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Mobility and Inequality in the First Three Waves of NIDS

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Mobility and Inequality in the First Three Waves of NIDS

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Abstract: How much income mobility was there in South Africa between 2008 and 2012? Did this mobility serve to equalise or disequalise longer-term measures of income? In this paper we address the first question by assessing the extent of absolute and relative economic mobility. We then turn our attention to the second question of the joint relationship between mobility and inequality, and implement a new measure that is designed to reveal just how equalising or disequalising mobility has been. We find that there was a lot of absolute and relative mobility in the period covered by the first three waves of NIDS, and that this mobility served to equalise longer-term incomes slightly.

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1 Introduction

The purpose of this paper is to investigate the relationship between economic mobility and income inequality using the first three waves of the National Income Dynamics Study (NIDS). The key question that our analysis focuses on is 'to what extent did economic mobility serve to equalise or disequalise longer-term incomes in South Africa?' Ideally, this would imply a comparison of cross-sectional inequality with inequality of 'permanent income'. However, given that our data currently span the period of 2008 to 2012, we must lower our ambitions somewhat, and study something akin to 'medium-run' income over this five year period, rather than permanent income.

This paper adds to the South African literature by not only studying mobility and inequality as separate processes, but also by investigating how the two interact over a number of years. There is a poignant motivation for studying this joint relationship. In a society with very high inequality (such as South Africa) the degree of mobility over time may impact both the demand for redistribution and social stability (Friedman, 1962). Higher mobility (even higher perceived rather than actual mobility) may be coupled with a higher tolerance for inequality. On the other hand, the median voter theorem implies that low mobility and persistently high inequality will lead to stronger demands for redistribution. In this paper we use a recent measure by Fields (2010) that allows us to measure how much mobility has equalised or disequalised longer-run incomes. It should be noted that mobility in the context of this study refers to economic mobility as measured by income rather than intergenerational mobility which is sometimes used as a measure of inequality of opportunities. To this end we focus only on inequality of outcomes, while acknowledging that these unequal outcomes lead to unequal opportunities in an intergenerational sense. Mobility analysis tends to focus on an individual's changing position relative to others in the distribution of income. However, it is also possible to consider absolute mobility where the analysis is unconcerned with an individual's rank or position in the distribution. We will consider both kinds of mobility in this paper. In particular, the Fields index is a measure of absolute mobility, and the latter part of the paper will focus exclusively on this. Other kinds of mobility and volatility are the subjects of complementary NIDS Wave

3 discussion papers - see Finn and Leibbrandt (2013) for an analysis of poverty dynamics and Ranchhod (2013) for an analysis of volatility and mobility in the labour market.

We begin with a review of the existing literature on mobility and income inequality in South Africa. In section 3 we move on to a description of the data and longitudinal weights that are used in the analysis. Sections 4 and 5 assess mobility and inequality in isolation before they are joined into a single measure in section 6. Section 7 provides some concluding remarks.

2 Mobility and Income Inequality in South Africa

The measurement and evolution of income inequality in post-apartheid South Africa has received a great deal of attention in the academic literature (see *inter alia* Leibbrandt et al. (2010), Yu (2010), van der Berg et al. (2008) and Özler (2007)). Unsurprisingly, all studies of income inequality find that disparities are extremely high by international standards, with the post-tax, post-transfer income Gini coefficient being above 0.65 for every nationally representative survey since 1993 (Yu, 2010). Another finding that is common to all post-apartheid studies of income inequality is that the racial component of inequality has changed somewhat over the past 20 years. Inequality within racial groups has become more of a contributor to overall inequality than inequality between racial groups, though the latter is still exceedingly high by any measure. Finally, decompositions of the Gini coefficient by income source (Leibbrandt et al., 2001, 2010) find that income from the labour market is by far the most important contributor to overall inequality, with the wage share of overall inequality standing at over 90% according to recent estimates in Leibbrandt et al. (2010).

Studies of income mobility in the country over this period are less common, but there are a number of prominent examples. Cichello et al. (2005) use the first two waves of the KwaZulu Natal Income Dynamics Study (KIDS) to study earnings mobility among just over 1 000 African respondents in KwaZulu Natal in 1993 and 1998. They find that wage changes were substantial over the period under study and that more people gained than fell behind over the period. Nevertheless, almost a third of respondents earned less in real terms in the second wave than they did in the first. A decomposition of the determinants of earnings changes revealed that almost all of the variation in earnings could be explained by the combination of sectoral changes of occupation and the initial level of earnings itself.

Woolard and Klasen (2005) also use the first two waves of KIDS but focus on the mobility of household income, rather than the mobility of labour market income. Expanding the sample to all panel respondents (rather than restricting to the economically active only) the authors calculate a rigidity index for both incomes and expenditures. They also test the sensitivity of the index to the presence of outliers. They find that the rigidity level amongst African income was significantly

lower than for comparison countries over a similar period in both the developed and the developing world, and that the presence of measurement error does not change this finding. Once again, the importance of the labour market in a dynamic context is highlighted, with employment changes ranking as the most important determinants of mobility between waves, conditional on demographic changes not occurring.

More recently, Finn et al. (2013) use the first two waves of NIDS to estimate the first nationally representative measures of income mobility in South Africa. The authors note that the economic downturn between wave 1 and wave 2 lowered the real mean of household income per capita, though the median rose for Africans and coloureds. The mobility that took place over this relatively short period was more concentrated in the middle quintiles than at the bottom of the distribution where a high proportion of the population was trapped. Respondents who moved from the original household tended to do better on average than those who stayed, with brighter labour market prospects and higher earnings, conditional on finding a job.

Finally, Posel and Casale (2011) explore the role of perceptions of mobility (that is, subjective rather than objective relative standing) on subjective well-being. The shift from an objective to a subjective measure of relative position in the income distribution is particularly interesting, as the subjective view may be more important in determining social dynamics and demand for redistribution. The authors find that the correlation between actual rank and perceived rank is very low and, in particular, that those in the top third of the income distribution significantly underestimate their position.

3 Data and Summary Statistics of the Balanced Panel

In this section of the paper we provide an overview of the data used in our analysis. The same information may be found in the NIDS Wave 3 discussion paper on poverty dynamics (Finn and Leibbrandt, 2013), but is repeated here for the reader's convenience. The data used in this study come from the first three waves of NIDS. As the focus is on mobility and the requirement is repeated observations for each respondent, 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.

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 Income Mobility in the First Three Waves of NIDS

The natural first attempt at understanding mobility involves the creation of transition matrices. The three quintile transition matrices below provide a very broad overview of how much relative mobility there was. The distinction between relative and absolute mobility is an important one. In this case, we divide the distribution of income into five equally-sized sections and the matrices show how people moved relative to others in the distribution and relative to their previous positions. This stands in contrast to an analysis of absolute mobility, where, for example, poverty lines are chosen and it is of interest whether people moved into or out of poverty. In this case the position of others in society is not important. While the issue of absolute mobility and poverty dynamics is an important one especially in South Africa (see Finn and Leibbrandt (2013)) with an income poverty rate of close to 50% (Leibbrandt et al., 2010) the focus of this paper is on relative mobility.

Of the three matrices below, we focus our attention on the one showing transitions between wave 1 and wave 3. The other matrices show transitions from wave 1 to wave 2 and wave 2 to wave 3, respectively, but we are more interested in transitions over the longest period that our data allow. About 40% of those who were in the lowest quintile in 2008 (wave 1) were still there in 2012 (wave 3). Just over a quarter move up into quintile 2, while 18% moved into the middle quintile. Mobility in quintiles 2, 3 and 4 was higher than in quintile 1, but this is not surprising, given that those in quintile 1 can only move in one direction. Movement in quintile 2 tended to be over short distances (one position up or down) while downward movement from quintile 3 was pronounced 46% of the weighted sample moved down either 1 or 2 positions. As usual in South Africa (or any) datasets, there was very little mobility for those who were in the top quintile in the first wave. Almost 70% of those in quintile 5 in wave 1 were in that quintile when re-interviewed in wave 3. The majority of those who moved downwards moved by 1 position.

The relatively high mobility at the bottom of the income distribution contrasted with relatively low mobility at the top should not surprise us. Given how long the upper tail of the South African income distribution is, it is easy to think of

examples where people could lose a great deal of money but stay in the top decile. In contrast, the compressed nature of the distribution at lower levels means that a relatively small amount of income gained or lost would be enough to push a household / individual into a new decile. This picture of mobility, then, needs to be interpreted with this in mind.

Table 2: Quintile transition matrices

		Wave 2 quintiles					
		1	**2**	**3**	**4**	**5**	
Wave 1 quintiles	**1**	**42.58**	28.58	16.08	10.36	2.4	**100**
	2	25.8	**32.07**	22.48	16.39	3.26	**100**
	3	21	25.78	**31.55**	17.71	3.96	**100**
	4	8.43	11.33	24.14	**37.79**	18.31	**100**
	5	2.3	2.12	6.03	17.52	**72.03**	**100**

		Wave 3 quintiles					
		1	**2**	**3**	**4**	**5**	
Wave 2 quintiles	**1**	**44.71**	25.7	17.86	9.54	2.19	**100**
	2	26.78	**32.55**	24.6	13.17	2.9	**100**
	3	18.3	24.25	**31.09**	21.68	4.67	**100**
	4	8.14	14.61	22.18	**35.98**	19.09	**100**
	5	2	2.87	3.92	19.8	**71.4**	**100**

		Wave 3 quintiles					
		1	**2**	**3**	**4**	**5**	
Wave 1 quintiles	**1**	**39.53**	26.55	17.97	11.72	4.23	**100**
	2	28.58	**28.31**	25.21	12.46	5.44	**100**
	3	18.76	27.01	**30.49**	18.71	5.03	**100**
	4	9.49	15.17	20.67	**37.78**	16.9	**100**
	5	3.6	3.02	5.4	19.37	**68.62**	**100**

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

Table 3 below complements the transition matrices by summarising income mobility relative to wave 1 in 2008. The basis for this table is Jenkins (2011) who uses a balanced sample of respondents from 6 waves of the British Household Panel Survey (BHPS). The two columns of numbers provide measures of the association of real household income per capita in wave 1 and in subsequent waves. By con-

struction, the strength of association between each successive wave and the origin must decline. The decline in association seen in waves 2 and 3 relative to wave 1 are rather small, though they are often based on fairly low correlations in the first place. The correlation of wave 1 and wave 2 real household income per capita was 60%, and this fell slightly to 58% by wave 3. A similarly sized drop is evident for the rank (Spearman) correlation which fell from 54% to 50%. The proportion of the weighted sample falling on the leading diagonal of the transition matrix was around 50% for both wave 1 to 2 and wave 1 to 3, although the latter was slightly smaller. The average change in real household income per capita was R90 between waves 1 and 2. A higher level of real growth took place between waves 1 and 3, however, and this is represented by an average change of R374.

Table 3: Relationships Between Income in Wave 1 and Subsequent Waves

Summary index	**Association between income in W1 and later waves**	
	Wave 2	**Wave 3**
Correlation (income), %	59.93	58.44
Correlation (log income), %	66.34	62.07
Rank correlation, %	53.97	49.69
% on leading diagonal	26.17	22.6
% on leading diagonal or one cell either side	51.79	49.4
Average change (R per month)	90	374

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

It is interesting to view the correlations of different subgroups in the data. Three waves of data are not enough to establish a robust trend, but if the levels of association are consistently different then this is something worth exploring. The figures below show the strength of correlation for different races, age-gender cohorts, labour market status and education, respectively. The two points of the x-axis (1 and 2) represent the correlation between wave 1 and wave 2, and wave 2 and wave 3, respectively. Time invariant characteristics (for example race and gender) are anchored on their wave 1 categories, while characteristics that are possibly time-varying (labour market status) are based on the base wave in the correlation.

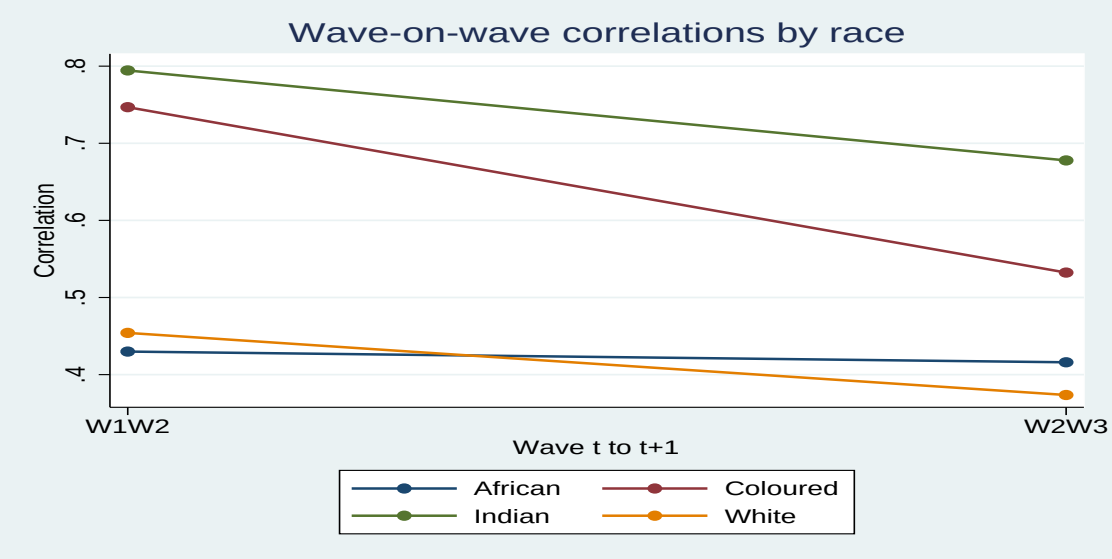
The correlations between wave-on-wave income for Africans and Whites are very similar at both data points in the figure below. Correlations for the Coloured and Indian population groups are higher than for Africans and Whites, although the Indian sub-sample of balanced respondents is very small and results using data from this group should be treated with caution.

Six gender-age cohorts were constructed and their wave-on-wave correlations are shown in the second figure below. The level of correlation was highest for females aged 60 and above, followed by males of the same age cohort. This is in line with expectations about a decreasing volatility of income as the life cycle is extended. The lowest correlations are for males and females in the cohort of 18 to 29 year olds, with the strength of association never being more than 50%.

The strength of association between wave-to-wave incomes was similar for the not economically active and for the employed. This is not a surprising finding, given that there was not pronounced movement into or out of these categories in between waves (see Ranchhod (2013) for a deeper analysis of these labour market transitions and associated earnings).

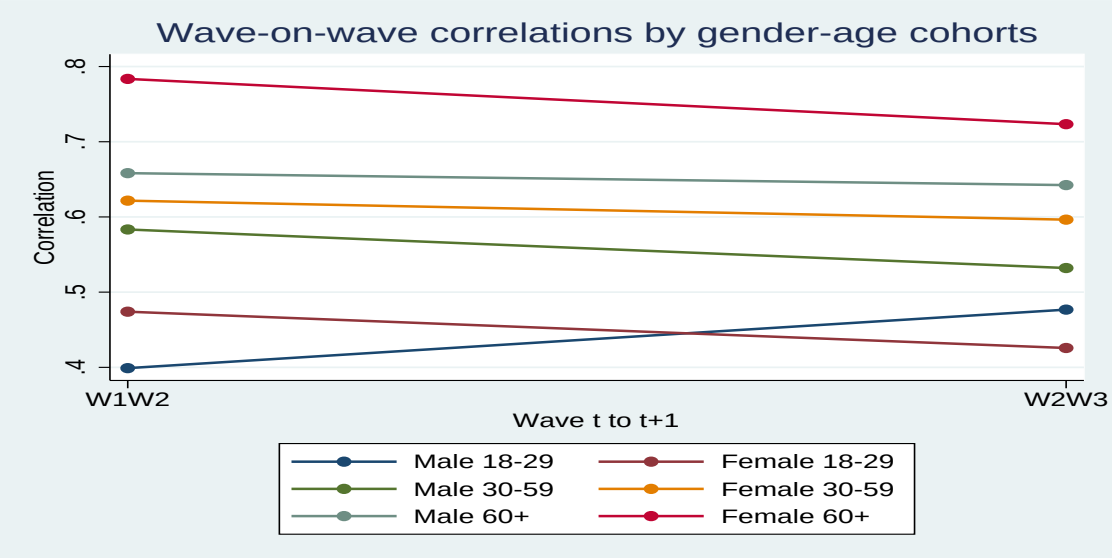
The final figure shows the strength of association for four different education categories. The balanced panel is now further restricted to adults over the age of eighteen. The highest correlation is for those with no education, followed by those with a matric, incomplete secondary and primary schooling. Of all the subgroups the education categories exhibit the smallest variation in terms of the difference of the correlations between wave 1 and 2, and wave 2 and 3.

Figure 1: Income Correlations by Race Over Time



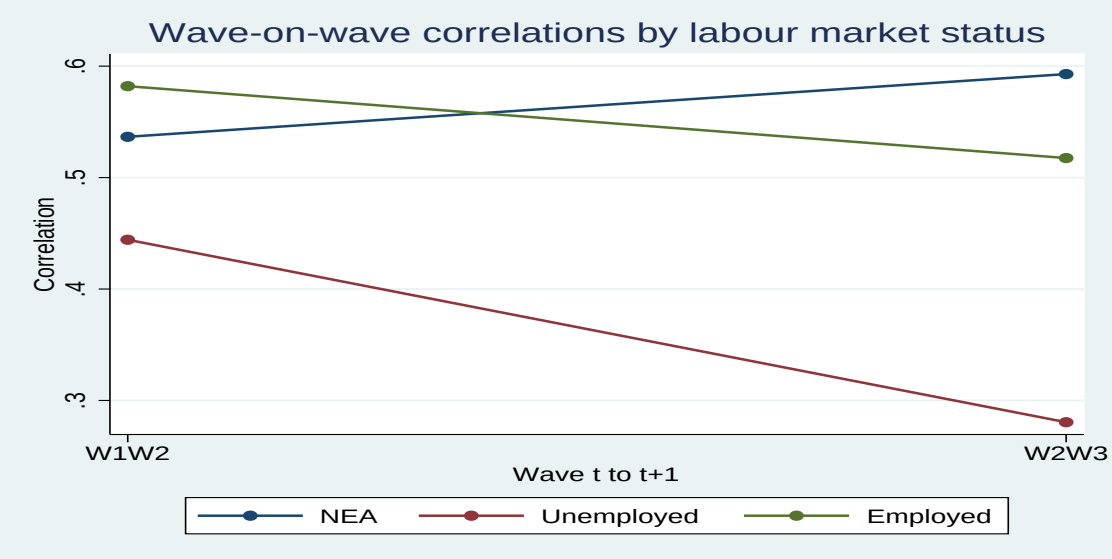
Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

Figure 2: Income Correlations by Gender and Age Cohorts



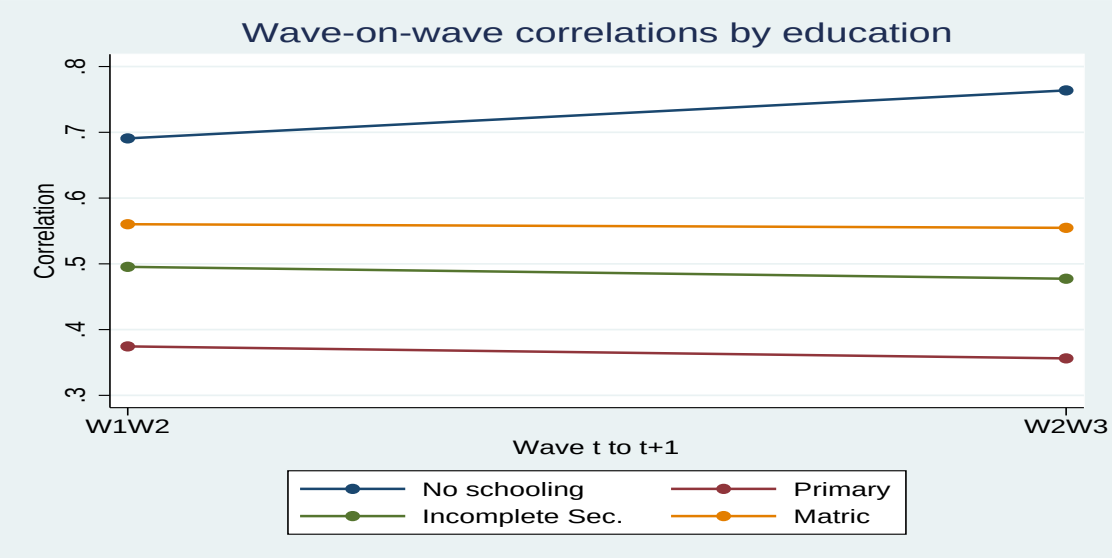
Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

Figure 3: Income Correlations by Labour Market Status



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

Figure 4: Income Correlations by Education Level



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

We now focus for a short time, on absolute mobility. By this we do not mean mobility related to some income category or poverty line, but rather to an individual's level of income in a previous wave. As such, the results are agnostic as to the individual's position in the distribution of income in the base wave. The table is based on a similar example in Zaidi (2008). Transitions from wave 1 to wave 2 fall into one of three categories. A flat pattern applies to cases where real income grew by less than 15% or shrank by less than 15%. A rising pattern applies to income growth in excess of 15%, while a falling pattern is the opposite. For wave 1, wave 2, wave 3 transitions, the definition of 'flat' remains the same. The definition of 'rising' changes to a significant upward change at least once, with no other significant change. The reverse applies for 'falling' over the three waves. The definitions for the 'down, up' and 'up, down' categories are self-explanatory.

The first thing to note from the table is how small a proportion of the sample experienced flat trajectories over waves 1 to 2 and waves 1 to 2 to 3. 45% of the balanced panel experienced an increase of household income per capita of more than 15% from wave 1 to wave 2, while a corresponding share of 38% experienced a significant drop. The wave 1, wave 2, wave 3 income path was flat for a mere 4% of the balanced panel. Over a quarter of the sample experienced a drop of more than 15% between wave 1 and wave 2, followed by a rise of more than 15% between wave 2 and wave 3. These measures of volatility suggest a higher degree of mobility than the transition matrices, and are more in line with the relatively low correlations shown in the earlier figures.

Table 4: Relationships Between Income in Wave 1 and Subsequent Waves

	W1 to W2	**W1 to W3**
Flat (< 15% change)	16.83	3.98
Rising	45.34	32.11
Falling	37.82	14.79
Down, up		27.28
Up, down		21.83
% non-flat	83.17	96.02

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

The final part of this mobility section uses regression analysis to investigate

whether the pattern of mobility was different between for each possible configuration of transitions. In the spirit of a Fields-type regression-based approach to mobility, we have the change in real household income per capita as our dependent variable. The key regressor of interest is the lagged level of real household income per capita. A negative and statistically significant value for this coefficient would lead to the conclusion that growth in incomes was 'pro-poor'. Controls are also added for household size, race, age, age squared, gender, geo-type and whether the household received a government grant in the base wave. Once again, all observations receive the balanced panel weights that have been used throughout this paper.

The lagged level of real household income per capita is negative and statistically significant for all three regressions. A test for differences in these coefficients is not statistically significant, implying that, on average, the overall pattern of growth between each configuration of waves was similar. Using the level of later wave income on the left hand side instead of the change in income shows that, for example, an additional rand of income in wave 1 was associated with an increase of income in wave 2 of 42 cents. The implication is that the rate of growth of income at the bottom of the distribution was higher than at the top between this pair of waves. The coloured, Indian and white dummies are all statistically and economically significant compared to the omitted African base. For whites in particular, the premium is both very high and very consistent.

Table 5: Mobility Regressions

VARIABLES	(1) Δ W1 W2	(2) Δ W2 W3	(3) Δ W1 W3
Lagged real HH inc. PC	-0.58***	-0.56***	-0.55***
	(0.01)	(0.010	(0.01)
HH size	-36.78***	-11.49	-6.18
	(6.84)	(7.45)	(7.83)
Coloured	259.53***	-282.03***	-198.08**
	(75.41)	(87.22)	(86.44)
Indian	1,284.73***	2,251.57***	1,735.75***
	(138.37)	(161.2)	(159.79)
White	3,183.52***	3,297.07***	3,199.08***
	(87.08)	(103.36)	(100.16)
Age	16.45***	26.32***	22.58***
	(3.46)	(4.11)	(3.97)
Age squared	-0.22***	-0.29***	-0.28***
	(0.05)	(0.05)	(0.06)
Female	-129.89***	-72.41	-63.94
	(40.04)	(46.36)	(45.93)
Tribal authority	162.51*	316.80***	285.87***
	(86.23)	(98.52)	(98.94)
Urban formal	512.46***	955.50***	904.73***
	(83.02)	(95.22)	(95.28)
Urban informal	104.23	198.93*	151.21
	(97.75)	(113.09)	(112.2)
HH receives grant	-560.70***	-694.96***	-759.27***
	(46.98)	(51.01)	(53.9)
Constant	819.63***	443.45***	677.46***
	(105.89)	(124.85)	(121.56)
Observations	18,341	18,752	18,327
R-squared	0.33	0.23	0.25

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using the balanced panel weight.

This section has suggested that although there was a fair amount of mobility of real incomes in between waves, the upper tail was far more rigid than the rest of the distribution. Given what we know about the structure of the South African economy, it appears reasonable to think that the mobility in the lower quintiles might not feed through to a lower level of longer-run inequality. It is to this question that we now turn.

5 Income Inequality in the First Three Waves of NIDS

As an introduction to the section on income inequality, let us assume that instead of being a longitudinal study, NIDS consisted of three cross-sections. Measuring inequality in cross-sections may provide a picture of inequality that is quite static, while the underlying processes may actually be reducing the inequality of longer-run incomes. Consider an extreme example of a society with three people and three waves. In wave 1 the distribution of income is (10, 20, 30), in wave 2 it is (20, 30, 10) and in wave 3 it is (30, 10, 20). Inequality measured in each of the cross-sections is constant, with a Gini coefficient of 0.22. However, the Gini of long-run income (the sum of incomes for each person over all waves) is 0, because everyone's long-run income is the same. While this example is far from what we might expect to observe in any society, it serves to illustrate the point that although repeated cross-sectional measures of inequality are a good place to start from, they miss the underlying dynamics.

Consider inequality of household income per capita for the full samples of each of the three waves of NIDS. Here we use the cross-sectional post-stratified weights instead of the balanced panel weights as we are measuring cross-sectional societal inequality. From the Gini coefficients it appears that income inequality is stubbornly high and persistent. It would be unusual if the Gini coefficient changed by more than a few percentage points over a relatively short time span and, indeed, the differences between the wave 1, wave 2 and wave 3 societal Gini coefficients are not statistically significant.[1]

Table 6: Inequality in the Population

Population		
W1 Gini	**W2 Gini**	**W3 Gini**
0.69	0.68	0.67

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using post-stratified cross-sectional weights.

[1] The slight decrease in inequality may also be partially driven by the fact that the high attrition rate for respondents at the top end of the income distribution is not wholly corrected for in the weights. For a brief overview of the implications of this, see Finn et al. (2013).

Measures of inequality for the balanced sub-sample of respondents show a similar marginal decrease from wave to wave. The Gini coefficient and both generalised entropy measures of inequality became progressively smaller, although the differences are not statistically significant. The inequality measures for total income over the three waves (wave 1 + wave 2 + wave 3) are lower than for any single wave, and this suggests that the mobility that took place had a mildly palliative effect on the extremely high and persistent level of inequality in society. Quantifying this effect forms the basis of the next section.

Table 7: Inequality in the Balanced Panel

W1 Gini	**W2 Gini**	**W3 Gini**	**Total Gini**
0.688	0.674	0.660	0.656
W1 GE(0)	**W2 GE(0)**	**W3 GE(0)**	**Total GE(0)**
0.94	0.90	0.843	0.814
W1 GE(1)	**W2 GE(1)**	**W3 GE(1)**	**Total GE(1)**
1.02	0.946	0.907	0.889

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

6 Did Mobility Equalise Longer-term Incomes?

The classic measure of mobility as an equaliser of longer-term incomes is due to Shorrocks (1978). This measure tells us the extent to which equalisation of incomes occurs as the time period under analysis is lengthened and is bound between zero (perfect mobility) and one (perfect immobility). Previous studies of South African data of Africans in KwaZulu Natal (Woolard and Klasen, 2005) calculated the Shorrocks rigidity index as approximately 0.9 for a panel with waves in 1993 and 1998, and it should be noted that this was based on a much lower level of inequality than that of the rest of South African society. The estimated rigidity index for the balanced panel members over the first three waves of NIDS is 0.975, indicating a small effect of mobility on equalisation of longer-run incomes, relative to the average income over all three waves.

One of the shortcomings of the Shorrocks measure is that it provides a measure of mobility relative to weighted inequality over time, rather than relative to inequality in the base year. Furthermore, it does not tell us how equalising or disequalising mobility has been - the sign and magnitude of the measure do not tell us the nature of the inequality-mobility relationship. To account for these problems, Fields (2010) proposed an index that allows for the calculation of exactly how equalising or disequalising mobility has been. Specifically, the measure is positive if mobility is inequality-reducing, negative if mobility is inequality-increasing and zero if base year and longer-term incomes are equally distributed. The measure, E, is defined as:

$$E = 1 - \left(\frac{I(\ell)}{I(s)} \right)$$

where $I(\ell)$ is any Lorenz-consistent measure of inequality of longer-run incomes (measured as the inequality of average income over the whole period) and $I(s)$ is inequality in the base year (wave 1 in our case).

The Gini coefficients for wave 1 to wave 2 and wave 1 to wave 3 average incomes are practically identical, as shown in the table below. This means that the E-index is very similar for both periods as well. The E-index for the wave 1 to

wave 3 period is positive which indicates that the mobility that took place served to equalise longer-term incomes somewhat.

Turning our attention to wages, it appears that wage mobility was more equalising than overall income mobility. The third and fourth rows of Table 8 report Gini coefficients for those respondents with positive earnings in all three waves. Note that it a respondent was unemployed in any one wave then he /she is omitted from the analysis. The wave 1 to wave 3 Gini of mean wages is substantially lower than the base Gini coefficient of 0.468 and 0.538, respectively. The equalisation over the longer wave 1 to wave 3 period was stronger than it was over the first two waves.

Table 8: The Fields Equalisation Index

	Gini of Mean	**Gini W1**	**E**
Income W1-W2	0.655	0.688	0.048
Income W1-W3	0.656	0.688	0.046
Wages W1-W2	0483	0.538	0.102
Wages W1-W3	0.468	0.538	0.130

Source: Own calculations using NIDS Waves 1, 2 and 3. Observations weighted using post-stratified cross-sectional weights.

7 Conclusion

This paper began with a question about the relationship between income mobility and income inequality in the first three waves of NIDS. In order to understand the joint distribution of these two measures, we began by assessing the level of mobility in our sample of balanced panel respondents. Mobility was found to be high in both relative and absolute terms. As always in a study using South Africa data, we found that relative movement in the top fifth of the income distribution was far more muted than in in the lower quintiles. In absolute terms, a tiny proportion of our sample had a 'flat' trajectory over the three waves. Almost a third of the balanced panel experienced increases in real incomes over the wave 1 to wave 3 period, while 15% experienced a fall. Just over a quarter fell between wave 1 and wave 2, before rising in real terms from wave 2 to wave 3.

Ignoring the longitudinal nature of the dataset and treating NIDS as three cross-sections results in an extremely high but stable measure of inequality, with the Gini coefficients standing at about 0.68 in each wave. The Gini coefficient for the balanced panel members fell between wave 1 and wave 3, and this drop is largely attributable to higher labour market earnings.

Using the Fields E-measure to investigate whether mobility served to equalise income relative to inequality in wave 1 reveals that the longer-run distribution is slightly more equal that the wave 1 base, though inequality is still extremely high for the pooled time period. Wage mobility (conditional on being employed in all three waves) was more equalising than mobility in total real income.

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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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