The role of demographic and income events in poverty dynamics: Evidence on the impact of births using South African panel data

Rocco Zizzamia, Murray Leibbrandt and David Lam [1]

1. Introduction

Poverty is an individual indicator of deprivation, and the threshold separating the poor from the non-poor is understood as the level of well-being below which an individual is unable to meet his or her basic needs. However, individuals are embedded within households, and it is largely through these household structures that resources are distributed (whether equally or not). Acknowledging this, surveys typically measure the consumption and income of households, and researchers move backwards from this to derive individual measures of well-being by making assumptions about how resources are distributed within households. In the simples case, total household consumption is divided by the number of members in a household – assuming equal demand for and distribution of resources.

Changes in per capita consumption (which may be realised as a discreet change in poverty status) could occur because of a change in the resources available to the household, or through a change in the way that a household's resources are divided, for instance, by a change in household size or composition. Since changes in aggregate poverty levels over time are determined by how much greater the poverty entry rate is than the exit rate (or vice versa), an analysis of the events which lead to changes in well-being and poverty status are of special interest to policy concerned with reducing poverty.

A rich body of work in poverty dynamics which draws heavily on Bane and Elwood's (1986) canonical contribution has been concerned largely with analysing spells of poverty and the events which are associated with these poverty spells. In much of this work, household size and composition is treated as exogenous to other events which may affect the poverty status of households. In other words, it is typically assumed that households do not respond to events which increase resources (income events) or change the demands made on resources (household events) by reconfiguring their own household composition.

[1] Rocco Zizzamia and Murray Leibbrandt work as part of the African Centre of Excellence for Inequality Research within the Southern Africa Labour and Development Research Unit at the University of Cape Town. David Lam is the Director of the Institute for Social Research at the University of Michigan.

At the same time, a small but growing literature has analysed how the living arrangements of households, such as household size and composition, may shift in response to exogenous income shocks (Hamoudi and Thomas, 2014 *inter alia*). In these cases, an analysis of the welfare effect of income events which does not take into account the endogeneity of household structure may lead to misleading conclusions.

In this paper we investigate the association between childbirth and poverty transitions, while at the same time remaining sensitive to the ways in which households may respond in order to off-set increases in the consumption burden represented by the addition of a child to a household. This includes an investigation into the endogeneity of household reconfiguration to events affecting household welfare. The birth of a child is a useful case since it is clear to see that, in the absence of household reconfiguration[2], we would expect that household size would increase by one person, and that the consumption burden of the household would increase proportionately. In the simplest case when using a per capita household consumption measure unadjusted for differences in adult versus child consumption, the introduction of an infant would be measured as a full adult equivalent increase in the consumption burden. We would expect that this increase in the consumption burden of the household would precipitate a fall into poverty for many vulnerable households situated just above the poverty line.

Using panel data from the South African National Income Dynamics Study (NIDS), which collected five waves of data between 2008 and 2017,we investigate household responses to childbirth. Exploiting the panel dimension of the data, we are able to identify women who have given birth between survey waves and to reside with their children (in the second wave). We show that households of these "recent mothers" appear to respond to the birth of a child primarily by adjusting consumption downward, often resulting in descents into poverty. However, we also show that the poverty-increasing effect of the addition of a child to a household is substantially lower than what it would have been in the absence of any mitigating household response. This suggests that households can and do avail themselves of mechanisms which allow them to cope – however inadequately – with the effect of the birth of a child on consumption.

This paper is structured as follows: In the following section we present a review of relevant literature. In the third section we discuss our data and methods. In the fourth section we use the panel

---

[2] By household reconfiguration we intend to signal any demographic change in household structure, whether this means in- or out-migration of members, deaths or other births, households splitting, or household dissolution)

data to present a descriptive picture of poverty dynamics and household structure in South Africa. The fifth section constitutes a more formal empirical investigation into the impacts of the birth of a child on consumption, among other variables. A final section concludes and offers reflection on next steps.

2. Literature review

Poverty levels remain persistently high in South Africa, at 55.5 percent in 2015 (StatsSA, 2017). However, it is probable that the dynamics of development in post-apartheid South Africa were accompanied by significant changes in terms of who constituted the poor. Indeed, the production of panel data in South Africa from the late 1990s onwards allowed researchers to show clearly that a part of the fluid socio-economic environment, post-1994, consisted of significant segments of the population escaping from poverty at the same time as others are falling into poverty (Carter and May, 2001; Woolard and Klasen, 2005; Finn and Leibbrandt, 2017; Zizzamia, Schotte and Leibbrandt, 2019). As more waves of panel data became available, it became clear that significant number of those who escaped poverty in earlier periods returned to poverty later and vica versa for those who might have fallen into poverty at a particular time. Poverty affects many more South Africans than a cross sectional analysis reveals – with frequent churning around the poverty line (Zizzamia, Schotte and Leibbrandt, 2019).

The production of panel data in South Africa have also made it possible to analyse the drivers of these poverty transitions. This corpus has shown that demographic events are very important and sometimes dominant as determinants of poverty transitions (Woolard and Klasen, 2005; Finn and Leibbrandt, 2017; Zizzamia, Schotte and Leibbrandt, 2019). Increases in household size and changes in household headship are associated strongly with descents into poverty.

In South Africa as well as internationally, much of this literature has applied variations on a simple empirical framework first derived by Bane and Ellwood (1986) which is in many ways the analytical cornerstone to the study of poverty dynamics: We first need to understand how per capita consumption is measured, and then how changes in per capita consumption (and by extension poverty status) occur through changes in consumption or changes in household size.

Poverty is typically measured at the individual level, while consumption is measured at the household level. In the developing country context, researchers calculate individual poverty in two steps: In a first step, household income/consumption is converted to a per capita figure by dividing household income/consumption by household size, according to the following equation:

$$y_{pc} = \frac{y_{hh}}{hhsize}$$

where y_{pc} is per capita income, y_{hh} is household income, and $hhsize$ is household size.[3] In a second step, an individual is classified as poor if per capita income falls below a nationally determined per capital poverty threshold. In South Africa this is set at R1,136, per capita, per month.[4]

From (1), we can see that changes in y_{pc} can be driven either by an event which changes the numerator y_{hh} or the denominator $hhsize$, or both. A change in the numerator is frequently identified as an "income" event, while a change in the denominator is identified as a "demographic" event. Understanding how poverty transitions are determined by income or demographic events allows us to better understand the sources of economic vulnerability as well as the avenues through which individuals escape poverty. These findings will also allow us to more appropriately target policies which prevent slides into poverty and which aim to facilitate poverty escapes. For instance, if rural to urban migration is an effective route out of poverty, then facilitating both migration and expanding service delivery and economic opportunity in rural areas may be an appropriate response. If employment volatility is a common route into poverty, then labour market protections for vulnerable workers may be an appropriate response. With this empirical framework in mind, we proceed to discussing the state of play in the literature on demographic determinants of poverty transitions, focussing on the empirical literature on South Africa.

Using KwaZulu-Natal Income Dynamics Study (KIDS) data, Woolard and Klasen (2005) investigate the determinants of poverty transitions between 1993 and 1998. They find that about one quarter of movements are due to demographic events, while the rest can be attributed to economic events. Amongst the latter, changes in employment are clearly dominant – a symptom of unemployment and a high degree of "churning" in the labour market.

Due to the limited geographic coverage of KIDS, these early studies are, however, constrained to analyse poverty dynamics and risk factors in a predominantly rural setting, which may not speak for South Africa as a whole. Finn and Leibbrandt (2013, 2017) and Finn et al. (2014) are the first to use nationally representative NIDS data to investigate poverty dynamics in South Africa. Like Woolard and

---

[3] While consumption can be adjusted for household economies of scale, and children counted as less than full adult equivalents, for the sake of simplicity we consider a simple per capita measure for the moment.
[4] Expressed in March 2017 Rands.

Klasen (2005), Finn and Leibbrandt (2017) find that race, household size and labour market insertion are the most important determinants of poverty status and that changes in the latter two dimensions dominate as determinants of poverty transitions. The empirical work in this paper starts by replicating this framework, now with five waves of NIDS data, and using expenditure data rather than income data. It confirms the findings of Finn and Leibbrandt (2017) for four waves.

This framework has played a crucial role, both in South Africa and internationally in surfacing the importance of demographic changes as drivers of changes in well-being. Until this was done, it had been assumed that changes in poverty status were driven overwhelmingly by changes income/consumption.

Alongside the increased application of this framework, a large literature has developed showing that household size and composition respond to changes in income and also that initial demographic changes (a birth or death in the household for example) lead to further demographic adjustments. Thus, it appears that household formation is endogenous and in a way that makes the separating out of income versus demographic events very tricky. This literature suggests, for example, that the loss of a job leads to compensating adjustments to household composition and to labour participation behaviour so that the net effect of the job loss might well be very different to the initial loss of earnings.

Thus, this endogeneity, linking income changes and demographic changes, cautions against the accuracy of the magnitudes reflected in the initial change decomposition and against the naïve use of these initial results for policy analysis. While this certainly complicates a simple message, it is important to note though, that this in no way dampens the importance of demographic change on well-being as many of these responses are demographic responses that need to be understood.

Even Bane and Ellwood's initial study recognised that this framework was only a start and moved beyond the initial accounting to explore the income and demographic drivers of spells in and out of poverty. In the work analysing the poverty impacts of a large, state old age pension, South African has its own example to illustrate the importance of this issue. Case and Deaton's (1998) early evaluation, showed that this pension had very strong poverty alleviation impacts, partly because of the prevalence of three-generation and skip-generation households which were and remain legacies of apartheid and of migrant labour. Further research by Ardington et al (2009) showed that this pension was large enough to release credit constraints that had been preventing the migration of poor, working age South Africans from a rural area. Thus, households lost migrants (and sometimes their children too) with the arrival of

the pension. However, Hamoudi and Thomas (2014) also showed that the arrival of the pension led to the arrival of those who had been living elsewhere but battling in the labour market. So, the arrival of the pension has a large initial income impact but is associated with a number of adjustments to household composition that make the actual, realised per capita income contribution much less clear.

Fortunately, the same panel data that spawned Bane and Ellwood type decompositions are also very useful in unravelling these demographic endogeneities. In this paper we use these panel data to explore the intersection of welfare and demographic changes occurring following the birth of a child. This demographic event would seem to have a simple accounting impact, but we find that the household adjustments to this birth are much more innovative.

3. Data

3.1 Welfare

This paper uses panel data from the National Income Dynamics Study (NIDS), South Africa's only nationally representative household panel study (SALDRU 2018a, 2018b, 2018c, 2018d, 2018e). NIDS began in 2008 with a sample of over 28,000 individuals in 7,300 households. It is these individuals that NIDS has followed since 2008 - literally tracking them across the length and breadth of South Africa - and it is their unfolding livelihoods that undergird the socio-economic dynamics that we address in this paper. There are currently five waves of data available spanning the nine years from 2008 to 2017, with each wave of data spaced approximately two years apart.

As our focus in this study is on poverty dynamics and household transition patterns, individuals need to be successfully tracked over at least two consecutive survey waves. In most of the analysis in this paper, we pool data from pairs of consecutive waves ($t-1$ and t), such that the analysis of changes over time represent changes between 2008 to 2010/11, 2010/11 to 2012, 2012 to 2014/15 and 2014/15 to 2017 respectively.

In line with related research in the South African context, we use expenditure rather than income as a measure of economic welfare. This requires the assumption that expenditure is a good proxy for the resources which are available to individuals and hence reflective of their overall living standards and economic wellbeing.5 Expenditure is used most often in South Africa to undertake analyses of poverty, since it is assumed that, to the extent that households are able to smooth

---

5 This is not to overlook expenditure's well-known limitations as a proxy for economic welfare. For instance, expenditure is measured at the household level, while our analysis is undertaken primarily at the individual level. This presumes that expenditure is divided equally within the household – an assumption which is almost certainly universally untrue (De Vreyer & Lambert, 2016).

consumption, expenditure is a better approximation of permanent household income.6 To facilitate comparisons across time, all monetary figures are deflated using the Stats SA consumer price index and are calibrated to March 2017.7 To convert household income and expenditure to a per capita measure, household figures are simply divided by the number of members in a household. This follows an established precedent in the South African microeconomics literature (see, in addition to work by the authors, Stats SA, 2017; Budlender, Leibbrandt and Woolard, 2015).

Recognising that income in a family of four is "stretched" further than a per capita equivalent in a single-person household, some argue that it is prudent to use an "equivalence scale" to derive an "adult-equivalent" measure of individual income/consumption which is adjusted to account for differences in the consumption needs of adults and children in a household. This can be further adjusted to consider economies of scale in larger households. However, since there is no consensus as to how to adjust for adult-equivalents and economies of scale, Deaton (1997) has suggested that the use of such scales may raise as many issues as they resolve, and their usefulness has been disputed in the South African context by Woolard and Leibbrandt (2006). Furthermore, for the specific purposes of this paper, we focus on analysing household responses to the addition of an infant to the household. By using a simple per capita measure, we effectively do not differentiate between the consumption needs of an infant and an adult. We note that treating the infant as equivalent to an adult consumer means that the arrival of an infant will be more likely to move a household into poverty than would be the case with an equivalent adult consumer adjustment. This will be important in interpreting our results below.

In this paper, households are classified as being poor versus non-poor using Statistics South Africa's upper bound poverty line (UBPL) set at R1,136 per person per month in March 2017 Rands. In addition, extreme (food) poverty refers to those households falling below Stats SA's food poverty line (FPL) set at R515. The FPL captures the level of consumption below which individuals are unable to purchase sufficient food to fulfil their caloric requirements, even if all expenditure is dedicated to food.

Panel sampling weights are used to correct for the presence of non-random panel attrition in NIDS. Of the 26,775 sample members who were successfully interviewed in 2008, 15,673 were re-interviewed in all four subsequent waves, giving an attrition rate for the balanced panel of 41.47 per

---

6 The total expenditure variable is simply the aggregation of rental, food, and non-food expenditures, with imputations for missing values and imputed rent for owner-occupied housing (see Finn, Franklin, Keswell, Leibbrandt, & Levinsohn, 2009).

7 To adjust for inflation, for each line the food component (equal to the FPL) is inflated by using the food specific Stats SA CPI and the non-food component (equal to the difference between the FPL and the UBPL) is inflated by using the non-food specific Stats SA CPI.

cent. However, between-wave attrition, which is most important in this study, is substantially lower, ranging from 9.3 to 21.1 per cent. This is because it is fairly common that respondents who are missed in one wave are successfully contacted again in the next. We refer interested readers to Schotte et al., (2017) and Schotte et al., (2018) for further details on the construction of weights.

3.2 Demographics

A major focus in this paper is on the demographics of household composition, size, and change. It should be noted at the outset that NIDS is a panel of individuals and not households. All those individuals interviewed in the first wave (2008) remain in the panel as "Continuing Sample Members" (CSMs). In subsequent waves, all household members of CSMs, whether they are themselves CSMs or whether they are new sample members are interviewed. However, only CSMs are tracked in subsequent years, and all sample members co-resident with CSMs but not observed in 2008 are identified as "Temporary Sample Members". Children of CSMs, do, however, join the panel as CSMs themselves. We limit our analysis to CSMs, though clearly the analysis of the households of CSMs will include information in TSMs.

Regardless of the structure of these data, it is worth reflecting on the difficult philosophical question of what it would mean for a household to persist over time. Perhaps the simplest case might be that of a nuclear family-unit household which does not change in size or composition over a given time period. It would be straightforward to follow this household and identify it as the same household at two points in time. However, the nuclear family household is not the norm in South Africa, certainly among the African population (Du Toit and Neves, 2011). Rather, African households are fluid, ill-defined and spatially stretched. Distinctions between extended family and kin networks and the household unit are blurry. Because of this, the notion of following a household unit over time is not only practically unfeasible, but may be of limited value in these cases in which family and kin networks are just as important as spaces in which resources are distributed and agency is exercised.

An individual's role and bargaining power in both households and extended kin networks is determined by events which affect him or her, as well as other members of these networks. When analysing an event such as childbirth, it is not immediately apparent why it would be desirable – either practically or theoretically – to try follow the household over time. Rather, the approach that we take is that childbirth is an event which affects, in the first instance, the mother and child, and only indirectly, mediated by kin and household ties, other household members. Crucially, these kin and household ties are not fixed, but are determined by the balance of a household member's needs and resource

contributions. Of immediate interest, then, are the changes to the mother which are associated with childbirth – where these changes include shifts in household composition. This household reconfiguration may reflect changes in the demands and or bargaining power of the mother following the birth of a child. The fact that NIDS provides us with a detailed picture of the individual's household at each wave means that we are better equipped than usual to see the impact of childbirth on an individual's migration / household reconfiguration response.

A key variable used in the analysis below will be women who we have identified as mothers of recently born children, defined as mothers who co-reside with a biological child under the age of two who could not be found and matched to the mother in the previous survey wave. In other words, these are mothers of children who we can be confident were born between survey waves. We will refer to these women as "recent mothers." We will also analyse women who had their first birth between panel waves, who we will refer to as "recent first-time mothers." Occasionally we compare these women to a comparison group. The comparison group is defined as coloured or African women who are between 17 and 41 years of age, who have not had a child born during the previous two years.

In addition, in order to analyse the distribution of membership of household types, and transitions between types, we have developed a typology of household types in which each individual in each of NIDS's five survey waves is exhaustively classified. Transitions between household types using this classification schema are tied to the individual panel member's household membership (again, since individuals are tracked, not households).

We developed this classification schema in four stages: First, four broad household types were defined on the basis of the marital status of the household head: Married, co-habiting with a partner but not married, widowed, and single parent. Second, we subdivided each of these broad household types into households without children, those containing children, those without children but containing additional adults except the household head or his/her spouse or partner, and those households containing both additional adults and children. In households containing children, no distinction is made between households with differing numbers of children. Third, we created a separate category for households containing only adults receiving pensions – either state old age pensions or private pensions. This category was further subdivided into those pensioner-headed households without children and those with children. Finally, a residual "Other household" category was defined containing all those individuals in households not described by the above schema. In those cases in which we are only

interested in the household transitions of women with children, we use a version of the above typology which does not distinguish between households with children and those without.

3.3 Caveats

Before moving on to the analysis, it is important to briefly highlight some of the limitations of the data at hand. The 2008 sample was drawn on a nationally representative basis and the poverty headcount (UBPL) calculated from these data based on per capita household expenditure closely matches official statistics. However, the poverty trends observed over subsequent waves should be treated with caution (see

Table). Using household expenditure, poverty increased in NIDS up to 2010/11, with a remarkable rise by five percentage points in the share of households being pushed below the food poverty line. From 2010/11 to 2014/15, poverty levels decreased, with the strongest fall observed from 2012 to 2014/15. This general trend is consistent across key variables and robust across subsamples (a similar pattern emerges when restricting the sample to respondents that were successfully interviewed in all five waves). However, the strong reduction in poverty over the last two years of NIDS in particular may raise doubts, given that it was not mirrored by a major event at the macro-level and it does not match with the official statistics on poverty trends as reported by Stats SA in 2017 (see

Table).[8] There are thus good reasons to believe that the poverty dynamics observed in NIDS are not fully representative at the national level but rather apply to a certain sub-population that was somewhat more likely to be upwardly mobile.[9] This may be a consequence of differential attrition. Nevertheless, our estimates can still offer important information on the household characteristics and events associated with movements into and out of poverty. It is important to note that our estimates of the chances of poverty exit should thus be treated as an upper bound. In other words, poverty will tend to be yet more persistent at the national level than what we are recording here. Additionally, Table A1 in the appendix compares differences in poverty incidence and mean expenditure between the NIDS panel and NIDS cross-sections – illustrating that poverty rates in the balanced panel are slightly lower than in the NIDS cross-sections.

[Table 1 here]

---

[8] Please note that by using a panel of pooled wave-to-wave transitions, we attempt to limit the influence of the last two survey waves.
[9] We are grateful to Victor Sulla and Kanishka Kacker for pointing this out.

4. Poverty dynamics and demographics in South Africa

4.1. Poverty dynamics

As shown in Table 1 above, South Africa's poverty headcount ratio is high for a middle-income country. However, these cross-sectional snapshots reveal nothing about the extent of economic mobility which is constantly moving individuals into and out of poverty (Zizzamia, Schotte and Leibbrandt, 2019; Finn and Leibbrandt, 2017).

Fortunately, the availability of household panel data in South Africa permits us to observe the frequency and correlates of poverty transitions. In Figure 1, we do this by dividing the population into six groups according to the number of periods in which individuals are observed to be poor (Bane and Ellwood, 1983). We then compare these dynamic patterns of poverty across several demographic groupings (race, gender, education and location). For the total population, we find that only a small portion (14.7 per cent) remained consistently non-poor through the five waves of NIDS. In contrast, 36.1 per cent of all panel members remained consistently below the poverty line in all five waves, with an additional 21.3 per cent being poor in four out of five waves.

These patterns differ dramatically according to demographic and geographic criteria: Black South Africans, those living in rural areas, in female headed households and those with low levels of education are substantially more likely to experience poverty as a state that persists over time compared to urban households, whites, those with secondary or tertiary education or those in male headed households.

[Figure 1 here]

Describing the extent and the correlates of these dynamics is a valuable exercise (see Zizzamia, Schotte and Leibbrandt, 2019) but is limited as long as an analysis of the *events* which determine transitions is absent. However, if household living arrangements respond to events which affect household welfare, understanding these household responses will be crucial in an analysis of poverty trigger events. Some background on South African households will be necessary.

4.2. South African households

As discussed above, the concept of the nuclear family-unit household has limited relevance in the South African context of spatially extended and fluidly composed households, especially among the African population. The role of kin-based networks in determining household structure is important, yet remains obscure within traditional survey methods. At the same time, white South African households

display characteristics which on average conform much more closely to the nuclear-family household model. These differences are evident in Figures 2 and 3 below. Using pooled NIDS data for all available waves, Figure 2 displays trends in household size by age, and Figure 3 displays trends in the number of children in households by age. In Figure 2 we see that the top lines, representing household size for African and coloured respondents, is consistently above the line representing household size for white respondents. Until approximately the mid-50s, white individuals reside in households averaging four members, and this drops off steeply to settle at two members during retirement. Figure 3 reveals some of the demographic dynamics underlying this: The average white child lives in a household with one other child and moves out of home by about age 20. As these young adults form their own households, fertility rises between the early 20s and late 30s and leads to a steady rise in the number of children per household for adult whites. As white adults age and children move out, the number of children steadily declines until age 60, at which point the average number of children in a household is close to zero.

Trends for African and coloured respondents are markedly different. The first thing to note is that average household size of African and coloured households is consistently above five members. There is a steady decline in household size associated with higher age, with, however, a modest but notable *increase* in household size at age 60. While retirement coincides with a steep drop in household size for white respondents, household size for African respondents *increases* at retirement. As others have shown (Hamoudi and Thomas, 2014, inter alia), this increase is a consequence of household living arrangements responding to the roll-out of the old age-pension at the age of eligibility.

These dynamics are again understood better when analysing Figure 3. African children co-reside with an average of 2.6 other children. Unlike white respondents who in their early adult-hood do not co-reside with any other children, African respondents co-reside with an average of over two children for their entire adult lives, with an expected small increase in the average number of children at retirement age. The striking stability of the number of children in African and coloured households can be explained by a number of factors: First, African and coloured women have children earlier than White women – meaning that the one child decrease which occurs when a child turns 18, will often be compensated by the addition of a child. Second, unlike White adults, it seems that African and coloured adults co-reside with children who are not their own biological children – again pointing at the more complex non-nuclear structure which characterises African and coloured households.

[Figure 2 and 3 here]

Another perspective on household structure in South Africa is given by analysing the distribution of individuals across the household typology introduced in the previous section. According to this typology, households are sorted based on the relationship status of the household head, and the composition of households in terms of the presence of adults apart form the head and her/his partner (for our purposes termed "additional adults"), and the presence of children. The distribution of NIDS respondents in household types is presented in Table 2 below. It should be noted that this is the distribution of *individuals* across household types, and not the share of total households belonging to various types. We see that most individuals in the NIDS sample are concentrated in households where both children and additional adults are present – a crude indicator for non-nuclear households. Only 6.11 percent of individuals are in married couple households with children and no additional adults.

[Table 2 here]

Exploiting the panel dimension of NIDS data, we are able to track movements of individual respondents between household types. Table 3 is a summary table of the full household-type transition matrix. In it, we present two sets of statistics. In the first column we report the percentage of individuals who were in a given household type who remained stably in this household type between survey waves. Note that these may include individuals who have changed *actual* households entirely, but have remained in the same *type* of household. The second column lists the household type into which those who did change household types between survey waves are most likely to have transitioned into. For instance, of those individuals who lived in a married couple-only household in a given period and *did* not remain in a married couple-only household in a subsequent period, the majority transitioned into a "married couple with other adults" household. The final column reports the percentage of those from an origin household type were observed to be in the "most likely" destination household type. For instance, of those individuals who lived in a married couple-only household in n initial period, 12.9 percent moved into a "married couple with other adults" household in a subsequent period.

Table 3 illustrates that, apart from individuals in "Married-head" households, there is a remarkable degree of movement between household types. For individuals in most household types, more than half had transitioned household type between waves. Even those household types which appear more stable (such as "Single adult & child(ren) & other adult(s)" and "Widow& child(ren) & other adult(s)") are generally household types which are large enough that there may be a lot of household reconfiguration which occurs without an observed change in household type. For instance, a single-mother-headed household with other adults and children may lose and gain several children and adults

without however changing its household type classification. As expected, most movements between household types maintain the household head's relationship status. These household type transitions are most often driven by the addition or loss of children or adults, rather than a change in the relationship status of the household head.

[Table 3 here]

South African households are complex and fluid. The statistical indications of both this complexity and the extent of household instability however, provide few clues as to what might be determining this household fluidity, or what effects this fluidity has on individual welfare. In the following section we turn to examine how fertility is related to household reconfiguration and how the intersection of these events determine changes in individual welfare.

5. Poverty, household dynamics, and the arrival of children

All things being equal, we would expect that a birth in a household would increase household size by 1, and decrease per capita consumption. This decrease in consumption per capita would lead to a descent into poverty for households who were close to the poverty line prior to the birth of the child. We might also expect that recent mothers withdraw from the labour market in order to provide care work for their child.

Drawing on the Bane and Ellwood (1986) approach, we can use trigger event analysis to try to understand the determinants of vulnerability to poverty and the routes through which the poor escape poverty. While this approach does not allow us to give a causal interpretation to the impact of these events, it does permit us to understand something of the strength and nature of the association between various events and poverty transitions. The results from this analysis are reported in Table 4 below.

The trigger events listed in Table 4 are split between labour market events, non-labour market income events, and demographic events. For each event, in the first column of the respective tables we report the prevalence with which the event occurred for the initially non-poor.

In the second column of each table, we report the poverty entry rate, conditional on event occurrence - that is, the poverty entry rate among the subset of the population which experienced the trigger event in question. This can be compared to the unrestricted sample's poverty entry rate of 23.1 per cent, as reported in the second column of the two tables. The final column in Table 5 indicates the proportion of total poverty entries which are associated with particular events. These figures are jointly

determined by those reported in columns 1 and 2: The total share of poverty entries associated with an event will be a function of how frequently an event occurs, and how often it leads to a poverty descent when it does occur.

These results are useful for getting a sense of the importance of various events in determining poverty transitions. An increase in household size, for instance, is associated with approximately half of all poverty entries. The addition of a young child to the household is associated with one third of all poverty entries. Of those individuals who gain a young child in their households between periods, 44.66 per cent descent into poverty. At first glance, this suggests, perhaps not unexpectedly, that child birth is strongly associated with vulnerability to poverty.

[Table 4 here]

However, there is still reason to be cautious of accepting the meaningfulness of these associations: First, the associational analysis reported in Table 4 fails to take into account that the strength of associations between various events and poverty entries may be confounded by factors which the associational analysis fails to account for. Second, the expectation that a birth in a household would lead to an increased vulnerability to poverty may be most realistic in the context of clearly defined and stable nuclear-family household units. The fact that this household structure fails to accurately describe the majority of South African households suggests that we ought to be open to different and heterogeneous household responses to the birth of a child.

Table 5, for instance, shows that recent mothers are highly likely to have transitioned between household types after having had a child. The possibility that some of these transitions may be driven by the arrival of a child is non-trivial, and the effect that child-birth motivated household reconfiguration has on individual welfare is not clear, a priori.

[Table 5 here]

Table 6 reports changes across a number of variables for recent mothers, comparing the period prior to childbirth to the period following childbirth. In the same table, these changes are compared to those observed in a comparison group.

The leftmost column in Table 6 lists variables of interest: Individual-level variables include: poverty status, per capita consumption, individual earnings, employment status (dummy variable where employed = 1), level of education, age, and household head status (dummy variable where household head = 1). Household level variables include household size, number of children in the household,

number of women in the household, number of men in the household, number of pension recipients, household income from government grants, and a dummy for being an urban resident.

The second column presents averages for all of these variables for the sub-sample of "recent mothers". Recent mothers are observed in two periods – the period prior to the birth of their child (t-1), and in the subsequent period in which they co-reside with their biological child (t). Statistics are presented for both of these periods, allowing us to observe the change in outcomes of interest which is associated with the birth of a child. In the final column, averages are reported for a "comparison group". Averages for the comparison group are reported in both time *t-1* and time *t* – allowing us to compare changes between *t-1* and *t* for both recent mothers and the comparison group. Statistics for both recent mothers and the comparison group are restricted to coloured or African women who are between 17 and 41 years of age – that is, of child-bearing age. The comparison group is only distinguished from the recent mothers in that they have not had a child in the prior two years.

Table 6 shows that the birth of a child is associated with increasing poverty rates and decreased per capita expenditure among recent mothers. These changes are especially stark when compared to the increases in consumption and decreases in poverty among the comparison group. Interestingly, there appears to be a substantial decrease in individual earnings of recent mothers, even while their employment rate appears to have remained stable. We might expect that recent mothers withdraw from the labour market to look after children, while in fact we observe little change in employment, but evidence that recent mothers may be willing to work for less. Table 6 provides some clues in this regard – on average, recent mothers co-reside with over two other women in the household as well as a pensioner. This may indicate that the care responsibilities that come along with a child might be shared by several women, thereby to some extent facilitating labour market insertion of recent mothers. It is also noteworthy that, while household size does increase substantially (from an already large base of 5.6 people), it does not increase neatly by 1 person. Rather, the increase is of 0.7 members – which is accounted for by the 0.7 child increase in the number of children per household. Income from government grants increase accordingly – though only by about half of the amount of a child support grant. Finally, there appears to be a small but striking decrease in the percentage of recent mothers who reside in urban areas. Unlike the comparison group, which becomes on average *more* urban, the trend among recent mothers appears to move in the opposite direction. Migration (back) to rural areas may be motivated by seeking childcare, as suggested by Du Toit and Neves (2009).

[Table 6 here]

It is also worth exploring to what extent the aggregate patterns reported in Table 6 are the result of recent mothers having their first child, or mothers who have had children in the past having an additional child. In other words, to what extend is the aggregate effect associated with the addition of a child, versus the change in status from woman without children to being a mother. Table 7 explores this issue by reporting the same statistics in Table 6 separately for recent first-time mothers, and for recent non-first-time mothers. Recent first time mothers are defined as women who co-reside with a biological child under the age of two, and where this biological child is their first child. Recent non-first-time mothers are defined as women who co-reside with a biological child under the age of two, where this biological child is not their first child.

Table 7 shows that the association between childbirth and poverty is fairly similar for recent first-time mothers and recent non-first-time mothers. However, first-time mothers are more likely to have gained employment after child-birth (though from a low base) than non-first-time mothers, who on average decrease their employment rate. Demographic changes between first-time mothers and non-first-time mothers are also noteworthy – the increase in the number of children and members per household for first-time mothers is substantially smaller than for non-first-time mothers. First-time mothers experience an increase in the number of children per household of only 0.5, compared to 0.9 for non-first-time mothers. In both cases, on average there are already about 2.5 children per household in *t-1.* These findings suggest that household reconfiguration in response to childbirth may be more responsive to the "motherhood" effect than to the "child effect" – i.e. of having a first child versus having an additional child after the first.

[Table 7 here]

We also use the household typology described previously to compare changes in the standard set of outcome variables between recent mothers who changed household types and those who remained in the same household type between periods (where household types are defined as above, for instance as in Table 3). The intention here is that we would expect that those women who changed household types presumably map well (though imperfectly) onto the set of women who changed their household configuration following the birth of a child. Similarly, those who remained in the same household type between periods presumably map well onto the set of women who did not undergo household reconfiguration following the birth of a child. While changes in poverty, consumption, and employment are roughly similar for those who changed household type and those who did not, it is interesting to note that those who di change household type experience a smaller increase in household

size than those who remain in the same household type – an increase of only 0.5 compared to 0.9. It appears that those who transition households are being sorted into smaller households, on average. It also seems that the decrease in the proportion of recent mothers in urban areas is also driven by those who transition households.

[Table 9 here]

In Table 8, we exploit the panel dimension of the NIDS data to test whether the above observations persist in a multivariate model. To do so, we first define several outcome variables (top row of Table 8) as changes between *t-1* and *t*. For instance, change in consumption is defined as consumption in *t* minus consumption in *t-1*, so that if consumption increases, the change variable will be positive. The explanatory variable of interest is a dummy variable which is equal to one if an individual is identified as a recent mother, and zero otherwise. We also distinguish between first-time recent mothers and non-first-time recent mothers in the final rows. Control variables are defined in *t-1*, and include age, an African race dummy, education, geographical location, province, and year dummies. In addition, the lagged dependant variables household size and per capita household expenditure are included. The sample is restricted to African and coloured women between the age of 17 and 41 in *t*. Panel weights are used to correct design weights for differential attrition.

Table 8 provides further support for the findings we report above. Childbirth is associated with an increase in poverty, a decrease in consumption, a decrease in wages, and an increase in household size of approximately one person. However, it is worth noting that the less-than-one increases in children / members per household discussed above are not as clearly present in these regression results. This will be a finding that requires further investigation.

[Table 8 here]

Summing up, it seems that households respond to the birth of a child by adjusting consumption downward, in many cases leading to a descent into poverty among initially vulnerable households. However, there is also evidence of other household responses, including household reconfiguration, urban to rural migration, and an increased attachment to the labour market. Presumably, these other responses are intended to mitigate the increase in the consumption burden imposed by the arrival of a child. Because of this, perhaps another revealing way of analysing the relationship between childbirth and household poverty is not to compare the consumption and poverty rates of recent mothers to a period prior to the birth of a child, but to compare the *observed* poverty and consumption of recent mothers after having had a child to the *simulated* poverty and consumption of recent mothers under a

strict *ceteris paribus* assumption. That is, by assuming that households do not respond to the birth of a child by undergoing a process of household reconfiguration or by increasing total consumption, we simulate the effect that childbirth would have on poverty and consumption in the absence of such responses. We do this simply by keeping consumption between *t-1* and *t* constant, and increasing household size in *t-1* by one person. Thus, according to the following equation, we derive a simulated per capita consumption figure for *t* under a *ceteris paribus* assumption.

$$ysimul_{pc}^{t} = \frac{y_{hh}^{t-1}}{hhsize^{t-1} + 1}$$

(2)

This approach allows us to understand something of the effectiveness of household responses to childbirth, having separated these out from the strategy of simply adjusting consumption downwards. Table 10 below shows that, while there is a large increase in poverty and a decrease in consumption among recent mothers between *t-1* and *t*, these changes would have been far more severe had households not been at least partly able to off-set the increase in the consumption burden represented by the addition of a child.

 [Table 10 here]

Kernel density plots allow us to understand in greater detail changes between *t-1* and *t* across the distribution. Figure 4a demonstrates that there is a generalised shift to the left in the kernel density plot of recent mothers – indicating an increased concentration of households in poverty. Figure 4b presents the same plots for the comparison group, illustrating that changes occurred in the opposite direction across the distribution – a poverty-decreasing rightward shift.

[Figures 4]

However, as in Table 10, we can also compare the observed distribution of consumption in *t* for recent mothers to the simulated distribution of consumption for recent mothers under a *ceteris paribus* assumption. In Figure 5 we see that, compared to the simulated distribution, there is evidence that households are able, to a limited extent, to off-set effect of childbirth on poverty.

[Figure 5 here]

While there is thus evidence both that childbirth does have a poverty-increasing effect, there is also evidence that households are able to at least partly mitigate this effect. Understanding *how* households are able to do this will need to be explored in future research on this topic.

6. Conclusion

The birth of a child is a demographic event to which households are forced to respond. If there is not increase in income which offsets the consumption burden a child represents and if the household remains intact and otherwise unchanged, the household would have to respond by adjusting per capita consumption downwards. We would therefore expect that the increase in the household consumption burden represented by the arrival of a child would increase household vulnerability to poverty.

In this paper we provide evidence that, in the South African context, childbirth does have a substantial poverty-increasing effect on the mothers of new-borns. It appears that recent mothers do respond to the addition of a child in the household by adjusting consumption downward. At the same time, there is evidence that other co-occurring events offset this consumption-decreasing effect. Part of this can be explained by the provision of child-support grants to recent mothers, while it is possible that household reconfiguration also has a role to play.

Comparing the observed distribution of consumption of recent mothers in time *t* to a simulated consumption distribution (generated under the assumption that households respond to child-birth *only* by adjusting consumption downwards), we find that households are at least partly effective in off-setting the effect of childbirth on poverty. However, which households are most effective in off-setting these effects and by what means is not obvious, and will need to be investigated. Analogously, which households are least able to off-set the effects of childbirth on poverty is also not clear, and remains an important topic for further investigation.

7. Bibliography

Ardington, C., Case, A., & Hosegood, V. (2009). Labor supply responses to large social transfers: Longitudinal evidence from South Africa. *American economic journal: Applied economics*, *1*(1), 22-48.

Bane, M. J., & Ellwood, D. T. (1986). Slipping into and out of Poverty: The Dynamics of Spells. *Journal of Human Resources*, 1-23.

Budlender, J., Leibbrandt, M. and Woolard, I.(2015). *South African poverty lines: a review and two new money-metric thresholds* (SALDRU Working Paper 151). Cape Town: Southern Africa Labour and Development Research Unit

Carter, M. R., & May, J. (2001). One Kind of Freedom: Poverty Dynamics in Post-apartheid South Africa. *World Development*, *29*(12), 1987–2006

Case, A. and Deaton, A. (1998), Large Cash Transfers to the Elderly in South Africa. The Economic Journal, 108: 1330-1361.

De Vreyer, P. & Lambert, S. (2017, March). *Intrahousehold inequalities and poverty in Senegal*. Paper presented at the Centre for the Study of African Economies Conference, Oxford, U.K.

Deaton, A. (1997). *The analysis of household surveys: a microeconometric approach to development policy.* Washington D.C.: World Bank Publications.

Finn, A., Franklin, S., Keswell, M., Leibbrandt, M., & Levinsohn, J. (2009). Expenditure: Report on NIDS Wave 1. *National Income Dynamics Study Technical Paper*, *4*.

Finn, A., & Leibbrandt, M. (2017). T*he dynamics of poverty in the first four waves of NIDS*. SALDRU Working Paper Number 174/ NIDS Discussion Paper 2016/1. Cape Town, South Africa: Southern Africa Labour and Development Research Unit (SALDRU), University of Cape Town.

Hamoudi, A., & Thomas, D. (2014). Endogenous coresidence and program incidence: South Africa's old age pension. *Journal of development economics*, *109*, 30-37.

SALDRU (2018a). National Income Dynamics Study 2008, Wave 1 [dataset]. Version 5.3. Cape Town: SALDRU [producer],Cape Town: DataFirst [distributor].

SALDRU (2018b). National Income Dynamics Study 2010-2011, Wave 2 [dataset]. Version 2.3. Cape Town: SALDRU [producer], Cape Town: DataFirst [distributor].

SALDRU (2018c). National Income Dynamics Study 2012, Wave 3 [dataset]. Version 1.3. Cape Town: SALDRU [producer], Cape Town: DataFirst [distributor].

SALDRU (2018d). National Income Dynamics Study 2014-2015, Wave 4 [dataset]. Version 1.0. Cape Town: SALDRU [producer], Cape Town: DataFirst [distributor], Pretoria: Department of Planning Monitoring and Evaluation [commissioner].

SALDRU (2018d). National Income Dynamics Study 2014-2015, Wave 4 [dataset]. Version 1.0. Cape Town: SALDRU [producer], Cape Town: DataFirst [distributor], Pretoria: Department of Planning Monitoring and Evaluation [commissioner].

SALDRU (2018e). National Income Dynamics Study 2017, Wave 5 [dataset]. Version 1.0.0 Pretoria: Department of Planning, Monitoring, and Evaluation [funding agency]. Cape Town: Southern Africa Labour and Development Research Unit [implementer], Cape Town: DataFirst [distributor].

Statistics South Africa (2017). *Poverty trends in South Africa: An examination of absolute poverty between 2006 and 2015.* Report No. 03-10-06. Pretoria: Statistics South Africa.

Woolard, I., & Klasen, S. (2005). Determinants of income mobility and household poverty dynamics in South Africa. *Journal of Development Studies*, 41(5), 865-897.

Woolard, I., & Leibbrandt, M. (2006). *Towards a poverty line for South Africa: Background note.* Southern Africa Labour and Development Research Unit Background Note. Cape Town: SALDRU, University of Cape Town.

Zizzamia, R., Schotte, S., Leibbrandt, M. (2019). Snakes and Ladders and Loaded Dice: Poverty dynamics and inequality in South Africa between 2008-2017. Cape Town: SALDRU, UCT. (SALDRU Working Paper Number 235, Version 1/ NIDS Discussion Paper 2019/2).

Tables:

Table 1: Poverty rates (%) for South Africa, 2008-2017

Poverty Line (PL)	NIDS					Stats SA (2017)				
	2008	**2010/11**	**2012**	**2014/15**	**2017**	**2006**	**2009**	**2011**	**2015**	**2017**
Poor (<UBPL)	61.96	65.69	63.82	56.88	52.23	66.6	62.1	53.2	55.5	..
Food-poor (<FPL)	36.34	42.00	37.82	30.38	24.71	28.4	33.5	21.4	25.2	..

Source: StatsSA (2017) and authors' calculations using NIDS waves 1 to 5 (post-stratified weights applied).

Table 2: Percentage of all individuals in the NIDS sample falling into various household types (2008-2017)

	Household composition				
	No additional members	**includes children**	**includes additional adults**	**includes children & additional adults**	**Total**
Married	1.55	6.11	2.58	21.17	31.41
Cohabit	0.69	2.77	0.4	3.32	7.18
Widow	0.22	0.59	2.21	14.16	17.18
Single	2.92	2.9	3.65	18.63	28.1
	Without children	**With children**			
Pensioner-headed household	0.63	0.45			1.08
Other	15.02				15.02
				Total	*100*
				no. of individuals	*164,421*

Household type (row axis label)

Notes:

a) This classification schema is developed in four stages: First, four broad household types were defined on the basis of the marital status of the household head: Married, co-habiting with a partner but not married, widowed, and single parent. Second, we subdivided each of these broad household types into households without children, those containing children, those without children but containing additional adults except the household head or his/her spouse or partner, and those households containing both additional adults and children. In households containing children, no distinction is made between households with differing numbers of children. Third, we created a separate category for households containing only adults receiving pensions – either state old age pensions or private pensions. This category was further subdivided into those pensioner-headed households without children and those with children. Finally, a residual "Other household" category was defined containing all those individuals in households not described by the above schema.

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Table 3: Transition matrix summary: Individual household type stability and most likely transition destinations

	% of individuals stably in given household type	Individual most likely to transition to:	with % probability
Married couple	64.03%	*Married couple & other adults adult(s)*	12.93%
Married couple & child(ren)	65.34%	*Married couple & child(ren) & other adult(s)*	13.31%
Married couple & other adults adult(s)	49.68%	*Married couple & child(ren) & other adult(s)*	25.40%
Married couple & child(ren) & other adult(s)	71.55%	*Married couple & child(ren)*	10.39%
Cohabiting couple	45.35%	*Single adult*	15.08%
Cohabiting couple with child(ren)	48.25%	*Single adult & child(ren) & other adult(s)*	7.14%
Cohabiting couple & other adult(s)	28.72%	*Cohabiting couple & child(ren) & other adult(s)*	16.24%
Cohabiting couple & child(ren) & other adult(s)	51.18%	*Cohabiting couple with child(ren)*	13.71%
Single widow(er)	36.60%	*Widow & other adult(s)*	27.26%
Widow(er) & child(ren)	33.10%	*Widow& child(ren) & other adult(s)*	23.20%
Widow & other adult(s)	40.12%	*Widow& child(ren) & other adult(s)*	17.37%
Widow& child(ren) & other adult(s)	58.66%	*Single adult & child(ren) & other adult(s)*	15.91%
Single adult	59.77%	*Single adult & other adult(s)*	9.73%
Single adult & child(ren)	43.85%	*Single adult & child(ren) & other adult(s)*	22.71%
Single adult & other adult(s)	45.10%	*Single adult & child(ren) & other adult(s)*	15.61%
Single adult & child(ren) & other adult(s)	57.80%	*Widow& child(ren) & other adult(s)*	13.53%
Pensioner(s) only	84.93%	*Widow & other adult(s)*	4.84%
Pensioner(s) & child(ren)	53.09%	*Widow& child(ren) & other adult(s)*	18.86%
Other	30.46%	*Married couple & child(ren) & other adult(s)*	14.30%

Notes:

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Table 4: Trigger events and poverty entry (UBPL)

	Event prevalence	Poverty entry rate conditional on event	Share of poverty entries associated with event
Poverty entry rate		23.13%	
Labour market events			
Fall in number of workers	22.02%	28.76%	27.37%
Fall in number of workers (formal)	19.78%	23.40%	20.01%
Fall in number of workers (informal)	16.99%	33.64%	24.71%
Fall in number of workers (household size constant)	9.10%	25.09%	9.87%
Fall in labour income (-10%) (number of workers constant)	14.49%	20.57%	12.90%
Non-labour income events			
Fall in income from public grants (-10%)	2.07%	43.40%	3.89%
Demographic events			
Change in gender of household head (male to female)	15.43%	23.03%	15.35%
Increase in household size	24.41%	41.24%	43.55%
Birth of a child (0 to 2 years)	17.56%	43.66%	33.15%
Death of a household member	4.93%	37.32%	7.96%
Death of a household member (with life insurance)	4.33%	14.49%	6.24%
Movement from urban to rural	1.12%	28.74%	1.39%

Notes: NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Table 5: Transition matrix summary: Recent mothers

	% household type stability	*Most likely to transition to:*	with % probability
Married couple	54.08%	*Married couple & other adult(s)*	14.80%
Married couple & other adult(s)	68.26%	*Single adult & other adult(s)*	10.51%
Cohabiting couple	42.48%	*Single adult*	14.41%
Cohabiting couple & other adult(s)	44.32%	*Single adult & other adult(s)*	19.41%
Widow & other adult(s)	59.44%	*Single adult & other adult(s)*	16.92%
Single adult	48.52%	*Single adult & other adult(s)*	21.98%
Single adult & other adult(s)	57.74%	*Single adult*	14.37%
Other	16.52%	*Married couple*	13.62%

Notes:

a) Sample limited to recent mothers, defined as mothers who co-reside with a biological child under the age of two who could not be found and matched to the mother in the previous survey wave. We further exclude all observations who are not African or coloured women between the age of 17 and 41 (defined in period t).

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Table 6: Individual and household characteristics of recent mothers compared to other women of child-bearing age

		Total: Mothers of newborns		Comparison group	
		Prior to child (*t-1*)	With child (*t*)	*t-1*	*t*
Individual variables	**Poor (%)**	71.46%	75.91%	69.39%	65.21%
	Per capita expenditure	1284.64	1058.24	1394.61	1512.00
	Per capita expenditure (median)	631.98	560.94	642.20	729.80
	Individual earnings	4007.24	2949.62	3940.29	3694.85
	Individual earnings (median)	2465.25	1255.46	2567.40	2181.81
	Employed (%)	28.90%	28.12%	32.05%	38.84%
	Education	11.31	11.84	11.59	12.18
	Age	24.86	27.19	26.18	28.43
	Household head (%)	23.25%	30.44%	25.68%	31.70%
HH variables	**Household size**	5.58	6.30	5.84	5.55
	Number of children in the household	2.47	3.20	2.62	2.34
	Number of women in the household	2.22	2.25	2.33	2.31
	Number of pensioners	1.16	1.11	1.20	1.14
	Government grant income	1506.87	1709.85	1659.12	1662.24
	Urban (%)	57.54%	56.56%	57.98%	60.23%
	Observations	*3,623*	*3,623*	*22,909*	*22,909*

Notes:

a) Sample limited to recent mothers, defined as mothers who co-reside with a biological child under the age of two who could not be found and matched to the mother in the previous survey wave. We further exclude all observations who are not African or coloured women between the age of 17 and 41 (defined in period t).

b) The comparison group is defined as coloured or African women between 17 and 41 years of age who are not recent mothers.

c) Medians are reported for continuous variables (consumption and earnings), and means for discreet variables.

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Table 7: Comparing recent first-time mothers to recent mothers with previous children

		First-time mothers		Not first-time mothers	
		Prior to child (*t-1*)	With child (*t*)	Prior to child (*t-1*)	With child (*t*)
Individual variables	Poor (%)	74.06%	78.77%	69.83%	74.11%
	Per capita expenditure	1172.68	992.00	1355.19	1099.98
	Per capita expenditure (median)	602.90	521.54	663.07	581.67
	Individual earnings	3985.28	3552.34	4013.72	2758.17
	Individual earnings (median)	3070.94	1729.57	2345.51	889.12
	Employed (%)	18.26%	19.35%	35.42%	33.63%
	Education	11.06	11.94	11.47	11.77
	Age	19.92	22.23	27.98	30.32
	Household head (%)	11.18%	16.16%	30.85%	39.44%
HH variables	Household size	5.82	6.53	5.44	6.16
	Number of children in the household	2.42	2.96	2.50	3.36
	Number of women in the household	2.58	2.58	2.05	1.98
	Number of pensioners	1.29	1.26	1.07	1.02
	Government grant income	1745.57	1805.18	1374.03	1648.34
	Urban (%)	52.88%	52.82%	60.47%	58.92%
	Observations	*1,484*	*1,484*	*2,139*	*2,139*

Notes:
a) Sample limited to recent mothers, defined as mothers who co-reside with a biological child under the age of two who could not be found and matched to the mother in the previous survey wave. We further exclude all observations who are not African or coloured women between the age of 17 and 41 (defined in period t).
b) The comparison group is defined as coloured or African women between 17 and 41 years of age who are not recent mothers.
c) First time mothers are defined as those recent mothers whose child is their first.
d) Medians are reported for continuous variables (consumption and earnings), and means for discreet variables.
Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Table 8: Individual and household characteristics: Comparing recent mothers who transitioned between household "types"

		Transitioned between household types		No transition between household types	
		Prior to child (*t-1*)	With child (*t*)	Prior to child (*t-1*)	With child (*t*)
Individual variables	**Poor (%)**	68.85%	73.94%	73.52%	77.48%
	Per capita expenditure	1374.01	1146.54	1214.48	988.82
	Per capita expenditure (median)	632.59	608.76	630.40	522.61
	Individual earnings	3596.05	2910.78	4323.23	2980.21
	Individual earnings (median)	2411.60	685.85	2584.80	1309.74
	Employed (%)	28.26%	28.97%	29.40%	27.44%
	Education	11.27	11.84	11.34	11.84
	Age	25.09	27.44	24.69	27.00
	Household head (%)	27.03%	36.85%	20.28%	25.42%
HH variables	**Household size**	5.47	5.95	5.67	6.58
	Number of children in the household	2.36	3.10	2.55	3.28
	Number of women in the household	2.21	2.07	2.28	2.34
	Number of pensioners	1.14	1.01	1.17	1.19
	Government grant income	1537.40	1630.61	1484.05	1771.08
	Urban (%)	59.81%	57.43%	55.74%	55.88%
	Observations	*1,755*	*1,755*	*1,865*	*1,865*

Notes:

a) Recent mothers are defined as mothers who co-reside with a biological child under the age of two who could not be found and matched to the mother in the previous survey wave. The comparison group is defined as coloured or African women who are between 17 and 41 years of age. These are intended to represent women of child-bearing age (while excluding the small white and Indian sub-samples)

b) Medians are reported for continuous variables, and means for discreet variables.

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Table 9: Panel regression

Outcome variable
Change in:

		Poverty	Consumption	Employment	Individual earnings	HH Size	No. children in HH	No. female adults in HH	No. male adults in HH
Constant, no controls	*coef*	-0.032***	78.496***	0.059***	376.788***	-0.139***	-0.116***	-0.020**	-0.058***
	SE	(0.004)	(24.908)	(0.004)	(25.370)	(0.022)	(0.014)	(0.009)	(0.007)
	obs.	19,874	19,874	17,947	19,484	19,874	19,874	19,874	19,874
Recent mother, no controls	*coef*	0.092***	-364.034***	-0.083***	-324.959***	1.025***	1.016***	-0.017	0.014
	SE	(0.013)	(92.891)	(0.016)	(107.214)	(0.073)	(0.044)	(0.032)	(0.025)
	obs.	19,874	19,874	17,947	19,484	19,874	19,874	19,874	19,874
	cons.	-0.047***	137.634***	0.073***	429.551***	-0.306***	-0.281***	-0.017*	-0.060***
Recent mother, with controls	*coef*	0.085***	-353.605***	-0.081***	-329.520***	0.974***	0.995***	-0.037	0.001
	SE	(0.013)	(97.515)	(0.016)	(111.199)	(0.073)	(0.044)	(0.032)	(0.025)
	obs.	19,815	19,815	17,912	19,425	19,815	19,815	19,815	19,815
	cons.	-0.009	173.583	0.133***	423.337**	-0.566***	-0.818***	0.203***	-0.208***
First time recent mother, with controls	*coef*	0.097***	-363.070***	-0.068***	-181.022	1.060***	0.929***	-0.029	0.049
	SE	(0.021)	(100.048)	(0.018)	(121.799)	(0.103)	(0.071)	(0.040)	(0.040)
Non-first time recent mother, with controls	*coef*	0.078***	-347.623**	-0.089***	-423.296***	0.919***	1.036***	-0.043	-0.029
	SE	(0.017)	(139.488)	(0.022)	(146.338)	(0.098)	(0.053)	(0.045)	(0.031)
	obs.	19,815	19,815	17,912	19,425	19,815	19,815	19,815	19,815
	cons.	-0.012	176.381	0.129***	379.249**	-0.591***	-0.799***	0.201***	-0.222***

Explanatory variable of interest

Notes:
a) Recent mother indicates a woman with a child under age 2 in period t and that child was not present in wave *t-1*.
b) Independent variables are measured in period t-1, dependant variables defined as change variables (between t-1 and 1)
c) Sample is restricted to African and coloured women between the age of 17 and 41 in t.
d) Standard errors are clustered at the individual level.
e) Controls include age, an African race dummy, education, geographical location, province, and year dummies.
f) Robust standard errors in parentheses.
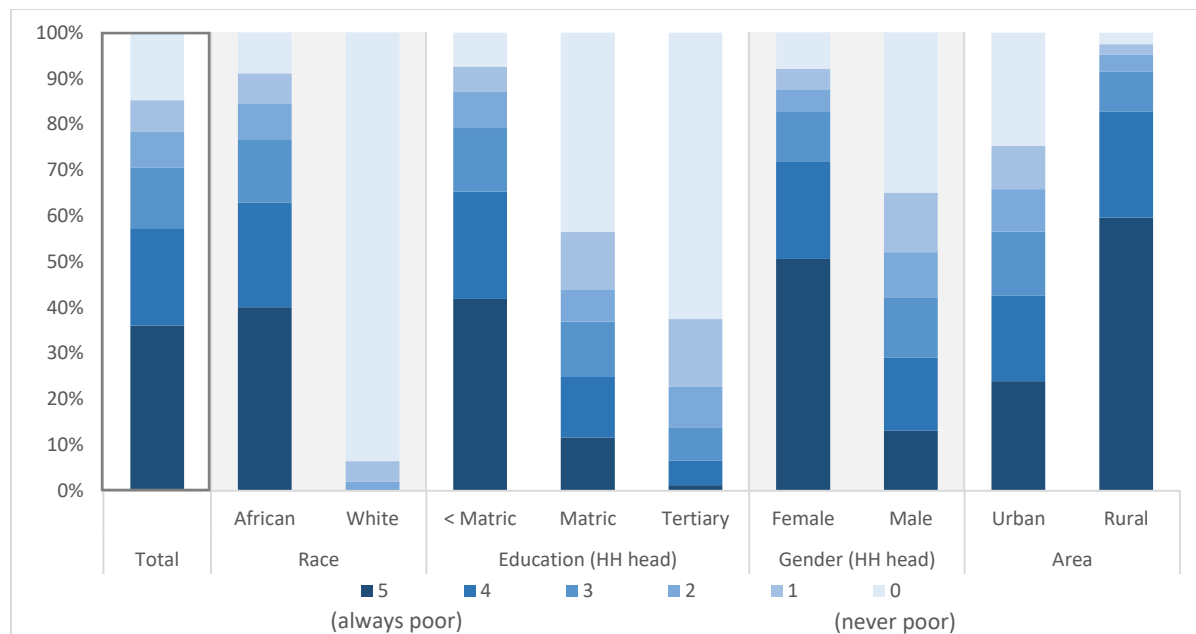*** p<0.01, ** p<0.05, * p<0.1
Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Table 10: Comparing observed versus simulated poverty, expenditure and household size for recent mothers

|	*Observed in t-1*	Observed in t	Simulated in t
Poor (%)	71.46%	75.91%	79.02%
P.c. expenditure	1284.64	1058.24	964.67
Household size	5.58	6.30	6.58

Figures:

Figure 1: Number of periods between 2008 and 2017 observed to be poor by various characteristics

Notes: Balanced panel, weighted using Wave 5 panel weights. Race, education of the household (HH) head, gender of the household (HH) head and area of residence as recorded in the first wave of NIDS (2008). "Non-African" identifies Whites and Coloureds. The Indian sample is small, and has been omitted.

Source: Author's calculations using NIDS waves 1 to 5 pooled sample (post-stratified weights corrected for panel attrition).

Figure 2: Household size by age
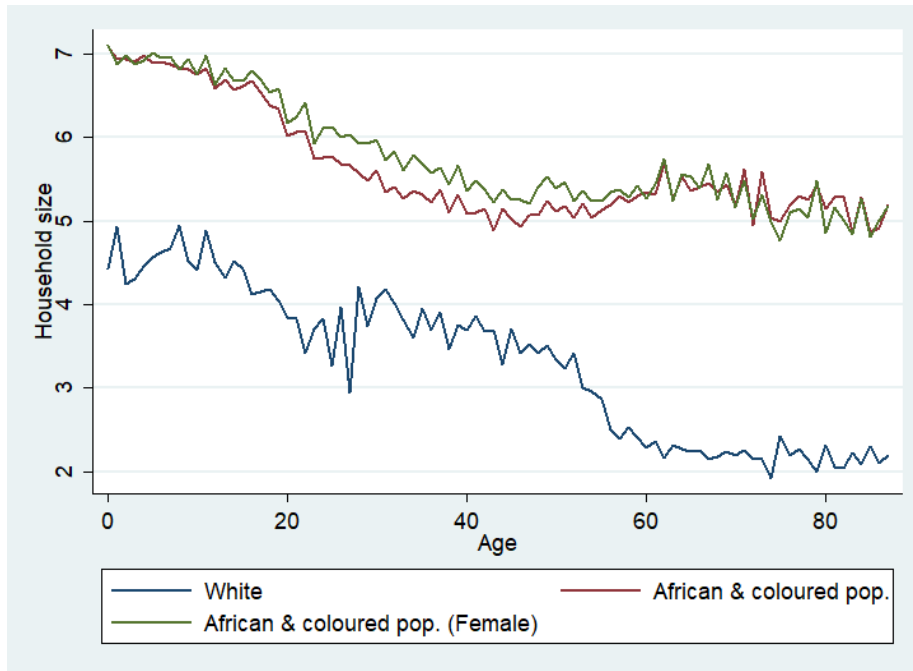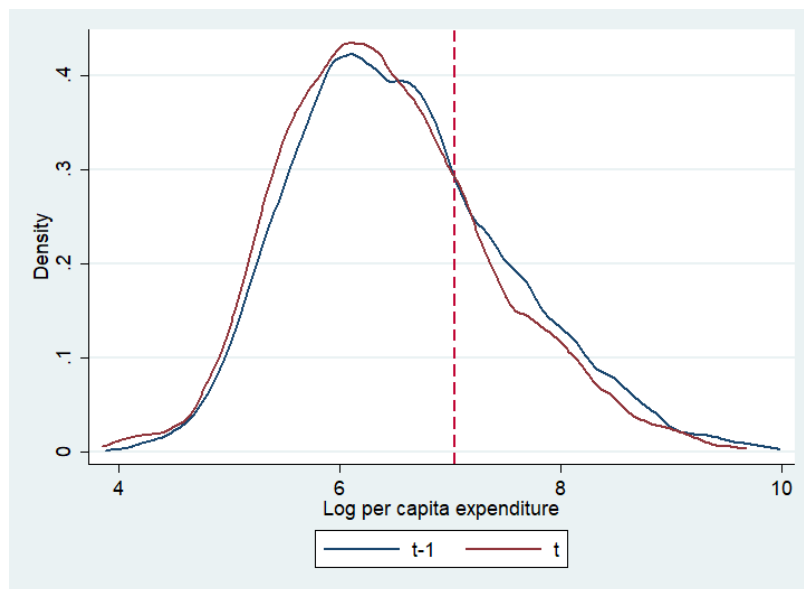

Notes:

a) All variables defined in *t*.

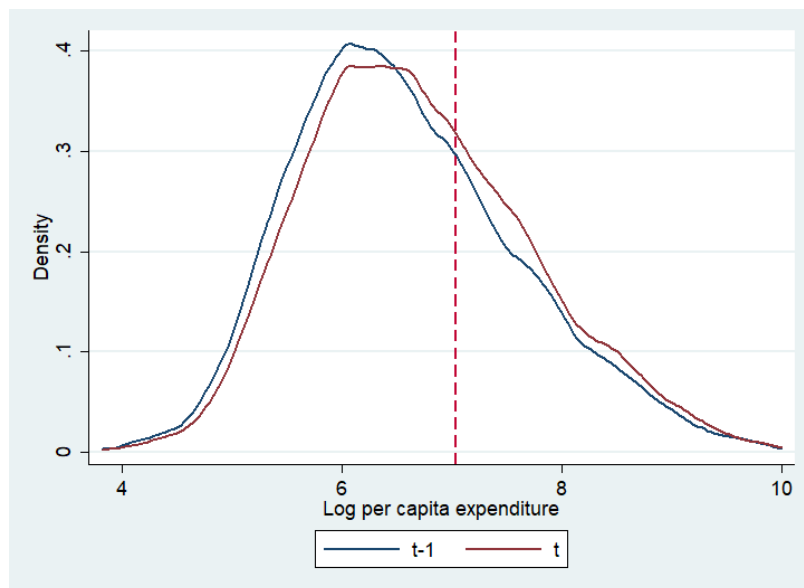b) Unless otherwise stated, sample only includes African and coloured individuals.

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Figure 3: Number of children (under age 18) in the household, by individual's age
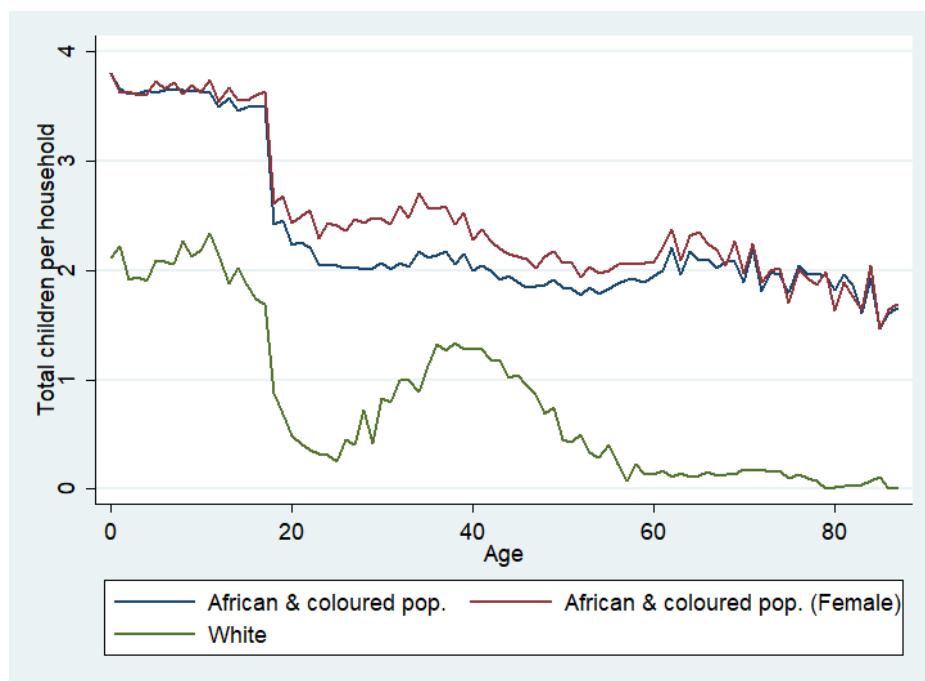
Notes:

a) All variables defined in *t*.

b) Unless otherwise stated, sample only includes African and coloured individuals.

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Figure 4: Kernel density estimate - log per capita expenditure in t-1 and t
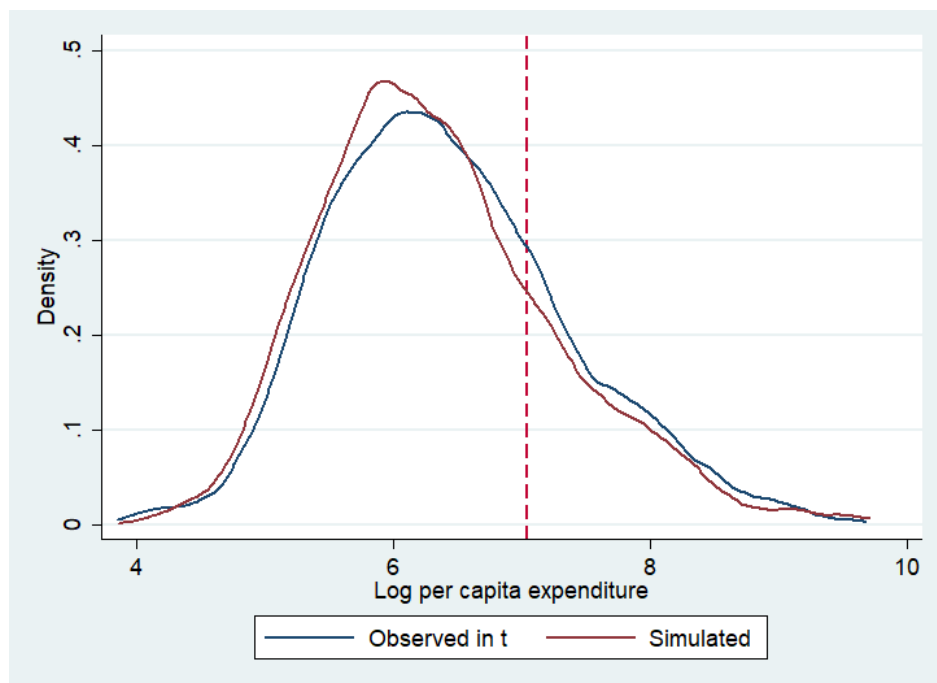
a) Recent mothers

b) Comparison group

Notes:

a) Mothers of new-borns are defined as mothers who co-reside with a biological child under the age of two who could not be found and matched to the mother in the previous survey wave. The comparison group is defined as coloured or African women who are between 17 and 41 years of age.

b) Dotted red line identifies the StatsSA upper-bound poverty line of R1,136 in March 2017 Rands.

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)

Figure 5: Kernel density estimate - log per capita expenditure for recent mothers: Simulation holding household expenditure and household size fixed compared to observed log per capita expenditure

Notes:

a) Mothers of new-borns are defined as mothers who co-reside with a biological child under the age of two who could not be found and matched to the mother in the previous survey wave. The comparison group is defined as coloured or African women who are between 17 and 41 years of age.

b) Dotted red line identifies the StatsSA upper-bound poverty line of R1,136 in March 2017 Rands.

Source: Author's calculations using NIDS waves 1 to 5 pooled panel of wave-to-wave transitions (post-stratified weights corrected for panel attrition)