



Migration and Longer Distance Commuting in Rural England

Tony Champion, Mike Coombes, David L Brown

► To cite this version:

Tony Champion, Mike Coombes, David L Brown. Migration and Longer Distance Commuting in Rural England. *Regional Studies*, 2009, 43 (10), pp.1245-1259. 10.1080/00343400802070902 . hal-00538017

HAL Id: hal-00538017

<https://hal.science/hal-00538017>

Submitted on 20 Nov 2010

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Migration and Longer Distance Commuting in Rural England

Journal:	<i>Regional Studies</i>
Manuscript ID:	CRES-2007-0147.R1
Manuscript Type:	Main Section
JEL codes:	J61 - Geographic Labor Mobility Immigrant Workers < J6 - Mobility, Unemployment, and Vacancies < J - Labor and Demographic Economics, O15 - Human Resources Income Distribution Migration < O1 - Economic Development < O - Economic Development, Technological Change, and Growth, R23 - Regional Migration Regional Labor Markets Population < R2 - Household Analysis < R - Urban, Rural, and Regional Economics, R41 - Transportation: Demand Supply Congestion Safety and Accidents < R4 - Transportation Systems < R - Urban, Rural, and Regional Economics
Keywords:	Commuting distance , Migration , Rural England, Binary logistic regression

SCHOLARONE™
Manuscripts

Migration and Longer Distance Commuting in Rural England

TONY CHAMPION*, MIKE COOMBES*, AND DAVID L. BROWN**

**Centre for Urban and Regional Development Studies, Newcastle University,
Newcastle upon Tyne NE1 7RU, UK. Emails: tony.champion@ncl.ac.uk and
mike.coombes@ncl.ac.uk*

*** Department of Development Sociology, 338 Warren Hall, Cornell University,
Ithaca, NY 14853, USA. Email: dlb17@cornell.edu*

first received: June 2007

Accepted: January 2008

ABSTRACT

This paper examines whether recent in-migrants to rural settlements in England commute further to work than the longer-term residents of these places and whether commuting distance differs according to the type of move and the geographical context of their home. The study is based on data from the Individual Controlled Access Microdata Sample (CAMS) of the 2001 Census of Population. It is found that recent in-migrants are much more likely than longer-term residents to commute at least 20km. Using binary logistic regression so as to allow for socio-demographic differences between people, it is shown that the likelihood of longer distance commuting was highest for people who had moved home by between 15 and 99km and for people moving from the largest cities.

Key words: Commuting distance In-migration Rural England Binary logistic regression

JEL classifications: J61, R23, R41, O15

Les migrations quotidiennes à plus grande distance aux zones rurales en Angleterre.

Champion et al.

Cet article cherche à examiner si, oui ou non, les migrations quotidiennes récentes à destination des villages ruraux en Angleterre sont à plus grande distance que ne le sont celles des habitants de longue date, et si, oui ou non, la distance des migrations quotidiennes dépend des caractéristiques du déplacement et du contexte géographique du foyer. L'étude est fondée sur des données qui proviennent de l'Access Microdata Sample (CAMS) du recensement de la population 2001. Il s'avère que les migrants récents sont plus susceptibles de faire des trajets quotidiens d'au moins 10km que ne le sont les habitants de plus longue date. A partir d'une régression logistique binaire pour tenir compte des différences socio-démographiques individuelles, on montre que la probabilité des migrations quotidiennes à plus grande distance étaient plus élevée pour ceux qui se sont déménagés entre 15km et 99km et pour ceux qui sont arrivés en provenance des plus grandes villes.

Migrations quotidiennes / Entrées / Angleterre rurale / Régression logistique binaire

Classement JEL: J61; R23; R41; O15

Migration und längere Anfahrten zum Arbeitsplatz im ländlichen England
TONY CHAMPION, MIKE COOMBES, AND DAVID L. BROWN

ABSTRACT

In diesem Beitrag wird untersucht, ob die in den letzten Jahren in ländlichen Gebieten Englands eingetroffenen Immigranten längere Strecken zu ihrem Arbeitsplatz zurücklegen als Personen, die seit längerem an diesen Orten ansässig sind, und ob die Entfernung zum Arbeitsplatz je nach der Art der Umsiedelung und des geografischen Kontexts der Heimat unterschiedlich ausfällt. Die Studie basiert auf Daten des Individual Controlled Access Microdata Sample (CAMS) aus der Volkszählung von 2001. Wir stellen fest, dass die in den letzten Jahren eingetroffenen Immigranten viel häufiger Strecken von mindestens 20 km zum Arbeitsplatz zurücklegen als seit längerem ansässige Personen. Zur Berücksichtigung der soziodemografischen Unterschiede zwischen den Personen wenden wir eine binäre logistische Regression an und weisen nach, dass die Wahrscheinlichkeit längerer Anfahrten zum Arbeitsplatz unter Personen, die von ihrer Heimat aus an einen zwischen 15 und 99 km entfernten Ort

umgezogen sind, sowie unter Personen, die aus den größten Städten umgezogen sind, am höchsten ausfällt.

Key words:

Entfernung zum Arbeitsplatz

Immigration

Ländliches England

Binäre logistische Regression

JEL classifications: J61, R23, R41, O15

Migración y desplazamientos al trabajo desde largas distancias en la Inglaterra rural

TONY CHAMPION, MIKE COOMBES, AND DAVID L. BROWN

ABSTRACT

En este artículo examinamos si las recientes inmigrantes en enclaves rurales en Inglaterra se desplazan al trabajo más lejos que los residentes a largo plazo de estos lugares y si las distancias de estos desplazamientos difieren según el tipo de movimiento y contexto geográfico de sus hogares. Este estudio se basa en los datos de la muestra de microdatos de acceso controlado individual (CAMS) del Censo de Población 2001. Se observa que es mucho más probable que las inmigraciones recientes se desplacen a trabajar como mínimo a una distancia de 20 km que los residentes a largo plazo. Usando una regresión logística binaria, a fin de tener en cuenta las diferencias sociodemográficas entre las personas, mostramos que la probabilidad de desplazarse a distancias más largas era la más alta para las personas que se habían cambiado de domicilio a una distancia entre 15 y 99 km y para las personas que se desplazan a trabajar desde las ciudades más grandes.

Key words:

Distancia de desplazamientos al trabajo

Inmigración

Inglaterra rural

Regresión logística binaria

JEL classifications: J61, R23, R41, O15

INTRODUCTION

This paper is focused at the intersection of two important and increasingly interconnected aspects of population mobility which raise questions about the role and

status of rural communities. Urban-to-rural shifts in population distribution (BROWN and WARDWELL, 1981; CHAMPION, 1989; KONTULY, 1998; JOHNSON *et al.*, 2005) and increased long distance commuting among rural workers (FROST, 2006) are both associated with a more decentralized settlement pattern where work and residence are becoming more separated and where dependence on the private car is heightened. As TIGGES and FUGUITT (1993) have observed, the increase in long distance commuting is part of the infrastructure that makes population deconcentration possible. At the same time, more people are now living in rural communities whose own labour markets may not provide a sufficient supply of jobs matched to their human capital (GREEN, 1999a). In addition to their impacts on settlement structure, these migration and commuting trends are thought to affect a wide range of household behaviours such as the gender division of household responsibilities (GREEN, 1997; HOFFMEISTER, 2002), the demand for local goods and services (GREEN, 2001) and community organization and civic participation (BROWN, 2002; PUTNAM, 2000). There are also implications for government policies aimed at reducing carbon emissions and increasing the sustainability of communities more generally (e.g. ODPM, 2003).

Despite these concerns about rural population growth being associated with increasing work-related travel, the relationships between commuting behaviour and migration in rural areas are not well documented. This study examines the distance to work of people moving to rural settlements in comparison with that of the longer-term residents of these places. Rural England is selected as the case study area, taking advantage of that country's detailed information about commuting behaviour, which can be cross classified with migration using the Individual Controlled Access Microdata Sample (CAMS)¹ of its 2001 Census of Population. This microdata source

also enables the socio-demographic differences between people to be controlled for, so that the effects of recent migration and of the type of move made can be isolated. What the Census's one-year data cannot show, however, is the extent to which migrants' commuting behaviour alters with duration of residence, one of the topics recommended for future research at the end of the paper.

COMMUTING AND MIGRATION IN RURAL AREAS

The overall research literature on the commuting behaviour of rural residents, especially those who are recent in-migrants from urban areas, is not extensive. This is an important gap in the literature because urban to rural population shifts have been observed widely around the world since at least the 1970s (BEALE, 1975). Moreover, it is fitting that this study is focused on England because counterurbanization first appeared there, and the grip of the phenomenon has remained firm in England for decades (CHAMPION, 2003).

The few previous studies of commuting in rural England tend to confirm the findings of nationwide analyses and the patterns found in other countries, insofar as such international comparisons are strictly possible. These indicate that rural residents tend to have longer commutes than average, though this is more a feature of those living near larger urban centres than of those living in more remote locations. BOYLE *et al.* (2001), for example, examined 1991 Census data and revealed that residents of wholly rural areas had an average commuting distance 65% greater than those of wholly urban areas. FROST (2006), using 2001 Census data and disaggregating journey-to-work flows by different types of urban and rural settlements, confirmed that out-commuting is higher from settlements located in the more densely populated

1
2
3 rural areas that are located around towns and cities than it is from settlements in more
4
5 sparsely populated areas. These findings have complemented research that has also
6
7 allowed for non-geographical factors that are associated with people's length of
8
9 journey to work, such as people's age and occupation (COOMBES and RAYBOULD,
10
11 2002; GREEN and OWEN, 2006).
12
13

14
15 Most commuting patterns have been linked primarily to the availability and
16
17 nature of work. SCHINDEGGER and KRAJASITS (1997) observed that long
18
19 distance commuting among rural residents is linked to the fact that rural areas often
20
21 lack sufficient job opportunities to fully utilize their resident workforces. According
22
23 to GREEN (1999a), rural location is more of a disadvantage for some groups of
24
25 people than others, with the former including young people, women seeking full-time
26
27 employment in high level non-manual occupations and men in specialist occupations.
28
29 By contrast, dual-career households have been found to display a strong preference
30
31 for certain accessible rural locations where longer distance commuting to a number of
32
33 urban labour markets might offset the need for future migration (GREEN, 1997). In
34
35 more remote rural areas, by contrast, the difficulty of accessing town-based jobs
36
37 increases the reliance on local opportunities. Rural residents desiring certain types of
38
39 work may need to move out of the deep countryside, while these remoter locations
40
41 will be less attractive migration destinations for similar workers living elsewhere.
42
43
44
45
46
47

48
49 Yet, while out-migration from rural areas in search of work is quite well
50
51 documented, there are as yet few studies of the interrelationship between migration
52
53 and commuting, apart from those examining the way in which people choose between
54
55 these two forms of mobility to access work (CAMERON and MUELLBAUER, 1998;
56
57 GREEN, 1999b; ROMANI *et al.* 2003). Our review of the literature on commuting
58
59 identified only three studies that examine the commuting behaviour of recent in-
60

migrants to rural areas in England. Nevertheless, all three point to the big impact that in-migration is likely to be having on the amount of work-related travel of rural residents.

GREEN (1999a) concluded that rural in-migrants who plan to maintain their previous occupational levels must be prepared to commute longer distances. Otherwise, they will have to ‘trade down’ by taking jobs at lower skill levels than their qualifications and ‘make do’ with the limited range of jobs available locally. Both of these strategies were evident from the interviews she conducted in the rural East Midlands with members of in-migrant households, including the growing-up children. The only other option is to move away again, just as so many of the indigenous population tend to do for their first job or early career progression, recognising that they need to ‘get out’ to ‘get on’ (GREEN, 1999a, p. 42).

FINDLAY *et al.* (2001) examined commuting behaviour in a survey of five areas of rural England that distinguished between ‘incomers’ who were migrants from places more than 15km away and people who had moved more locally or had not moved at all in the previous 17 years. They found a significant difference in commuting distance between these two groups, with 45% of the incomers travelling more than 15km to their workplace compared to only 28% of the long-term residents of the area. In a more detailed analysis that compared just the local movers with the incomers, it was found that members of the incomer households were around twice as likely as the local movers to commute at least 20km (FINDLAY *et al.*, 1999).

BOYLE *et al.* (2001) also found evidence of the effect of migration in their micro-level modelling of people’s commuting distances, using data from the 1991 Census on people who had changed address within the previous 12 months. In a nationwide model which was primarily designed to isolate the effect of rural versus

urban residence by controlling for other differences between people, being a recent migrant significantly increased the odds of travelling 30km or more to work. Similarly, in a separate model analysing the commuting behaviour of just rural residents, recent migration over both longer and shorter distances again increased the likelihood of a long commute compared to the distance travelled by longer-term rural residents.

THE STUDY

The aim of this study is to build on this previous work by putting the links between migration and commuting centre-stage. It does this, firstly, by examining how far commuting distances in rural England differ between recent migrants and longer-term residents. This is done by crosstabulating the commuting and migration data with typologies of rural people's place of residence at the time of the 2001 Census.

Subsequently, the focus is on calculating how the probability of a rural resident being a longer distance commuter varies between recent migrants and longer-term residents and between migrants according to the distance moved and the type of place moved from. These analyses also investigate how far commuting behaviour differs according to the characteristics of the rural area lived in, including the size of settlement, type of local district and broad regional location within England, and control for differences in personal characteristics associated with commuting behaviour.

These aims add up to a challenging list of data needs. The only sources that come close to satisfying it are the Census of Population and the Labour Force Survey (LFS). The LFS has the advantage of being an annual survey. The Census, however, has the twin benefits of much larger population size and greater geographical detail,

both of which are crucial considerations in studying rural England with its relatively small proportion of the national population and its highly localised variation in settlement size. The most satisfactory component of 2001 Census output for present purposes is the Individual Controlled Access Microdata Sample (CAMS), which includes a 3.125% sample of English residents. Whereas standard ‘area tables’ limit the information available on patterns of movement (ROSEMAN, 1971), the microdata from the CAMS allows crosstabulation of workplace information by migrant status, and multiway crosstabulation of commuting with a wide range of social and economic attributes needed to isolate the impact of migration on commuting distance. Moreover, unlike the standard area tables from the 2001 Census, the CAMS contains information about the distance moved by migrants. It also provides anonymised data on the full range of characteristics covered on the census form, with a high level of disaggregation including the identity of the local authority area (LA) of migrants’ address one year before.

In terms of the individual variables relevant to the aims of this study and available from the CAMS, the most crucial ones relate to commuting behaviour and migrant status. With respect to commuting, CAMS identifies whether a person works mainly at home or has no fixed workplace and, for all other workers, includes an estimate of distance to workplace.² It should be noted that CAMS gives no further details about the location of the workplace, neither the direction along which the distance is travelled nor the LA in which the workplace is situated (other than whether or not it is in the same LA as the worker’s home).

As regards migrant status, this study uses two of the variables derived from the census question about people’s usual address one year previously – distance of move and the LA of previous residence. As regards the former, given the study’s emphasis

on in-migrants to a rural settlement, people who moved less than 5km are combined with those who did not change usual address during the pre-census year. They are treated as 'longer-term residents' of the local area, or 'stayers' for short. In contrast, migrants or 'movers' are persons who moved in from at least 5km away. Distinguishing between people moving into a settlement from those moving within it is a rather arbitrary decision, but the 5km cut-off is appropriate because no settlement in rural England has a diameter larger than this.

It is important not to overstate the analytical power of this separation of movers and stayers. The census data's 12 month look-back means that every migrant whose relocation was prior to that 12 month 'window' is included in the stayer population. In other words, the stayer category includes numerous fairly recent in-migrants, and so the actual difference between long-term residents and more recent in-migrants could well be under-estimated. On the other hand, for many movers the process of adjusting work and home locations can take a considerable period, so the simple 12 month cut-off means that the observed commuting patterns of some movers are part of a rather brief period of adjustment. The commuting pattern of such people may not persist for long, so their behaviour recorded in the census data may not indicate a long-term commitment to longer distance commuting. While these two limitations may counter balance each other to some degree, they should be kept in mind in interpreting the results.

The information on the LA of residence one year ago is used to classify the type of place a migrant moved from. Given that for present purposes the urban-rural dimension of people's moves is of particular interest, we have classified this by the Department of Environment, Food and Rural Affairs (DEFRA) typology of LAs (RURAL EVIDENCE RESEARCH CENTRE, 2005), which, as shown in Figure 1,

provides a 6-way division of England between most urban and most rural. This allows migrants to be classified according to whether they had moved from another part of rural England and, if not, the type of urban LA that they had left. For the purposes of this study, rural England is defined in terms of the three rural types in this classification.³

FIGURE 1 ABOUT HERE

The other variables used in our study are primarily selected in order to control for the other attributes that may affect people’s commuting behaviour and thereby isolate the impact of migration status on distance commuted. As shown in Table 1, the list has strong similarities to that used by GREEN and OWEN (2006) in their nationwide study of commuting. The main difference is that, for our rural study, we exclude ethnicity and housing tenure because these do not vary much across rural England: whites and owner-occupied housing strongly predominate in rural areas.

TABLE 1 ABOUT HERE

This study’s rural emphasis also led us to adopt definitions and categories that give more detailed breakdowns than most earlier studies. For instance, we separate out the self-employed (who have above-average representation in rural areas) from employees. In terms of industry, we distinguish the primary sector so as to identify farmers and farm workers. In terms of geographical context, we use the CAMS urban/rural settlement indicator which is based on very precise physically built-up-area definitions: all such settlements with 10,000 residents or more are deemed ‘urban’ whilst other areas are divided into ‘towns’, ‘villages’ and ‘hamlets and isolated dwellings’ according to settlement size (for further details, see COUNTRYSIDE AGENCY *et al.*, 2004). Finally, as indicated in Table 1, the LA

employment rate – being measured on a residence basis rather than at workplace – is used as a supply-side factor rather than as a measure of labour market demand.

THE COMMUTING BEHAVIOUR OF RURAL RESIDENTS

This section begins by examining how commuting behaviour varies by type of current residence. It then addresses the question whether recent in-migrants to rural settlements tend to commute further than the longer-term residents of these settlements. These analyses are based on all those in the CAMS who were aged 16-74 that were resident in households in England at the time of the 2001 Census and had a job in the previous week.

By way of context, Figure 2 shows that, across England as a whole, most people travel short distances to work. Almost half travelled less than 5km, with 9.2% of people in work stating their workplace as ‘at home’ and 40% giving a workplace elsewhere but less than 5km away. At the other extreme, only 1 in 8 commuted at least 20km.

FIGURE 2 ABOUT HERE

Compared to the national picture, rural areas are characterised by larger shares at both extremes. Taking rural England as a whole, the proportion of workers travelling at least 20km (17.1%) was two-fifths higher than the national figure, while the proportion working at home was around a fifth higher, at 11.2% (Figure 2). Moreover, while these differences from the national pattern were the case for all three types of rural LA and for all four sizes of settlement in rural England, generally they can be seen to rise progressively with increasing rurality. This pattern is consistent with more rural areas having a higher proportion of farmers and others who have no

distance to travel to work, and about the probable relative scarcity of jobs there being associated with more residents travelling longer distances. An exception is provided by the little variation between settlement sizes in the proportion travelling 20km or more, though this may reflect lower rates of overall out-commuting from the most remote locations.

Against this background, Figure 3 explores how far the commuting behaviour of England’s residents varies by migrant status. Here the focus is on the extent of longer distance commuting, where the latter is defined in terms of the one-eighth of workers nationally who, as just shown, travel at least 20km.⁴ For England as a whole, a big difference is evident between the recent in-migrants (movers) and the longer-term residents (stayers), with 20 per cent of the former commuting at least 20km compared to only 12 per cent of the stayers. For all the rural LAs taken together, the margin is even wider. Clearly, at least within the first year of arriving, the new residents of a rural settlement are much more likely to travel further to work than those who have lived there for longer.

FIGURE 3 ABOUT HERE

Turning to the two breakdowns of rural England shown in Figure 3, the big contrast between recent in-migrants and longer-term residents is found to apply across the board. The former’s proportion of longer distance commuters is more than 10 percentage points higher than the latter’s for all the categories shown except for village. Consistent with the results of previous studies, it is found that people who moved at least 5km to a settlement in rural England ended up further from their workplace than is the norm for longer-term residents. Additionally, it can be seen that commuting distance varies according to where people live within rural England and that this patterning is broadly similar for the two groups of residents, the main

exception being the higher than 'expected' proportion for those moving recently into hamlets and isolated dwellings.

What cannot be concluded from this analysis, however, is whether it is the act of migration itself that is responsible for the greater prevalence of longer distance commuting or whether the latter is more a function of the selectivity of the migration process (CHAMPION *et al.*, 1998). The next section controls for the compositional differences between the movers and the stayers in order to determine whether recent migration has an independent impact on commuting distance. Additionally, it tests whether where people live in rural England remains significant once the effect of differences in migrant status and other aspects of population composition are taken into account.

FACTORS ASSOCIATED WITH VARIABILITY IN COMMUTING DISTANCE AMONG RURAL RESIDENTS

This section investigates the propensity of a person to travel 20km or more to work, with the primary aim of measuring the effect on this of being a recent in-migrant to a rural settlement compared to being a longer-term resident. We use binary logistic regression, following the lead of BOYLE *et al.* (2001) and GREEN and OWEN (2006), as well as other related studies (for instance, BOYLE, 1995; MOKHTARIAN and SALOMON, 1997; ROUNWENDAL and MEIJER, 2001). To isolate the effect of being a recent in-migrant, the regression modelling also takes into account people's personal characteristics and their geographical context. The results of two sets of models are presented. The first set examines the simple distinction between movers

and stayers, while the second disaggregates movers by broad bands of distance moved and by the type of LA that they moved from.⁵

Examining the impact of recent migration on commuting distance

The analysis in Table 2 shows the impact of recent migration, using the mover/stayer dichotomy, and of the various personal and geographical characteristics listed above (Table 1) on the propensity to be a longer distance commuter. The explanatory variables are entered sequentially in four ‘blocks’, starting with people’s migrant status, then adding variables relating to their labour market status, their demographic and household characteristics and, finally the geographical context of their home. Progressively expanding the model to include these blocks of additional variables enables the robustness of the model parameters to be assessed and, in particular, to show whether and how far the initially estimated influence of in-migration to a rural settlement alters as the subsequent blocks of variables take account of the compositional and contextual factors. This can be seen by looking across the ‘mover’ row of the table from model 1 to model 4.

TABLE 2 ABOUT HERE

In model 1, where the only factor taken into account is whether a person is a mover, it is found that the odds of commuting at least 20km are just over twice as high for a recent in-migrant as compared with longer-term residents (as indicated by the odds value of 2.051 for ‘mover’ compared with the value of 1 for the reference case of ‘stayer’). When the block of variables describing people’s labour market characteristics is included (model 2), the odds of a mover commuting this far fall somewhat but are still about 60% higher than for the stayers. This value then remains

1
2
3 broadly stable when the demographic/household and geographical context variables
4
5 are entered into the analysis (models 3 and 4). Therefore, assuming that the modelling
6
7 has not left out any key compositional factors influencing people's length of journey
8
9 to work, the act of recent migration has an important independent effect on the
10
11 propensity of England's rural residents to make a longer distance commute.
12
13

14
15 Looking at the non-migration factors, how stable are they when subsequent
16
17 blocks of variables are added to the model, and do they have the type of effect
18
19 suggested by previous research? The general picture provided by the results in Table 2
20
21 is that they alter little between models and that their effects are as expected from
22
23 Table 1 above. Model 2 shows that the probability of longer distance commuting is
24
25 higher among full time workers, persons with higher professional and managerial
26
27 occupations, persons working outside of the primary sector, and workers with a first
28
29 degree or its equivalent. The impact of these factors on commuting distance holds up
30
31 after demographic and geographical variables are added in models 3 and 4, although
32
33 the discriminatory power of employment status and occupational prestige is somewhat
34
35 diminished.
36
37
38
39

40
41 The addition of demographic and household attributes in model 3 shows that
42
43 the probability of commuting at least 20km is greater for workers aged 30-44 and
44
45 lowest for workers age 60-74. These data also show that longer distance commuting is
46
47 more likely among males, household reference persons, sole earners in households
48
49 where other adults do not work for pay, and those in households with at least one car.
50
51 In contrast, being a female household reference person with a dependent child
52
53 depresses one's chances of commuting 20km or longer by about 20%. Similar to the
54
55 comparison between models 2 and 3, these demographic and household factors hold
56
57
58
59
60

stable in direction and strength when geographic factors are added to the analysis in model 4.

Model 4 shows that living in south-eastern England significantly increases the chances of having a relatively long journey to work. As BOYLE et al. (2001) observed, London is particularly likely to attract longer distance commuters who use public transport. Secondly, living in the most rural type of LA raises the chance of commuting 20km or further by about 20% compared with workers who live in the least rural type. This is consistent with the idea that jobs, especially well paying jobs, are less available in more highly rural areas, though it is at variance with previous reports of more long commutes from more accessible rural areas and of a greater reliance on local work in more remote localities. This apparent deviation is possibly due to the present study's emphasis on longer distance commuting (cf. GREEN and OWEN, 2006), as well as to differences in the nature and scale of the rural area typologies used (cf. BOYLE *et al.*, 2001; GREEN and OWEN, 2006).

Thirdly, living in a LA with a higher employment rate, a continuous variable, increases the probability of commuting at least 20km by 0.4% for every 1.0% increase in the employment rate. This fits our expectation, given that this is used as a measure of the demand for work by residents and, as such, is similar to the approach employed by ELIASSON et al. (2003). The result here is consistent with the idea that jobs are generally scarcer in rural areas, so that people living in areas with higher proportions of people in work need to travel further to find jobs.

The results reported above are all significant at the 5% level or higher. The only variable considered for the model that did not prove to be a significant predictor of people's chances of being a longer distance commuter in rural England is the size of settlement that a person lives in. This is perhaps not surprising given the positive

association between this measure of rurality and our LA type variable. At the same time, given the variation in settlement sizes within the majority of individual rural localities, people living in an isolated dwelling or hamlet near a village or small town may well face a labour market 'offer' that is little different from that faced by residents of the larger settlements there.

While there is scope for further discussion and investigation of the commuting impact of the non-migration factors examined in our model, the key point in terms of the present study is that being a recent migrant is a clear driver of longer distance commuting in rural England even when compositional variables are taken into account and allowance is made for geographical differences across rural territory. This is in line with previous studies, and it provides a firm basis for expanding that work and taking a more detailed look at the relationship between migration and commuting.

Commuting by distance moved and by the type of previous residence

As set out in the methodology section, we now disaggregate movers in two ways: by the distance they moved and by the type of LA of their previous residence. The results of substituting these alternatives in the logistic regression predicting the probability of commuting 20km or longer are shown in Table 3, with distance of move in model 5, type of LA moved from in model 6, and model 7 including both measures. All of the compositional and geographic variables are included in each of these three models, i.e. as for model 4 in Table 2.

TABLE 3 ABOUT HERE

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Model 5 examines the effect of disaggregating movers into four bands of migration distance. The results provide much more information about the relationship between recent in-migration and commuting than the simple observation from Table 2 that, after allowing for other factors, being a mover rather than a stayer raised the odds of a 20km+ commute by around 60%. They also suggest that BOYLE *et al.*'s (2001) binary distinction between a long- and short-distance migrant cannot do justice to the variation between migrants who have moved differing distances. In this context, the key finding is that the relationship is not linear, but instead the odds of commuting at least 20km are highest for those who moved 30-99km, and lower both for moves that were longer than this and for those that were shorter. Moreover, the odds of these 30-99km movers being a longer distance commuter are over two and a half times what they are for people who had not changed address during the pre-census year or who had moved home by less than 5km. Those who moved 15-29km had odds almost as high as this, but those who moved only 5-14km are found to have a likelihood of being a longer distance commuter that is not significantly different from stayers. At the other end of the scale, movers whose previous address was at least 100km away from their census-night residence have a 50% greater chance of being a longer distance commuter than stayers. This is not nearly as high odds as for persons who moved 15-29 or 30-99km. In other words, the longest distance movers are more likely to work near their new homes than are the 'medium' distance migrants. This is an intuitively plausible result if the pre-move workplace was close to the previous residence, owing to the challenges posed by very long-distance commuting and reflecting the conceptual distinction between 'migration' between labour market areas, on the one hand, and more local 'residential mobility' or 'moves', on the other (LONG, 1988; ZAX, 1994).

Model 6 tests the effect of disaggregating movers on the basis of the degree of urbanization of the areas they moved from, but without taking into account the distance they had moved. This relationship with the odds of being a longer distance commuter is much closer to being linear. The larger the urban place moved from, the higher are the odds of being a longer distance commuter. Those who left a major urban LA had well over twice the stayers' odds of commuting at least 20km, and those from the two smaller types of urban LA had odds around 40% higher. Rural-to-rural migrants had a 12% higher chance of being a longer distance commuter than stayers. Thus, moving into rural England from an urban LA – especially from one of England's largest cities – greatly increases the migrant's likelihood of being a longer distance commuter, as BOYLE *et al.* (2001) surmised but did not test.⁶

At the same time, however, model 7 reveals a strong interaction between distance moved and type of LA moved from. When both classifications are included, the parameters of both differ from those when each is entered separately – in marked contrast to the parameters for all the non-migration variables, which hardly change at all between models. While the odds of being a longer distance commuter has the same pattern for the distance-of-move variable as in model 5, the parameters for the type of previous LA are quite different from those in model 6. Moving into rural England from a major urban LA still raises the odds of being a longer distance commuter compared to rural stayers, but only by 17%. In contrast, the likelihood of longer distance commuting by people moving in from the other two urban LA types falls below that of the stayers, as it also does for those moving within rural England. In other words, once distance of move is accounted for, longer distance commuting is less likely among movers from all but the largest LAs than it is among rural stayers.

The most likely interpretation of this result is that the distance of move is indeed the key aspect of people’s recent migration affecting their journey-to-work behaviour. Irrespective of where they move from, the mere fact of making a long distance change of residence will put many of them at a considerable distance from their place of work. One way of rationalising this is that, in the majority of cases, people’s decision to move home is not made with the primary aim of moving closer to their workplace. Unfortunately, it is not possible to examine this question with census data, because the census provides no information about workplace location or commuting distance one year before. But if migration was primarily aimed at reducing distance to work, movers’ commuting distance would be expected to be less than that of non-movers. Accordingly, it is reasonable to assume that people are moving to rural areas for non-workplace-related reasons and end up further from their workplace than the average stayer. It may be that many longer distance commuters are in households with two earners working at very different locations. It may also be that, sometime after their move, they may decide to change their workplace to one that is closer to their new home. These are hypotheses that cannot be tested with the data available from the census.

This still leaves the challenge of trying to unpack the interaction between distance of move and type of place moved from. Certainly, it is likely that people moving from urban LAs into rural England will have moved further on average than those moving between one rural area and another. Most notably, those moving from major urban LAs are likely to have moved further than those from the other two types of urban LAs, because the former are much larger in geographical extent and are less likely to be surrounded by rural LAs than are smaller urban areas. It is worth recalling here that these analyses have taken into account location within the region around

1
2
3 London and that this did prove to have a significant role in the modelling. One way
4 forward might have been to produce a more detailed classification of movers using
5 both distance of move and type of previous LA, but this would lead to a marked
6 increase in the number of categories used in the modelling, presenting sample-size
7 problems given that movers (as defined for this study) make up less than 5% of the
8 population.
9
10
11
12
13
14
15
16
17
18
19

20 **DISCUSSION AND CONCLUDING COMMENTS**

21
22
23
24 This paper has sought to extend our knowledge of commuting behaviour in rural
25 England by focusing explicitly on the behaviour of recent newcomers to settlements,
26 while controlling for a range of other factors that previous studies identified as
27 influences on the distance between people's homes and workplaces. The empirical
28 analyses have centred on two principal questions. The first asked whether people who
29 had moved 5km or more into a rural settlement in the pre-census year were more
30 likely than their longer established neighbours to commute at least 20kms to their
31 main place of work. The second question asked whether the likelihood of longer
32 distance commuting varied with the movers' distance of move and/or the type of area
33 they had moved from.
34
35
36
37
38
39
40
41
42
43
44
45
46
47

48 As was found by BOYLE *et al.* (2001) and FINDLAY *et al.* (2001) with
49 earlier data, our 2001-based analysis found that recent migrants are more likely to
50 commute 20km or further than are longer term rural residents. This positive impact of
51 recent migration on commuting distance persists after compositional differences
52 between movers and stayers are accounted for. The analyses here extended previous
53 work by examining the type of rural area where people live, finding that longer
54
55
56
57
58
59
60

distance commuting is not strongly associated with settlement size, but that it is linked to the broader context in which the settlement is situated. FROST (2006) raised the expectation that very rural areas would be too remote for migrants to go there with the intention of commuting to jobs elsewhere, whilst the local people would still be ‘wedded to the land’ in a way that makes them likely to work locally. The evidence here is to the contrary, with rural England no longer including any broad type of area where very local working remains overwhelmingly the norm. Insofar as longer distance commuting is largely a response to the lack of suitable work, more remote areas are all the more likely to see longer distance commuting, both by recent migrants and by longer-term residents.

Turning to the study’s second question, which had not been tackled by any of the previous studies, the simple answer is that type of move does affect people’s odds of travelling 20km or more to work from their new rural location. In separate models, it was found that people moving 15-29 and 30-99km to their new address had a much greater propensity to be a longer distance commuter than any movers, as did people who had moved from a major urban area. If the distance of the move and type of LA moved from are taken into account at the same time, however, then the greater likelihood of migrants from large cities travelling at least 20kms to work is substantially reduced. In addition, once distance moved is controlled, rural in-migrants from settlements other than the major urban areas are actually *less* likely to be longer distance commuters than are stayers.

Migration distance itself proves to be more powerful predictor of commuting distance than the type of district that the migrant has come from, but the effect is not linear. The probability of longer distance commuting increases with the distance of the migration up to the 30-99km bracket, but then it declines. One plausible

1
2
3 interpretation centres on a proportion of migrants 'commuting back' to the same work
4 place as they had before their migration, at least for some period after the changed
5 home location.⁷ For those who have migrated a very long way, represented here by
6 the category 100km or more, commuting to a workplace close to their old home is
7 much less feasible. In other words, migrating over a long distance seems likely to be
8 associated with changing both workplace and home location more or less
9 simultaneously, a process that is likely to result in a home location relatively close to
10 the new workplace.
11
12
13
14
15
16
17
18
19
20
21

22 Of course, it is not possible with the census data, or in fact any cross sectional
23 data, to test the hypotheses which underlie an interpretation of the data such as that
24 just set out. It may be plausible, but is it correct? Part of the problem is the fact that
25 migrants are defined as persons who moved at some time between one day and 12
26 months prior to census day, giving a simple 'snapshot' of post-migration commuting
27 behaviour which may well have been in the midst of a process of adjustment. The
28 eventual adjustment may often be different to that originally envisaged, perhaps due
29 to new information gained about job opportunities near the new home, or more simply
30 as a reaction to the realities of longer distance commuting. Only longitudinal data
31 could satisfactorily document this adjustment process.
32
33
34
35
36
37
38
39
40
41
42
43
44
45

46 To assess how many in-movers commute back to the same workplace as they
47 had before their house move, it is essential to know where the mover worked prior to
48 their change of address. This information would also help determine whether
49 migration increased or decreased migrants' commuting trip length, and what
50 proportion of movers from urban to rural areas commute back to the *same urban area*
51 from their new rural residential locations. These are critical questions, so far as the
52 rural policy implications of migrants' commuting patterns are concerned, but they
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

could only be addressed with census data if the census were to ask about people’s work location 12 months previously in the same way as it asks about their home location then. Another key improvement to the census data would be to ask people how long they had lived at their current address.

Our findings hold important implications for the future of rural settlements, not least in terms of the issues raised in England’s Sustainable Communities policy setting framework (ODPM, 2003). Although the term sustainability is contested, increased longer distance commuting linked to rural in-migration seems sure to raise overall levels of carbon emission. At present, national policy does not set an objective of reducing average commuting trip lengths. Higher priority is placed on the unconstrained working of the labour market in seeking sustained economic growth. A fuller interpretation of sustainability would also include social and economic aspects. For example, commuters often link shopping, going to the doctor, and/or participating in cultural and leisure activities with their journey to work in a process known as ‘trip chaining’ (e.g. COOMBES and RAYBOULD, 2004), with the result that much of the income generated by commuters may leak from the local community. Commuting also affects family dynamics and the ways couples organize their everyday activities. The balancing of family roles is complicated when both members of a couple work, especially when younger children are involved (HOFFSMEISTER 2003). Our finding that Household Reference Persons are some 10% more likely to commute at least 20km than their spouses suggests that the latter are sticking closer to home. Changes in professional responsibilities, work hours, travel commitments, and/or job transfers can disrupt commuting arrangements of either spouse and may provoke marital discord and perhaps even instability. There is also speculation that commuting

1
2
3 contributes to lower civic participation since time spent in one's car is time spent out
4
5 of the community (PUTNAM 2000).
6
7

8 Some of these policy concerns are based on relatively limited evidence: in part
9 anecdotal, in part conjectural. This is not to say that they are not serious. The problem
10 is that the evidence is not yet available to assess whether they are well founded. To
11
12 this extent, the lack of a systematic policy response to increasing commuting trip
13
14 lengths is justified, because the evidence is not yet in place to firmly establish how
15
16 this behaviour links with other parts of a household's location and travel strategies
17
18 and assess how it affects the wider community. If the goal is to produce evidence-
19
20 based policy related to commuting, then much improved data collection is needed.
21
22 First and foremost, the need is for longitudinal data linking commuting, employment
23
24 and migration and for information on how household members dove-tail and adjust
25
26 their residential location and travel patterns. In addition, much more needs to be
27
28 known about commuters' time budgets, and how longer distance commuting affects
29
30 the roles individuals play in their households. Since commuting may also affect the
31
32 local economy, civic participation, and support of local organizations and institutions,
33
34 research on contextual effects operating at the settlement scale is also needed
35
36 (HANSON and PRATT, 1988). For smaller rural settlements especially, it seems
37
38 likely that if many residents are away for long periods there will be a substantial
39
40 negative impact on the chances of developing community support activities and
41
42 identity.
43
44
45
46
47
48
49
50
51
52

53 At the same time, there is some scope for further work using 2001 Census
54
55 CAMS data. Firstly, given that the descriptive analyses above are England-wide and
56
57 the modelling includes only one broad regional variable (south-eastern England
58
59 versus the rest), further insights into variations in commuting behaviour may be
60

achieved by a fuller breakdown by region. Secondly, the modelling could be extended to include the further two-thirds of England’s residents that live in urban areas, allowing direct comparison of commuting behaviour between the two types of areas. Thirdly, the dependent variable could be broadened out from the simple binary of longer distance commuting or not, by either modelling the banded distributions shown in Figure 2 or by modelling the unbanded commuting distance variable that is also available in the CAMS dataset. Additionally, and most importantly in terms of our primary focus on the migration factor in this study, it is possible to develop a more sophisticated measure of migrant status: this could combine measures of distance of move with the types of LA that people were living in both before and after their move. Even so, the absence of information on pre-move commuting, and on migrants’ possible adjustments to their commuting behaviour with sometime after their move, remain severe restrictions which can be overcome only with alternative data sources.

In sum, given the current state of knowledge on the interplay of urban-rural migration and longer distance commuting, it is not possible to determine the costs and benefits of in-migration to rural communities. Most rural areas are pleased to attract new residents in the hope that they can breathe new vitality into social and economic institutions and community life. However, it is important to take a balanced view of the pros and cons associated with this aspect of population redistribution. Our research demonstrates that many urban to rural migrants travel long distances to work, and this is likely to result in the leakage of time and resources from the community. Working age in-movers who commute long distances spend a significant time away from home, and it is likely that their community participation and local spending is diminished as well. The factors underlying longer-distance commuting patterns, and

their positive and negative impacts, are increasingly important issues for future research and policy.

Acknowledgements – These results were presented at the 2007 meeting of the Population Association of America in New York. David Brown's contribution to this research is part of USDA multi-state research project W-1001: Rural Population Change. The support of the Office for National Statistics, CCSR and ESRC/JISC Census of Population Programme is gratefully acknowledged. Simon Raybould produced the map (Figure 1). We thank Anne Green and Petra Vergunst for their helpful comments on an earlier draft of the paper, and are also grateful for the anonymous comments of three referees. The authors alone are responsible for the interpretation of the data. Census output is Crown copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland.

NOTES

1. The CAMS are anonymised with no direct identifiers such as name or address. The lowest geography available is local authority district.
2. CAMS provides distance to workplace in both banded form (with prescribed distance intervals) and in unbanded form (to the nearest 0.1km of straight-line distance between residence and workplace postcodes). This study uses the banded version, as this provides all the detail needed for present purposes. As for commuting distance, migration distance also comes in both banded and unbanded form. Again, the banded form is used, with the categories 5-14km, 15-29km, 30-

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

99km and 100km or more being chosen primarily by reference to sample size but also bearing in mind that the longer the distance of move, the more likely a change of workplace is involved.

3. The DEFRA classification of LAs is based principally on the proportion of people living in settlements with fewer than 10,000 residents or in urban areas of up to 30,000 people that DEFRA labels ‘larger market towns’. The Rural-80 LAs are those with at least 80% of their populations in these rural settlements, the Rural-50 have at least 50% but less than 80% in them, and the Significant Rural have at least 20% and/or more than 37,000 residents in them. The remainder of England is composed of Major Urban LAs (the best fit of LAs to urban areas with over 750,000 residents), Large Urban LAs (the best fit to areas with between 250,000 and 750,000 residents) and Other Urban LAs. On this basis, the three rural types combined account for just over a third (36%) of England’s total population.
4. The choice of 20km as the cut-off for longer distance commuting also strikes a compromise between the adoption of 30km by BOYLE *et al.* (2001) and the use of both 15km and 20km in analyses reported by FINDLAY *et al.* (1999), while GREEN and OWEN (2006) treat commutes of under 5km as short-distance. .
5. The population analysed is somewhat smaller than that examined in the descriptive statistics of the previous section, as it has to exclude people who had no fixed workplace and those recorded as working outside the UK (for both of whom no commuting distance is available) as well as movers who were

previously living outside England (for whom it is impossible to classify by their pre-move LA type).

6. A similar pattern had in fact been found to exist over 50 years ago in Rhode Island by GOLDSTEIN and MAYER (1964).

7. With longitudinal data it would be possible to find out if longer distance commuting persists for extended periods after persons move into rural areas.

REFERENCES

BEALE C. (1975) *The Revival of Population Growth in Non-metropolitan America*.

Economic Research Service, U.S. Department of Agriculture, ERS 605.

BOYLE P. (1995) Public housing as a barrier to long-distance migration,

International Journal of Population Geography **1**, 147-164.

BOYLE P., CASSIDY S., DUKE-WILLIAMS O., REES P., STOKES G. and

TURNER A. (2001) *Commuting Patterns in Rural Areas*. Countryside Agency, London.

BROWN D.L. (2002) Migration and community: social networks in a multilevel

world, *Rural Sociology* **67** (1), 1-23.

BROWN D.L. and WARDWELL J.M. (1981)(Eds) *New Directions in Urban-Rural*

Migration: The Population Turnaround in Rural America. Academic Press, New York.

- CAMERON G. and MUELLBAUER J. (1998) The housing market and regional commuting and migration choices, *Scottish Journal of Political Economy* **45**, 420-446
- CHAMPION A.G. (1989)(Ed) *Counterurbanization: The Changing Pace and Nature of Population Deconcentration*. Edward Arnold, London.
- CHAMPION T. (2003) Testing the differential urbanization model in Great Britain, 1901-1991, *Tijdschrift voor Economische en Sociale Geografie* **94** (1), 11-22.
- CHAMPION T., FOTHERINGHAM S., REES P., BOYLE P. AND STILLWELL J. (1998) *The Determinants of Migration Flows in England: A Review of Existing Data and Evidence*. Report for the Department of the Environment. Department of Geography, University of Newcastle upon Tyne.
- COOMBES M. and RAYBOULD S. (2002) Commuting in England and Wales: people and places factors, in Pitfield D. (Ed) *Transport Planning, Logistics and Spatial Mismatch*. Pion, London.
- COOMBES M. and RAYBOULD S. (2004) Planning a network of sites for the delivery of a new public service, in STILLWELL J. and CLARKE G. (Eds) *Applied GIS and Spatial Analysis*. Wiley, Chichester.
- COUNTRYSIDE AGENCY, DEFRA, ODPM, ONS and WELSH ASSEMBLY GOVERNMENT (2004) *Rural and Urban Area Classification 2004: An Introductory Guide*. Office for National Statistics, London.
- www.statistics.gov.uk/geography/nrudp.asp
- ELIASSON K., LINDGREN U. and WESTERLUND O. (2003) Geographical labour mobility: migration or commuting, *Regional Studies* **37**, 827-837.
- FINDLAY A.M., SHORT D. and STOCKDALE A. (1999) *Migration Impacts in Rural England*. Countryside Agency, London.

- 1
2
3 FINDLAY A.M., STOCKDALE A., FINDLAY A. and SHORT D. (2001) Mobility
4
5 as a driver of change in rural Britain: an analysis of the links between migration,
6
7 commuting and travel to shop patterns, *International Journal of Population*
8
9 *Geography* **7** (1), 1-16.
- 10
11
12 FROST M. (2006) *The structure of commuting flows in Rural England and Wales: An*
13
14 *initial report*. Unpublished paper. Rural Evidence Research Unit, Birkbeck
15
16 University of London.
- 17
18
19 GOLDSTEIN S. and MAYER K. (1964) Migration and the journey to work, *Social*
20
21 *Forces* **42**, 472-481.
- 22
23
24 GREEN A. (1997) A question of compromise? Case study evidence on the location
25
26 and mobility strategies of dual career households, *Regional Studies* **31** (7), 641-
27
28 657.
- 29
30
31 GREEN A. (1999a) Employment opportunities and constraints facing in-migrants to
32
33 rural areas in England, *Geography* **84** (1), 34-44.
- 34
35
36 GREEN A. (1999b) Longer distance commuting as a substitute for migration in
37
38 Britain: a review of trends, issues and implications, *International Journal of*
39
40 *Population Geography* **5** (1), 49-67.
- 41
42
43 GREEN A. and OWEN D. (2006) *The Geography of Poor Skills and Access to Work*.
44
45 Policy Press, Bristol.
- 46
47
48 GREEN G. (2001) *Kenosha County Commuter Survey*. Report to Kenosha County
49
50 Economic Development Corporation. University of Wisconsin Extension,
51
52 Madison.
- 53
54
55 HANSON S. and PRATT G. (1988) Reconceptualising the links between home and
56
57 work in urban geography, *Economic Geography* **64**, 299-321.
- 58
59
60

- HOFFMEISTER H. (2002) *Couple's Commutes to Work Considering Workplace, Household and Neighborhood Context*. PhD dissertation, Cornell University.
- JOHNSON K.M., NUCCI A. and LONG L. (2005) Population trends in nonmetropolitan America: The rural rebound and beyond, *Population Research and Policy Review* **24**, 527-542.
- KONTULY T. (1998) Contrasting the counterurbanization experience in European nations, in BOYLE P. and HALFACREE K. (Eds) *Migration into Rural Areas*. Wiley, Chichester.
- PUTNAM R. (2000) *Bowling Alone*. Simon Shuster, New York.
- LONG L.H. (1988) *Migration and Residential Mobility in the United States*. Russell Sage Foundation, New York.
- MOKHTARIAN P.L. and SALOMON I. (1997) Modelling the desire to telecommute: the importance of attitudinal factors in behavioural models, *Transportation Research A: Policy and Practice* **31**, 35-50.
- OFFICE OF THE DEPUTY PRIME MINISTER (2003) *Sustainable Communities: Building for the Future*. ODPM, London.
- ROMANI J., SURINACH J. and ARTIS M. (2003) Are commuting and residential mobility decisions simultaneous? The case of Catalonia, Spain, *Regional Studies* **37**, 813-826.
- ROSEMAN C.C. (1971) Migration, the journey to work, and household characteristics: an analysis based on non-areal aggregation, *Economic Geography* **47**, 467-474.
- ROUNWENDAL J. and MEIJER E. (2001) Preferences for housing, jobs and commuting: a mixed logit analysis, *Journal of Regional Science* **41**, 475-505.

- 1
2
3 RURAL EVIDENCE RESEARCH CENTRE (2005) *DEFRA Classification of Local*
4
5 *Authority Districts and Unitary Authorities in England: An Introductory Guide.*
6
7 Department for Environment, Food and Rural Affairs, London.
8
9
10 www.defra.gov.uk/rural/ruralstats/rural-definition.htm
11
12
13 SCHINDEGGER F. and KRAJASITS C. (1997) Commuting and its importance for
14
15 rural analysis, BOLLMAN R. and BRYDEN J. (Eds) *Rural Employment: An*
16
17 *International Perspective*. CAB International, Wallingford.
18
19
20 TIGGES L. and FUGUITT G.V. (2003) Commuting: a good job nearby? in BROWN
21
22 D.L. and SWANSON L. (Eds) *Challenges for Rural America in the 21st Century*.
23
24 Penn State University Press, University Park.
25
26
27 ZAX J.S. (1994) When is a move a migration?, *Regional Science and Urban*
28
29 *Economics* **24**, 341-360.
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Figure 1. A classification of England’s local authority areas based on rurality
Source: after RURAL EVIDENCE RESEARCH CENTRE (2005); see endnote 3 for details of the classification scheme

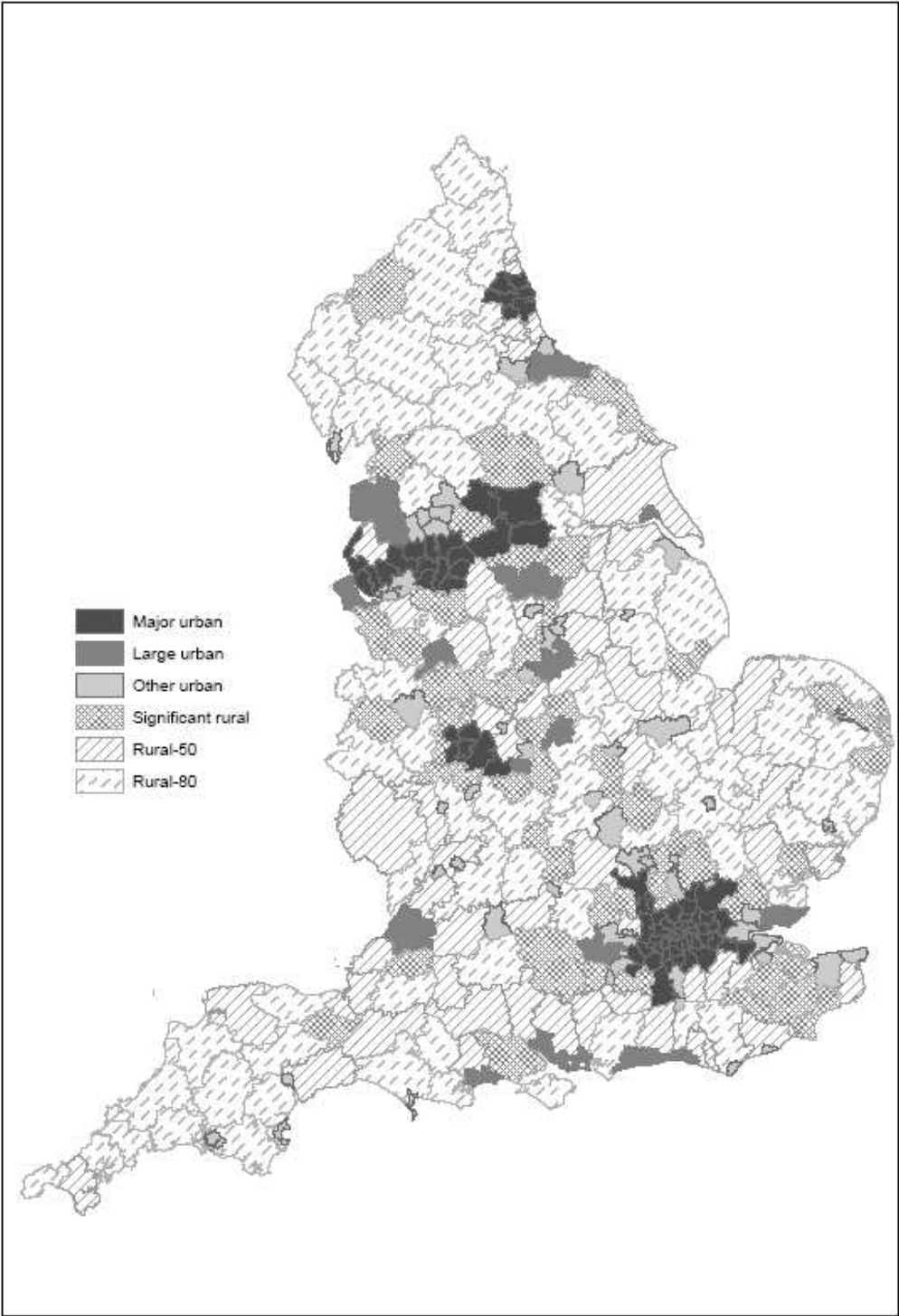


Table 1. Variables shown in previous research to be associated with distance to workplace

Characteristic	Expected relationship with commuting distance
Age group	Longer commuting journeys in middle working age
Gender	Men more likely than women to commute longer distances
Relationship to Household Reference Person	HRP more likely to commute longer distances than other household members
Number of earners in household	Member of single-earner household likely to commute further than the average of all members of a multi-earner household
Female HRP with dependent child	Female HRP with dependent child not likely to commute as far as others, due to child minding commitments
Car availability	People without access to cars more likely to commute shorter distances, due to reliance on walking, cycling and public transport
Employment type	Full-time employees more likely to commute further than the full-time self-employed and part-timers
Occupation	Longer commuting distances for higher-level non-manual occupations
Industry of employment	Shorter commuting journeys in the primary sector
Educational attainment	Longer commuting journeys for people with at least a first degree
Regional location	Longer commuting journeys in south-eastern England, due to the effect of London
Local Authority (LA) type	Longer commuting journeys for those living in more rural areas, due to greater sparsity of jobs there
Settlement size	Longer commuting journeys for those living in smaller settlements, due to the concentration of jobs in larger urban areas
LA employment rate	Longer commuting journeys for those living in areas where a higher proportion of working-age people are in employment, due to greater demand for jobs locally

Source: after Green and Owen (2006), with amendments and additions

Figure 2: Distance to work, England, and rural England by type of local authority area and size of settlement

Note: 'Other' refers predominantly to 'no fixed workplace' but also includes 'working outside the UK'.
Source: 2001 Census, Individual CAMS © Crown copyright.

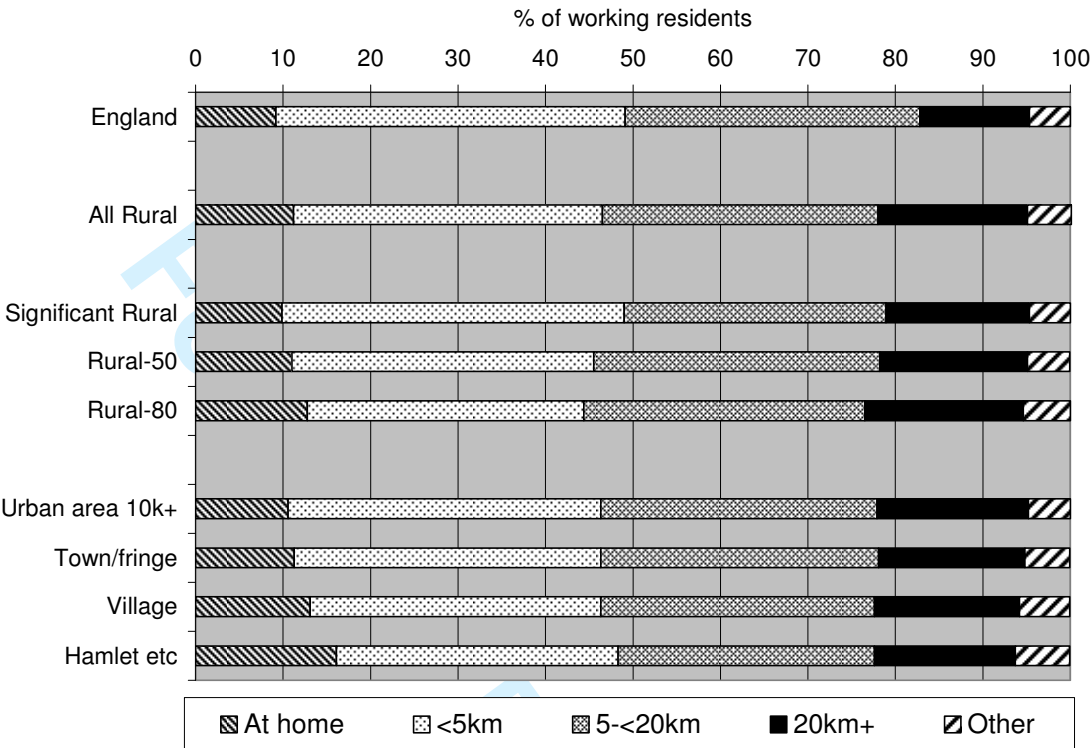


Figure 3: Proportion of stayers and movers commuting at least 20km, England, and rural England by type of local authority area and size of settlement

Source: 2001 Census, Individual CAMS © Crown copyright.

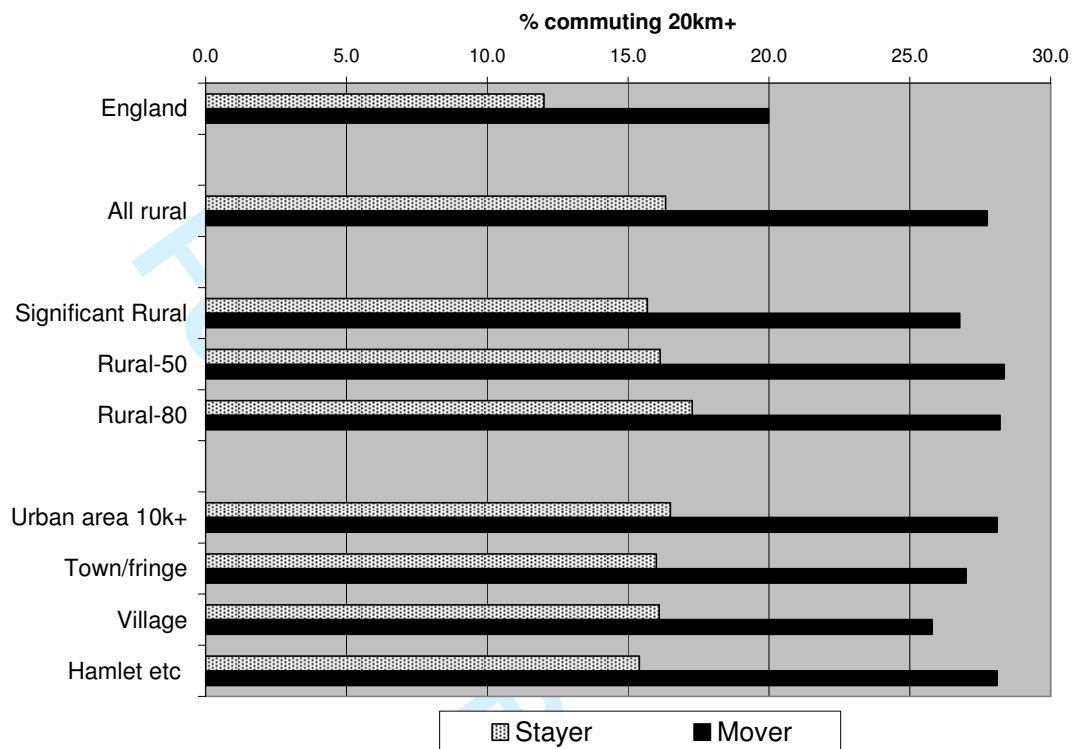


Table 2: Modelling of the propensity of rural England's residents to commute 20km or more, with binary migrant status variable

Characteristic	Model 1	Model 2	Model 3	Model 4
Constant	0.208***	0.741***	0.544***	0.540***
Migrant status				
<i>Stayer</i>				
Mover (moved 5km+)	2.051***	1.606***	1.640***	1.614***
Labour market				
<i>Full-time employee</i>				
Full-time self-employed		0.318***	0.268***	0.269***
Part-time employed & self-employed		0.299***	0.384***	0.384***
<i>Higher professional/managerial</i>				
Lower professional/managerial		0.647***	0.722***	0.728***
Intermediate occupation		0.483***	0.595***	0.600***
Low skill occupation		0.298***	0.349***	0.358***
<i>Working in non-primary sectors</i>				
Primary sector		0.770***	0.692***	0.697***
<i>With a first degree or equivalent</i>				
Does not have first degree or equiv		0.694***	0.699***	0.695***
Demographic & household				
<i>Aged 30-44</i>				
16-29			0.871***	0.871***
45-59			0.815***	0.813***
60-74			0.671***	0.661***
<i>Male</i>				
Female			0.635***	0.633***
<i>Household Reference Person (HRP)</i>				
Spouse or partner of HRP			0.892***	0.892***
Child of HRP			0.782***	0.783***
Other relation of HRP or unrelated			0.729***	0.721***
<i>1 earner in household</i>				
2 earners in household			0.883***	0.888***
3+ earners in household			0.737***	0.739***
<i>Not female HRP with dep't child</i>				
Female HRP with dependent child			0.791***	0.795***
<i>No car available to household</i>				
1 car available to household			1.513***	1.481***
2 cars available to household			2.257***	2.169***
Geographical context				
<i>Living in south-eastern England</i>				
Not in south-eastern England				0.733***
<i>Living in urban area with 10K+ inhabs</i>				
Town/fringe				1.004
Village				0.970
Hamlet & isolated dwelling				0.964
<i>Living in Rural-80 LA (most rural)</i>				
Rural-50 LA				0.892***
Significantly Rural LA (least rural)				0.802***
<i>Employment rate of LA (continuous variable)</i>				1.004**
Nagelkerke R Square	0.009	0.130	0.154	0.160
-2 log likelihood	228541	209636	205809	204779

Notes: N= 244,079 working people living in households in Rural LAs at the 2001 Census who had a workplace address and were living at a known address in England one year ago. Table shows the odds of commuting 20km or more compared to the reference case (odds=1.000) for each variable (shown in italics). South-eastern England comprises London, South East, and East of England Government Office Regions. Significance levels: *** 0.001, ** 0.01, * 0.05.

Source: 2001 Census, Individual CAMS © Crown copyright.

Table 3: Modelling of the propensity of rural England's residents to commute 20km or more, with alternative migrant status variables

Characteristic	Model 5	Model 6	Model 7
Constant	0.553***	0.533***	0.557***
Migrant status			
<i>Stayer</i>			
Moved 5-14km	0.934		1.053
Moved 15-29km	2.399***		2.667***
Moved 30-99km	2.686***		2.850***
Moved 100km and over	1.498***		1.619***
<i>Stayer</i>			
Moved from Major Urban LA		2.354***	1.170**
Moved from Large Urban LA		1.411***	0.782***
Moved from Other Urban LA		1.421***	0.806***
Moved from Rural LA		1.123***	0.873***
Labour market			
<i>Full-time employee</i>			
Full-time self-employed	0.268***	0.268***	0.268***
Part-time employed & self-employed	0.384***	0.382***	0.384***
<i>Higher professional/managerial</i>			
Lower professional/managerial	0.729***	0.728***	0.730***
Intermediate occupation	0.601***	0.600***	0.602***
Low skill occupation	0.359***	0.358***	0.360***
<i>Working in non-primary sectors</i>			
Primary sector	0.695***	0.699***	0.695***
<i>With a first degree or equivalent</i>			
Does not have first degree or equiv	0.699***	0.695***	0.699***
Demographic & household			
<i>Aged 30-44</i>			
16-29	0.871***	0.882***	0.883***
45-59	0.813***	0.811***	0.809***
60-74	0.659***	0.658***	0.656***
<i>Male</i>			
Female	0.631***	0.633***	0.631***
<i>Household Reference Person (HRP)</i>			
Spouse or partner of HRP	0.893***	0.894***	0.892***
Child of HRP	0.781***	0.774***	0.771***
Other relation of HRP or unrelated	0.721***	0.724***	0.725***
<i>1 earner in household</i>			
2 earners in household	0.887***	0.883***	0.887***
3+ earners in household	0.739***	0.734***	0.737***
<i>Not female HRP with dep't child</i>			
Female HRP with dependent child	0.801***	0.794***	0.801***
<i>No car available to household</i>			
1 car available to household	1.484***	1.493***	1.478***
2 cars available to household	2.180***	2.195***	2.169***
Geographical context			
<i>Living in south-eastern England</i>			
Not in south-eastern England	0.736***	0.734***	0.737***
<i>Living in urban area with 10K+ people</i>			
Town/fringe	1.005	1.005	1.004
Village	0.971	0.971	0.971
Hamlet & isolated dwelling	0.966	0.966	0.965
<i>Living in Rural-80 LA (most rural)</i>			
Rural-50 LA	0.891***	0.888***	0.891***
Significant Rural LA	0.802***	0.794***	0.801***
<i>Employment rate of LA (continuous variable)</i>	1.004**	1.004***	1.004**
Nagelkerke R Square	0.163	0.160	0.164
-2 log likelihood	204270	204860	204200

Notes: as for Table 2.

Source: 2001 Census, Individual CAMS © Crown copyright.