Labor supply responses to large social transfers: Longitudinal evidence from South Africa

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March 1, 2007

Analysis is based on data collected through the Africa Centre Demographic Information System. We have benefited from the ACDIS field and data centre staff under the leadership of the principal investigator, Dr. Kobus Herbst, and Wellcome Trust Grants 065377 and 067181. Ardington acknowledges funding from the National Institute of Child Health and Development and the National Institute of Aging R01 HD045581-01. Case acknowledges funding from the National Institute of Aging R01 AG20275-01 and P01 AG05842-14. Hosegood acknowledges funding from the Africa Centre for Health and Population Studies, The Wellcome Trust and the London School of Hygiene and Tropical Medicine.

1. Introduction

There is much debate about whether and to what extent governments can improve the wellbeing of individuals through the delivery of cash transfers. If individuals or households change their behavior to become eligible for a cash grant, or change their behavior in response to a grant, they may offset government's original intentions. (See Moffitt 2004 for a discussion of both the theoretical issues and empirical evidence.) At the same time, governments can potentially use cash transfers to encourage particular behaviors, such as sending children to school or presenting them at clinics (Behrman et al 2005, Gertler 2000).

The South African old-age Social Pension has been much studied by both researchers and policy makers, in part for the larger lessons that might be learned about behavioral responses to cash transfers in developing countries. A non-contributory pension, the Social Pension pays more than twice median per capita African (Black) income and represents an important source of income for a third of all African households in the country. For the vast majority of South African women aged 60 and above, and men aged 65 and above, the Social Pension provides a generous means of support in old age. In principle the pension is means tested, and the amount received should depend on the recipient's other income, but in practice the pension pays the maximum each month (currently 820 Rands) to women and men who reach pension age without access to private pensions. (See Case and Deaton 1998 for details.) Africans often live in three, or four, or five generation households, so that the pension has the potential of reaching many poor children and prime aged adults.

Because the pension relies on age-eligibility, researchers can largely eliminate changes in personal behavior, undertaken to create eligibility, from the list of potential behavioral responses, when evaluating its impact. Relatedly, because pension eligibility for the African community is very well predicted by age-eligibility, data sets containing information on the ages of persons under study are often adequate to examine the impact of the pension on individual and household behavior. The Social Pension is also generous enough to have the potential of changing behaviors in important ways.

In this paper, we will focus on whether and to what extent this large, stable source of income leads to change in the labor force attachment of the prime-aged adults in households containing pensioners. To the extent that labor and credit markets function well, if leisure is a normal good, we might expect prime aged adults who share resources with pensioners to reduce their work hours, or choose not to participate in the labor market, upon the arrival of the pension. The consequences of reduced work effort include not only a reduction in earnings coming into the household, but also reduced incentives for skill development. Alternatively, if social transfers allow households to overcome credit constraints, enabling households to bankroll potential migrants who need financial support to look for jobs, then social transfers may help households to break out of poverty traps. It is an empirical question whether and to what extent resources channeled into households, in the form of Social Pensions, change the labor market behavior of household members.

To date, evidence on labor supply responses to pension receipt in South Africa has largely relied on careful analysis of cross sectional data. Bertrand, Mullainathan and Miller (2003), using nationally representative cross-sectional data, find that prime-aged

adults living in three generation households with pensioners have significantly lower rates of labor force participation than do those in three generation households without a pensioner. They conclude that "the pension dramatically reduces the labor supply of the prime-age members of the household." Using the same data, Posel, Fairburn and Lund (2004) argue that the labor supply effects are more nuanced: households with pensioners may be observed with lower labor force participation among *resident* prime-aged members, but these households are significantly more likely to have members who have migrated either to work or to look for work. These authors argue that this effect may be due to credit constraints, or to the need potential migrants have for a woman to be at home to care for children left behind – a role that could be played by female pensioners.

Both of these papers look for significant differences in labor market activity between households with and without pensioners. However, using cross-sectional data, it isn't possible to identify whether the pension has a causal effect on household outcomes or is simply correlated with attributes of pension households that do. Pension households vary markedly in many important observable characteristics from other households, and it may be that differences in household characteristics are responsible for the results found.

In this paper, we identify individual labor supply responses to the Social Pension using longitudinal data recently collected in Northern KwaZulu-Natal (KZN). Beginning in January 2000, the Africa Centre for Health and Population Studies has followed members of approximately 11,000 households in the Umkhanyakude District of KZN. Because the survey has been carried out in multiple waves, we can examine changes in employment and migrant status between waves, given changes in household pension status. We examine the effect of household pension receipt, and pension loss, on labor

force participation for all prime-aged adult members of households containing pensioners in the Demographic Surveillance Area (DSA). The longitudinal nature of these data allows us to use the timing of events – pension receipt, migration, labor force participation – to estimate causal pathways. Our ability to compare households and individuals before and after pension receipt, and pension loss, allows us to control for a host of unobservable household and individual characteristics that may determine labor market behavior.

When we estimate labor supply effects using only cross-sectional data from the household socioeconomic survey, we replicate many of the findings from the earlier cross-sectional analyses. Similar to Bertrand et al, we find a negative and significant relationship between the presence of a pensioner in the household and employment among prime-aged adults who are co-resident with the pensioner. As did these earlier authors, we find this result is driven by prime-aged men living with pensioners being less likely to be employed. Similar to Posel et al, we find prime-aged adults are significantly more likely to be labor migrants when their households include an adult age-eligible for the pension. Like these authors, we find this effect is larger for women than for men, although in our data the associations are positive and significant for both. When we turn to longitudinal analysis, we find a small positive increase in the employment of prime-aged men once pension receipt begins in their households. The larger effects, however, regard where that employment takes place. Prime-aged adults are significantly more likely to be labor migrants after pension receipt. If prime-aged adults have better employment opportunities away from the DSA, the arrival of the pension may help these individuals accept better jobs. On the flip side, we find individuals in households that lose

a pension between rounds of the survey are significantly less likely to be labor migrants once the pension is lost, a result largely driven by migrants returning to the DSA once the household loses pension status.

The paper proceeds as follows. Section 2 presents details on the Africa Centre Demographic Information System (ACDIS), with which we will evaluate the behavioral response to the pension. Section 3 demonstrates that our results match those found in earlier cross-sectional analysis. Section 4 presents results in which we map the changes through time that we observe in households before and after pension receipt, and before and after the withdrawal of the pension. Section 5 presents evidence that our results, as earlier hypothesized by Posel et al, are due both to resource constraints, and to the needs of households that must care for young children. Section 6 concludes.

2. The Africa Centre Demographic Information System (ACDIS)

We evaluate individual and household behavioral responses to the Social Pension using data collected on approximately 100,000 people being followed by ACDIS. The surveillance site, part of one of the poorest districts in KwaZulu-Natal, lies approximately 2.5 hours north of Durban. The field site contains both a well-established township and a rural reserve that continues to be subject to both civil and tribal law. The area is shouldering a heavy disease and death burden associated with the AIDS pandemic.

Demographic data on individuals and households in the surveillance area are collected twice annually, and information on births, deaths, changes in marital status, and migration is updated at each round. To reflect the complexity of living arrangements in South Africa, data collection here allows individuals to be members of multiple

households (a man may have multiple wives, each in a separate household, for example, or a woman may be recognized as a member of both her mother's and her sister's households). However, an individual can only be resident at one household at a time – chosen to be the household where he or she is sleeping the majority of nights. An individual can change residency without changing membership status: residency is defined physically, while membership is defined socially (Hosegood and Timæus 2001). As noted by Posel et al, in a country in which migrant work is a dominant feature of the labor market, it is essential to understand the behavior of both resident and non-resident household members. The ACDIS data allow us to do so.

During the first five years of demographic surveillance, two rounds of socioeconomic data were collected, first in 2001 and then in 2003/04. We refer to the first round of Household Socio-Economic data collected as HSE1, and the second round as HSE2. We will use these data to measure changes in labor force participation upon pension receipt. Table 1 presents relevant characteristics of households in the Demographic Surveillance Area (DSA) at the time of the second socioeconomic survey, in the upper panel, and changes observed between HSE1 and HSE2, in the bottom panel, for households that existed in both periods.

In all that follows, we will refer to households as "receiving a pension" if they report having a member, resident in the DSA, who is age-eligible for a Social Pension. This allows us to sidestep issues of selection associated with a handful of elderly persons who worked for firms that maintain a private pension for them.

As is true for South Africa as a whole, one-third of households in the DSA report a person of pension age at HSE2. Twenty nine percent reported receiving a pension at

both HSE1 and HSE2, 5.5 percent became pension households between rounds of the socioeconomic survey, and 3.5 percent lost pension status. (As a shorthand, we will sometimes refer to individuals who are members of households that became pensioner households between HSE1 and HSE2 as having "gained pension status" between waves of the survey, and those who had housed pensioners at HSE1 but not at HSE2 as having "lost pension status.") Households can gain a pension because someone of pension age joins the household as a resident member, or because someone already resident becomes age-eligible between waves of the survey. The latter represents the great majority (80 percent) of cases in which households in the DSA gained a pension between HSE1 and HSE2.

Households with pensioners at HSE2 (columns 2 and 4) are significantly larger than those that never had a pensioner and, on average, they report a significantly greater number of resident members. This by itself is not remarkable: in order to have a pension, the household has to have at least one resident member of pension age. What is more noteworthy is that pension households contain a significantly greater number of young children (ages 0 to 5) and older children (ages 6 to 17) than do households that never had a pension. Pensioner households at HSE2 also report a greater number of prime-aged members who are working migrants. (That these differences by type of household are statistically significant is indicated by an asterisk (*), which signals that the difference between households that never had a pension and households of other types is significant at a 5 percent level.) Households that were never observed with a pension are wealthier, measured both by the number of assets owned by the household, and by household expenditure per resident member. These results – on relative household size, living

arrangements of children, and lower socioeconomic status among pension households – are consistent with data for the country as a whole (see Case and Deaton 1998).

Households that gained or lost a pension display larger changes in household composition between waves of the survey than do households that never had a pension. The loss of a pension is associated not only with the loss of approximately one household member above age 50 (–0.97), but also with a decline in the number of children aged 0 to 5 (–0.17) and those aged 6 to 17 (–0.28). Table 1 also allows us to take an initial look at the change in migration between waves of the survey. Approximately one in five households (0.17) that gained a pension between the waves of the survey report an additional working migrant at HSE2.

Our focus will be on the behavior of prime-aged adults (men and women ages 18 to 50 at HSE2). Characteristics for these individuals are presented in Table 2. There is little difference between individuals who are members of households that do not have a resident member age-eligible for a pension in either period (column 1) and other prime-aged adults in terms of their ages and levels of education. However, prime-aged adults who live in households that had pensions in both periods are significant less likely to be female (50 versus 54 percent). We see no significant difference in employment between individuals living in households that always had a pension and those that never had a pension. Prime-aged adults in pension receiving households (columns 2 and 4) are significantly and substantially more likely to be working migrants (27 percent of prime-aged adults in pension households, compared with 20 percent in non-pension households). Those that gained a pension between the rounds of the survey are significantly more likely to become labor migrants between rounds of the survey.

In summary, households with pensioners tend to be larger and poorer on average than those that do not contain pensioners. They contain a significantly greater number of resident minors, but no greater number of resident prime-aged adults. They have significantly larger numbers of non-resident working members. Upon the loss of pension status, households lose (non-resident) migrant adults and (resident) children – an observation we will return to when discussing our findings in Section 5.

3. Cross-sectional patterns of employment and migration

Age patterns of employment and migration can be seen in Figure 1, which presents results separately for men and women, resident and non-resident, who were ages 18 to 50 at HSE2. The probability of being employed increases from something close to zero for men and women at age 18 to approximately 65 percent for men, and 55 percent for women, in their mid-thirties. Labor migration, which we define as working and being non-resident in the DSA, also increases with age: by their late twenties, approximately 40 percent of men are reported to be labor migrants, and approximately 20 percent of women. After age 30, migration rates for women begin to decline, so that by their late forties only 10 percent of women are reported to be labor migrants. In what follows, we include a quartic in age in employment and migration regressions that do not include individual fixed effects. These polynomials in age adequately capture the patterns observed in Figure 1.

We examine the education pattern in employment and migration in Figure 2, where we plot, for each level of completed education, the fraction of men and women who are reported to be working or working migrants. Of special interest here is the role

played by high school graduation (matric) for reports of employment. (This is marked in Figure 2 using a vertical line at grade 12.) Adults who have more than a high school degree are the most likely to be employed. Those who have fallen just short of a high school degree are the least likely to be employed. Because the pattern is not linear in years of completed schooling, nor adequately captured by an indicator of having completed a certain grade, we include a complete set of indicator variables for years of completed schooling in our cross-sectional analysis.

Our results are based on the regressions of the following form.

$$y^o_{iht} = \beta P_{ht} + \gamma X_{iht} + \varepsilon^o_{iht}, \quad o = e, m \qquad (1)$$

For individual i in household h observed in survey wave t, our focus is on two labor market outcomes: employment (y^e =1 if working, and =0 otherwise), and labor migrant status (y^m =1 if non-resident in the DSA and reported working, =0 otherwise). These are modeled as a function of the presence of a resident household member age-eligible for the pension ($P_{ht} = 1$ if a pensioner is resident, =0 otherwise). We also include in equation (1) a set of household and individual level controls X that we believe independently affect employment and migration status. These controls will vary, depending on whether we are estimating equation (1) in the cross-section, or in the panel (where we can control for individual-level fixed effects).

Throughout our analysis, the coefficient of interest will be β. If the presence of a pensioner is associated with a lower probability of employment among prime-aged household members, for example, we would expect β to be negative and significantly different from zero.

We present cross-sectional regression results of the association between the presence of a pensioner and employment and migration in Table 3. Each coefficient presented is an estimate of β from a different regression. Employment results are presented in the first two columns for resident members (column 1) and all members (column 2). Migration results are presented in the last two columns, where the dependent variables are equal to 1 if the individual is a migrant who is working or looking for work (column 3), or is a migrant and working (column 4). The first row of the table presents results in which the effect of being a member of a pension household is estimated jointly for men and women. The second row presents results for women estimated separately, and the last row reports results for men alone. All regressions include the number of resident members in four age categories: ages 0 to 5, 6 to 17, 18 to 50 and above age 50. (This is our preferred specification, which we believe reflects the ages at which individuals' economic and social needs change.) In addition, all regressions include a quartic in age, indicators for years of completed schooling, and (in row one) an indicator for sex. We allow for correlation in the unobservables of individuals who are members of the same household.

Estimates presented in column 1 are closest in spirit to those presented by Bertrand et al. Similar to their results, we find, when restricting the sample to resident members only, that the presence of a resident pensioner is associated with a three percentage point lower probability that a prime-age member is working. That this result is being driven by prime-aged resident men being less likely to be employed can be seen by comparing results in the second and third rows of column 1. For women, the association is very small (–0.008) and not significantly different from zero. In contrast, holding all

else constant, we find that prime-aged men living in pension households are five percentage points less likely to be employed, and that this effect is significantly different from zero.

Our specification in column 1 differs from that reported in Bertrand et al in ways that could affect our results, but in practice do not. Bertrand et al control for education by including an indicator variable that an individual has completed at least grade 8. In addition, these authors control for the number of resident members, and the number of members who are ages 0 to 24, using several categories between 16 and 24. They also include 16 and 17 year olds in their analysis of employment. Bertrand et al restrict their sample to households that have at least three-generations (grandparents, parents and children), in order to reduce the heterogeneity of their sample. We prefer to include all households – primarily because the middle generation is the most likely to have migrated for work (as seen in Figure 1) and the absence of a middle-generation adult might drop the household from the sample, if we restrict our sample to three generations. We exclude 16 and 17 year olds, because the probability that they are employed is very close to zero. However, when we estimate equation (1), restricting our sample to three-generation households, and using the same education variable and number of resident members variables used by Bertrand et al, our results do not change in any meaningful way. Prime-aged resident men, using their specification, are 6 percentage points less likely to be employed in pension households (results not shown).

Posel et al focus on the fact that restricting analysis to resident household members will miss an important group of working household members: labor migrants. Following Bertrand et al (in order to make their results as comparable as possible) Posel

et al use data from the Project for Statistics on Living Standards and Development (PSLSD). The PSLSD only recorded whether there were household members who were migrants, and why they were absent (working, looking for work, etc.) but otherwise collected no information on the hours worked or earnings of the migrants. Perhaps for this reason, Posel et al do not show how the probability of employment for all prime-aged adults (resident and non-resident alike) corresponds to the presence of a pensioner in the household. We provide this information for our sample in column 2 of Table 3. Once non-resident prime-aged members are added to our analysis, we find no statistically significant association between the presence of a pensioner and the probability of employment for men and women examined separately (rows 2 and 3) or jointly (row 1). The results for men are particularly interesting: including non-resident members, the coefficient on the presence of a pensioner falls from –0.05 to –0.01, and is no longer significantly different from zero.

That the presence of a pensioner is significantly associated with migrant status for both men and women can be seen in columns 3 and 4 of Table 3. Prime-aged women in pension households are 5 to 6 percentage points more likely to be migrants than are other women, holding constant age, education and household composition, and prime-aged men are 4 percentage points more likely. Evidence in Table 3 is consistent with a model in which the presence of a pensioner allows women a greater opportunity to leave for work elsewhere – in many circumstances leaving an older adult to care for her children.

4. Panel estimates of the impact of pension receipt on employment and migration

Data collected in ACDIS allow us to examine the timing of pension arrival, pension withdrawal, and changes in employment and migration. In this section, we present estimates based on longitudinal analyses of these data.

With data available from two rounds of the socioeconomic survey, we can modify equation (1) to allow for individual fixed effects. That is, the unobservable component of (1) can be written

$$\varepsilon^{o}_{iht} = \alpha^{o}_{i} + u^{o}_{iht}, \quad o = e, m \qquad (2)$$

where α^{o}_{i} is an individual-specific fixed effect for labor market outcome o. This effect will absorb all determinants of employment (α^{e}_{i}) or migration (α^{m}_{i}) that are constant within person i over time. This includes, inter alia, unobserved ability and characteristics of the household in which an individual was raised, together with his or her sex, year of birth, and (often) years of completed schooling. A straightforward way to estimate the fixed effects model, given we have two observations per person, is to run changes in labor market outcomes on changes in household's pension status and in characteristics that may change through time:

$$y^{o}_{iht} - y^{o}_{ih,t-1} = \beta(P_{ht} - P_{h,t-1}) + \gamma(X_{iht} - X_{ih,t-1}) + (u^{o}_{iht} - u^{o}_{ih,t-1}). \qquad (3)$$

We present estimates of β from equation (3) in Table 4 for employment outcomes. The first row of Table 4 presents results for all household members ages 18 to 50 at HSE2 (column 1), for women separately (column 2) and for men separately (column 3). In addition to change in pension status, we control for change in the number of resident household members, and the time in days between the household's survey date at HSE1 and its survey date at HSE2.

We find a small, positive and significant relationship between the pension receipt and employment for men and women, estimated jointly. On average, gaining pension status is associated with a 2 percentage point increase in the probability that prime-aged men and women are working. That this effect is driven by men's employment can be seen by comparing results for men and women estimated separately. Women's employment is not significantly related to the arrival or withdrawal of the pension. However, men's employment changes by 3 percentage points on average in households when pension status changes between rounds of the survey.

This result stands in contrast to the earlier cross-sectional results of Bertrand et al, Posel et al, and our results in Table 3. All of the earlier cross-sectional results may suffer from omitted variable bias: the presence of a pensioner in the household may be correlated with unobservable characteristics about the household that also determine employment. In that case, in the absence of panel data one might not find a positive relationship between household pension status and men's job holding, even if pension receipt had a positive causal effect on prime-aged men's employment.

With fixed effect estimation, the only individuals who contribute information for the estimate of β are those that either gained a pension between the survey rounds, or lost a pension between the rounds. (The effects for individuals who were always living with a pensioner or who never lived with a pensioner are absorbed in those individuals' fixed effects.) Estimates in row 1 of Table 4 treat pension gain and pension loss symmetrically. That is, the employment effect of gaining the pension between rounds of the survey is assumed to be equal and opposite to that of losing the pension between rounds. We can test whether the data support this by replacing our change in pension

status variable by two variables – one that indicates that the individual's household gained pension status, and one that indicates the household lost pension status.

Results from this estimation are presented in the lower panel of Table 4, where we also present tests of whether one can reject an equal and opposite effect of pension receipt and withdrawal. We find, for both men and women, that the loss of a pension between rounds of the survey is associated with a lower probability of working, and the gain of a pension with a higher probability of working. Moreover, we cannot reject these coefficients being equal and opposite in sign. The standard errors on the pension loss and gain indicator variables are quite large, however, and we cannot reject that these indicator variables are jointly equal to zero. The results in Table 4 provide modest support for a positive impact of pension receipt on men's employment. They provide no evidence to support claims that the arrival of the pension has a negative causal effect on work.

Estimates of the impact of change in pension status on migration are provided in Table 5. Both the arrival and withdrawal of an old-age pension are significantly associated with change in migrant worker status, for both men and women. On average, individuals from households that lost pension status were 8 to 9 percentage points less likely to become or remain working migrants between HSE1 and HSE2. Individuals from households that gained pension status between HSE1 and HSE2 were 3 to 5 percentage points more likely to become or remain migrants.

Change in labor migrant status can occur either because the individual returns to the DSA, or because he or she remains outside of the DSA, but stops working. In our data, between rounds of the household socioeconomic survey, household members who stopped being labor migrants split almost evenly on this: 53 percent stopped working but

remained non-resident, and 47 percent returned to the DSA. Among women migrants, the split was even closer: 51 percent of women who were reported to be labor migrants at HSE1 but not at HSE2 were still non-resident, but not working, and 49 percent had returned to the DSA. In Section 5, we present evidence that the loss of the pensioner changes labor migrant status through its effect on residency: women from households that lose a pension are significantly more likely to return to the DSA. For both women and men, we find that loss of a pension has little effect on employment status, conditional on remaining non-resident. This is discussed in detail below.

Losing pension status has a significantly larger effect on prime-aged adults' migration status than does gaining pension status. For both men and women, *F*-tests reject that the impact of losing a pension is equal and opposite in effect to that of gaining a pension. These results, by themselves, do not tell whether this arises because individuals who were labor migrants return to homesteads in the DSA after an the household stops receiving the social pension, or whether households are less likely to send new migrants when they no longer receive the pension, or both. We examine which description best fits our data in the last two panels of Table 5. In the third panel, we restrict our analysis to individuals who were labor migrants at the time of the first household socioeconomic survey (HSE1), and in the last panel, we restrict our analysis to individuals who were not labor migrants at HSE1. We find that the impact of pension loss works partially through the effect it has on reducing the probability of sending migrants, which falls by 5 percentage points for men and women when estimated jointly. More important is the effect of pension loss on reducing the probability that a current working migrant remains a working migrant, which falls by 17 percentage points.

The impact of pension loss on working migrants is significantly larger for women. Among women who were working migrants at HSE1, the probability of being a working migrant at HSE2 fell by 21 percentage points for those women whose households lost pension status between survey rounds. The decline for men, although significantly smaller, is still substantial at 13 percentage points. In the next section, we examine different hypotheses that could explain why the loss of a pension could affect migration decisions.

5. Discussion

Results in Section 4 demonstrate that the migration status of prime-aged women is more closely connected to the presence of a resident pensioner in her household in the DSA than is that of prime-aged men. This may be true for many reasons. Households may help to subsidize women migrants, and may be less able to do so upon the withdrawal of the social pension. Alternatively, it may be that when a pensioner dies, prime aged women must return to the DSA to care for their children or other household members. We explore these hypotheses by adding interaction terms to the labor migration regressions presented in Table 5.

Household socioeconomic status and pension status

Table 6 presents the results of regressions in which indicators that the household gained or lost a pension are interacted with markers that the household is of relatively high socioeconomic status (SES). We add these interaction terms in order to test whether

households of greater means are less likely to have working migrants who change their status, upon the loss of pension funds, than are other households.

We use two measures of household SES: an indicator that the household owned more than 5 assets at HSE2, which is the median number owned in the DSA (results presented in columns 1 and 3), and an indicator that at least one prime-aged member had at least a high school degree (columns 2 and 4). The main effect of either measure of SES will be absorbed in the individuals' fixed effects. Our interest is in the interaction term of SES and pension loss. Using either measure, we find that having come from a household of higher SES protects migration status for women. For women who were migrants at HSE1, those who come from lower SES households and lost pension status were 30 percentage points less likely to remain migrants than were other women migrants. Using household assets as our marker of household SES, we find that women who are working migrants from higher SES households face a much lower risk (approximately 6 percentage points: –0.288+0.225). Interaction terms for men are not statistically significant, suggesting that the mechanisms at work determining men's status as working migrants upon pension loss are different.

The decision to send migrants for work, upon the loss of a pension, is different in character from the decision to bring migrants home. The bottom panel of Table 6 demonstrates that, for both men and women, pension loss between waves of the survey reduces the probability of being sent as a migrant, while the introduction of the social pension into the household increases the probability significantly. However, the socioeconomic status of the household appears to have little effect on this process.

We explore whether it is a woman's own education that protects her status as a working migrant, upon loss of a pension, in Table 7, where we include an additional interaction term between loss of pension status and an indicator that the migrant is a high school graduate. If returns to education are higher in (say) Durban, we might expect better educated women would be less likely to leave jobs, upon loss of household pension status, than other women would. This is not the case: we find that it is the presence of having any household member with a high school degree – and not a woman's own education – that reduces the probability she will stop being a working migrant when pension status is lost.

Children left in the care of pensioners

Results in Tables 1 suggested that pensioner households have a greater number of resident children, and working migrants. These may be closely related: a woman may leave her children with a parent or grandparent, and leave to find work in the city. The death of the pensioner may unravel this arrangement, forcing working migrants back to the DSA to care for children. We examine this possibility in Table 8, where we again focus on working migrants. We find, for women migrants coming from households that contained children ages 0 to 5 at HSE1, that the loss of a pensioner significantly reduces the probability she maintains her status as a working migrant. Such women face a 16 percentage point lower probability of being observed as working migrants at HSE2. For men, the probability of maintaining working migrant status is lower (12 percentage points), but not significantly different from zero. This is worthy of further examination.

It may be that households of higher SES do not need to pull women migrants back to the DSA to care for young children. We begin to examine this in the bottom panel of Table 8, where we interact pension loss with both an indicator of children aged 0 to 5 at HSE1 and with an indicator that the household was of higher socioeconomic status. Consistent with results presented in Table 6 and 7, we find that higher socioeconomic status does help women to maintain their status as working migrants. However, it does so through its interaction with the presence of young children: women from lower SES households are more likely to lose their working migrant status when there are young children in the DSA household, but women from higher SES households are not.

Change in working migrant status

Individuals can exit working migrant status by returning to the DSA, or by remaining away from the DSA but stopping work. We investigate which of these channels is important, for working migrants who lost pension status between the rounds, in Table 9. We present results for returning to the DSA in columns 1 and 2, and for remaining non-resident but stopping work in columns 3 and 4, having carried out our estimation separately for men and women. The top panel presents results from regressions in which these outcomes are regressed on indicators that the household lost a pension between the waves, or gained a pension between the waves, controlling for change in the number of resident members and the number of days between the HSE1 survey date and the HSE2 survey date. We find, for women, that pension loss increases the probability of returning to the DSA by 27 percentage points. For men, the effect of pension loss is significant, but less than a third of the size it is for women. The result of pension loss (or gain) on the

probability that a labor migrant remains a non-resident but stops work is generally small and not significantly different from zero.

The important effect at work for labor migrant status is that women in households that lose pensions return to the DSA in large numbers. We examine this in greater detail in the bottom panel of Table 9, where indicator variables for returning to the DSA, and for remaining non-resident, but losing work, are regressed on indicators for the loss or gain of a pension, and those indicators interacted with an indicator that at HSE1 there were children aged 0 to 5 in the migrant's DSA household, and interactions between loss and gain of a pension with household socioeconomic status, here proxied by the presence of a prime-aged household member with at least a high school degree. We find, for women only, that the presence of young children have a large and significant effect on the probability that women return to the DSA upon the loss of a pension. In addition, household socioeconomic status reduces the probability that women return after pension loss.

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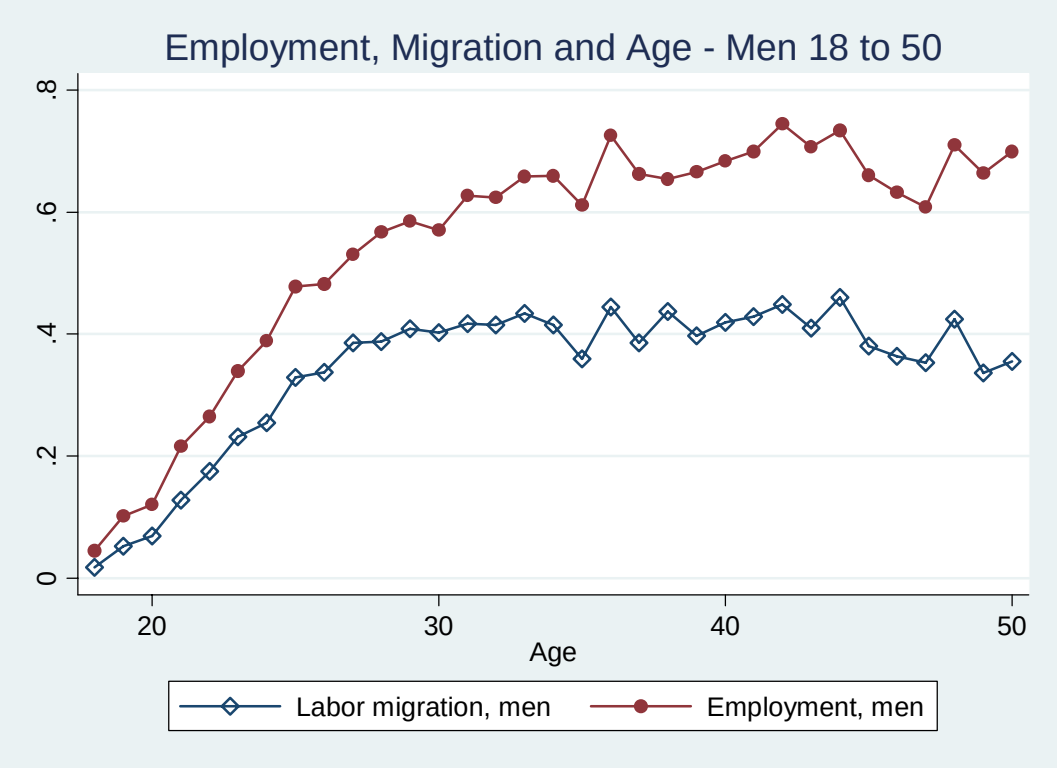
Figure 1. Age patterns in employment and migration



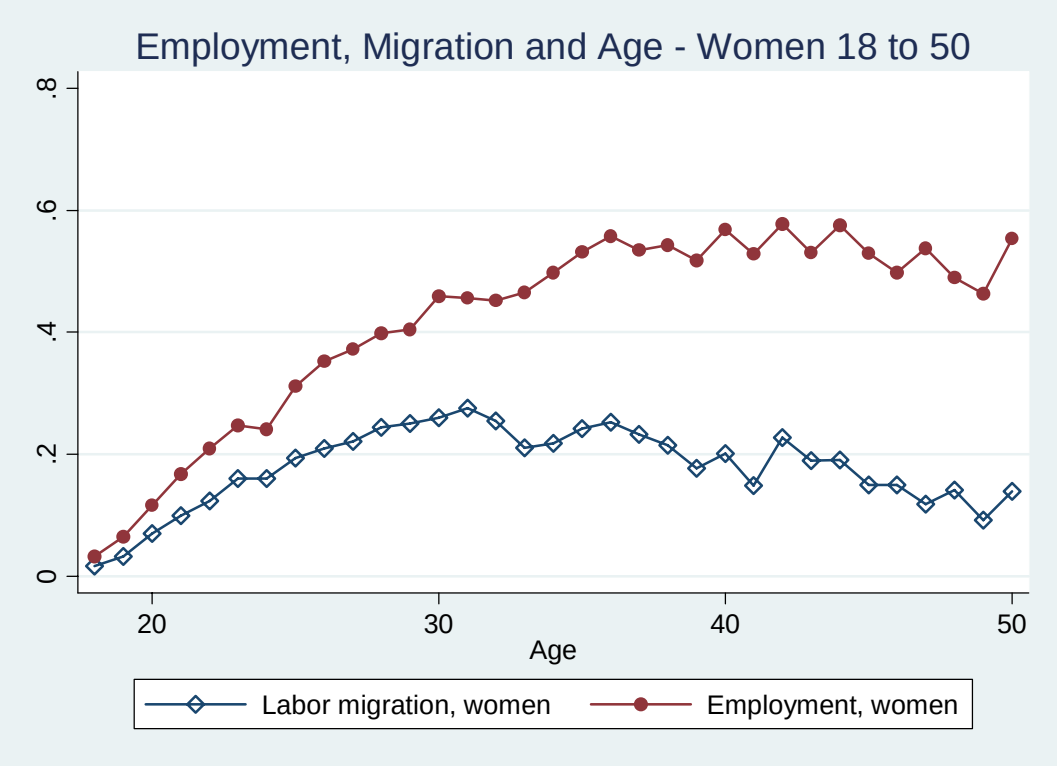
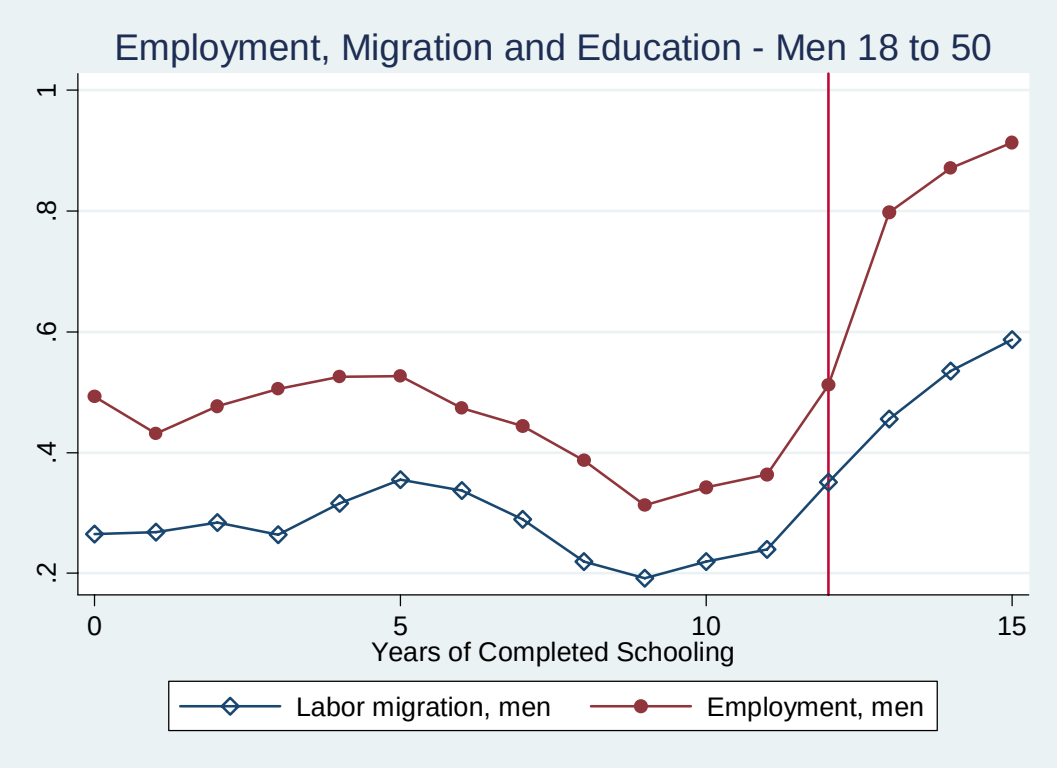


Figure 2. Education patterns in employment and migration



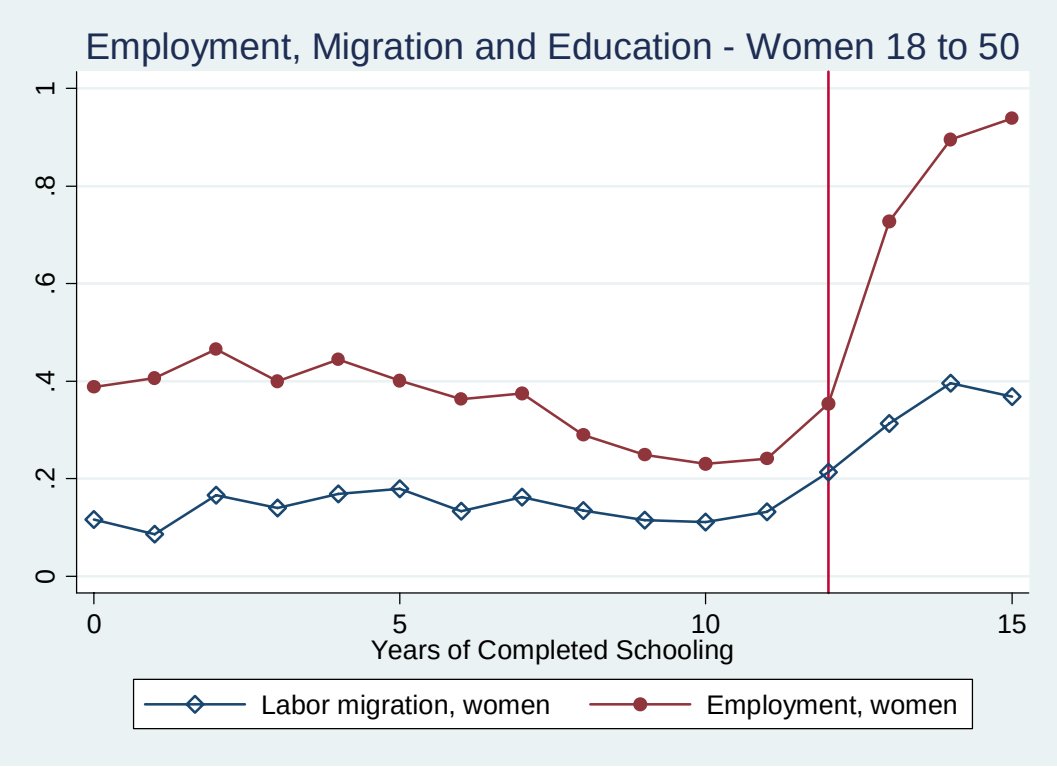


Table 1. Households characteristics in the Africa Centre Demographic Surveillance Area

	Never had a pension	Always had a pension	Lost pension status from HSE1 to HSE2	Gained pension status from HSE1 to HSE2
Number of households	5597	2594	315	498
Number of members	7.67	10.17*	8.82*	9.54*
Number of resident members	5.24	6.77*	5.21	6.43*
Residents aged 0 to 5	0.75	0.87*	0.78	0.91*
Residents aged 6 to 17	2.05	2.37*	2.03	2.24*
Residents aged 18 to 50	2.09	2.16	2.13	1.95
Residents aged 51 +	0.36	1.37*	0.27*	1.32*
Number of working migrants	0.70	1.12*	0.89*	1.10*
Number of assets	5.43	4.91*	4.70*	5.09*
Expenditure per resident member	306	180*	209*	185*
		Changes observed between HSE1 and HSE2		
Change in members	0.39	0.26*	–0.80*	0.71*
Change in resident members	0.09	–0.13*	–1.42*	0.61*
Change in resident members aged 0 to 5	–0.06	–0.14*	–0.17	0
Change in resident members aged 6 to 17	–0.01	0.02	–0.28*	0.07
Change in resident members aged 51+	0.08	–0.02*	–0.97*	0.40*
Change in number of working migrants	0.05	0.01	–0.03	0.17*
Change in assets	0.63	0.52*	0.28*	0.73

Notes. Column 1 reports means for households that did not have a resident member age-eligible for the social pension at either wave of the household socioeconomic status module (HSE1 or HSE2). Column 2 reports on households that had an age-eligible member at both waves. Column 3 reports on households that had an age-eligible member at HSE1, but not at HSE2. Column 4 reports on households that did not have an age-eligible member at HSE1 but did at HSE2. Of those households that gained a pension between the waves, 80 percent had a resident member who aged into pension age between rounds of the survey. Working migrants are household members reported to be working and non-resident in the DSA. Asterisks (*) denote that the difference between households that never had a pension and households of other types are significant at the 5 percent level.

Table 2. Adult members aged 18 to 50 at HSE2

	Never had a pension	Always had a pension	Lost pension status from HSE1 to HSE2	Gained pension status HSE1 to HSE2
Number of individuals	18072	9768	1582	1991
Female	0.54	0.50*	0.56	0.52*
Years of education	8.71	8.68	8.58	8.93*
Employed	0.41	0.41	0.39	0.39*
Working migrant	0.20	0.27*	0.19	0.27*
Resident in the DSA	0.61	0.51*	0.62	0.52*
	Changes observed between HSE1 and HSE2			
Gained employment between HSE1-HSE2	0.15	0.15	0.14	0.16
Lost employment between HSE1-HSE2	0.09	0.11*	0.09	0.10
Became a working migrant HSE1-HSE2	0.09	0.10*	0.08	0.12*
Stopped being a labor migrant HSE1-HSE2	0.05	0.07*	0.08*	0.06*

Notes. Column 1 reports means for individuals living in households that did not have a resident member age-eligible for the social pension at either wave of the household socioeconomic status module (HSE1 or HSE2). Column 2 reports on individuals in households that had an age-eligible member at both waves. Column 3 reports on individuals in households that had an age-eligible member at HSE1, but not at HSE2. Column 4 reports on individuals in households that did not have an age-eligible member at HSE1 but did at HSE2. Of those individuals represented in column 4 (gained pension, 63 percent had a resident member who aged into pension eligibility between rounds of the survey. Working migrants are household members reported to be working and non-resident in the DSA. Asterisks (*) denote that the difference between individuals in households that never had a pension and households of other types is significant at the 5 percent level.

Table 3. Employment, migration and the presence of a pensioner at HSE2

	Employment		Migration	
	Dependent variable: Employed at HSE2		Migrant working or looking for work	Migrant working
	Resident members only	All members	All members	All members
Men and women	–0.025 (0.009)	0.003 (0.008)	0.050 (0.007)	0.045 (0.006)
	n=17885	n=30884	n=30884	n=30884
Women only	–0.008 (0.012)	0.009 (0.010)	0.056 (0.009)	0.048 (0.008)
	n=10494	n=16359	n=16359	n=16359
Men only	–0.046 (0.014)	–0.005 (0.011)	0.038 (0.010)	0.037 (0.010)
	n=7391	n=14525	n=14525	n=14525

Notes. Table 3 reports the coefficients and standard errors from OLS regressions of employment (columns 1 and 2) and migration (columns 3 and 4) on an indicator that a household has a resident member of pension age. Also included in each regression are the number of resident members ages 0 to 5, 6 to 17, 18 to 50, and aged 51 and above, a complete set of indicators for the member's years of completed schooling, and a quartic in the member's age. Unobservables are clustered at the household level. The sample is restricted to household members aged 18 to 50 at HSE2. In column 1, it is further restricted to resident members only.

Table 4. The effect of change in pension status on employment

	Dependent variable: Change in employment status HSE2 – HSE1		
	All members	Women	Men
Change in household pension status HSE2 – HSE1	0.019 (0.010)	0.011 (0.013)	0.028 (0.015)
Indicator: Household lost pension status HSE2 – HSE1	–0.024 (0.015)	–0.016 (0.020)	–0.033 (0.023)
Indicator: Household gained pension status HSE2 – HSE1	0.016 (0.013)	0.008 (0.018)	0.025 (0.020)
F-test: pension loss + gain = 0 (p-value)	0.13 (.7179)	0.09 (.7621)	0.06 (.8083)
Number of observations	26548	14152	12396

Notes. Table 4 reports the coefficients and standard errors from OLS regressions of change in employment status (HSE2–HSE1) on change in the presence of a resident member age-eligible for the pension (HSE2–HSE1). Also included in each regression are the change in the number of resident members, and the number of days that elapsed between HSE1 and HSE2. The sample is restricted to household members aged 18 to 50 at HSE2.

Table 5. The effect of change in pension status on migration for work

	Dependent variable: Change in working migrant status HSE2 – HSE1		
	All members	Women	Men
Change in household pension status HSE2 – HSE1	0.060 (0.008)	0.066 (0.010)	0.050 (0.012)
Number of observations	26548	14152	12396
Indicator: Household lost pension status HSE2 – HSE1	–0.087 (0.012)	–0.091 (0.015)	–0.080 (0.019)
Indicator: Household gained pension status HSE2 – HSE1	0.038 (0.011)	0.046 (0.014)	0.029 (0.016)
F-test: pension loss + gain = 0 (p-value)	8.81 (.0030)	4.69 (.0304)	3.87 (.0491)
Number of observations	26548	14152	12396
	Change in working migrant status for those who were labor migrants at HSE1		
Indicator: Household lost pension status HSE2 – HSE1	–0.174 (0.028)	–0.205 (0.043)	–0.126 (0.037)
Indicator: Household gained pension status HSE2 – HSE1	0.006 (0.024)	0.014 (0.040)	0.002 (0.030)
Number of observations	5775	2302	3473
	Change in working migrant status for those who were not labor migrants at HSE1		
Indicator: Household lost pension status HSE2 – HSE1	–0.052 (0.011)	–0.042 (0.013)	–0.062 (0.019)
Indicator: Household gained pension status HSE2 – HSE1	0.058 (0.010)	0.065 (0.012)	0.046 (0.017)
Number of observations	20773	11850	8923

Notes. Table 5 reports the coefficients and standard errors from OLS regressions of change in working migrant status (HSE2–HSE1) on change in the presence of a resident member age-eligible for the pension (HSE2–HSE1). Also included in each regression are the change in the number of resident members, and the number of days that elapsed between HSE1 and HSE2. The sample is restricted to household members aged 18 to 50 at HSE2.

Table 6. Household socioeconomic status, pension status and migration

	Dependent variable: Change in working migrant status HSE2 – HSE1			
	Women		Men	
	Household socioeconomic status based on:			
	Assets	Educ	Assets	Educ
	Change in working migrant status for those who were labor migrants at HSE1			
Indicator: household lost pension status HSE2 – HSE1	–0.288	–0.309	–0.113	–0.186
	(0.053)	(0.062)	(0.049)	(0.065)
Pension loss × high status	0.225	0.198	–0.029	0.090
	(0.084)	(0.082)	(0.072)	(0.078)
Indicator: household gained pension status HSE2 – HSE1	0.027	0.061	–0.055	–0.051
	(0.053)	(0.071)	(0.040)	(0.055)
Pension gain × high status	–0.028	–0.054	0.122	0.071
	(0.078)	(0.084)	(0.057)	(0.064)
Number of observations	2302	2284	3473	3455
	Change in working migrant status for those who were not labor migrants at HSE1			
Indicator: household lost pension status HSE2 – HSE1	–0.046	–0.073	–0.046	–0.069
	(0.017)	(0.019)	(0.024)	(0.028)
Pension loss × high status	0.009	0.053	–0.040	0.009
	(0.025)	(0.025)	(0.037)	(0.037)
Indicator: household gained pension status HSE2 – HSE1	0.067	0.049	0.074	0.038
	(0.016)	(0.020)	(0.023)	(0.027)
Pension gain × high status	–0.004	0.025	–0.062	0.013
	(0.023)	(0.024)	(0.032)	(0.034)
Number of observations	11850	11775	8923	8852

Notes. Table 6 reports the coefficients and standard errors from OLS regressions of change in working migrant status (HSE2–HSE1) on indicators for the total loss or initial gain of a pension, and those indicators interacted with markers that the household is of high socioeconomic status. In columns 1 and 3 we use an indicator that the household owns more than 5 assets as our measure of high socioeconomic status. In columns 2 and 4, we use an indicator that someone in the household has at least a high school degree as our measure of high socioeconomic status. Also included in each regression are the change in the number of resident members, and the number of days that elapsed between HSE1 and HSE2. The sample is restricted to household members aged 18 to 50 at HSE2.

Table 7. Education, pension status and migrant status for working migrants at HSE1

	Dependent variable: Change in working migrant status HSE2 – HSE1	
	Women	Men
Indicator: household lost pension status HSE2 – HSE1	–0.334 (0.065)	–0.191 (0.068)
Pension loss × household has a high school graduate	0.208 (0.116)	0.092 (0.096)
Pension loss × migrant is a high school graduate	0.001 (0.123)	–0.016 (0.092)
Indicator: household gained pension status HSE2 – HSE1	0.071 (0.073)	–0.066 (0.057)
Pension gain × household has a high school graduate	–0.067 (0.104)	–0.007 (0.077)
Pension gain × migrant is a high school graduate	0.037 (0.097)	0.153 (0.069)
Number of observations	2131	3250

Notes. Table 7 reports the coefficients and standard errors from OLS regressions of change in working migrant status (HSE2–HSE1) on indicators for the loss or gain of pension, and those indicators interacted with an indicator that someone in the household has at least a high school degree and, separately, that the migrant has at least a high school degree. Also included in each regression are the change in the number of resident members, and the number of days that elapsed between HSE1 and HSE2. The sample is restricted to household members aged 18 to 50 at HSE2 who were working migrants at HSE1.

Table 8. Children in the DSA and the status of working migrants at HSE1

	Dependent variable: Change in working migrant status HSE2 – HSE1	
	Women	Men
Indicator: household lost pension status HSE2 – HSE1	–0.103 (0.070)	–0.052 (0.060)
Pension loss × household had children aged 0 to 5 at HSE1	–0.159 (0.085)	–0.119 (0.075)
Indicator: household gained pension status HSE2 – HSE1	0.030 (0.058)	0.019 (0.046)
Pension gain × household had children aged 0 to 5 at HSE1	–0.028 (0.077)	–0.028 (0.059)
Number of observations	2302	3473
Indicator: household lost pension status HSE2 – HSE1	–0.128 (0.093)	–0.216 (0.094)
Pension loss × household had children aged 0 to 5 at HSE1	–0.315 (0.122)	0.054 (0.129)
Pension loss × household high SES (measured by education)	0.052 (0.137)	0.275 (0.128)
Pension loss × household had children aged 0 to 5 at HSE1 × household high SES	0.262 (0.172)	–0.284 (0.160)
F-test: joint significance of all household SES and children aged 0 to 5 interactions (p-value)	2.30 (.0324)	1.52 (.1660)
Number of observations	2284	3455

Notes. The top panel of Table 8 reports the coefficients and standard errors from OLS regressions of change in working migrant status (HSE2–HSE1) on indicators for the loss or gain of pension, and those indicators interacted with an indicator that the household contained children ages 0 to 5. The bottom panel include these indicators and an indicator that someone in the household has at least a high school degree and has had a pension loss (gain) interacted with household SES and the presence of children aged 0 to 5. Also included in each regression are the change in the number of resident members, and the number of days that elapsed between HSE1 and HSE2. The sample is restricted to household members aged 18 to 50 at HSE2 who were working migrants at HSE1.

Table 9. Residency, employment and change in household pension status

	Dependent variable:			
	Working migrant at HSE1 had returned to the DSA at HSE2		Working migrant at HSE1 remained away but was reported not working at HSE2	
	Women	Men	Women	Men
Indicator: household lost pension HSE2 – HSE1	0.273 (0.034)	0.081 (0.027)	–0.076 (0.035)	0.042 (0.030)
Indicator: household gained pension HSE2 – HSE1	–0.007 (0.032)	–0.011 (0.022)	–0.008 (0.033)	0.009 (0.024)
Number of observations	2338	3540	2302	3473
Indicator: household lost pension HSE2 – HSE1	0.264 (0.063)	0.051 (0.056)	–0.068 (0.066)	0.067 (0.061)
Pension loss × household had children aged 0 to 5 at HSE1	0.153 (0.067)	0.055 (0.055)	0.032 (0.071)	0.071 (0.061)
Pension loss × high SES	–0.170 (0.064)	–0.001 (0.057)	–0.045 (0.069)	–0.107 (0.063)
***F*-test: Pension loss coefficients (*p*-value)**	**24.25 (.0000)**	**3.60 (.0129)**	**1.55 (.2004)**	**1.77 (.1516)**
Indicator: household gained pension HSE2-HSE1	–0.075 (0.068)	–0.011 (0.047)	–0.005 (0.070)	0.041 (0.052)
Pension loss × household had children aged 0 to 5 at HSE1	0.005 (0.068)	0.034 (0.043)	0.026 (0.065)	–0.001 (0.047)
Pension gain × high SES	0.086 (0.067)	–0.027 (0.047)	–0.030 (0.040)	–0.044 (0.052)
***F*-test: Pension gain coefficients (*p*-value)**	**0.60 (.6132)**	**0.40 (.7509)**	**0.17 (.9145)**	**0.28 (.8389)**
Number of observations	2317	3516	2284	3455

Notes. The top panel of Table 9 reports the coefficients and standard errors from OLS regressions of change in the status of individuals who were working migrants when observed at HSE1. These individuals can exit working migrant status by returning to the DSA (columns 1 and 2), or by remaining away but stopping work (columns 3 and 4). Indicator variables for these outcomes are regressed on indicators for the total loss or initial gain of a pension, and those indicators interacted with an indicator that at HSE1 there were children aged 0 to 5 in the migrant's DSA household, and interacted with an indicator that someone in the household has at least a high school degree. Also included in each regression are the change in the number of resident members, and the number of days that elapsed between HSE1 and HSE2. The sample is restricted to household members aged 18 to 50 at HSE2.