Examining the Migration-Commuting Nexus: Migration and Commuting in Rural England, A Longitudinal Analysis

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Introduction & Background

Net urban to rural migration has been a main source of counter-urbanization, e.g., a higher rate of population growth in rural vs. urban areas, in England since at least 1980 (Champion 2003). Even though counter-urbanization ceased between 2001 and 2011, the net direction of internal migration still favored rural areas (Champion 2013). Accordingly, urban to rural migration has the potential of placing a large number of employed migrants at a far distance from their workplace unless they change the location of work subsequent to migrating.

Migration and commuting are the two main forms of internal population mobility within nation states. Migration is a permanent or semi-permanent change of residence of sufficient duration and distance to interrupt everyday activity patterns. Commuting, in contrast, is a form of population circulation that typically involves a daily journey between a permanent residence and a fixed workplace (Green 2004). [1] Migration and commuting are both fairly common behaviors in England and Wales. While the rate of internal migration has tended to fluctuate in response to the business cycle and other social and economic circumstances, on average, about one in ten people have changed residence annually during the last 35 years, indicating that change of residence is fairly common in England and Wales (Champion 2014). This is particularly true in comparison with other EU countries such as France or Germany where residential change is less common (International Organization for Migration 2013:

[1] Commuting is typically involves a daily journey to work, but can also involve longer duration, albeit temporary trips between permanent residence and a fixed workplace.

Clark and Drever 2000). Similarly, while working at home has increased recently (to about 10% in England), the vast majority of workers in England and Wales commute to their jobs (ONS 2014).

Internal migration and commuting are often examined separately with the implicit assumption that they are independent forms of geographic mobility. However, some researchers see these two spatial processes as interrelated, and have identified the so called "migration-commuting nexus" (Sandow and Westin 2010). A main question motivating research on this nexus concerns the extent to which migration can be a substitute for commuting, or vice versa. For example, Sandow and Westin (2010) contend that longer distance commuting has replaced internal migration in Sweden. They believe that longer distance commuting is more prevalent now than in the past because of enhanced transportation and communication infrastructure, housing restrictions in urban areas, and residential preferences for lower density areas. The difficulties which dual worker families often encounter in finding an optimal residential location for both workers is also thought to make longer distance commuting, at least by one spouse, more acceptable. Research supports this general conclusion. For example, Green (1999) found that some families engage in long distance weekly commuting in lieu of migrating even though such arrangements were shown to place the "stay at home spouse" at an economic and social disadvantage.

Understanding how migration and commuting might substitute for each other is an important research question, but this paper's focus is somewhat different. Rather than considering the substitutability of these two forms of internal population movement, this research examinines the commuting behavior of workers who have recently moved to or within rural areas in England. This is an important question because the drivers of moves from the city to the countryside are generally considered to be consumption- related, e.g., motivated by amenities and perceived community attributes associated with quality of life, rather than by employment-related concerns. As Champion

(2001:45) has observed, urban-rural migration has persisted in Britain because of the British people's "love affair with the countryside" which he contends has been reinforced by planning policies of urban containment. Hence, workers who move from the city to the countryside for amenity reasons might be expected to tolerate a long commute in return for a perceived enhancement of their quality of life. Similar to the short distance intra-city consumption-related moves researched by Green (2004), urban to rural migration is not necessarily accompanied by workplace moves, suggesting that many people who are employed both before and after migrating commute back to their urban jobs. This expectation is generally consistent with previous research, although as will be discussed below, such research has used cross sectional data, and hence is unable to directly examine whether urban-rural migrants retain or switch their workplaces subsequent to moving.[2] Trading off increased commuting time for perceived enhancements of quality of life is also consistent with the notion of "commuting time tolerance." In a study of Lisbon, Portugal, for example, Vale (2013) found that employees tended to retain their previous residences after their employers moved production facilities into intercity development zones.[3] Similarly, Romani and his colleagues (2003) showed that Catalonian workers who migrated to a new municipality were more likely to commute outside of their residence sub-region than workers who were residentially stable. They explain this by noting that persons who moved to the suburbs for consumption reasons typically commute back to central city jobs. In other words, urban to suburban migration resulted in longer commutes. The authors pointed out that this finding is at variance with the conventional theory of urban land use change proposed by Alonso (1964) that workers typically change their residence in order to minimize their journey to work.

The present authors agree that the persistence of longer distance commuting among persons who might otherwise be expected to reduce their journey to work through migration is an important

[2] Similarly, the present authors believe that migration between different rural places is not typically associated with a change of workplace.
[3] Although they might change the mode of transportation.

focus of research, but it is not the same as examining the commuting behavior of persons who have *already migrated*, especially workers who migrate from urban to rural areas? This latter question is the focus of this research.

Why Focus Specifically on Commuting Among Urban to Rural Migrants?

Rural-Urban Population Change and Migration: As indicated above, even though urban and rural areas of the UK grew by approximately the same rate between 2001 and 2011, the net direction of internal migration has continued to favor rural areas, albeit at a lower rate during 2007-2012 than between 2001 and 2007 (Champion 2013). Champion (2013) examined the components of population change experienced by urban and rural areas in England between 2001 and 2011, and showed that rural-urban equality in overall population growth rates during this time is a result of net internal migration *from* urban to rural destinations being offset by differentially higher natural increase and international migration rates in urban areas. Moreover, net urban to rural migration is especially pronounced during the prime working ages (30-44), and before age 16 (Champion 2014). These age groups include persons with the highest rates of labor force participation and their children. Similar to the overall net volume of urban-rural migration, however, these data show that the magnitude of the urban to rural flows among working age persons has diminished since 2007.

Commuting: Journey to work distance is rising in the UK and in most other more developed nations (ONS 2014; Frost 2006; U.S. Bureau of the Census 2009).[4] For example, analysis of the 2001 and 2011 UK censuses shows the average journey to work increasing from 13.4 km to 15 km over the decade (ONS 2014). Moreover, when these two behaviors, urban-rural migration and rural-urban commuting, are experienced by the same persons, the likely result is a higher degree of rural-urban interpenetration.

[4] Commuting distance in the UK is calculated as straight line distance between enumeration postcode and workplace postcode. This excludes persons who work from home, off shore workers, persons working outside of the UK, and workers with no fixed workplace (ONS 2014).

In other words, migrants who commute back to their urban jobs have their feet in both urban and rural worlds. One might argue that this contributes to greater integration of urban and rural communities in the rural-urban interface. On the other hand, longer rural-urban commutes, especially if undertaken in a private automobile, may have deleterious environmental and other consequences because of vehicle exhaust, roadway congestion, wasted time, etc.

Potential Impacts of Longer Distance Commuting of Rural Workers:

Employment: The continuing, albeit diminished, net movement of urban persons to rural areas, especially persons of working age, raises the question of economic and other impacts. As indicated above, we are particularly interested in whether in-migrants to rural areas join the rural workforce or maintain their urban jobs and commute back. A number of studies have examined the employment impacts of urban to rural migration in various parts of the UK. For example, Findlay and his colleagues (2000) conducted a survey of 689 households in six study areas selected from across rural Scotland and reported that in-migrants tend to work locally. Their analysis was particularly focused on self-employment because the 1991 census indicated that many migrants to rural Scotland were self-employed persons. Findlay's survey found that one in five in-migrants to rural Scotland was self-employed, and that migrants 'make rather than take jobs.' Many migrants either relocated existing businesses or started new ones, and most employed other persons. Overall, they reported that each self-employed in-migrant generated 1.6 additional jobs. They also reviewed data from the 1991 UK Census on journey to work and showed that almost half of migrant household heads in rural Scotland worked locally (within 20 km); a further 39.3% lived in the countryside but were not in active employment; leaving just over 11% of migrants as long-distance commuters (20 km or more).

In another study, Findlay and colleagues (2001) reached somewhat different conclusions. They examined the association between migration, commuting and shopping patterns in England and

Scotland. Their assessment of the employment impacts in-migration are less positive compared with the study reviewed above. Examining data from two large surveys, one in England and one in Scotland, they reported that a half or more of in-movers commute outside of their residential community to work. Moreover, retail leakage is an indirect effect of in-migration since many commuters shop outside of their residential community during the journey to work. These two studies show that the employment and more general impacts of rural in-migration are far from clear. The extent to which in-migrants work locally or commute to distant jobs is not clear, nor is it known how this might change over time as migrants settle into their new communities.

Geographic Mobility and Changing Settlement Structure: Both migration and commuting contribute to what Castells (2000) has characterized as a 'world of flows' that is characterized by a heightened movement of labor, population, information, capital, ideas and objects. Spatially-oriented social scientists refer to this perspective as the 'mobilities paradigm.' Urry (2007) coined this term to call attention to the increased levels of mobility, and new forms of mobility, that structure today's increasingly interdependent world. The mobilities paradigm includes 'movements of people, objects, capital, and information across the world, as well as more local processes of daily transportation, movement through public and private spaces, and the travel of material things in everyday life' (Urry 2007:6). The mobilities paradigm 'connects the analysis of different forms of travel, transport, and communication with the multiple ways in which economic and social life is performed and organized through time and various spaces.' (Urry 2007:6)[5]

Commuting and migration are important in their own right, but they also contribute to integrating a nation's settlement structure, and in particular rural and urban spaces. As Lichter and Brown (2011) noted, the growing interpenetration of urban and rural life involves a diverse set of

[5] It should be noted that several researchers have determined that the rate of internal migration has declined significantly since around 1990 in more developed nations. (see Molloy et al. 2013 for a review)

cultural, economic, social, political and environmental transactions, but none is more visible than the movement of population and workers within the urban-rural interface. This research uses rural-urban migration and longer distance commuting as a window to examine particular aspects of social and economic organization of the space linking urban and rural, e.g., the urban-rural interface. The argument presented here is that by examining migration and commuting that either originates in or is destined for an urban area, we can understand one aspect of how cities interact with their surrounding peripheries. Hence, it is argued that examining migration and commuting is an inductive approach toward understanding the structure of urban regions because the rural-urban interface is at least partly defined by the migration and commuting that takes place within it.

There is a long tradition in urban and regional studies of seeing urban-rural migration as a *decentralizing* force, but the social and economic results of such decentralization are diminished to the extent that urban- rural migrants commute back to city jobs. Hence, rather than polarizing the rural and urban parts of a nation's settlement structure, the net effect of internal migration and commuting may actually heighten socio-demographic and economic integration between rural and urban spaces. The association between recent migration and commuting behavior with a particular focus on urban to rural flows is examined in the present research. The analysis sheds light on how urban-rural migration and commuting produce and reproduce one aspect of the urban-rural interface. This perspective is consistent with Shucksmith's (2014:4) observation that 'Place is understood as a social construct, continually co-produced and contested, and connected to other places through relational reach rather than by mere proximity.'

Moving the Migration and Commuting Agenda Forward With Longitudinal Analysis

<u>Previous research on the nexus of internal migration and commuting:</u>

While research demonstrates that rural workers commute farther than their urban counterparts (Champion 2009; Boyle et al. 2001; Frost 2006; Coombes and Raybould 2002 and Green and Owen 2006), and that urban-rural migrants commute farther than established rural residents (Green 1999; Schindegger and Krajasits' 1997; Findlay et al., 2001; Boyle et al., 2001; Champion, Coombes and Brown 2009), the interrelationship between urban to rural migration and commuting is not well understood. We have been able to identify only a few studies that examine the commuting behavior of recent rural in-migrants in the UK, and we are not aware of similar studies conducted elsewhere. Each of these studies uses cross sectional data. We know of no longitudinal studies of changes in residence and subsequent changes (or lack thereof) of place of work.

Green (1999) conducted interviews with members of in-migrant households in the rural East-Midlands and concluded that in-migrants who plan to maintain their previous occupational level must be prepared for longer distance commutes. Otherwise, they must expect to "trade down" to the lower skill jobs available locally. This finding is consistent with Schindegger and Krajasits' (1997) observation that a relatively high prevalence of long distance commuting among rural residents is associated with a lack of job opportunities sufficient to fully utilize the resident workforce. Findlay et al., (2001) conducted a survey on commuting behavior of in-migrants, local movers, and longer term residents of five areas of rural England. They reported that 45 pct. of in-migrants travelled at least 15 km to work compared with 28 pct. of longer term residents of the areas. Boyle et al., (2001) used micro data from the 1991 UK Census to conduct a nationwide study of migration (changing residence during the previous 12 months) and longer distance commuting (30 km or more). They found that being a recent in-migrant significantly increased the likelihood of travelling 30 km or more to work. Longer distance commuting characterized in-migrants to both urban and rural areas in comparison with longer term residents of such areas.

The most recent study of the interaction of internal migration and commuting was conducted on rural England by Champion, Coombes and Brown (2009). In addition to re-examining whether migrants were more likely than non-migrants to be longer distance commuters, they also extended previous research by asking whether longer distance commuting varied in response to distance migrated and/or type of origin area left behind by migrants. Not surprisingly given previous research, they reported that *recent* rural in-migrants commute farther than established rural residents ('stayers'). Using the Controlled Access Microdata Sample (CAMS) of the 2001 Census of England, Champion and his colleagues found that workers who had moved 5 km or more into a rural settlement in the pre-census year are about twice as likely to commute 20 km or farther to their work place compared with non-migrants. This positive impact of recent migration persists after migrant/non-migrant differences in employment characteristics, demographic and household attributes and geographical context are controlled.

Champion and his colleagues (2009) also found that, compared with rural stayers, migrants who had moved 15-99 km were over twice as likely to be longer distance commuters after their change of home address, but the positive effect of migration distance on commuting distance diminished for rural in-migrants who moved 100 km or more. In other words, there appears to be a threshold after which some recent in-migrants may begin to obtain jobs in their new rural communities. In addition, the authors found that people who moved to rural areas from major urban areas were more likely to be longer distance commuters than in-movers from smaller urban areas. However, the effect of size of origin community diminishes substantially when distance moved and size of origin community are entered in the same model. In fact, except for persons who moved to rural areas from the largest cities, all other in-movers, regardless of size of community of origin, are less likely than stayers to be longer distance commuters. In contrast, distance moved continues to have a strong positive impact on the likelihood of being a longer distance commuter, although as indicated earlier, the strength of the impact

diminishes at 100 km. Hence, this study provides convincing evidence that many recent rural in-migrants are also longer distance commuters. As suggested earlier, they might be considered to be 'marginal people' (Park 1969), with a foot in both urban and rural worlds. Or, considered in a more positive light, they may be rural-urban integrators; persons who split their daily activities between urban and rural places.

A Longitudinal Approach:

While Champion, Coombes and Brown (2009) advanced knowledge about the interaction of internal migration and commuting, their study had a number of shortcomings that could be addressed by examining longitudinal data that include information on place of residence and place of work at several points in time. First of all, the UK Census' definition of migration as being a change of usual residence occurring at some time between one day and 12 months prior to the census is problematic. How many of these moves actually stick or are quickly reversed? Is it reasonable to expect that such recent in-movers would be able to adjust their place of work in such a short time? And, among persons who become long distance commuters subsequent to an urban to rural move, how many make a subsequent change of either work place or home address that increases or decreases their commuting distance?

The act of changing one's workplace subsequent to moving is an inherently time varying phenomenon which can only be satisfactorily examined with longitudinal data.[6] Champion and colleagues were simply able to correlate whether working age respondents to the 2001 UK Census who moved from an urban to a rural area sometime within the year prior to the census, and who work at

[6] Having longitudinal data is the gold standard for examining time varying phenomena such as migration and changing job location, but Champion et al could have gained some empirical evidence about the coincidence of urban-rural migration and workplace change if the UK Census had provided *place of work one year ago*. But the Census didn't do that, so it was not possible for them to tell whether people changed workplace at the same time as moving home.

least 5 km from their homes, also commute a relatively long distance to their jobs. In other words, it is not possible with this or any cross sectional data to examine whether rural in-movers retain their urban jobs, or change their workplace to be closer to their new residence. It may be plausible to interpret the cross sectional findings as showing that long distance rural in-movers are likely to retain their urban jobs, but is it correct? Developing longitudinal research on migration-commuting interaction will provide a theoretically-shaped and evidence-based framework for understanding the roles of migration and commuting in producing the evolving structure of regions, and a more solid basis for forming regional development policies in the future.

Research Questions:

As indicated earlier, in England net internal migration has been from urban to rural since at least the 1980s, and this has placed many migrants far from their jobs. Accordingly, this paper examines the commuting behavior of recent in-migrants to rural areas. The following interrelated questions are investigated:

1. Do rural workers who move from urban to rural areas, or among places within rural regions, commute farther than rural workers who are stayers?
    a. If so, can this association between migration and commuting distance be explained away by controlling for other attributes of rural workers that are associated with commuting distance?
2. Are rural workers who move from urban to rural areas, or among places within rural regions, more likely to change [increase or decrease] their commuting distance subsequent to moving compared with rural workers who are stayers?

a. If so, is retaining or changing one's commuting distance subsequent to moving associated with one's commuting distance prior to moving?

b. What attributes of workers, other than initial commuting distance, are associated with the likelihood of increasing or decreasing one's commuting distance?

3. Do workers residing in rural areas who change their commuting distance type do so by changing workplace, residence, or both?

Little research to date has directly examined these questions. This paper seeks to fill this gap by analyzing a longitudinal data file that includes annual information on place of residence and place of work in England from 2002 through 2006.

Data and Analytical Strategy:

The ASHE Data Set: Its Advantages and Limitations: As indicated above, longitudinal research on the migration-commuting nexus between urban and rural areas can advance our knowledge of geographic mobility in ways that are not possible using comparative cross sectional analysis like that from censuses. Hence, advancing this research agenda requires a longitudinal data set. Fortunately, such a data set exists: the *Annual Survey of Hours and Earnings* (ASHE) produced by the Office for National Statistics (ONS) and available from the UK Data Service (2013).[7] ASHE is a one per cent random sample drawn from National Insurance records and has been running since 2002 on its current basis which includes geographical details of employee's home address as well as work place. Survey forms are sent to workers' respective employers to complete rather than to employees themselves, which results in more complete and accurate data than would otherwise be true. ASHE contains information for each individual relating to wages, hours of work, pension arrangements, occupation and industrial

[7] There are other longitudinal data sets like the British Household Panel Study (now called 'Understanding Society)' which do have the right variables but much smaller sample and a tendency to lose migrants through attrition.

classifications, date of first employment by the current employer, sex and date of birth. Hence, it is possible to develop a time varying panel data set for a one percent sample of Great Britain's employees that permits one to determine if a worker changed residence during any particular year, and then to cross classify residential mobility with changes of work place in that year or in any succeeding year. Moreover, since ASHE provides the full postcode of work and residence, location can be recoded to a variety of geographies including rural-urban location and size of settlement. Hence, it is possible to distinguish between rural-urban, urban-rural, urban-urban and rural-rural migration (and commuting),[8] and GIS techniques can be used to measure both migration and commuting distances. This dataset permits us to directly examine whether migration from urban to rural, or within rural, results in longer distance commuting, whether urban-rural and/or rural-rural migrants adjust their work place or their place of residence to reduce the commuting distance, and the time trend of such adjustments.

While the ASHE has clear advantages for examining the interaction of migration and commuting over time, it also has some disadvantages. Foremost is the relative lack of social, economic, and demographic attributes collected for each respondent. In particular, previous research has shown that certain household-level characteristics – being the household reference person, living in a one-earner household, not being a female household reference person with a dependent child, having at least one car – are all associated with commuting longer distances. None of these variables can be examined in research using ASHE. This lack of compositional variables means that it is not possible to control for a number of important predictors of longer distance commuting. Nevertheless, it is possible to control for employment status, occupational skill level, industry, income, sex, and age, all of which have been shown to affect commuting distance.

[8] It can also be argued that identifying rural territory is an ambiguous enterprise in a highly urbanized nation such as England where settlements are relatively close together and few places are genuinely isolated from others. In other words, while urban places can be clearly delineated, rural is somewhat ambiguous. This poses a problem for research like this that proposes to examine geographic movements that link urban and rural.

The completeness and accuracy of ASHE data can also be affected by missing data for particular years when a person's employer did not comply fully with the data collection exercise, or when a person was unemployed, became self-employed or temporarily dropped out of the labor force. Accordingly, when data are available for persons in years 1 and 3 for example, but not in year 2, it is necessary to decide whether to keep them in the data set and impute missing values, or to delete them from the analysis. This is a particularly difficult problem for 2007 and 2008 when ONS reduced the ASHE sample by 20% to save money. These cuts were not random, in fact they were targeted to industrial sectors considered to have especially stable earnings. Hence, this could introduce a bias into our analyses because some of these establishments (and their workers) would have re-appeared in 2009. Accordingly, we have chosen to limit our analysis to 2002-2006.

Analytical strategy: The annual series provided by the ASHE data set allows a direct determination of whether employees who move home over relatively long distances retain their previous place of work, or if they move either place of work or residence to reduce their commuting distance. For the present study, those people who became long distance commuters between 2002 and 2003 are identified, and then these people are followed over a further 3 years to see whether they continued to be long-distance commuters over this period, i.e. what proportion of them had reverted to being short-distance commuters by 2006. The data set also permits the examination of sequences of moves, for example one can look at those who become longer distance commuters as a result of a residential move and subsequently revert to being a short-distance commuter and see how this was achieved, namely by a change of workplace address, another change of home address, or changes of both. In addition, the dataset enables one to differentiate the 'new' long-distance commuters by the route by which they became such; similarly; was it through a change of home address or a change of workplace address or changes of both. While ASHE contains data for the whole of Great Britain, the

present analysis is restricted to England because the definitions of rural and urban are different in Scotland and Wales.

Defining rural: Two separate classifications of urban and rural are used in this research. The primary measure is the Department of Environment, Food and Rural Affairs (DEFRA) typology of local authorities (LA). This classification provides a six way division of England between most urban to most rural (Rural Research Evidence Centre 2005). In this research, rural England is defined as the three rural types in this classification. This permits a determination of whether migrants moved to rural areas from urban areas or from other rural areas. In addition, the UK Census' classification of urban-rural context is used in some parts of the analysis. This scheme is based on precise measurements of physically built up area. All settlements with 10,000 or more residents are defined as urban; smaller areas are subdivided into towns, villages, and hamlets and isolated dwellings (Countryside Agency et al. 2004). However, unless otherwise stipulated, the DEFRA classification is used for basic operations such as extracting rural workers from the overall data set, examining urban-rural and rural-rural migration, etc.

Defining migrants and commuters: Since this analysis focuses on urban to rural and rural to rural migration of employed persons, it is limited to employed persons who worked outside of their home, and who resided in rural areas in 2003, the data set's second year. In this way, recent in-movers can be compared with employed rural residents who have lived at the same address for at least one year. The sample contains 26008 rural workers defined in this manner who are then disaggregated into migrants and stayers. Migrants are defined as workers who changed their residential post code between 2002 and 2003, where such moves were at least 5 km in distance. Migrants can originate in an urban area or in a different rural area. Workers who retain their same residential post code between 2002 and 2003, or who moved less than 5 km are considered 'stayers.' We make the 5km limitation in order to differentiate migrants from very local movers. Since the data set is restricted to rural residents in year 2,

migrants either originate in urban areas or come from other rural areas located at least 5 km from the current residence. As shown in table 1, seven percent of the *rural* workers in the 2003 ASHE data set, 1822 workers, are migrants. About 4 out of ten in-migrants originated in urban areas with the rest coming from other rural areas.

(Table 1 here)

Commuters are defined as persons who work outside of their homes. They are disaggregated into longer distance commuters, 20km or further, and shorter distance, less than 20km. This disaggregation is based on an analysis of data on the distance travelled to work among rural workers in ASHE during 2003. Analysis of ASHE data show that about 23 pct. of rural workers commute 20 or more km to work. While 20 km may seem like a modest commute, these data show it to be unusually long in England.[9]

Commuting Distance of Recent Rural Migrants

The data in table 1 show that commuting distance is positively associated with migration; about 1/3 of recent migrants are longer distance commuters compared with about 1 of 5 among stayers. Previous research (Boyle et al., 2001; Champion et al., 2009) has demonstrated that migration has a positive association with commuting distance even after controlling for the effects of other personal and household attributes that are associated with commuting and migration. Table 1 also shows that both types of migrants are more likely to commute long distances compared with stayers, but urban-rural migrants are more likely to commute long distance than their rural-rural migrant counterparts. In addition, these data also suggest that many recent rural in-migrants revert from longer to shorter commutes after moving. This is especially true of urban-rural migrants where 56% are short distance

[9] Data not shown here indicate that that rural workers commute farther than their urban counterparts. Moreover, commuting distance is slightly greater in the most rural places.

commuters within one year of moving. Since their initial urban workplaces would most likely have been located 20 or more km from their new rural homes this *suggests* that a half or more of rural migrants who originated in urban areas became shorter distance commuters after moving.

As is well known from the literature, migration is a selective process (see above). Accordingly, multivariate analysis is used to determine whether the relationship between recent rural migration and commuting distance holds up after allowing for the effect of other factors associated with personal and place characteristics. As shown in table 2, the relationship between migration and commuting distance persists in a multivariate analysis using the ASHE data. Workers who migrated from urban to rural areas between 2002 and 2003 are twice as likely to be longer distance commuters after their move compared with stayers in 2003, and rural to rural migrants are 1.3 times as likely.

(Table 2 here)

Table 2 also reveals that the associations between these factors and commuting distance are consistent with previous research using other data. Prime working age migrants are more likely than younger or older workers to commute 20 or more km., males are more likely than females, and the highest paid workers and workers with high status occupations are much more likely to commute a long distance than workers who earn less or who work at less prestigious jobs. Workers residing in the SE of England commute farther than workers residing in other regions and rural residents, especially those living in the most highly rural areas, commute farther than their more urbanized counterparts.

Persistence and Change of Commuting Distance:

Persistence and change of commuting distance, the study's second research question, is examined in table 3 by cross classifying commuting distance type in 2003 by migration status and length of commuting in 2002, e.g., prior to migration. These data show that migrants are substantially more

likely to change their journey to work distance status than stayers. Over 96% of stayers who were SDC in 2002 remained so in 2003 compared with only 73% of migrants who were originally SDC. Similarly, while almost 90% of stayers who were LDC in 2002 remained so in 2003, the same is true of only 52% % of migrants. Interestingly, the data show that about half of migrants who were LDC before their moves remained so at the end of the year of their moves, regardless of whether they moved from urban to rural or from one rural place to another. In contrast, while about 73% of all migrants who were SDC prior to moving remain so in 2003, the same is true of only 60% of those moving from urban areas. Thus, importantly, four out of ten urban to rural migrants who were initially short distance commuters switched to longer commutes after moving. This suggests that a substantial share of workers who move from urban to rural areas may commute back to their urban jobs. In contrast, over eighty percent of rural to rural migrants who were initially short distance commuters remain so after moving to a different rural area.

(Table 3 here)

Having examined persistence and change of commuting distance one year after migration to or within the rural sector, we now examine persistence and change over a four year period, 2002-2006 (last two columns of table 3). Similar to the initial post-migration period, both migrants and stayers who began as SDC are more likely to retain that status than workers who began as LDC. Among migrants, the 4 year results are almost exactly the same as the one year results. Three quarters of recent rural migrants who began as SDC in 20002 are still SDC in 2006 while 51% of migrants who were originally LDC persisted in that state. Again, this means that almost half of migrants who were LDC prior to moving reduced their commuting distance (i.e. to the extent of becoming SDC) within three years. It also appears that almost all of this change occurred within the first year (i.e. during the year in which they moved home). Similarly, the four year results among urban-rural and rural-rural migrants are very

similar to those described above for 2002-2003. To the extent that migrants change their commuting distance status, such changes occur during the year of their home moving regardless of whether workers move from urban to rural or from one rural place to another. [10]

Persistence and Change of Longer Distance Commuting Status Among Rural England's Recent Migrants, 2002-2006

Of the 26,008 workers in the ASHE file who had records in 2002, 2003, and 2006, 6031 (23.2%) were, or became, long distance commuters in 2003 (See Table 4). The vast majority of these LDCs were stayers (5395 or 89.5%). The remaining 636 long distance commuters had either moved from urban to rural (314) or moved to a rural area from elsewhere in rural England. In this section, the extent to which *workers who were LDCs in 2003* retain that commuting distance status 3 years later in 2006 is examined. In particular the focus is on the recent rural migrant population. Is the residential move in 2002-2003 that results in a worker being a LDC in 2003 followed by a later adjustment of home [or workplace] that brings the distance of commute down below 20km, or is it a more permanent feature of behavior lasting at least 3 years? And, does this vary between those who were already LDC prior to their 2002-2003 move compared with workers who switched from SDC to LDC during their move year? The data in Table 4 shed light on this question. First, 73% of the 6031 ASHE workers who were or became LDC in 2003 remained LDC in 2006 and 27% became SDC. Of the 636 workers who moved to or within rural during 2002-2003 and were LDC after their move, 438 (68.9%) retained that commuting distance status in 2006. Moreover, this degree of persistence does not vary by whether migrating workers originated in an urban area or elsewhere in rural England. LDC persistence over 3 years is slightly stronger among

[10] The time of change in commuting distance status appears to be simultaneous with the year of moving home as far as we can tell from our annual observations.

stayers who were LDC in 2003 (73.5% vs. 68.9%), although the stayer population as defined here includes some workers who moved residence before 2002 and who might still be adjusting.

(Table 4 here)

Another way of examining persistence of long distance commuting status among recent rural in-migrants is to see how many who persisted in LDC status over 2003-2006 had already been LDC in 2002 before their move and, as a corollary, how many of those who switched from LDC to SDC 2003-2006 were reverting to their previous SDC behavior, with both thereby not causing any long-term increase in aggregate commuting travel – at least not in terms of the binary distinction between SDC and LDC being used in the present study. The data in Table 5 provide a breakdown of the people who were LDC in 2003 by whether they were LDC or SDC in 2002 and 2006. We have characterized these situations as 'revert ', e.g., returning to SDC after being LDC; 'retain', e.g., keeping LDC status after attaining it in 2003, and 'maintain', e.g., being LDC in all three years. Workers can revert to SDC in 2006 after being LDC in both 2002 and 2003, or after becoming LDC between 2002 and 2003. As can be seen across the first panel of table 5, about 65% of workers who were LDC in 2003 were also LDC in 2002 and 2006 (LLL). Only 8% became LDC in 2003 and retained this status in 2006 (SLL). Slightly over one quarter of workers who were LDC in 2003 reverted to SDC status, 8.6% after becoming LDC in 2003 (SLS), and the other 18.5% accounted for by workers who were LDC in 2002 and 2003 (LLS). The distribution of recent rural migrants across these four categories of change in commuting distance is quite different than that of all ASHE workers (and of course of stayers). About 1 in 5 recent migrants, both urban-rural and rural-rural, who originated as SDC in 2002 and became LDC in 2003, reverted to shorter distance commuting by 2006 (SLS). This suggests that many may have found the longer commute displeasing and switched back to what they likely experienced prior to leaving their previous residences. In contrast, migrants who became LDC in 2003 as a result of their move to or within rural England are much more likely than rural

stayers who became LDCs in 2003 to retain this status in 2006. In fact, about 1/3 of workers who migrated to or within rural England between 2002 and 2003 and were LDC in 2003 retained that status for at least 3 years (SLL); substantially higher for urban-rural migrants than for rural-rural migrants. In contrast, only 5% of stayers who were LDC in 2003 retained this status 3 years later.

(Tables 5 & 6 here)

The analysis in Table 6 examines another aspect of the study's second question and in particular, the characteristics of workers that are associated with switching commuting distance status. The analysis is limited to workers who were LDC in both 2002 and 2003 or became LDC in 2003, and examines the odds of workers with particular attributes retaining LDC status three years later in 2006.[11] It can be seen that those who were already LDC in 2002, before their initial move (as well as being LDC immediately after it), have over the three times the odds of retaining LDC status in 2006 compared with workers who were SDC in 2002 before becoming LDC in 2003 after their move.

In examining the rest of table 6 it is helpful to remember what was shown in table 2 where factors associated with being LDC in 2003 were examined. The effect of migration is similar in both analyses. Migrants are more likely to be and to remain LDC than stayers, but urban-rural migrants are no more likely to retain LDC status than workers who moved within rural England, although they were more likely to be LDC in 2003 than within-rural movers. Age holds some effect, in that 16-29 year olds had substantially lower odds of remaining LDC in 2006 compared with the reference case of 30-44 year olds. Older age groups are slightly more likely than 30-44 year olds to retain LDC status, but these coefficients are only significant at the .05 level. This pattern of results differs from the impact of age on the likelihood of being LDC in 2003 as shown in table 2. In that analysis, only 45-59 was significant in comparison with 30-44, and the association was negative.

[11] The N is 6029. Two records were deleted because they lacked information on economic sector.

Similar to the results shown in table 2, men are much more likely to remain long distance commuters than women, as are highly paid workers and higher level professionals. The effect of pay level is especially strong, with the odds of remaining LDC falling with declining pay and with even the second highest quintile being significantly different from the top quintile. High wage workers who migrated to or within rural England between 2002-2003 are strongly committed to their original workplace, and are hesitant to relinquish such jobs, even if this means a long journey to work. It appears that having a career long attachment to long distance commuting enhances the likelihood that a worker will continue travelling a relatively long distance to work. In addition, well paid people have the resources to obtain high quality of life in rural areas, and they appear to be willing to commute far distances in order to both retain their pay level and enjoy an amenity rich residence.

A worker's current residence is only weakly associated with retention of LDC status. This is substantially different than the pattern of results displayed earlier in table 2 where the likelihood of being a LDC in 2003 increased directly as one moved down the urban hierarchy, and where workers living in the SE of England were more likely to travel longer distances to their work. The effect of residence on LDC retention between 2003 and 2006 shows that workers who live in the most highly rural areas are only slightly more likely to remain LDC than workers living in larger settlements and/or less isolated rural environs.

The analysis in table 7 examines the paper's third research question, e.g., whether workers residing in rural areas in 2003 who changed their commuting distance status between 2003 and 2006 did so by changing workplace, residence (again) or both. Examining the first column of table 7 shows that about 27% of workers who were or became LDC in 2003 switched to SDC three years later. Recent rural migrants, both to and within rural, were somewhat more likely to switch from LDC to SDC (about 31%). The surprising finding revealed in this table is the high degree of both residential and work place mobility, especially the latter, that has occurred among ASHE workers regardless of whether they

changed their commuting distance status or not. The second column of table 7 shows that changing workplace or residence is common even among workers who retained LDC status between 2003 and 2006. In fact, barely 40% of urban-rural migrants who were LDC in both 2003 and 2006 did not change either residence or workplace, and about half of rural-rural migrants and stayers who remained LDC for the three years switched workplace or residence. As might be expected, switching workplace or residence is more common among workers who switched their commuting distance status than those who remained LDC from 2003-2006. Among workers who switched from LDC to SDC, 87% changed their workplace or both their workplace and residence during this time, 54% and 33% respectively. This mobility is somewhat lower among rural-rural migrants, but still exceeds three quarters. In other words, there is a lot of geographic churning going on within England's working population even if changing one's residence or place of work does not result in changing one's commuting distance status.

(Table 7 here)

Summary and Conclusions

Summary:

This research was motivated by three questions. First, it examined the effect of recent migration to or within rural England on whether resident workers commute longer distance (20km or more) than non-migrants. The analysis showed that workers who migrated from urban to rural areas between 2002 and 2003 were twice as likely to be longer distance commuters in 2003 after their move compared with stayers, and rural to rural migrants were 1.3 times as likely. Moreover, consistent with previous research, this relationship between rural migration and commuting distance persists after other correlates of commuting distance are controlled in a multivariate analysis.

The second question examined persistence and change of commuting distance status among rural England's residents, and whether recent migrants to or within rural areas are more likely to change their commuting distance compared with stayers. The analysis showed a substantial amount of both

persistence and change. Four out of ten urban to rural migrants who were initially short distance commuters switched to longer commutes one year after moving. This suggests that a substantial share of workers who move from urban to rural areas may commute back to urban jobs. In contrast, over eighty percent of rural to rural migrants who were initially short distance commuters remain so after moving to a different rural area.

In contrast, workers who are or become long distance commuters are likely to retain that status. About 80% of the 6031 ASHE workers who were LDC in 2003 remained LDC in 2006 and 20% became SDC. With respect to the effect of recent rural migration on persistence, it was shown that almost 70% of workers who moved to or within rural England during 2002-2003 and were LDC after their move retained that commuting distance type in 2006. Moreover, this degree of persistence does not vary by whether migrating workers originated in an urban area or elsewhere in rural England. This means that almost half of migrants who were LDC prior to moving reduced their commuting distance (i.e. to the extent of becoming SDC) within three years. It appears that almost all of this change occurred within the first year (i.e. during the year in which they moved home).

The study's second question also examined the characteristics of workers that are associated with change or persistence of commuting distance status. The analysis showed that workers who were already LDC in 2002, before their initial move (as well as being LDC immediately after it), have over three times the odds of retaining LDC status in 2006 compared with workers who were SDC in 2002 before becoming LDC in 2003 after their move. Also, migrants are more likely to be and to remain LDC than stayers, but urban-rural migrants are no more likely to retain LDC status than workers who moved within rural England. Finally, men are much more likely to remain long distance commuters than women, as are highly paid workers and higher level professionals. The effect of pay level is especially strong. High wage workers who migrated to or within rural England between 2002-2003 appear to be

strongly committed to their original workplace, and are hesitant to relinquish such jobs, even if this means a long journey to work .

The third research question focused on the avenue by which workers who change their commuting distance status do so. It was shown that changing location of work is the most likely path to changing commuting distance status, but it was also found that a high degree of both residential and especially work place mobility occurred among ASHE workers regardless of whether they changed their commuting distance status or not. In other words, English workers move around a lot, but these moves of residence or/and workplace often cancel each other out, hence failing to significantly alter the distribution of commuting length over time, at least over the four years studied here.

Concluding Observations:

England has experienced continuous net urban to rural migration for several decades now. The research presented here examines the extent to which migration to and within rural England affects both commuting distance and change therein over time. A particular interest was whether rural migrants retain their original workplaces after moving, or bring work closer to home as a result of changing the location of their work, making a subsequent house move, or both. The research showed that English workers were highly mobile during 2002-2006 in terms of both residential and workplace location. Hence, rather than separating cities and their interdependent rural populations, we see internal migration and commuting as modes of regional integration that blur the boundary between cities and their peripheries, as well as between places within the periphery. Hence, the lens of population mobility is one vantage point for examining the production and reproduction of social and economic structures that constitute the urban-rural interface. Flows of residents and workers separate urban from rural, but they also result in spatial integration between urban and rural areas as well as among places within rural regions. Hence, the social and economic organization of the rural-urban

interface, at least as seen through the lens of population mobility, is a dynamic field of social and economic interactions.

This study revisited previous research on migration and commuting distance and confirmed the strong positive relationship between internal migration and journey to work distance. It also examined aspects of the migration/commuting puzzle that were not possible to investigate in previous research with cross sectional data such as that available from the decennial census. In particular persistence and change of commuting distance status, the time trend of such adjustments, and their association with recent rural migration and other socioeconomic attributes of English workers were examined.

Developing longitudinal research on the migration-commuting nexus contributes to a theoretically-shaped and evidence-based framework for understanding the evolving structure of urban regions. In particular, this study directly examined stability and change in commuting distance among rural in-migrants over a 4 year period from 2002 through 2006. This analysis shows that for many workers long distance commuting is a relatively stable feature of their everyday experience. This is especially true of male workers and workers in more highly paid occupations. These persons are more likely to commute longer distances, and they are more likely to maintain longer journeys to work regardless of migration status. The research showed that English settlement structure, especially during a period of net urban to rural migration, is characterized by a significant amount of long distance commuting (22% of all workers); that this situation is particularly prevalent among rural in-migrants; and that long distance commuting is not necessarily a transitory condition among workers who return to short distance commuting in the near or medium term.

The migration/commuting nexus is strongly associated with the economic security of English workers and with the labor supply available in English labor markets. As such, it is an important aspect of the nation's evolving spatial economy. In addition, urban to rural migration and commuting may also affect other aspects of rural and urban life over and above employment (Findlay et al 2001; Shields &

Deller 1998). Migration is conventionally defined as a change of usual residence of sufficient distance and duration to interrupt migrants' daily activities. Hence, many scholars tend to assume that rural migration contributes to a separation of rural and urban economy and community. But, research in the UK and in other developed nations that have experienced net urban-rural migration for at least some period of time has yet to establish the extent to which residential relocation of this type fundamentally alters migrants' social and economic life, or whether in-migrants continue to obtain services from the same urban-based professionals, socialize with friends and family in origin communities, and/or participate in urban civic life. For example, a recent study of German, Belgian and French residents working in Luxembourg estimated that these households spend almost a billion euros per annum in Luxembourg, reflecting about 10% to their total household final consumption expenditure (Thomas et al., 2014). Our examination of the commuting behavior of migrants to and within rural England indicates the extent to which such migration may rearrange the spatial pattern of migrants' daily work lives. Strong evidence of "back commuting," for example, is consistent with a conclusion that urban to rural migration is less disruptive of urban community structure than would appear to be true given the residential redistribution resulting from urban to rural migration in the UK. Accordingly, rather than separating rural from urban, the migration/commuting nexus revealed in this paper suggests that such population mobility contributes to durable social and economic relationships that bind rural and urban economy and society.

On the other hand, rural-urban migration and commuting may have deleterious environmental and social impacts. As shown in this study, a significant share of rural in-migrants become and remain longer distance commuters which means more workers travelling on the road for longer distances, and an increase in the nation's carbon footprint. Moreover, a recent study by ONS (2014) showed that longer distance commuting is associated with lower life satisfaction and anxiety. Clearly, further

research on the economic, social and environmental impacts of longer distance commuting is warranted.

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Table 1: Rural Residents in Work, by Migrant Status and Commuting Distance, 2003

	All Commuters		Short Distance (SDC)		Long Distance (LDC)	
	Number	%	Number	% all	Number	% all
Rural residents in work	26,008	100.0	19977	76.8	6031	23.2
Migrant status						
Stayers	24,186	93.0	18791	77.7	5395	22.3
Migrants	1,822	7.0	1186	65.1	636	34.9
Migrants	1,822	100.0	1186	65.1	636	34.9
Urban-rural	717	39.3	403	56.2	314	43.8
Rural-rural	1105	60.6	783	70.9	322	29.1

Note: The population comprises all ASHE members living in rural England in 2003 and with records in 2002, 2003 and 2006. Long distance refers to 20km or more.
Source: calculated from ASHE.

Table 2: Factors associated with the propensity of rural England's residents to commute 20km or more, for those with ASHE records in 2002, 2003 and 2006

Characteristic	B	S.E.	Sig.	Exp(B)
Non-migrant				
Urban-rural migrant	.709	.082	.000	2.033
Rural-rural migrant	.276	.073	.000	1.317
Aged 30-44				
16-29	.102	.049	.037	1.107
45-59	-.242	.035	.000	.785
60+	-.095	.092	.302	.909
Male				
Female	-.340	.037	.000	.712
Full-time employee				
Part-time employee	.002	.064	.980	1.002
Top (gross weekly) pay quintile				
Second pay quintile	-.428	.045	.000	.652
Third pay quintile	-.904	.051	.000	.405
Fourth pay quintile	-1.318	.061	.000	.268
Bottom pay quintile	-1.351	.083	.000	.259
Higher professional/managerial				
Lower professional/managerial	-.127	.046	.006	.881
Intermediate occupation	-.208	.053	.000	.812
Low skill occupation	-.670	.052	.000	.512
Working in non-primary sectors				
Primary sector	-1.070	.189	.000	.343
Living in south-eastern England				
Not in south-eastern England	-.241	.032	.000	.786
Living in urban area with 10K+ inhabs.				
Town/fringe	.115	.041	.005	1.122
Village	.224	.044	.000	1.251
Hamlet & isolated dwelling	.282	.064	.000	1.326
Significantly Rural LA (least rural)				
Rural-50 LA	.161	.040	.000	1.175
Living in Rural-80 LA (most rural)	.072	.038	.063	1.074

Notes: 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. N=25,995, i.e. excluding 13 cases with data missing for economic sector. Nagelkerke R Square = 0.159.
Source: calculated from ASHE.

Table 3: Persistence and Change of Commuting Type by Migrant Status and Length of Original Commute, Rural England, 2002-2006

Migrant status 2002-03	DC type 2002	All	LDC 2003	LDC 2006	%SDC 2003	%LDC 2003	%SDC 2006	%LDC 2006
Stayer	All	24186	5395	5441	77.7	22.3	77.5	22.5
	SDC	18867	670	1653	96.4	3.6	91.2	8.8
	LDC	5319	4725	3788	11.2	88.8	28.8	71.2
Migrant	All	1822	636	598	65.1	34.9	67.2	32.8
	SDC	1242	336	300	72.9	27.1	75.8	24.2
	LDC	580	300	298	48.3	51.7	48.6	51.4
Urban-rural migrant	All	717	314	286	56.2	43.8	60.1	39.9
	SDC	487	194	167	60.2	39.8	65.7	34.3
	LDC	230	120	119	47.8	52.2	48.3	51.7
Rural-rural migrant	All	1105	322	312	70.9	29.1	71.8	28.2
	SDC	755	142	133	81.2	18.8	82.4	17.6
	LDC	350	180	179	48.6	51.4	48.9	51.1

Note & source: See Table 1.

Table 4: Persistence of Long Distance Commuting Status by Migration Status, 2003-2006

Migrant type 2002-2003	LDC in 2003		Still LDC in 2006	
	N	% of total	N	% of 2003
Total	6031	100.0	4401	73.0
Stayer	5395	89.5	3963	73.5
Migrant	636	10.5	438	68.9
Urban-rural migrant	314	5.2	214	68.2
Rural-rural migrant	322	5.3	224	69.6

Note & source: See Table 1.

Table 5: Long distance commuters 2003, for two groups of migrants, by whether LDC or SDC in 2002 and 2006

Migrant type 2002-2003	Commute type 2002-2003-2006 respectively				
	Revert		Retain	Maintain	Total
	S-L-S	L-L-S	S-L-L	L-L-L	
All LDC in 2003					
N	516	1114	490	3911	6031
% of total	8.6	18.5	8.1	64.8	100.0
Stayers					
N	386	1046	283	3674	5395
% of total	7.2	19.4	5.2	68.1	100.0
Migrants					
N	130	68	206	232	636
% of total	20.4	10.7	32.4	36.5	100.0
Urban-rural migrants					
N	69	31	125	89	314
% of total	22.0	9.9	39.8	28.3	100.0
Rural-rural migrants					
N	61	37	81	143	322
% of total	18.9	11.5	25.2	44.4	100.0

Note: The population comprises the 6,031 ASHE members who were living in rural England in 2003, had records in 2002, 2003 and 2006, and were long distance commuters (20m or more) in 2003. L = long distance commuter, S = short distance commuter.
Source: calculated from ASHE.

Table 6: Modelling the propensity of rural England's residents who were long distance commuters (LDC) in 2003 to retain LDC status in 2006

Characteristic	B	S.E.	Sig.	Exp(B)
SDC in 2002				
LDC in 2002	1.138	.083	.000	3.121
Stayer				
Rural-rural migrant	.293	.142	.040	1.340
Urban-rural migrant	.374	.145	.010	1.454
Aged 30-44				
16-29	-.398	.090	.000	.672
45-59	.170	.072	.019	1.185
60+	.441	.200	.027	1.554
Male				
Female	-.355	.073	.000	.701
Full-time employee				
Part-time employee	.538	.134	.000	1.712
Top (gross weekly) pay quintile				
Second pay quintile	-.339	.092	.000	.712
Third pay quintile	-.647	.105	.000	.524
Fourth pay quintile	-1.118	.122	.000	.327
Bottom pay quintile	-1.855	.167	.000	.157
Higher professional/managerial				
Lower professional/managerial	-.194	.095	.042	.824
Intermediate occupation	-.268	.106	.011	.765
Low skill occupation	-.321	.107	.003	.726
Working in non-primary sectors				
Primary sector	-.055	.439	.901	.947
Living in south-eastern England				
Not in south-eastern England	-.073	.065	.262	.930
Living in urban area with 10K+ inhabs.				
Town/fringe	.077	.084	.360	1.080
Village	.185	.092	.044	1.203
Hamlet & isolated dwelling	-.004	.126	.976	.996
Significantly Rural LA (least rural)				
Rural-50 LA	.064	.078	.412	1.066
Living in Rural-80 LA (most rural)	.133	.082	.104	1.142

Notes and source: See Table 2. N = 6,029, i.e. excluding 2 cases with data missing for economic sector. Nagelkerke R Square = 0.191

Table 7: Long distance commuters 2003, for two groups of migrants, by change of LDC/SDC status 2003-2006, by combinations of change of residence (R) and change of workplace (W)

Migrant type 2002-2003 and commuting distance type combination	LDC in 2003	No change of R or W	Changed R only	Changed W only	Changed both R and W
Urban-rural migrants					
LDC in 2003, of whom:	314	28.3	14.6	27.7	29.3
Still LDC also in 2006	214	41.6	14.0	26.2	18.2
Switched to SDC 2006	100	0.0	16.0	31.0	53.0
Rural-rural migrants					
LDC in 2003, of whom:	322	34.8	14.0	24.2	27.0
Still LDC also in 2006	224	50.0	9.8	23.7	16.5
Switched to SDC 2006	98	0.0	23.5	25.5	51.0
Non-migrants					
LDC in 2003, of whom:	5395	36.8	11.0	35.9	16.2
Still LDC also in 2006	3963	50.1	10.8	28.1	11.0
Switched to SDC 2006	1432	0.0	11.6	57.6	30.8
All LDC in 2003					
LDC in 2003, of whom:	6031	36.3	11.4	34.9	17.5
Still LDC also in 2006	4401	49.7	10.9	27.7	11.6
Switched to SDC 2006	1630	0.0	12.6	54.0	33.4

Notes and source: see Table 5.