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The Dynamics of Poverty in the First Three Waves of NIDS

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The Dynamics of Poverty in the First Three Waves of NIDS

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Abstract: We use the first three waves of data from the National Income Dynamics Study (NIDS) to analyse poverty dynamics in South Africa between 2008 and 2012. Restricting ourselves to the sub-sample of balanced panel respondents, we find that poverty exit rates increased with time, though a substantial proportion of the population was trapped in severe poverty, defined as having income of less than half of the poverty line. The importance of demographic events in the household as drivers of poverty transitions are highlighted in a univariate and multivariate setting. Finally we look at the joint distributions of multidimensional poverty and income poverty in order to ascertain the extent to which they complement or offset one another.

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1 Introduction

The study of money-metric poverty has been the focus of a great deal of academic research in post-apartheid South Africa. While there are papers that exploit the longitudinal nature of some datasets, none are nationally representative and none use more than two waves. In the current South African policy milieu there is a rising emphasis on understanding how and why people enter and exit poverty. The aim of this paper is to investigate the dynamics of poverty in South Africa using the first three waves of the National Income Dynamics Study (NIDS). The focus is on absolute, rather than relative, poverty transitions. One of the key features of NIDS is the ability to model the dynamics of poverty over time. We are less interested in measuring cross-sectional poverty and more interested in understanding how and why people are moving relative to the real poverty line over time. Section 2 of this paper briefly outlines the South African literature on poverty dynamics and Section 3 discusses the data and weights used in this analysis. Section 4 develops a number of univariate and multivariate measure of poverty transitions, with inter-wave poverty entry and exit being treated separately. Section 5 delves into trigger events that are associated with poverty transitions, while Section 6 lines up multidimensional and income poverty against each other in order to understand the extent to which the two interact. Section 7 provides some concluding remarks.

2 The South African Literature on Poverty Dynamics

Although there are many studies of cross-sectional poverty in South Africa since the end of apartheid (see Finn et al. (Forthcoming) for a short review), there is a relative paucity of literature using panel data to analyse transitions. One of the first studies of poverty dynamics in post-apartheid South Africa is contained in Carter and May (2001). The authors use the first two waves (1993 and 1998) of the KwaZulu-Natal Income Dynamics Study (KIDS) to decompose poverty transitions into what they term 'structural' and 'stochastic' components. The study is restricted to approximately 1 200 African households in the KwaZulu-Natal province. Carter and May (2001) found a significant increase in poverty rates in African households in the province, and also found that the economic processes driving poverty dynamics also served to increase inequality. That is to say, upward economic mobility was stronger for those at the top of the income distribution than it was for those at the bottom. The authors find that approximately one fifth of the sample was poor in both 1993 and 1998, with a further 35% transitorily poor (that is, poor in at least one wave).

Woolard and Klasen (2005) also use the first two waves of KIDS to model the determinants of mobility and poverty transitions for just over 1 000 African households in KwaZulu-Natal. The authors identify the main event associated with a transition into or out of poverty in a univariate sense. These events are themselves split into demographic (household composition) changes and income changes. It is found that about one quarter of transitions into and out of poverty are due to demographic effects. The most important income effect for transitioning into poverty is the household head losing a job, while for transitioning out of poverty the most important income event is another household member finding employment. The importance of demographic effects is confirmed in a multivariate regression analysis, though the sample sizes are quite small with 129 households entering poverty and 223 households exiting poverty over the two waves.

Agüero et al. (2007) adds the third (2004) wave of KIDS to the study of dynamics. Parts of the paper are a natural update to Carter and May (2001), as the third wave is added as a new data point. The authors complement the income

analysis by calculating poverty rates using expenditure data, though there are some serious misgivings about using the 1993 expenditure data (see Leibbrandt et al. (2010)). The study finds that access to basic household services improved significantly between 1993 and 2004, and this improvement is in contrast to the backward steps taken on the poverty front in the mid-1990s. Finally, the authors highlight the importance of government grants and, particularly, the child support grant, in shifting the bottom of the income distribution to the right, and find that the importance of grants as inequality reducers increased over time.

A recent paper by Finn, Leibbrandt and Levinsohn (2013) uses the first two waves of NIDS to explore absolute and relative transitions over the 2008 to 2010/2011 period. They find that almost three quarters of those who were below the poverty line in 2008 were still below it in 2010/2011. This equates to approximately 34% of the total sample being poor in both waves. Poverty exits slightly outweighed poverty entries over the period, and this resulted in a small fall in the national poverty headcount ratio.

3 Data and Summary Statistics of the Balanced Panel

The data used in this study come from the first three waves of NIDS. As the focus is on poverty dynamics and transitions, the analysis is restricted to the balanced panel those who were successfully interviewed in all three waves. The analysis should therefore not be interpreted as being nationally representative, which would be the case if each wave was treated as an independent cross-section.

In order to adjust the balanced sample for the presence of attrition between waves 1 and 2 as well as waves 2 and 3, we constructed a balanced panel weight. This was done by adjusting the original wave 1 post-stratified weight to account for unfolding attrition. For each successive wave a probit model was run with the dependent variable being a dummy indicating whether the individual attritted or not. Wave 1 to wave 2 balanced panel members then received a new weight which was the product of the original wave 1 weight and the inverse of the conditional probability of re-interview. The same process was applied to the wave 2 to wave 3 period. All subsequent analysis in this paper makes use of this balanced panel weight.

There are 18 863 members of the balanced panel, and Table 1 presents some summary statistics for this sub-sample. 82% of our sample is African, with coloured and white proportions standing at about 8%. The Indian part of the balanced panel is very small, with only 182 respondents being successfully interviewed in all three waves. For this reason, racial breakdowns including this group are generally avoided, because of the lack of power associated with such a small sample size.

As expected with a sub-sample that is ageing, the average level of educational attainment rose with each successive wave. The share of the balanced panel with no schooling dropped from 20% in wave 1 to 12% in wave 3, and more than one fifth had obtained at least a matric by wave 3.

The evolution of the household size variables is interesting to observe. The share of the balanced panel living in single-person households rose by about two percentage points between wave 1 and wave 3. Most individuals lived in households with three to five other members, as shown by the category 4-6. About one fifth of the sub-sample lived in a household with 7 to 10 people, though his proportion

increased slightly. Mean household size rose marginally from wave 1 to wave 2, before declining to 3.5 in wave 3. The proportion of living in each of the four geotypes was very stable in each wave, as was the proportion living in each province (not reported).

Given that real monthly household income per capita is the measure of well-being used in this paper, it is worth spending a little bit of time explaining how it was constructed. The household income variable in the public-release dataset was adjusted to remove imputed rent from owner-occupied housing in each wave. This was done because the imputed rent variable in each wave contained a high percentage of missing values, making it a very noisy component of income (even after single regression imputations were used to predict the missing values). There is some precedent for removing imputed rent from household income in other South Africa studies (see Leibbrandt et al. (2010)), and we follow this precedent.

In order to adjust for inflation, Statistics South Africa's headline CPI index was used to deflate the nominal income data to their real values. The base period is August 2012, as this was the modal month of interview for wave 3. All analysis that follows reports the income variables at their August 2012 price levels. The poverty line used in this analysis is R636 per capita per month, in real terms. This figure is updated from Leibbrandt et al. (2010) which itself was founded on Özler (2007) which uses a cost of basic needs approach to select an appropriate poverty line for South Africa.

Table 1: Summary Statistics of the Balanced Panel

	Wave 1	**Wave 2**	**Wave 3**
Race			
African	81.66% (15 733)		
Coloured	8.40% (2 511)		
Asian/Indian	2.35% (182)		
White	7.59% (437)		
Gender			
Male	46.83% (8 275)		
Female	53.17% (10 588)		
Education			
None	20.23% (4 933)	15.79% (3 925)	12.02% (3 037)
Primary	32.23% (6 757)	31.42% (6 704)	30.49% (6 563)
Secondary	28.51% (4 744)	31.57% (5 481)	34.50% (6 106)
Matric	16.82% (2 193)	18.74% (2 505)	20.18% (2 880)
Tertiary	1.80% (163)	2.07% (188)	2.53% (231)
Household Size			
1	5.71% (630)	6.50% (820)	7.50% (1016)
2-3	23.04% (3 586)	20.29% (3 325)	23.03% (3 694)
4-6	43.47% (8 410)	41.57% (7 933)	41.15% (7 770)
7-10	19.73% (4 706)	23.04% (5 036)	21.16% (4 753)
>10	8.07% (1 531)	8.60% (1 839)	7.15% (1 593)
Mean	3.65	3.69	3.51
Geo-type			
Rural Formal	7.14% (1 778)	7.32% (1 810)	7.37% (1 807)
Tribal Authority	34.91% (9 176)	34.96% (8 992)	34.40% (8 703)
Urban Formal	46.17% (6 733)	46.47% (6 802)	47.16% (7 072)
Urban Informal	11.78% (1 176)	11.25% (1 172)	11.07% (1 244)

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight. Observation numbers in parentheses.

4 Poverty Transitions

4.1 Transition Matrices

We begin this section by considering the transition matrices in Table 2, below. In this table and for the remainder of the paper we will first consider changes from wave 1 to wave 2, then changes from wave 2 to wave 3 and finally changes from wave 1 to wave 3. This allows us to see if there is a trend to the dynamics over the three waves, or if things are more volatile than we expect.

Of all the balanced panel members who were poor in wave 1, three quarters were still poor in wave 2. The mirror image of this is evident for those who were non-poor in wave 1, with one quarter entering poverty by wave 2. The proportion of the sample that is poor in both waves falls to about 67% between waves 2 and 3, and to about 64% if the wave 1 to wave 3 period is considered.

The rates of poverty entry and exit are implied by the table below, and it can be seen that the exit rate (poor to non-poor) increased from 25% to 36%, while the entry rate is lower for the wave 1 to wave 3 period than it is for the wave 1 to wave 2 period.

Table 2: Transition Matrices for the Balanced Panel

		Wave 2	
		Poor	**Non-poor**
Wave 1	**Poor**	74.57	25.43
	Non-poor	24.96	75.04

		Wave 3	
		Poor	**Non-poor**
Wave 2	**Poor**	66.96	33.04
	Non-poor	20.8	79.2

		Wave 3	
		Poor	**Non-poor**
Wave 1	**Poor**	63.6	36.4
	Non-poor	21.63	78.37

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

It needs to be recognised that providing transition matrices in which the rows sum to 100% has some limitations. Most importantly, it does not tell us the proportion of the entire sample present in each cell of the matrix, rather than the conditional proportion (where the condition is the starting state of poor or non-poor). Table 3 presents the proportion of the balanced sample in each of the four combinations of wave 1 and wave 2 states. It is clear that, for the balanced panel, the proportion in poverty fell with each successive wave. While about 42% were poor in both wave 1 and wave 2, only 36% were poor in wave 1 and wave 3. The wave 2 to wave 3 transition saw the highest proportion of the sample retained in the non-poor category, at approximately 37%.

Table 3: Proportion of Balanced Sample in Each Cell

		Wave 2	
		Poor	**Non-poor**
Wave 1	**Poor**	41.8	14.25
	Non-poor	10.97	32.98

		Wave 3	
		Poor	**Non-poor**
Wave 2	**Poor**	35.33	17.44
	Non-poor	9.83	37.41

		Wave 3	
		Poor	**Non-poor**
Wave 1	**Poor**	35.65	20.4
	Non-poor	9.51	34.44

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

In order to provide slightly more nuance to the transitions, we follow Carter and May (2001) in defining a state of 'severe' poverty as one in which an individual's real household income per capita is less than half of the poverty line. This means that someone is thought to be in severe poverty if his or her real (2012) monthly household income per capita is less than R318.

A significant proportion of those who we consider to be in severe poverty remained stuck in that category irrespective of the chosen transition period. How-

ever, the exit rate from severe poverty increased as the waves of NIDS progressed. This suggests that the left hand tail of the income distribution shifted progressively rightwards. Exit rates from poverty (real monthly household income per capita of between R318 and R636) were also higher in the wave 2 to wave 3 and wave 1 to wave 3 periods than in the wave 1 to wave 2 period.

Table 4: Transitions with Two Poverty Levels

		Wave 2		
		Severe	**Poor**	**Non-poor**
Wave 1	**Severe**	52.86	26.62	20.52
	Poor	30.4	38.48	31.12
	Non-poor	10.41	14.55	75.04
		Wave 3		
		Severe	**Poor**	**Non-poor**
Wave 2	**Severe**	41.84	31.66	26.5
	Poor	23.09	36.25	40.66
	Non-poor	7.25	13.56	79.2
		Wave 3		
		Severe	**Poor**	**Non-poor**
Wave 1	**Severe**	39.44	30.7	29.86
	Poor	21.1	34.92	43.98
	Non-poor	8.15	13.48	78.37

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

4.2 Three Wave Poverty Paths

There are significant challenges in presenting poverty data from three waves rather than two. Given three waves and two possible states in each wave, we have eight possible poverty paths that a balanced panel member may take. In Table 5, below, P stands for poor and N stands for non-poor. The column of percentages provides the share of all balanced panel member who experienced each particular poverty path. Almost 30% of the sample was poor in all three waves. This was counterbalanced by the 29% of the sample that was non-poor in all three waves.

The third most common path was poor, poor, non-poor, and this was experienced by 12% of the sample. 8% transitioned out of poverty in wave 2 and remained non-poor in wave 3. Of those who were non-poor in wave 1, 6% and 4% entered poverty in waves 2 and 3, respectively.

Table 5: Three Wave Poverty Paths for the Balanced Panel

	Percent
PPP	29.59
NNN	29.21
PPN	12.21
PNN	8.19
PNP	6.06
NPP	5.74
NPN	5.23
NNP	3.77

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

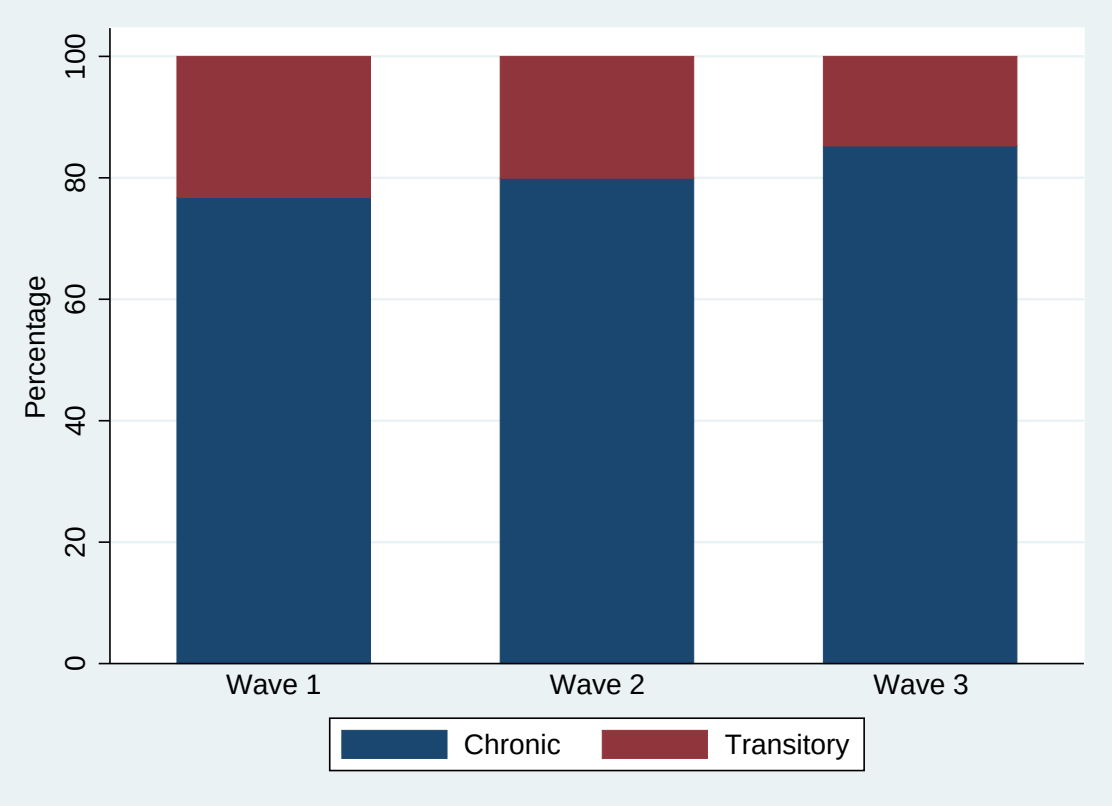
4.3 Chronic Versus Transitory Poverty

Table 5 showed that a large proportion of the sample remained in poverty in all three waves, it is useful to consider the extent to which the overall poverty rate is made up of chronic versus transient poverty in each of the three waves. Although this type of analysis may be better suited to income data that spans a longer period of time (so that we can obtain a better measure of permanent income), it is nonetheless useful to analyse the relative importance of chronic and transient deficits.

We follow, *inter alia*, Jenkins (2011) by defining someone as chronically poor if his or her income averaged over the three waves is less than R636 in real terms. The question, then, is what percentage of the poor is chronically poor by this definition? Of course, every person on the poor-poor-poor path is chronically poor, so our measure of chronic poverty must be higher than that. Once a state of chronic poverty is defined for each wave, the transient component is calculated by subtracting the chronic share from the total poverty rate.

The proportion of total poverty made up of the chronically poor stood at just over three quarters in wave 1. This increased to 80% and 85% in waves 2 and 3, respectively. This dynamic is consistent with the results presented earlier, which suggest a poverty rate that is falling over time for the balanced panel members. We now go on to draw out some of the key characteristics associated with these very different trajectories.

Figure 1: Chronic Versus Transitory Poverty



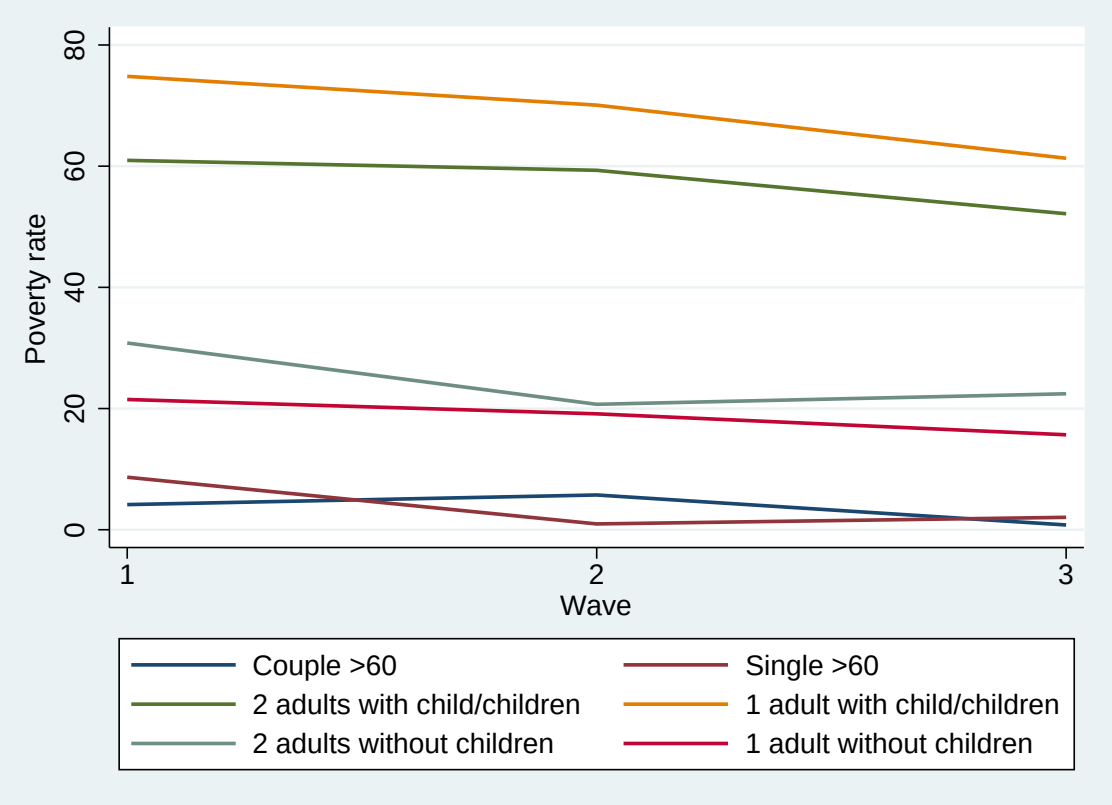
Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

4.4 Poverty Rates by Household Type

Thus far we have presented poverty rates at the aggregate only for the balanced panel members. Figure 2, below, shows the evolving poverty rates for each one of six different household types. Respondents were split into categories representing

the kind of household in which they live in each wave. The general trend is that poverty rates dropped with each successive wave, and that is evidenced by Figure 2. By far the highest poverty rates (and, indeed the most common household types) are to be found in households with one or two adults and at least one child. 75% of single parent households were in poverty in wave 1, though this dropped to just over 60% in wave 3. A similar trend was observed for households in which there are at least two adults and children. Couples over the age of 60 had the lowest poverty rates in the first and third waves, with the rates for single-older-person households being very similar.

Figure 2: Poverty Rates by Household Type



Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

Breaking down poverty rates by household type and other categories is a useful part of understanding dynamics. Of course there are also processes and characteristics that interact to determine whether an individual enters of exits poverty

over time. It is to this kind of multivariate analysis that the paper now turns.

4.5 Regression Analysis of Poverty Transitions

Table 6 reports the average marginal effects of a probit regression where the dependent variable takes a value of 1 if an individual transitioned into poverty, and 0 if not. This marginal effect provides an estimate of the change in the probability of moving into poverty associated with a change in that variable. Given that the conditional switch happens only for people who were non-poor in the base wave, the sample is restricted accordingly. Each of the regressions was weighted using the balanced panel weights described in Section 3. The province of each household was controlled for in all regressions, though these coefficients and standard errors are not reported here. Other controls included the household size in the base year, a dummy for female respondents, a dummy for whether an individual lived in a rural areas and race dummies (African is the omitted category). Furthermore, there are also dummies for whether each respondent lives in a home that is owned by someone in the household and for whether there is at least one employed person living in the household.

The household size coefficient is consistent (in terms of both statistical and economic significance) for each of the transitions under consideration. On average, adding one person to the household increases the conditional probability of transitioning into poverty by about 2 percentage points. This is further supported by the findings of Table 8 in Section 5, which highlights the importance of demographic events in determining poverty entry and exit. Females were significantly more likely to enter poverty between waves 1 and 2 and waves 1 and 2 compared to males, but, interestingly, this was not the case for the wave 2 to wave 3 period. In general, Africans were more likely to enter poverty than was the case for the other racial groups. The exception is transitions between wave 2 and wave 3 where Coloureds were most likely to transition into poverty. Surprisingly, living in a home that is owned by a household member in the base wave was associated with a higher probability of transitioning into poverty. Finally, the primacy of the labour market in driving poverty dynamics is reflected in the coefficients of the dummy for having at least one employed person in the household in the base

wave. Having an employed household member protected against poverty entry by between 13 and 18 percentage points, depending on the period under consideration.

Table 6: Marginal Effects for Transitioning into Poverty

	Transition Into Poverty		
VARIABLES	W1 to W2	W2 to W3	W1 to W3
Household size	0.018***	0.020***	0.021***
	(0.003)	(0.002)	(0.003)
Female	0.056***	0.001	0.032**
	(0.013)	(0.013)	(0.013)
Rural	0.049***	0.072***	0.085***
	(0.016)	(0.014)	(0.015)
Coloured	-0.153***	-0.041	-0.048*
	(0.023)	(0.028)	(0.028)
Asian/Indian	-0.298***	-0.250***	-0.266***
	(0.018)	(0.01)	(0.011)
White	-0.320***	-0.232***	-0.243***
	(0.012)	(0.013)	(0.014)
Own home	0.080***	0.052***	0.056***
	(0.018)	(0.017)	(0.018)
Employed in HH	-0.160***	-0.134***	-0.184***
	(0.019)	(0.018)	(0.019)
Observations	6 463	6 878	6 463

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight. Standard errors in parentheses.

Table 7 does much the same as Table 6, except that now our dependent variable is a dummy for transitioning out of poverty. The estimation sample is different as well, and is restricted to those respondents who could have transitioned out of poverty - that is, those who are poor in the base wave. Once again, larger households and the female and rural dummies are correlated with lower probabilities of poverty exit. Coloureds, Indians and whites (in the first period) were significantly more likely to exit poverty than the base group of Africans. The home ownership and employment coefficients largely work in the same direction as in the previous table.

Table 7: Marginal Effects for Transitioning Out of Poverty

	Transition Out of Poverty		
VARIABLES	W1 to W2	W2 to W3	W1 to W3
Household size	-0.013***	-0.015***	-0.011***
	(0.002)	(0.002)	(0.002)
Female	-0.034***	-0.026**	-0.017
	(0.011)	(0.012)	(0.012)
Rural	-0.166***	-0.133***	-0.139***
	(0.013)	(0.016)	(0.015)
Coloured	0.077**	0.128***	0.126***
	(0.033)	(0.034)	(0.036)
Asian/Indian	0.267***	0.496***	0.527***
	(0.097)	(0.084)	(0.055)
White	0.365***	-	-
	(0.13)	-	-
Own home	-0.055***	0.032*	-0.104***
	(0.018)	(0.019)	(0.02)
Employed in HH	0.054***	0.078***	0.044***
	(0.012)	(0.013)	(0.013)
Observations	12 400	11 977	12 376

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight. Standard errors in parentheses.

The importance of demographic events at the household level is clear from the previous two tables. In order to assess the relative importance of demographic versus income events in determining poverty entry and exit, Section 5 echoes Woolard and Klasen (2005) and Jenkins (2011) by unpacking some key 'trigger' events associated with poverty dynamics.

5 Trigger Events

5.1 Demographic versus Income Events

Given that the welfare measure that we have chosen to analyse poverty is real monthly household income per capita, we can expect changes either through the numerator (income events) or through the denominator (demographic events). The trigger events that we use in this paper are a combination of those found in Jenkins (2011) and Woolard and Klasen (2005). The first kind of demographic event is a change in the household head and/or a change in the composition of the household. This is typically one or more people entering/leaving the household due to birth, migration or death.[1] Thus the dynamics of household composition affects our sub-sample, even though the people entering/leaving the household may not be balanced panel members. The first category of 'head or composition changed' therefore includes headship changes as well as other household formation changes.

The second category is assigned to cases where the head of the household did not change in between waves, but the composition of the household did. Given that the head did not change, it was necessary to determine whether changes in needs outweighed changes in income. This was accomplished by comparing the proportional change in the household size for each individual compared to a proportional change in total household income, following Jenkins (2011). If the proportional change in needs was larger (in absolute terms) than the proportional change in income, then the trigger event 'needs > money' was assigned to all individuals in the relevant household.

There are five types of income trigger events — changes in formal earnings of the household head, formal earnings of the spouse of the household head and formal earnings of any other household members make up the first three categories. The final two income triggers are changes in remittance income received by the household and changes in income from government grants received by the household. Income events are ranked according to the size of the change between waves. So, for example, if the household heads real formal earnings fell by R200, the spouse's real formal earnings fell by R800 and there was no change in the

[1] A full account of household compositional change in the first two waves of NIDS can be found in Grieger et al. (2013).

other income triggers, then the appropriate trigger event is 'fall in spouse's formal labour market earnings'. Finally, there is an 'inconclusive' category that soaks up households for which no clear ranking could be established.

More formally (and assuming that all trigger events are assigned), we borrow notation from Jenkins (2011) to show that the probability of exiting poverty[2] is made up of mutually exclusive events 1 to J.

$$Pr(\text{exit poverty}) = \sum_{j=1}^{J} Pr(\text{exit poverty via trigger j})$$

Given that each event 1 to J can be formulated as the product of the probability of poverty exit, conditional on event j, and the probability of event j itself occurring, we have:

$$Pr(\text{exit poverty}) = \sum_{j=1}^{J} Pr(\text{exit poverty}|\text{trigger j}) \times Pr(\text{trigger j})$$

It is important to note that although this analysis of demographic versus income events is interesting and useful, we should be very cautious about assigning causality from the trigger to the transition. As Jenkins (2011) notes, it is tempting to say that losing an employed member caused a particular household to enter poverty, but it could also be the case that a household entered poverty first, and this stress caused the household to break up.

5.2 The Role of Trigger Events

The first feature to note about Table 8 is the fact that demographic events were increasingly correlated with transitions both into and out of poverty during the period under study. Fully two thirds of individuals who entered poverty between wave 1 and wave 3 experienced a demographic change in the household. A fall in the real formal labour market earnings of the household head was the primary correlate of entering poverty for between 8% and 13% of the balanced panel, depending on the relevant period. The shares of falling remittances and falling

[2]The notation for the probability of entering poverty via trigger k is easily seen from this example.

income from government grants were relatively similar for poverty entry during each of the three time periods under study.

For those respondents who exit poverty, the head change/compositional change share is very similar to its counterpart in the poverty entry category. It is interesting that the needs > money category (no change in the household head but a compositional change in the household) contributes relatively little to the total explanation of poverty exit – dropping to as low as 0.4% for the wave 2 to wave 3 period. The importance of other household members' (non-head or spouse) earnings in driving poverty exits is highlighted by the contributions of 22% between wave 1 and 2, 17% between waves 2 and 3, and 16% between waves 1 and 3. The relative importance of additional income from government grants over additional income from remittances is evidenced by grant income's share of between 8% and 9% compared to the remittance share of between 3% and 6%. It is notable that receiving additional income from government sources is generally a bigger driver of poverty exit than losing income from government grants is a driver of poverty entry. This should not surprise us though, as the means tests of social grants results in a targeting system that is highly effective.

Thus far in this paper we have focused exclusively on poverty transitions where real income has been the only welfare measure. It is also informative to broaden the components of welfare and allow for a multidimensional measure and an analysis of multidimensional poverty dynamics. The following section looks first at the dynamics of multidimensional poverty before turning to an analysis of the joint distributions of multidimensional and money-metric poverty.

Table 8: Trigger Events and Poverty Entry and Exit

	Poverty entry			Poverty exit		
	W1 to W2	**W2 to W3**	**W1 to W3**	**W1 to W2**	**W2 to W3**	**W1 to W3**
Demographic						
Head and composition change	37.29 (797)	43.66 (809)	55.99 (887)	40.02 (1 003)	47.16 (1 789)	53.92 (2 237)
Needs > money	8.67 (182)	5.51 (119)	10.32 (177)	3.27 (55)	0.36 (20)	3.28 (76)
Demographic share	**45.96**	**49.17**	**66.31**	**43.29**	**47.52**	**57.2**
Income						
Head earnings	13.11 (230)	9.87 (146)	7.85 (134)	12.7 (287)	11.61 (334)	9.36 (320)
Spouse earnings	0.79 (28)	6.37 (72)	2.00 (46)	3.80 (86)	2.62 (93)	2.13 (104)
Other earnings	12.39 (302)	14.35 (222)	6.94 (150)	21.81 (532)	16.55 (610)	15.99 (651)
Remittances	8.94 (195)	4.05 (76)	7.36 (162)	3.35 (95)	5.60 (172)	3.09 (128)
Grant income	9.64 (248)	5.60 (129)	6.46 (117)	8.32 (308)	9.15 (382)	8.22 (370)
Inconclusive	9.16 (132)	10.59 (172)	3.08 (87)	6.74 (163)	6.97 (189)	4.01 (133)
Total	100	100	100	100	100	100
Observations	**2 114**	**1 745**	**1 760**	**2 529**	**3 589**	**4 019**

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight. Observation numbers in parentheses.

6 Multidimensional Poverty and its Interaction with Income Poverty

6.1 Background to the MPI Measure

In order to gain a richer understanding of the kinds of deprivations faced by individuals, the multidimensional poverty index (MPI) is a useful starting point. The details of the construction of the measure can be found in Alkire and Foster (2011), and a recent application to South Africa using the 1993 PSLSD survey and the second wave of NIDS can be found in Finn, Leibbrandt and Woolard (2013).

The MPI measure for South Africa used in this study contains nine indicators spread over three dimensions. The education dimension contains indicators for schooling years and enrolment. The health dimension comprises indicators of child mortality and nutrition. Finally, the living standards dimension is made up of five indicators that include cooking fuel, sanitation, water, electricity and a list of assets. All dimensions are weighted equally, and all indicators are weighted equally within each dimension. Thus, for example, the nutrition indicator receives an overall weight of 1/6, while the electricity indicator receives a weight of 1/15.

Indicator-specific poverty lines are defined for each indicator (see Finn, Leibbrandt and Woolard (2013) for more details), and the overall MPI poverty is defined as being deprived in 20% or more of weighted indicators. An alternative MPI poverty line of deprivation in one third of weighted indicators is also commonly used, but we felt that the 20% cut-off was more appropriate, as the MPI headcount ratio and income poverty headcount ratio are more easily comparable at poverty lines of 20% and R636 respectively.

6.2 MPI transitions

Table 9 provides the multidimensional poverty transitions for each of the three periods in the study. There are four multidimensional categories which are increasing in the level of poverty. The 0 category applies to those who are not poor in any of the indicators listed previously. The 0-20% category contains those experience some deprivation, but not enough to be classified as MPI poor. Those in

the 20-33% category are MPI poor, and are poor in 20% to one third of weighted indicators. Finally, the >33% category applies to those who are the most severely poor according to our measure.

The patterns for individuals in the first two categories are relatively consistent, irrespective of the chosen transition period. Approximately 85% of those who were not deprived in any indicator in the base wave were still not deprived in the next wave, while about 10% transitioned into MPI poverty. Of those who were deprived in between one fifth and one third of weighted indicators in wave 1, 44% exited multidimensional poverty by wave 3. This increased to 49% between waves 2 and 3, and to 51% for the wave 1 to wave 3 period.

Table 9: Multidimensional Poverty Transitions

		Wave 2 Status				
		0	**0-20%**	**20-33%**	**>33%**	
Wave 1 Status	**0**	85.78%	3.41%	9.60%	1.21%	100
	0-20%	41.70%	22.07%	27.68%	8.55%	100
	20-33%	43.79%	10.52%	33.95%	11.73%	100
	>33%	15.73%	10.90%	36.10%	37.27%	100
		Wave 3 Status				
		0	**0-20%**	**20-33%**	**>33%**	
Wave 2 Status	**0**	86.17%	2.95%	9.67%	1.21%	100
	0-20%	50.68%	18.16%	21.60%	9.56%	100
	20-33%	49.13%	10.34%	31.96%	8.57%	100
	>33%	25.00%	9.49%	33.32%	32.19%	100
		Wave 3 Status				
		0	**0-20%**	**20-33%**	**>33%**	
Wave 1 Status	**0**	87.26%	2.37%	9.38%	0.99%	100
	0-20%	51.35%	17.61%	21.24%	9.81%	100
	20-33%	51.19%	9.44%	30.63%	8.74%	100
	>33%	29.99%	12.83%	31.42%	25.76%	100

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

Once again, the transition matrices do not give us an idea of the total proportion of the sample in each transition cell. Table 10 mirrors the money-metric

analysis by showing the weighted proportion of the sample in each combination of states. The proportion of individuals who were non-MPI-poor in both waves was between 56% and 59%, depending on the transition period. Approximately 2% of the sample was in severe multidimensional poverty in the base and subsequent wave. As is clear from the row and column totals, the lower MPI poverty rates for the balanced panel match the falling income poverty rates, though they fell from a lower base.

Table 10: MPI Poverty Transitions - Proportion of Total Sample in Each Cell

		Wave 2 Status				
		0	**0-20%**	**20-33%**	**>33%**	
Wave 1 Status	**0**	56.33%	2.24%	6.30%	0.80%	65.67%
	0-20%	3.28%	1.74%	2.18%	0.67%	7.86%
	20-33%	7.93%	1.91%	6.15%	2.13%	18.12%
	>33%	1.31%	0.91%	3.01%	3.11%	8.34%
		68.86%	6.79%	17.64%	6.70%	100%

		Wave 3 Status				
		0	**0-20%**	**20-33%**	**>33%**	
Wave 2 Status	**0**	59.34%	2.03%	6.66%	0.83%	68.86%
	0-20%	3.44%	1.23%	1.47%	0.65%	6.79%
	20-33%	8.67%	1.82%	5.64%	1.51%	17.64%
	>33%	1.68%	0.64%	2.23%	2.16%	6.70%
		73.12%	5.72%	16.00%	5.15%	100%

		Wave 3 Status				
		0	**0-20%**	**20-33%**	**>33%**	
Wave 1 Status	**0**	57.31%	1.56%	6.16%	0.65%	65.67%
	0-20%	4.04%	1.38%	1.67%	0.77%	7.86%
	20-33%	9.28%	1.71%	5.55%	1.58%	18.12%
	>33%	2.50%	1.07%	2.62%	2.15%	8.34%
		73.12%	5.72%	16.00%	5.15%	100%

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

6.3 Cross Tabulations of MPI and Income Poverty

Our final table presents a picture of the interaction between multidimensional poverty transitions and income poverty transitions. In each matrix, the rows are comprised of the four possible multidimensional poverty transition paths non-poor to poor, poor to non-poor, poor to poor and non-poor to non-poor. The same categories apply to the columns, which represent income poverty transitions. We are thus comparing MPI and income transitions rather than MPI and income states. Starting with the fourth row in each table, we see that approximately half of those who were non-MPI-poor in both waves were also non-income-poor in the same two waves. Interestingly, between 23% and 28% of those who were never multidimensionally poor, were nonetheless income poor in both waves. This speaks to the fact that not only was the income poverty headcount ratio higher that the MPI headcount in each wave, but also that income poverty does not necessarily imply deprivation in other measures of well-being. The strength of the opposite pattern (always MPI poor but never income poor) is far weaker, with only 10% of those who were always MPI poor never being money-poor for waves 1 to 2 and waves 1 to 3. A fairly consistent trend is that about half of those who experienced transitory MPI poverty (poor in one wave and not the other) were income poor in both waves, while about 20% were income non-poor in both waves. This makes the important point that the indicators in the MPI represent the potential to improve livelihoods but this has to facilitate accessing of jobs before it translates into income.

Table 11: Multidimensional and Money-metric Poverty Transitions

		W1 W2 Rand Poverty Transitions				
		NP	**PN**	**PP**	**NN**	**Total**
W1 W2 MPI Poverty Transitions	**NP**	11.79	18.44	49.72	20.05	100
	PN	9.96	20.89	49.51	19.64	100
	PP	8.77	11.58	69.6	10.06	100
	NN	11.91	13.11	28.02	46.96	100

		W2 W3 Rand Poverty Transitions				
		NP	**PN**	**PP**	**NN**	**Total**
W2 W3 MPI Poverty Transitions	**NP**	9.74	20.08	49.17	21.02	100
	PN	12	23.3	44.61	20.09	100
	PP	10.09	16.62	60.97	12.32	100
	NN	9.26	15.89	23.46	51.4	100

		W1 W3 Rand Poverty Transitions				
		NP	**PN**	**PP**	**NN**	**Total**
W1 W3 MPI Poverty Transitions	**NP**	13.2	20.91	45.84	20.04	100
	PN	7.07	24.58	48.28	20.07	100
	PP	9.4	20.15	60.84	9.61	100
	NN	9.67	19.25	22.54	48.53	100

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

7 Conclusion

In this paper we used the balanced three wave sample of NIDS comprising almost 19 000 respondents to analyse poverty dynamics in South Africa from 2008 to 2012. We found that the rate of exiting poverty was higher between waves 2 and 3 than it was between waves 1 and 2, though 36% of the sample was poor in the first and third waves. A large percentage of the poor were seemingly trapped in severe poverty, with income per capita less than half of the poverty line.

The importance of demographic events in shaping dynamics was highlighted by the role of household composition changes as drivers of poverty entry and exit. This was complemented by the importance of any household member finding a job, on the income side. Finally, although the transitions into and out of multidimensional poverty were of similar magnitudes to those of the income poverty transitions, multidimensional poverty was lower than income poverty in all waves, and being chronically income poor did not necessarily mean being multidimensionally poor (in a chronic or transitory sense) over the same period.

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southern africa labour and development research unit

The Southern Africa Labour and Development Research Unit (SALDRU) conducts research directed at improving the well-being of South Africa's poor. It was established in 1975. Over the next two decades the unit's research played a central role in documenting the human costs of apartheid. Key projects from this period included the Farm Labour Conference (1976), the Economics of Health Care Conference (1978), and the Second Carnegie Enquiry into Poverty and Development in South Africa (1983-86). At the urging of the African National Congress, from 1992-1994 SALDRU and the World Bank coordinated the Project for Statistics on Living Standards and Development (PSLSD). This project provide baseline data for the implementation of post-apartheid socio-economic policies through South Africa's first non-racial national sample survey.

In the post-apartheid period, SALDRU has continued to gather data and conduct research directed at informing and assessing anti-poverty policy. In line with its historical contribution, SALDRU's researchers continue to conduct research detailing changing patterns of well-being in South Africa and assessing the impact of government policy on the poor. Current research work falls into the following research themes: post-apartheid poverty; employment and migration dynamics; family support structures in an era of rapid social change; public works and public infrastructure programmes, financial strategies of the poor; common property resources and the poor. Key survey projects include the Langeberg Integrated Family Survey (1999), the Khayelitsha/Mitchell's Plain Survey (2000), the ongoing Cape Area Panel Study (2001-) and the Financial Diaries Project.

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