ultimo 1999 and ultimo 2000. We use information on individuals in couples aged 20-59 years, who are both employed in both 1999 and

2000. This leaves us with about 450,000 couples.[1] A change of job or a change of residence is defined geographically. Thus, what we call a change of residence is a move from one commuting are to another commuting area, and a change of job is a change of workplace from one commuting are to another commuting area. Commuting areas are regional units in which most inhabitants both reside and work. More specifically, the commuting areas are defined as geographic areas where commuting in and out is below a certain factor. Using this definition, Denmark is divided into 45 commuting areas usually centred on major towns (Andersen, 2000). The Copenhagen area is the largest commuting area.

The means of the variables are found in table 1. In the table, we distinguish between couple-specific variables (such as children and housing) and individual-specific variables (such as labour market characteristics). 2.6% of the couples moved residence to another commuting area between 1999 and 2000, while 11.9% of the men and 9.8% of the women changed job to another commuting area. Geographical job mobility is thus relatively high and is furthermore substantially larger than the geographical residence mobility.

The age distribution of the sample is given both for the men and for the women, as well as the mean age of the couple. Looking at the mean age of the couples, we find that about two-thirds are aged 30-49 years, while the last third are 20-29 years or 50-59 years on average. The men are older than the women, thus about 26% of the men are aged 50-59 years compared to 18% of the women. The average age difference is 3 years, which is a typical finding for couples. Concerning children, both the number of children and the age of the oldest child are included. We expect that having children increase the cost of moving residence, both because it may be difficult to find childcare in the new region and because the children must adjust to a new neighbourhood. In addition, we expect the child costs to be stronger for children in the school age than for younger children, thus we distinguish between age groups.

Education is split into 3 categories: low, medium and high. Two-thirds of both men and women have medium educational attainment, while more men than women – 8% compared to 5% - have higher education. This primarily reflects the men's older age, as they are more likely to have completed their educations. Moreover, the share of individuals who have completed their education

[1] The couples may be married or cohabiting. For convenience, we use the terms 'husband' and 'wife' whether the spouses are legally married or not.

during the year 2000 (and thus is likely to move from the low education category to another category) is twice as high for women compared to men (2% compared to 1%).

Other studies have found that higher educated people are more likely to be geographically mobile than lower educated individuals (Wayne, Webber and Walton, 2002; Greenaway, Upward and Wright, 2002). However, when studying the mobility of couples it is interesting to analyse possible differences between different combinations of education. As seen in table 1, in almost half of the couples (48%) both spouses have medium education. However, in 23% of the couples the husband has more education than the wife, and in 16% of the couples the wife has more education than the husband (in the remaining couples both have low education or both have high education). We include these "combination-variables" in the estimation of residence mobility.

The distance between job and residence is measured in kilometres. We do not have information on actual commuting costs, thus commuting distance is used as a proxy for the costs. On average, men commute more than women – 16 kilometres compared to 10 kilometres. Considering commuting at the household level, the average maximum commuting distance is 20 kilometres and the difference in commuting distances between the spouses is 15 kilometres on average. Thus, many couples make arrangements such that one spouse (typically the woman) works close to home, while the other works further away.

The vast majority of the couples live in owned residences (80%), while 19% lives in rented residences. The average size of the residence is calculated per family member, and on average people has lived in the same residence 10 years. Unfortunately, we do not have information on how long people has lived in the same commuting area. An indicator variable is included for the residence being in the Copenhagen area. This specific commuting area is much larger than the others both concerning job and residence opportunities, and thus it is natural to expect lower residence mobility for individuals living in Copenhagen.

Finally, some labour market variables are included. Actual labour market experience is measured in years and averages 19 years for men and 15 years for women. The Danish labour market is highly segregated; thus, 77% of the men are employed in the private sector compared to 52% of the

women, while 12% of the men are employed in the local government public sector compared to 40% of the women. Finally, about 36% of the jobs are situated in the Copenhagen commuting area,

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Table 1 around here

The relationship between change of job and change of residence is underlined in table 2. From this table, we see that the proportion of job changes is much higher among the individuals that moved residence than among the others. Thus, 31% of both men and women that moved to another commuting area also changed job to another commuting area, compared to 11% and 9% among those who did not move. Furthermore, in about 15% of the couples that moved residence, both spouses changed job to another commuting area compared to less than 2% of the non-moving couples. This indicates the importance of addressing the interrelationship between the moves.

Table 2 around here

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4. Empirical Results

In Table 3, the estimated coefficients for the probabilities of changing residence, the husband changing job, and the wife changing job to another commuting area are presented. The majority of the variables are highly significant, due to the large number of observations. Consequently, the significance of the estimated coefficients is less interesting than the size of the parameters. Thus, the discussion in this section will be based on the calculated marginal effects presented in Table 4.[2]

In the first three rows of Table 4, we find the interaction coefficients, i.e. the estimated effect of a move in one dimension on a move in another dimension. The largest marginal effect is found for a

[2] Marginal effects are calculated at sample means.

change in residence. Thus, moving residence to another commuting area increases the probability that the wife changes job to another commuting area with 14 pct. while the probability of the husband changing job increases with 57 pct. This effect might seem dramatic, but keep in mind that only 2.5 pct. of the couples move residence within the given year, while the job mobility rate is much higher. The finding here thus implies that given a change of residence to another commuting are, the probability of a simultaneous job change is very high, especially for men.

Looking at the opposite relationship, job changes also have a significant impact on the probability of moving residence, although smaller. Thus, a change in the man's job-region increases the probability of a residence move by 11 pct., while the corresponding effect of the woman's job change is about 9 pct. Although the marginal effect of the husband's job change is slightly larger than the effect of the wife's job change, the difference is not significant and, thus, we cannot conclude that the job of one spouse is generally more important than the job of the other spouse. In both cases, however, the job change implies that the probability of moving residence increases considerably. This makes sense, because by definition the majority of couples live and work within the same commuting area. One (or both) getting a job in another commuting area will thus most likely increase the commuting distance for at least one of the spouses considerably, thus making a move logical.

The last interaction effect that we consider is the relationship between the spouses' jobs. The findings here indicate that the husband's job has a greater effect on the wife's job than the other way around. Thus, a change in his working area increases her probability of changing work area by 11 pct., while the opposite effect is only 6 pct. We know that men on average commute more than women, probably because women are the main responsible for possible children in the household. Thus, if the husband gets a job in another region further away from home, she may react by moving even closer to home. This could explain that she is more sensitive to changes in his working area than the other way around.

In total, we find that the interaction effects are very important, which confirms that it is central to take both job and residence moves into account. Compared to the other explanatory variables in the analysis, the largest marginal effects thus relate to the interaction parameters. Furthermore, residence seems to matter more for jobs than the other way around. This finding is in line with

Deding and Filges (2004), where we analysed reasons for residence mobility between municipalities among Danish wage earners. Those results indicated that more than half of the residence moves were initiated by various family reasons, but that own or partner's job move were involved in two-thirds of the moves. In other words, although the decision to move residence comes first for many couples, the residence move is succeeded by a job move.

Looking at the other explanatory variables, in general the results are as expected. For the probability of moving residence, we use the average age of the couple as well as the age difference between the spouses as explanatory variables. Compared to couples aged 20-29 years, unexpectedly the probability of moving residence for the 30-39-year-olds is marginally higher. A reason for this may be that many Danish couples are in their thirties before they have children and settle down. However, the difference between the two age groups is very small. Being older, i.e. 40-49 years or 50-59 years reduces the probability of moving residence, as we would expect. The older you get, the more attached you are likely to be to your neighbourhood and the less likely you probably are to move. The age difference between the spouses, however, has no effect on the probability of moving residence. Although a large age difference could imply that the spouses are at different point of their life-cycle, this does not have an impact on the probability of moving.

Regarding change of job-region, we find that this declines constant with age for both men and women. Thus, the older the individual, the less likely is a job change. This result, as well as the result for the older couples regarding residence moves, can easily be interpreted in terms of search theory. According to this theory, individuals or couples search for better jobs or better dwellings constantly. But given that a better job or a better dwelling has been accepted at one point in time, the next offer should be better than the present in order to be accepted. Thus, as time goes by the probability of receiving job or residence offers above the reservation level decreases and so does the probability of moving either job or residence.

Children are included in the residence equation, but not in the job change equations. We thus assume that children have a direct effect on the probability of moving residence, but only an indirect effect on the probability of changing job (through the interaction term). The probability of moving residence decreases with the number of children in the household. This makes sense as moving to another area with more children is a bigger decision than moving with fewer children.

Besides the number of children, we have included a dummy for age of the oldest child in the estimation. The reason for this is that we expect the moving behaviour to be different for a couple that has just become parents compared to a couple with say school-aged children. The results in the table confirm this expectation. Thus, when a child is born, it may be necessary to adjust the size and location of the residence, corresponding to the positive effect of having a child aged 0-2 years. However, as the children grow older, the probability of moving decreases and especially so when the oldest child is in the school age 7-17-years old. Parents are thus more reluctant to move when it involves changing school for their offspring.

Education is classified in 3 categories: basic, medium, and high education. The individual level of education is included in the job change equations. Interestingly, education has a different effect across genders. Compared to individuals with a basic (non-qualifying) level of education, high-educated men have a lower probability of changing job-region, while the corresponding effect for women is insignificant. On the other hand, both men and women with medium educations are less geographically job-mobile than men and women with basic educations. One reason for this dissimilarity could be that the male and female unskilled labour markets differ, so that the male unskilled labour market is more characterised by short-term contracts than the female unskilled labour market. Thus, the percentage of unskilled men paid by the hour is higher than for women. Another reason for the finding is that labour markets are distinctively different for the different educational groups. Demand for basic educated individuals is spread out across the country, but the more specialised you are in terms of education, the more concentrated is the demand for labour around the big town/cities. Although higher educated people may thus be more willing to move, given the residence they do not have the same opportunities as lower educated individuals.

Although the individuals in the analysis are employed in both 1999 and 2000, some are also students. Especially for the university educations, the average age of completion is quite high and student jobs are common. In our data, we cannot identify whether the jobs are regular jobs or student jobs, but we have included a dummy in the job change equations for having completed an education during the year 2000. As expected, this increases the probability of having changed job-region significantly for both women and men. Thus, just after finishing an education the individual is more likely to shift to a job in another geographical region.

Concerning the probability of changing residence, the interesting issue is how mobile couples with different combinations of education are. Our expectation is that high-education couples are more geographically mobile, both because their local job opportunities may be limited and because they may be less attached to the present residential area, as they often have had to move geographically in order to achieve the education. The results clearly confirm the expectation. Thus, we find that the probability of moving residence is largest for couples where both have high educations (the baseline category is couples where both have basic educations). The second largest positive effect is found for couples where the husband is highly educated and the wife is medium educated followed by couples where the husband is medium educated and the wife is highly educated. Also combinations where one of the spouses is highly educated while the other has a basic education are associated with larger moving probabilities than the baseline couples.

The findings concerning education point to the importance of education when analysing residential mobility. We thus find that higher education makes geographical mobility more likely. However, the results point to the importance of analysing the couple rather than the individual. Expected mobility for one person thus depends on the educational attainment of the spouse. For an individual with basic education, the difference in the probability of moving depending on whether the spouse also has basic education or whether the spouse has higher education is about one percentage-point. Finally, interestingly the results do not show any gender differences. Thus, it does not matter for the geographical mobility of the couple whether the husband or the wife has the highest education.

Interestingly, education seems to have a different effect on residence mobility and job mobility. Whereas the effect on geographic residence mobility is the expected, namely that higher educated couples are more likely to move, this relationship is not found for the geographic job mobility. Hence, we conclude that higher educated couples are less attached to a specific region and thus are more willing to move geographically to other regions, and then change job through the interaction term; whereas the likelihood of a job change to another region in itself does not increase with education.

The commuting distance between home and work has a positive effect on the probability of changing job for both men and women. However, we see that a longer commuting distance has a

greater impact on the women's probability of moving job then the men's. Taken together with the fact that women's average commuting distance is two-thirds of men's average commuting distance (Table 1), an interpretation is that women simply prefer to work closer to home than men - as mentioned earlier, possibly because of their family responsibilities.

When commuting distances are regarded too long, individuals can adjust either by changing job or by moving residence. However, for the couples in this analysis, adjusting by moving residence is more drastic than adjusting by changing job because the first also implies a change in the spouse's commuting distance. Consequently, it is not surprising that the marginal effect of the commuting distance is much larger in the job change equations than in the residence change equation. Rather than including the commuting distance of each spouse in the residence change equation, we include the maximum distance along with the difference in commuting distances. The maximum distance has no significant effect on the probability of moving residence; but the greater the difference between the commuting distances of the spouses, the lower is the probability of moving. The interpretation of this must be that the longest commuting distance does not matter in itself, but that given a maximum distance, the closer to home the other spouse works the lower is the probability of moving residence.

A number of housing variables are only included in the residence change equation. Relative to living in an owned residence, we find that the probability of moving is higher if the residence is rented or the owner information is missing. Thus, individuals living in an owned residence are less geographically mobile, as also found by e.g. Munch, Rosholm and Svarer (2003). The size of the residence per family member has a negative effect on the probability of moving, indicating that when the couple has found a residence that is large enough, the probability of moving away decreases. The duration in the same residence (defined as the same address) seems to have a positive impact on the probability of moving; however, the effect is negligible in size. Finally, couples are unexpectedly slightly more likely to move if they live in the Copenhagen area – a reason for this can be that housing prices have increased so much in the metropolitan area during the last decade that people are forced to move further away from the city in order to find affordable housing.

Similar to the change of residence equation, some labour market specific variables are included in the job change equations. Years of labour market experience decrease the probability of changing job-region for both women and men, but with a decreasing magnitude for women (experience squared has a positive sign). This reflects that job changes (geographic or not) are more frequent in the beginning of the labour market career. Compared to employees in the private sector, employment in the public sector decreases the probability of changing jobs to another region for both men and women. This is as expected, because job turnover is generally larger in the private sector than in the public sector, whether the state government or the local government sector.

Finally, having a job in the Copenhagen area increases the probability of changing to a job in another area. Like for the residence mobility, this is somewhat contra-intuitive because the large concentration of jobs in Copenhagen should make moving for job reasons less necessary. However, as mentioned above the explanation might also here be the increasing house prices.

Table 3 around here

Table 4 around here

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5. Conclusion

The purpose of this paper has been to analyse geographical mobility of Danish dual-earner couples. Contrary to previous analyses on Danish data, the focus is on the household as the decision-making unit. Based on register data for 1999 and 2000, we estimate the probability of the household changing residence to another commuting area within the country.

Very often, a geographical residence change is followed by a geographical job change and vice versa; the link between the two being the commuting distance. Because the decision of moving residence and the decision of changing job to another geographical region is so closely linked, we analyse the job changing probability of both spouses together with the probability of moving residence taking the interrelationship between the three events into account.

As we want to focus on the relationship between family migration and geographic job mobility of both spouses, the analysis is limited to dual-earner couples aged 20-59 years. Consequently, we do not study life-cycle events such as marriage, divorce, or retirement. Residence mobility for these couples is lower than job mobility. Between 1999 and 2000, 2.6 pct. of the couples moved residence to another commuting area, while 11.9 pct. of the husbands and 9.8 pct. of the wives changed job to another commuting area.

Looking at the empirical results, the close link between the probabilities of the couple moving residence, the husband changing job, and the wife changing job is evident. In particular, the link from the residence move to the job-changing probabilities is strong. Thus, moving residence increases the probability of the wife changing to a new job by 14 pct-points, while the probability of the husband changing job increases by 57 pct-points. Especially for the men, the link between residence mobility and job mobility thus appear to be very strong. Also the opposite relationship matters; a job-change by the husband thus increases the probability of moving residence by 11 pct-points, while a job-change by the wife increases the probability of moving residence by 9 pct-points. This gender-difference, however, is not significant, i.e. the results do not support the hypothesis of the husbands being more important for the migration-decision than the wives. The results suggest that residence is more important than job for the geographic mobility decision.

Also regarding education, the findings are gender neutral. Thus, higher education makes moving residence more likely, no matter whether the wife or the husband have the longest education. The important variable seems to be the highest level of education within the couple, more than the educational level of either the husband or the wife.

Besides a residential move's impact on the job-changing probability, the largest gender-difference concerns the effect of the commuting distance. An increase in commuting distance increases the

wife's probability of changing job to another commuting area significantly more than it affects the husband. At the same time, women's average commuting distance is considerably shorter than men's average commuting distance. An explanation for this difference is that although active in the labour market, women are still the main responsible for the family and are thus inclined to work closer to home.

Summing up, the analysis in this paper gives new insight about the mechanisms of geographical mobility of Danish dual-earner couples and about the link between their residential mobility and geographic job mobility. The findings stress the importance of analysing geographical mobility in this manner. If policy-makers want to increase job-mobility within the country and induce labour to shift between regions, these issues must clearly be taken into account. Mobility-promoting initiatives must thus focus on families rather than individuals and must also recognize that for most families the choice of residence location dominates the choice of job location.

References

Ahn, N., S. de la Rica and A. Ugidos (1999). Willingness to Move for Work and Unemployment Duration in Spain. *Economica* 66, 335-357.

Amemiya, T. (1974). Multivariate Regression and Simultaneous Equation Models When the Dependent Variables are Truncated Normal. *Econometrica* 42, 999-1021.

Amemiya, T. (1979). The Estimation of a Simultaneous Equation Tobit Model. *International Economic Review* 20(1), 169-181.

Andersen, A.K. (2000). *Commuting Areas in Denmark*. AKF, Copenhagen.

Bielbye, W.T. and D.D. Bielby (1992). I Will Follow Him: Family Ties, Gender-Role Beliefs, and Reluctance to Relocate for a Better Job. *The American Journal of Sociology* 97(5), 1241-1267.

Böheim, R. and M. Taylor (2002). Tied Down or Rome to Move? Investigating the Relationships between Housing Tenure, Employment Status and Residential Mobility in Britain. *Scottish Journal of Political Economy* 49(4), 369-92.

Danish Economic Council (2002). *Dansk Økonomi, efterår 2002 (Danish Economy, fall 2002)*. Copenhagen.

DaVanzo, J. (1978). Does Unemployment Affect Migration? – Evidence from Micro Data. *Review of Economics and Statistics* 60, 504-514.

Deding, M. and T. Filges (2004). *Derfor Flytter vi – Geografisk Mobilitet i den Danske Arbejdsstyrke (That's Why We Move – Geographical Mobility in the Danish Labour Force)*. The Danish National Institute of Social Research, Report 04:19.

Gardner, J., G. Pierre and A. Oswald (2001). *Moving for Job Reasons*. Department of Economics, University of Warwick.

Graversen, B.K., H. Hummelgaard, D. Lemmich og J.B. Nielsen (1997). Flytninger til og fra land-kommunerne (Moves to and from rural municipalities). *AKF forlaget*, April 1997.

Greenaway, D., R. Upward and P. Wright, Peter (2002). *Structural Adjustment and the Sectoral and Geographical Mobility of Labour*. CEPR Discussion Papers 3662.

Greenwood, M.J. (1985). Human Migration: Theory, Models, and Empirical Models. *Journal of Regional Science* 25(4), 521-544.

Maddala, G. S. (1983). *Limited Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, Cambridge.

Mincer, J. (1978). Family Migration Decisions. *The Journal of Political Economy* 86(5), 749-773.

Munch, J.R. (2002). *Har kommunal skat og service betydning for flyttemønstrene? (Does municipal tax and service matter for moving?)*. The Danish Economic Council, Working Paper 2002:2.

Munch, J.R., M. Rosholm and M. Svarer (2003). *Are Homeowners Really More Unemployed?*. IZA Discussion Paper 872.

Nivalainen, S. (2004). Determinants of Family Migration: Short Moves vs. Long Moves. *Journal of Population Economics* 17(1), 157-176.

Nordstrand, R. & A.K. Andersen (2002). Indkomster, flytninger og uddannelse (Incomes, moves and education). *AKF Forlaget*, København.

OECD (2000). *Employment Outlook, June 2000*. Paris.

Rasmussen, L.E. (2001). Flyttemønstre i socialt belastede boligområder (Moving in socially deprived areas). *AKF Forlaget*, February 2001.

Sandefur, G.D. and W.J. Scott (1981). A Dynamic Analysis of Migration: An Assessment of the Effects of Age, Family and Career Variables. *Demography* 18(3), 355-368.

Sandell, S.H. (1977). Women and the Economics of Family Migration. *The Review of Economics and Statistics* 59(4), 406-414.

Spilimbergo, A. and L. Ubeda (2004). Family Attachment and the Decision to Move by Race. *Journal of Urban Economics* 55, 478-497.

Van Leuvensteijn, M and P. Koning (2004). The Effect of Homeownership on Labour Mobility in the Netherlands. *Journal of Urban Economics* 55, 580-596.

Van Ommeren, J., P. Rietveld and P Nijkamp (1999). Job Moving, Residential Moving, and Commuting: A Search Perspective. *Journal of Urban Economics* 46, 230-253.

Van Ommeren, J., P. Rietveld and P Nijkamp (2000). Job Mobility, Residential Mobility and Commuting: A Theoretical Analysis Using Search Theory. *The Annals of Regional Science* 34, 213-232.

Van Ommeren, J. (2000). Job and Residential Search Behaviour of Two-Earner Households. *Papers in Regional Science* 79(4), 375-91.

Wayne T., D.J. Webber and F. Walton (2002). The School Leaving Intentions at the Age of Sixteen: Evidence from a Multicultural City Environment. *Economic Issues* 7(1), 1-14.

Table 1. Means of variables, 1999

	Couples		Men		Women	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Change of residence (1999-2000)	0.026	(0.160)				
Change of job (1999-2000)			0.119	(0.323)	0.098	(0.298)
20-29 years	0.146	(0.353)	0.122	(0.327)	0.170	(0.376)
30-39 years	0.338	(0.473)	0.306	(0.461)	0.334	(0.472)
40-49 years	0.342	(0.474)	0.316	(0.465)	0.315	(0.465)
50-59 years	0.220	(0.414)	0.256	(0.437)	0.180	(0.385)
Age difference	3.193	(2.969)				
Number of children	0.988	(1.020)				
Oldest child 0-2 years	0.070	(0.256)				
Oldest child 3-6 years	0.109	(0.312)				
Oldest child 7-17 years	0.385	(0.487)				
Low education			0.247	(0.431)	0.283	(0.450)
Medium education			0.666	(0.471)	0.666	(0.472)
High education			0.087	(0.281)	0.051	(0.221)
Finished education			0.009	(0.094)	0.019	(0.138)
Male low - female low	0.102	(0.303)				
Male low - female medium	0.139	(0.346)				
Male low - female high	0.005	(0.074)				
Male medium - female low	0.171	(0.376)				
Male medium - female medium	0.478	(0.500)				
Male medium - female high	0.018	(0.131)				
Male high - female low	0.009	(0.096)				
Male high - female medium	0.049	(0.215)				
Male high - female high	0.028	(0.166)				
Distance between home and work (in km)			15.567	(28.557)	9.698	(19.002)
Max distance between home and work	20.073	(31.149)				
Distance difference	14.880	(29.266)				
Owned housing	0.800	(0.400)				
Rented housing	0.194	(0.395)				
Missing owner information	0.006	(0.079)				
Size of residence per family member (in m^2)	48.673	(25.042)				
Residence duration (in years)	10.561	(9.488)				
Residence in Copenhagen area	0.351	(0.477)				
Labour market experience (in years)			19.146	(9.042)	15.052	(8.210)
Private sector			0.768	(0.422)	0.524	(0.499)
Municipal (public) sector			0.124	(0.330)	0.397	(0.489)
Government (public) sector			0.108	(0.311)	0.078	(0.268)
Job in Copenhagen area			0.371	(0.483)	0.361	(0.480)
Number of observations	451,964		451,964		451,964	

Table 2. Relationship between change of residence and change of job

	Male job change	Female job change	Male and female job change
No residence change	11.33%	9.25%	1.61%
Residence change	31.34%	31.51%	14.62%

Table 3. The probability of changing residence and changing job, 1999-2000

	Change of residence		Change of his job		Change of her job	
	Coef.	Std. Err	Coef.	Std. Err	Coef.	Std. Err
Changed residence			1.738 ***	(0.123)	0.649 ***	(0.131)
Changed his job	1.199 ***	(0.181)			0.560 ***	(0.048)
Changed her job	1.016 ***	(0.168)	0.294 ***	(0.041)		
30-39 years	0.040 *	(0.015)	-0.102 ***	(0.009)	-0.088 ***	(0.009)
40-49 years	-0.083 ***	(0.021)	-0.179 ***	(0.012)	-0.182 ***	(0.012)
50-59 years	-0.164 ***	(0.026)	-0.251 ***	(0.014)	-0.370 ***	(0.014)
Age difference	0.003	(0.002)				
Number of children	-0.080 ***	(0.011)				
Oldest child 0-2 years	0.062 **	(0.019)				
Oldest child 3-6 years	-0.100 ***	(0.024)				
Oldest child 7-17 years	-0.274 ***	(0.025)				
Medium education			-0.028 ***	(0.006)	-0.026 ***	(0.006)
High education			-0.081 ***	(0.010)	-0.003	(0.013)
Finished education			0.159 ***	(0.023)	0.180 ***	(0.017)
Male basic female medium education	0.096 ***	(0.018)				
Male basic female high education	0.201 ***	(0.050)				
Male medium female basic education	0.081 ***	(0.018)				
Male medium female medium education	0.142 ***	(0.016)				
Male medium female high education	0.267 ***	(0.031)				
Male high female basic education	0.216 ***	(0.041)				
Male high female medium education	0.310 ***	(0.023)				
Male high female high education	0.359 ***	(0.026)				
Distance between home and work (in km)			0.664 ***	(0.008)	1.096 ***	(0.012)
Maximum distance	0.145	(0.058)				
Difference in distance	-0.206 ***	(0.046)				
Rented housing	0.497 ***	(0.011)				
Missing owner information	0.141 *	(0.045)				
Size of residence per family member	-0.271 ***	(0.028)				
Residence duration (in years)	-0.012 ***	(0.001)				
Residence in Copenhagen area	0.036 *	(0.012)				
Labour market experience (in years)			-0.015 ***	(0.001)	-0.039 ***	(0.002)
Labour market experience squared			0.002	(0.004)	0.071 ***	(0.005)
Municipal (public) sector			-0.179 ***	(0.009)	-0.071 ***	(0.006)
State (public) sector			-0.140 ***	(0.009)	-0.193 ***	(0.011)
Job in Copenhagen area			0.183 ***	(0.006)	0.230 ***	(0.006)
Constant	-2.203 ***	(0.041)	-1.025 ***	(0.016)	-1.090 ***	(0.014)
Pseudo R2	0.1437		0.0732		0.0956	
Number of observations	451,964		451,964		451,964	

*** significant at 0.01%-level, ** significant at 0.1%-level, * significant at 1%-level

Table 4. Marginal effect on the probability of changing residence and changing job, 1999-2000

	Change of residence		Change of his job		Change of her job	
	Mar. Eff	Std. Err	Mar. Eff	Std. Err	Mar. Eff	Std. Err
Changed residence			0.571 ***	(0.044)	0.143 ***	(0.038)
Changed his job	0.115 ***	(0.033)			0.111 ***	(0.012)
Changed her job	0.087 ***	(0.027)	0.061 ***	(0.010)		
30-39 years	0.001 *	(0.001)	-0.018 ***	(0.002)	-0.013 ***	(0.001)
40-49 years	-0.003 ***	(0.001)	-0.031 ***	(0.002)	-0.026 ***	(0.002)
50-59 years	-0.005 ***	(0.001)	-0.042 ***	(0.002)	-0.047 ***	(0.001)
Age difference	0.000	(0.000)				
Number of children	-0.003 ***	(0.000)				
Oldest child 0-2 years	0.002 **	(0.001)				
Oldest child 3-6 years	-0.003 ***	(0.001)				
Oldest child 7-17 years	-0.009 ***	(0.001)				
Medium education			-0.005 ***	(0.001)	-0.004 ***	(0.001)
High education			-0.014 ***	(0.002)	0.000	(0.002)
Finished education			0.032 ***	(0.005)	0.030 ***	(0.003)
Male basic female medium education	0.004 ***	(0.001)				
Male basic female high education	0.009 ***	(0.003)				
Male medium female basic education	0.003 ***	(0.001)				
Male medium female medium education	0.005 ***	(0.001)				
Male medium female high education	0.012 ***	(0.002)				
Male high female basic education	0.009 ***	(0.002)				
Male high female medium education	0.015 ***	(0.001)				
Male high female high education	0.018 ***	(0.002)				
Distance between home and work (in km)			0.119 ***	(0.001)	0.164 ***	(0.002)
Maximum distance	0.005	(0.002)				
Difference in distance	-0.007 ***	(0.002)				
Rented housing	0.024 ***	(0.001)				
Missing owner information	0.006 *	(0.002)				
Size of residence per family member	-0.009 ***	(0.001)				
Residence duration (in years)	0.000 ***	(0.000)				
Residence in Copenhagen area	0.001 *	(0.000)				
Labour market experience (in years)			-0.003 ***	(0.000)	-0.006 ***	(0.000)
Labour market experience squared			0.000	(0.001)	0.011 ***	(0.001)
Municipal (public) sector			-0.030 ***	(0.001)	-0.010 ***	(0.001)
State (public) sector			-0.023 ***	(0.001)	-0.026 ***	(0.001)
Job in Copenhagen area			0.034 ***	(0.001)	0.036 ***	(0.001)
Pseudo R2	0.1437		0.0732		0.0956	
Number of observations	451,964		451,964		451,964	

*** significant at 0.01%-level, ** significant at 0.1%-level, * significant at 1%-level