THE IMPACT OF SOUTH AFRICA'S OLDER PERSONS' GRANT ON THE LABOUR MARKET OUTCOME OF PRIME AGE INDIVIDUALS

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DECLARATION

I certify that this Research dissertation titled **"The Impact of South Africa's Old People's Grant on the Labour Market Outcome of Prime Age Individuals"** was conducted and written by me in partial fulfilment of the degree Masters of Economic Science at the University of Cape Town.

I know the meaning of plagiarism and declare that all the work in this dissertation, save for that which is properly acknowledged, is my own. Each contribution to, and quotation in, this dissertation from the work(s) of other people has been attributed, and has been cited and referenced according to the Harvard system of referencing.

I have not allowed, and will not allow anyone to copy my work with the intention of passing it off as their own.

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February 2014

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ABSTRACT

The study evaluates the impact of the presence of an individual who is age eligible for "state older persons' grant" on the labour force participation of prime age individuals who live with these individuals. Exploiting the panel structure of the National Income Dynamic Study (NIDS) data set, the study uses all three waves (2008, 2010 and 2012) of the data set to estimate if whether or not a causal relationship exists between the probability of employment of these prime age individuals and the existence of an individual eligible for pension in the household. Apart from employing cross sectional methods, the study makes use of pooled OLS and an Individual Fixed Effect model to estimate different equation specifications which control for various factors. To facilitate better comparison with previous literature, certain regression specifications in both the cross section and Panel evaluation methods restricts the sample to households with at least three generations of individuals residing within the household unit. Consistent with previous research, cross sectional results show that holding other factors that affect the probability of employment constant, there exists a negative association between the existence of age eligible individuals in households with prime aged adults, and the probability that these adults are employed. Contrary to previous research however, the panel results uphold instead of contradicting the results from cross sectional analysis and hence suggest that there indeed exists a negative causal relationship between the existence of at least one pension eligible individual and the probability that prime age adults living with them are employed. The results also find that consistent with previous research, the males in the household are the major drivers of this effect.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

Social grants have long been employed by governments of various economies to tackle problems of poverty, unequal distribution of income and wealth, low living standards and a host of other socio-economic challenges. The majority of these programs have been employed in First World economies with varying scope, reach, target groups, success rates and failure rates in certain cases (Kruger 1992; Ardington & Lund 1995).

Given the financial burden of such programs on the state and tax payers, it has been of paramount interest to economists, policy makers and the general populace alike to ascertain the impact of such programs on the target population and the spillover effects, if any, in the course of the program implementation and thereafter.

In Southern Africa, countries such as South Africa, Botswana, Lesotho and Namibia have all implemented some form of social intervention system (Pelham 2007). South Africa in particular presents an interesting case, given its history of Apartheid. At present, the "Rainbow Nation" has the following grants which exclude other forms of social security: the Older Persons' Grant (formerly known at the Old Age Pension), Grant-in-Aid, the Disability Grant, the Child Support Grant, War Veterans' Grant, Care Dependency Grant, and the Foster Care Grant.

Many studies have been conducted to evaluate the impact of these grants on both the personal and socio-economic outcome and wellbeing of the recipients, those around them and the wider populace/economy at large. The majority of these studies have made use of cross-sectional analysis to arrive at varied conclusions with a few making use of panel data methods.

In this vein, this study aims to evaluate the impact, if any, of the Older Persons' Grant on the labour force participation of prime aged individuals who live with the pensioners. This grant has been extensively analysed and picked through in the past, mostly with the aim of understanding the rudiments, costs, benefits and path of effect on the populace. The intended "treatment effect" of the grant is to provide support for the elderly. However, research in the past has shown that this grant actually generates a spillover effect on those who live with the pensioners, such as the health of children, educational outcomes of members and the labour force participation status and labour mobility of prime aged adults living with these pensioners (Duflo 2003; Duflo 2000; Legido-quigley 2003).

Investigating the plight of many black South Africans has proved rewarding for many researchers, given the family structure of many black households where more than one generation often exists within a household unit, and the history of Apartheid which restricted this grant initially to a certain preferred race.

This study hence will attempt to employ panel data methods using National Income Dynamic Study (NIDS) data set to investigate the impact of the grant on the labour market outcome of prime age individuals living with the pension receivers.

1.1 THE NATIONAL INCOME DYNAMIC STUDY (NIDS) DATA SET

This dissertation evaluates the impact of the Older Persons' Grant cash transfer on the labour market behaviour of prime age individuals living with the elderly in extended families using the NIDS data set. This data set is the first nationally representative panel survey which follows individuals and goes to the field every two years to source information. It cleans up this information and compiles it, resulting in a well-organized modus for analysis. Although

individuals are targeted, much information is available about household level variables as well. The first survey was carried out in 2008, being a random survey of 28, 226 sample members from 7, 296 households. The most recent survey was carried out in 2012 (National Income Dynamics Study, 2013). Data on individual demographics, livelihood and wellbeing were initially collected in the first round (or "wave" as it is preferably called), and bi-annually this information is updated, taking into account new births, deaths, migration and changes in marital status. The survey only follows "Continuing Sample Members (CSMs)" and children born to female CSMs, but also collects data on "Temporary Sample Members" (TSMs) who live within the same household as the CSMs in that particular wave. The data set is very careful to collect information on employment transitions, migration, income and expenditure and other labour market outcomes of the CSMs and TSMs as well, and hence proves an invaluable tool in finding a solution to the question this thesis tries to answer. Each round of the survey is referred to as a wave and consequently each of the three rounds completed are referred to as Wave 1, Wave 2 and Wave 3, respectively. The paper follows this naming convention in referring to each of the completed survey data sets.

1.2 STATEMENT OF THE PROBLEM

Increasing amounts of state funds are being directed towards the cost of social grants for the populace. Given the increase in grant take-up due to increased awareness, and the increasing cost implication for government and tax payers, many scholars and researchers alike have been interested in estimating the real impact of this expense as opposed to the targeted or perceived impact. In the past, cross-sectional data methods have been used, with the exception of Ardington et al, 2007, Ranchhod, 2006, who have employed the panel data method. NIDS recently released the third wave of their panel data and this study intends to take advantage of all

three waves of this nationally representative data set to assess the impact of the Older Persons' Grant on the labour force participation of prime aged individuals in the same household as age-eligible individuals. This would also go a long way towards contributing evidence to the pool of knowledge in which controversy exists as regards the direction of impact of the South African social grants (given their non-contributory nature), if at all any exists.

1.3 RESEARCH QUESTION

What is the impact, if any, of the South African Older Persons' Grant on the employment outcome of prime aged individuals living with the pensioners in extended families?

1.4 OBJECTIVE OF THE STUDY

To establish if any spillover effects of the Older Persons' Grant on the labour market outcome of prime aged individuals exist, and if it does, to establish what direction such effects are in.

1.5 SIGNIFICANCE OF STUDY

The purpose of this study is to explore a previously researched area using a data set that has not been used in previous works for such a study. The NIDS data set is a more nationally representative data set, and this study employs more advanced methods than some of the research done in this area in the past, due to their data limitations. Employing panel data methods, the issue of "unobservables" is controlled for and inference on causal effects is permissible after controlling for observed characteristics. This study hence contributes to the literature on the labour supply effects of the Older Persons' Grant, but makes use of a more representative data set and a different method from that employed in previous studies.

1.6 PLAN OF THE STUDY

The rest of the study is organized as follows: Section Two gives more insight into the South African Social Grant environment and employment environment. The third section focuses on a review of literature relevant to this study. The methodology employed for analysis is discussed in the fourth section while data descriptives, empirical analysis and results are presented in the fifth section. The sixth section concludes the paper and gives recommendations for further research where necessary.

2. THE SOUTH AFRICAN OLDER PERSONS' GRANT AND EMPLOYMENT ENVIRONMENT

This section provides a background of the Older Persons' Grant and employment setting in South Africa. The history of this grant, progress over time and prevalence in the nation as evidenced in the NIDS dataset are briefly outlined. Also, the South African employment environment is briefly discussed and a panel view of employment transitions and unemployment statistics is presented. This provides a backdrop to the key variables of analysis in the methods and results section.

2.1 SOCIAL GRANTS IN SOUTH AFRICA: OLDER PERSONS' GRANT

South Africa has a well-developed social security system with the following grants in place: the Older Persons' Grant, Grant-in-Aid, the Disability Grant, the Child Support Grant, War Veteran's Grant, Care Dependency Grant, and the Foster Care Grant.

The South African Older Persons' Grant is a non-contributory, means-tested cash transfer to South Africa citizens above 60 years of age. At present, the maximum amount payable per month is R1, 270 with R20 being added if the recipient is more than 75 years old. Provision is also made for those who are disabled to receive a Grant-In-Aid from the government in addition to the Older Persons' Grant. For the 2012/2013 period, the amount as published by the National Treasury was R1, 200 and R1, 220 for those over the age of 75 (National Treasury 2012).

Although South Africa's structure for retirement financing is now well-established, the coverage rate still varies widely amongst different income categories, with those in the lower income category eventually having to rely on state grants. The means tests are structured in a way as to reach those with the greatest need for it. As a result, a large percentage of the recipients are

members of the black race, since they account for the largest percentage of the entire population and, given the history of Apartheid, they constitute the majority of the most disadvantaged group. Table 1 shows that about 78% of those who receive the state pension are black, while they account for about 80% of the total South African population. White South Africans receive the least, when viewed as a ratio to the sample constitution of those in receipt to the sample constitution in the total population.

Historically, the origin of the grant is traced to 1882 in the old South African Republic, but was not regarded as a social grant as there were no formal or informal legal proceedings before its implementation. The initiative was born from the desire to cater for the needs of whites in the then Transvaal region. By the 1920s, these retirement funds had rapidly expanded to the skilled labour of that time who were mostly white, but formal regulation only came into play in 1956 when the "Pensions Funds Act" was enacted to regulate pension funds. (van der Berg 1997). The social pensions for the elderly were only extended to blacks in 1944 (Van der Merwe 1990:378)[1], who only received less than 10% of the figure that whites received. Moreover, the proportional constitution of blacks was very small due to stricter requirements in the means testing. By 1990, these numbers had grown greatly with the benefits received by black South Africans constituting over 70% of the total, while they accounted for 67% of pension receivers (Van der Berg 1997). As of 2012, about 79% of those in receipt of the state social pension were black (See table below), and they accounted for roughly 74%[2] of the total financial outlay on social pensions.

[1] As referenced by Van der Berg, 1997 (the main article is in a language other than English).
[2] Figure based on author's computation and figures released by the National Treasury. From the table on 'pension receipt by race', average total black earnings from state pension are approximately 2.7 Billion Rands. Meanwhile, the total expenditure on the old peoples grant for the 2011/2012 period was approximately 37.3 Billion Rands, being the largest by way of expenditure on grants (National Treasury Budget Review, 2012; Chapter 6: 86).

Table 1: Pension Receipt by Race[3]

Race	Sample Population	mean amount	No. receiving state pension
	%	ZAR	%
African	80.20	1,179.732	78.78
Coloured	8.71	1,189.619	11.42
Asian/Indian	2.30	1,199.251	3.97
White	8.73	1,159.26	6.03
Total	100	1,180.402	100

Data is weighted and the wave 3 data set is used.
Source: Computation from NIDS wave 3 data set (2012).

The expenditure on Older Persons' Grants is forecast to grow at an annual rate of 10% and the number of beneficiaries of this grant is said to have grown at an annual rate of 3.5% between the period 2008/09 and 2012/13 (National Treasury 2012). In the 2013 report, it is stated that for the 2013/14 period, the Older Persons' Grant will be increased by 5% to R1, 260, and by 4.9% to R1, 280 for those above 75 years of age. The 2012/2013 projected revised estimate reports approximately 2.85[4] million people in receipt of this Grant and this figure is expected to reach about 3.1 million by the 2015/16 period, an average annual growth rate of 3.7% 2009/10 and 2015/16 (National Treasury 2013).

[3] These percentages are similar to the STATS-SA mid-year figures of 2013 (Statistics South Africa 2013).
[4] Figure is reported to include those in receipt of the War Veterans Grant.

2.2 PENSION ELIGIBILITY IN THE DATA SET

Table 2 shows the change in household age-eligibility status of individuals across waves. A household can gain eligibility either by an already existing member of the household becoming of age, or by an age-eligible member moving into the household. On individual basis, individuals can move from one household that lacks an age -eligible individual into a new household that has one and vice versa.

The table suggests that there is not much movement of individuals within households based on the presence or absence of age-eligible individuals. Less than 10% of individuals report a change in the pension status of their household between waves. Between wave 1 and 2, less than 10% of individuals not residing in age-eligible households in wave 1 of the sample had a change in their household age-eligibility status. For individuals who belonged to age-eligible households in wave 1, about 30% lost household age-eligibility status. These proportions are somewhat similar between waves 2 and 3 and change slightly when assessed between wave 1 and 3. As will be seen later, this has important implications.

Table 2: Pension Eligibility* Transition across Waves

wave 1 to wave 2	Does NOT live in Pension Eligible Household	Lives In Pension Eligible Household	Total
	%	%	%
Does NOT live in Pension Eligible Household	91.59	8.41	100
Lives In Pension Eligible Household	30.75	69.25	100
Total	81.71	18.29	100
wave 2 to wave 3			
Does NOT live in Pension Eligible Household	93.43	6.57	100
Lives In Pension Eligible Household	32.84	67.16	100
Total	82.28	17.72	100
wave 1 to wave 3			
Does NOT live in Pension Eligible Household	90.43	9.57	100
Lives In Pension Eligible Household	45.64	54.36	100
Total	82.28	17.72	100

*A Pension eligible household is one that has at least one age-eligible individual as a member.
Percentages are weighted. Sample includes all prime aged individuals who occur in all 3 waves, both residents and non-residents and excludes duplicates.
The earlier wave is on the column axis while the later wave is on the row axis. E.g. cell 2,2 (row2, column 2) gives the proportion of individuals who did not live in pension-eligible households in wave 1 and still did not live in pension-eligible households in wave 2. Cell 2, 3 gives the proportion of individuals who did not live in pension-eligible households in wave 1 but now live in pension-eligible households in wave 2.
Source: Computation from NIDS wave 1, 2 and 3 data set (2008, 2010 and 2012).

2.3 EMPLOYMENT IN SOUTH AFRICA

The dynamics of unemployment in South Africa are similar to those faced by many other developing countries, but have their own idiosyncrasies, due to the country's history. The unemployment rate has grown, despite various efforts by the government to curb it.

From Table 3, it is seen that between waves, the highest proportion of individuals are employed and the next large group consists of those who are not economically active. Between waves 1 and 2, and waves 2 and 3 respectively, however, the proportion of those who remain "Not economically active" reduces by about 10%, while the proportion of those who remain unemployed and discouraged also reduces, and the proportion of those who remain employed increases by about 10%. The proportion of those who remain strictly unemployed increases however.

The histogram in Figure 1 presents figures as of the 2012 wave 3 releases. The unemployment rate[5] (broad rate of 29.62% and strict rate-24.92%) is similar to nationally reported figures which report unemployment rate to be at about 24.9% as of the fourth quarter of 2012 (National Treasury 2013; Statistics South Africa 2012).

In Figure 2, employment status is presented by race group and consistent with anecdotal evidence - white South Africans have the highest employment rate, while black South Africans the lowest.

[5] This is calculated for the sample that occurs in all three waves and corrected for attrition using panel weights. The strict rate is calculated by excluding both the economically in-active and the discouraged while the broad rate excludes just the economically-inactive. Calculations are based on figures reported in the NIDS data set.

Table 3: Employment Transition across Waves

Wave 1 to 2	Not Economically Active	Unemployed Discouraged	Unemployed Strict	Employed	Missing	Total
	%	%	%	%	%	%
Not Economically Active	50.72	5.8	14.21	24.61	4.66	100
Unemployed Discouraged	39.02	10.8	16.93	26.01	7.25	100
Unemployed Strict	38.48	5.31	21.71	31.12	3.38	100
Employed	16.57	2.72	5.93	70.44	4.34	100
Missing	22.08	2.96	8.27	53.96	12.73	100
Total	27.09	4.04	10.57	52.47	5.83	100
Wave 2 to 3						
Not Economically Active	42.5	4.73	23.19	29.34	0.24	100
Unemployed Discouraged	37.64	6.59	20.67	34.54	0.56	100
Unemployed Strict	23.75	6.14	26.01	44.10	0.00	100
Employed	9.79	1.27	7.97	80.88	0.09	100
Missing	20.39	4.85	12.97	61.16	0.63	100
Total	21.76	3.19	14.78	60.09	0.18	100
Wave 1 to 3						
Not Economically Active	45.37	4.48	17.15	32.79	0.21	100
Unemployed Discouraged	26.43	9.49	30.72	33.24	0.12	100
Unemployed Strict	24.59	3.27	26.82	45.13	0.19	100
Employed	14.44	1.95	8.94	74.53	0.14	100
Missing	17.42	3.36	12.27	66.69	0.26	100
Total	21.76	3.19	14.78	60.09	0.18	100

NOTE: Percentages are weighted, sample sizes are not. Sample includes all prime aged individuals who occur in all 3 waves, both residents and non-residents and excludes duplicates.
The earlier wave is on the column axis while the later wave is on the row axis as in Table 2 above.
Source: Computation from NIDS wave 1, 2 and 3 data set (2008, 2010 and 2012).

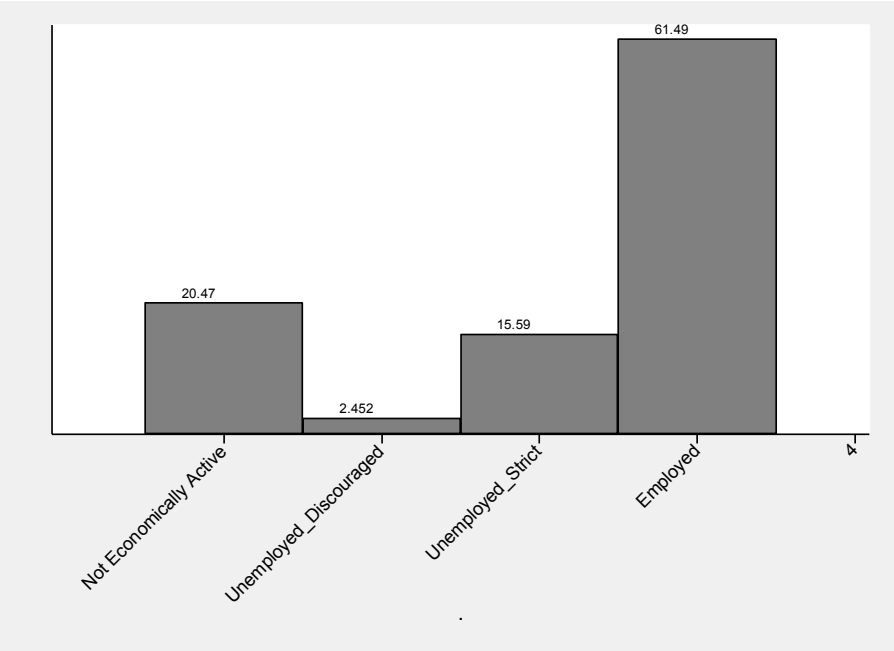

Figure 1: Labour Market Outcome

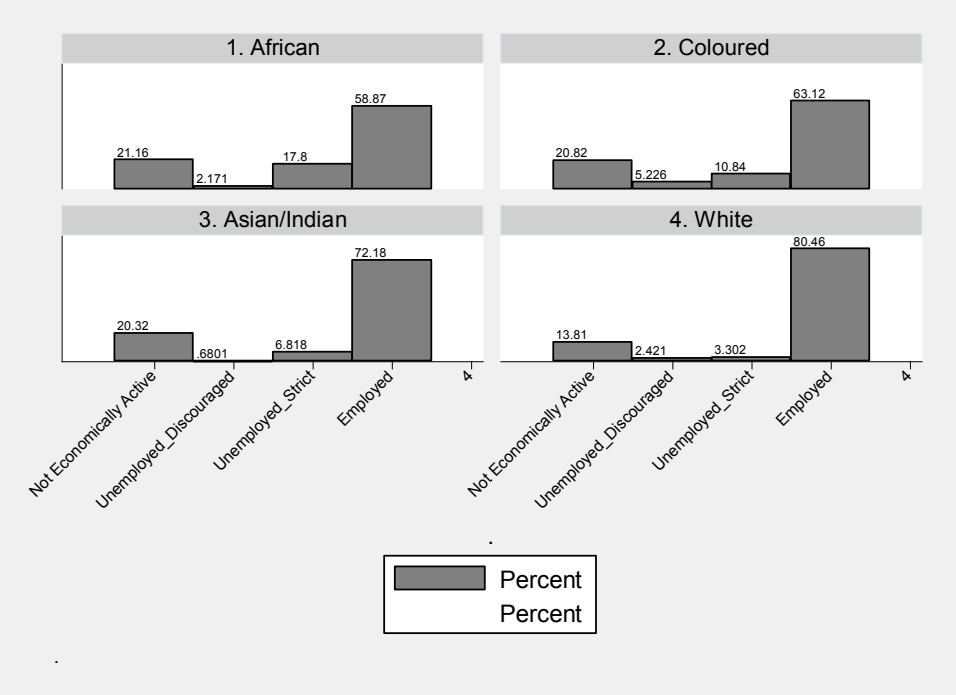

Figure 2: Labour Market Outcome by Racial Group

3. REVIEW OF RELEVANT LITERATURE

In this section, past literature relevant to this research is reviewed. A brief appraisal of the findings of studies that analyse the impact of different social grants in South Africa is provided. Moving from the general to the specific, Focus is given to studies that carry out research on other grants except the Older Persons' Grant, and then narrowed down to those that evaluate the Older Persons' Grant with more focus being given to studies that analyse the labour supply effect of the grant.

Woolard & Leibbrandt (2010), look at South Africa's social cash transfers in general and evaluate their impact on poverty. They provide evidence that given the history of Apartheid in South Africa, the various cash transfer programs are highly redistributive in nature and also go beyond the short term to break the perpetual cycle of poverty among the disadvantaged population by providing a constant and predictable source of income.

Pelham (2007) employs a more political approach in understanding the conditions under which social pension schemes have evolved in Lesotho, Namibia and South Africa and the implications for citizens and the state as a whole. The author argues that the motivation behind the pension in all three economies is as much demand-driven as it is supply driven.

In two recent studies, Mutasa looks at the effects of actual receipt of the disability grant on the labour supply of individuals between ages 18 and 60 (Mutasa, 2012a, 2012b). In both papers, he employs three different survey data methods on the 2007 wave of the General Household Survey (GHS). He finds that the Disability Grant alters the labour force participation of the individuals in his sample, but doubts the authenticity of the result as he is unable to control for the "severity of disability" due to data limitations.

The next group of studies focus on the various impact of the Older Persons' Grant (referred to as its former name, "Old Age Pension", in the majority of the studies) on different groups of people in the population. This grant has been much analysed by researchers and, as such, ample amounts of literature exist about this grant.

Esther Duflo in two different studies evaluates the impact of social pension receipt on the health of children living with pensioners. In her papers, Duflo (2000) and Duflo (2003), she provides significant evidence of the positive impact of receiving the grant on the health and nutrition of female children living in households with at least one female pensioner.

Focusing on the impacts of the Older Persons' Grant on labour market outcome, Bertrand et al (2003), Ardington et al (2007) and Sienaert (2008) evaluate the impact of the grant on labour supply of working/prime aged individuals. Bertrand et al (2003) make use of the "Integrated Household Survey of South Africa" to access the effect of the South African Old Persons' Grant on the labour supply of prime aged individuals in multi-generational African households, and in doing so investigates the evidence of income pooling in developing economies. The research instruments for actual pension income receipt with age-eligibility to circumvent issues of heterogeneity in the sample. They find significantly negative association between the existence of an age-eligible individual and the employment probability of individuals' aged 16 to 50 who reside with the age-eligible individuals. They also find evidence of intra-household income redistribution, but reject a common preference approach to modelling labour supply within African families opting rather for the existence of a household bargaining framework.

Sienaert (2008) also investigates the impact of the state pension in South Africa on "working age members" of households that receive pensions using the South African LFS survey of September

2004. The paper follows the common trend of proxying for pension receipt with age-eligibility in some of the strategies employed in their analysis, and finds that consistent with most studies (including this one), the grant significantly reduces the probability of employment of prime aged individuals living in households that have pensioner-members. They however also find that consistent with Ardington et al (2007), the grant increases the probability of labour migration of these individuals.

Ardington et al (2007), on the other hand, make use of panel data collected in KwaZulu-Natal from the "Africa Centre Demographic Information System" to analyse the labour supply responses of individuals aged 18 to 50 about changes in the presence of pension-eligible individuals in their household. The panel follows households as a whole. As such they are able to exploit the timing of pension arrival/loss in the household to estimate causal relationships. They find that this large cash transfer not only significantly increases the employment of the prime aged individuals within the household, but also facilitates labour migration.

Posel, Fairburn, & Lund (2006) also look at the labour migration angle of labour supply as affected by the Social Pension Scheme in South Africa. They make use of survey data methods to explore factors that might cause people to migrate for work-related reasons. The approach employed in the paper is similar to that used by Bertrand et al (2003) where household social pension is measured using more than two different approaches for three-generational African households. They find that pension receipt is significantly associated with increased labour migration amongst female prime aged household members. They argue that this is evidence that the pension encourages labour migration by reducing the cost and augmenting the constraints associated with migration. They also find results which support the findings of Duflo, (2003) that pension receipt by grandmothers enable them to support their grandchildren.

Ranchhod (2006) pools two waves of the "South African Labour Force Surveys (LFS)" to constitute a panel and evaluates the labour supply of black South Africans over the age of 50[6] on receipt[7] of the Older Persons' Grant. This study strays away from the usual focus on the labour supply of working-class individuals by focusing on the elderly. The paper does not find any significant effect of the pension receipt on the labour supply of these elderly individuals.

[6] The paper however excludes those over the age of 75.
[7] For women above the age of 60 and men above the age of 65.

4. METHODOLOGY

In this section of the study, the methods used in data analysis and empirical interpretations are outlined and the reduced form equation specification used in estimating regression results in the Empirical section. Details of the dependent and explanatory variables are provided as well as an explanation of how they are constructed.

In general, the purpose of the study is to provide evidence of some level of association and maybe a causal effect between the South African Older Persons' Grant and the labour market outcome of prime aged adults who live with individuals who are age-eligible for the grant.

Prime aged individuals refer to those who were older than 22 years as of wave 1 (2008) and less than 51 years as of wave 3 (2012). Although the official working age in South Africa is 16, the study excluded those between the ages of 16 and 22 for two major reasons; the probability of employment for those between the ages of 16 and 18 is less than 1%, and to avoid bias issues associated with individuals leaving school and trying to find jobs.

Both cross-sectional and longitudinal methods are employed in analysis. The identification strategy and reduced form equation specification follows that of Ardington et al, 2007. Individuals in households with at least one age-eligible individual are considered as a treatment group and compared to the control group which consists of individuals in households without age-eligible individuals. Age-eligibility and not actual pension receipt is used to control for biases that might be introduced as a result of selection into treatment (Ardington et al. 2007; Bertrand et al. 2003). This selection might arise as a result of certain people below the pension-eligible age receiving some form of pension, either from their previous establishment or from private pension funds they set up for themselves. It is also the case that not all pension-eligible

individuals receive the pension even when they meet the means-test requirement (Bertrand et al. 2003). If the differences between the age-eligible who receive the pension and those who don't are systematic, or those who are not age-eligible but receive a pension and have a certain characteristic which sets them apart, this will go against the "strict erogeneity" requirement of the "classical linear regression model" and hence bias Ordinary Least Squares (OLS) results.

Age-eligible individuals are those aged above 50. Although the official pensionable age up till 2012 is 60 for females and 65 for males, the 50 years-old cut-off age is used to circumvent biases that might be introduced as a result of people modifying their behaviour in anticipation of pension receipt. This idea is consistent with the literature (see Bertrand et al. 2003; Sienaert 2008; Ardington et al. 2007).

This study examines the changes in employment status given changes in household age-eligibility status. Exploiting the panel structure of the NIDS dataset, the study estimates causal pathways using the timing of changes in age-eligibility and employment status. For Individual *i* in household *h* in survey wave *t*, the following reduced form equation is estimated;

$$y_{iht}^{e} = \beta P_{ht} + \gamma X_{iht} + \varepsilon_{iht}^{e}$$

$$\varepsilon_{iht}^{e} = \alpha_{i}^{e} + u_{iht}^{e}$$

Where;

y_{iht}^{e} =Labour market outcome; employment: y^{e} =1 if employed and = 0 if the individual reports any other labour market outcome but "employed";

X=household and individual level controls that independently affect employment status;

α_i^e =Individual-specific fixed effect for labor market outcome 'e'. It absorbs all determinants of employment that are constant with person '*i*' over time.

The fixed effects model in which variables are demeaned using the "within transformation" is to capture changes in labour market outcome through time and is specified as follows;

$$y_{iht}^e - \overline{y_{ih}^e} = \beta(E_{ht} - \overline{E_h}) + \gamma(X_{iht} - \overline{X_{ih}}) + (u_{iht}^e - \overline{u_{ih}^e})^8$$

The variable α_i^e is constant over time and as such $\overline{\alpha_i^e} = \alpha_i^e$ and the determinants of employment that are constant with an individual over time is eliminated.

Given the peculiarity of the data set, in that it follows individuals and not households over time, the primary explanatory variable, age-eligibility, is a dummy variable that equals 1 if for individual i in wave *t*, there exists at least one individual who is age-eligible within his/her household *h* and zero otherwise. As such, focus is on the coefficient "β". A significant and negative β implies that the presence of an age-eligible individual in individual *i's* household is associated with a decrease in the probability that individual is employed if he/she belongs to the prime-aged category.

In some specification of the results, focus is restricted to multi-generational black South households and the variable used in estimation is an indicator that takes on the value of 1 if within a given household, at least three generations of members exist. This three-generational relationship is established by looking at relationships between household members via a variable

[8] This specification differs from that of Ardington et al (2007) only slightly. The fixed effects model specification in their paper is written in the form of a first difference model specification because they make use of only 2 waves of a data-set and the estimates of the two different models are equal when time is exactly equal to 2. This study makes use of 3 waves of data (i.e. time=3) and as such, the model is specified differently.

called “relationship to resident head” in the NIDS data set. Restricting the sample to three-generational households is in line with the specification in Bertrand et al. (2003) and the explanation given for this is that the majority of black South Africans (who constitute the majority of the populations) live in multi-generation households as well as a large proportion of pension-eligible individuals above the legal cut-off age.

5. DATA DESCRIPTIVES AND RESULTS OF EMPIRICAL FINDINGS

5.1 DATA DESCRIPTIVES

In the spirit of Ardington et al, 2007, to sidestep bias due to sample selection, this paper categorizes individuals into two groups based on whether they live in a household where at least one household member is "age-eligible" to receive the state Older Persons' Grant. This selection issue can arise as a result of private pensions provided to certain elderly people by their employers (Ardington et al. 2007).

The tables in Appendix 1 present descriptive characteristics of individuals in the NIDs data set in all the three waves, weighted such that they can be extrapolated to represent the entire population. The descriptives are grouped into "Eligible" and "Ineligible" categories.

From Table A.1, as expected for a growing population, the number of unique households increases between 2008 (wave1) and 2012 (wave 3) except for a drop in the number of ineligible households in wave 2, where NIDS reports encountering field challenges during the data gathering process. However, the consistent trend across all three waves is that there are more ineligible households than eligible ones implying that a higher proportion of households in South Africa do not have household members aged over 50 residing in them. There are almost twice as many households with age-eligible members than without. Eligible households across all three waves have higher household incomes than ineligible households. However, a larger proportion of prime aged individuals reside in the ineligible households when compared to eligible households (see Table A.2). Also, more than 60% of those in the ineligible households are employed, compared to 45% in the eligible Households (see Table A.3). Combining these figures with the fact that the percentage of children and teenagers is higher in these ineligible

households, it can be postulated that these ineligible households are newly formed units made possible by the fact that the individuals are employed and can hence sustain a family. It is also worthy of note that in general, the employment rate seems to have increased, albeit slightly, between 2008 and 2012 (all three waves of the data set, see Table A4).

From Table A.2, those in the eligible households are about 10 years older than those in the ineligible households on average. This can be explained by a number of factors, one of which is the fact that the eligible households have an elderly individuals component, which the ineligible households lack by reason of variable construction.

It is quite interesting to see the trend in the education of prime aged individuals in Table A.3. First, note that the proportion per level of education is almost the same for each eligibility category and this trend is consistent across all three waves. A high proportion of the population seems to have some level of education, but did not complete Matric/Grade 12 (about 55%). The next group by size are those who have a Matric certificate (about 25%). About 10% have a post-Matric Diploma/National Technical Certificate (NTC), and about 5% have no schooling in general. Looking across the waves though, it is seen that the proportion of those with Matric certificates decreases somewhat and those with NTC or post-Matric diplomas increases. Also, it is seen increases in the proportion of people with graduate and post-graduate degrees across waves. The proportion of those without schooling also decreased. One can thus safely say that in terms of education, the population seems to be advancing, albeit quite slowly, but progress is observed.

Between the eligible and ineligible groups, figures presented in the tables are as expected and no outright anomalies are observed. Tests[9] of significance on the differences between the two groups (eligible and ineligible) based on household size, household income, age, gender, race, and educational outcome of individuals are carried out. The results of the tests shows that the two groups are significantly different based on these characteristics and, as such, are controlled for in the regression analysis.

Table 4 gives the labour market outcome of individuals by their pension category. Given that the NIDs data set follows individuals and not households individual characteristics are reported, instead of household characteristics as done in Ardington et al, 2007, as identifying households across waves becomes problematic given that households move and household composition changes. From the table, it is observed that a high proportion of the population does not show any variation in terms of whether or not they reside with individuals that are eligible for the state pension. An individual can belong to a pensionable household or lose pensionable household status by moving into a house where a pensioner exists, or by having a pensioner move into his/her household and vice versa. About 60% of the population report never having belonged to a pensionable household between 2008 and 2012 and only 17% report belonging to a pensionable household throughout the three waves. Of particular interest to this study, however, is the category of individuals amongst which there is some variation between and across waves. The table shows that 6% of the population gained pensionable household status from wave 1 to wave 2, 7% lost it within the period while about 5% gained pensionable household status between wave 2 and 3 and 6% lost it.

[9] Student's t-test is used for continuous and categorical variables while probability test is used for binary variables.

Table 4: Descriptive Statistics by Pension Status: Household pension status transition of individuals

	Never belonged %	Always belonged %	Gained from 1to2 %	Lost from 1to2 %	Lost from 2to3 %	Gained from 2to3 %	Total %
Labour Market Outcome:							
Not Economically active	53.14	23.11	7.31	6.24	5.7	4.5	100
Unemployed	50.67	35	1.56	5.52	3.65	3.61	100
Discouraged Unemployed	51.91	23.38	4.79	9.53	6.4	3.99	100
Strict Employed	65.89	12.16	5.64	7.15	6.41	2.75	100
Gender breakdown:							
Female	57.61	17.55	6.9	6.95	6.42	4.57	100
Male	63.24	16.84	4.65	7.35	5.79	2.13	100
Total (n)	60.38	17.2	5.79	7.15	6.11	3.37	100
Mean age	38.13	35.88	36.08258	34.25	34.58	39.09	37.16

NOTE: Figures presented are in percentages and the data is restricted to a balanced sample of prime aged[10] individuals as of wave 3.
Panel weights which have been calibrated, trimmed and adjusted for attrition are provided in the data set and are used.
Source: Computation from NIDS wave 1, 2 and 3 data set (2008, 2010, and 2012)

Although these differences are quite small, it is seen that 1% more people seem to have lost pension status between each wave than gained. This might suggest evidence of migration due to increased mobility.

A higher proportion of individuals are males in their mid to late 30's, and the majority of those amongst which variation is observed are either employed or not economically active. This group

[10] Prime aged individuals are categorized as those who were aged between 23 in wave 1 and 50 in wave 3. This implies that the category includes all those that fall into the 23-46 year-old age bracket inclusively in wave 1, 25 and 48 in wave 2 and 27 and 50 in wave 3 respectively.

of individuals proves to be interesting when evaluating effects of the grant on employment probability, as would be seen in regression analysis.

5.2 EMPIRICAL ANALYSIS AND RESULTS

This sub-section gives empirical results and interpretations of these results both for the cross-section and panel methods employed in an attempt to answer the research question and test the relevant hypothesis.

5.2.1 CROSS SECTIONAL PATTERNS IN EMPLOYMENT

In the figures below, the probability of employment for those between ages 16 as at wave 1 and 50 as at wave 3 is graphed. Figure 3 shows the probability of employment irrespective of gender while Figure 2 and 3 restrict the sample to female and male sample members respectively. These graphs are created in line with those in the paper by Ardington et al, 2007. The probability of employment is calculated following Bayes' theorem as follows;

Probability that individual "*i"* is employed given his/her age is calculated as:

$$\Pr(E|A) = \frac{\Pr(A|E) \times \Pr(E)}{\Pr(A)}$$

That is, it is equal to the probability that given *i*'s age, he/she is employed, times the probability that *i* is employed in the sample; all divided by the probability that *i* is that age in the sample.

Similar to Ardington et al, Figures 3, 4 and 5 shows that the probability of employment increases from about zero for those who just enter the official working age (16 in SA). This figure only increases to about 1% when individuals turn 18. However, for the purpose of this study, individuals in the age bracket of 16 to 22 are excluded from the prime aged sample to avoid biases associated with the effect of school leaving and finding first jobs on employment.

Graphed samples are those within the stated age group as at wave 3, both residents and non-residents.

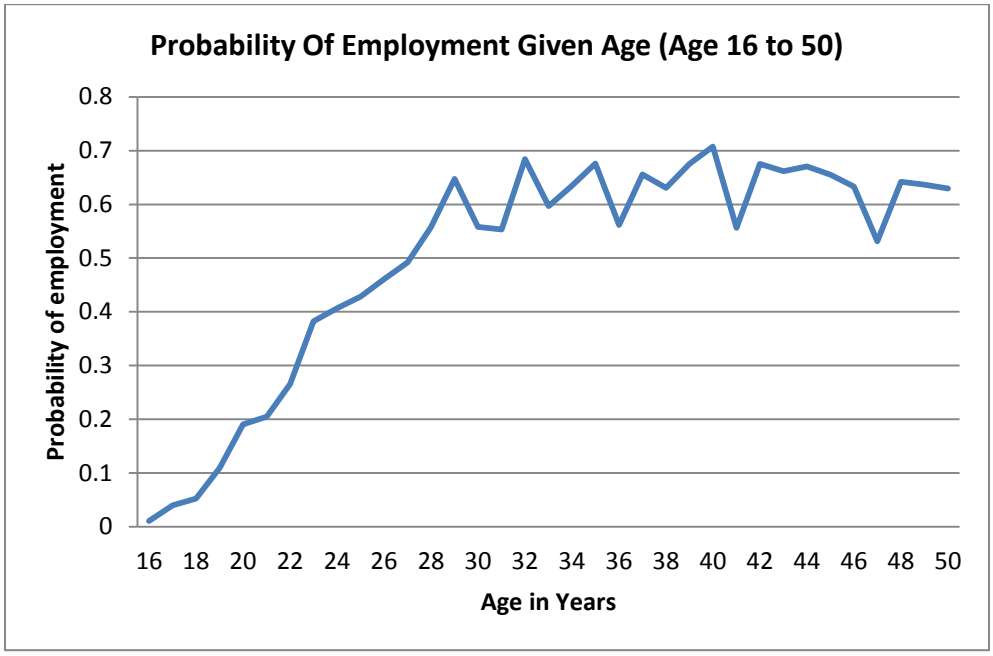

Figure 3: Probability of Employment Given Age (Male and Female)

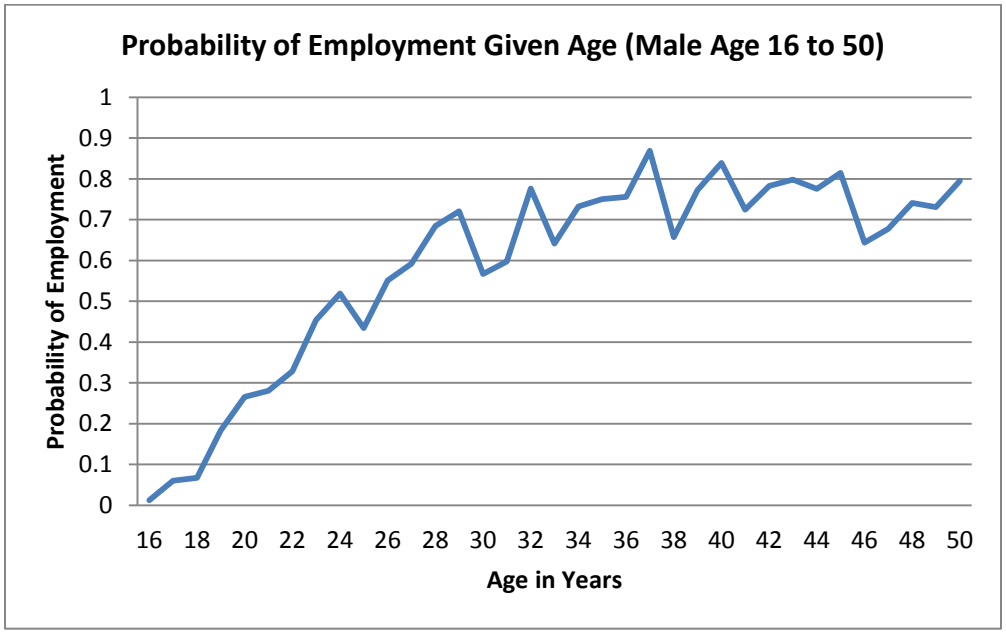

Figure 4: Probability of Employment Given Age (Male Only)

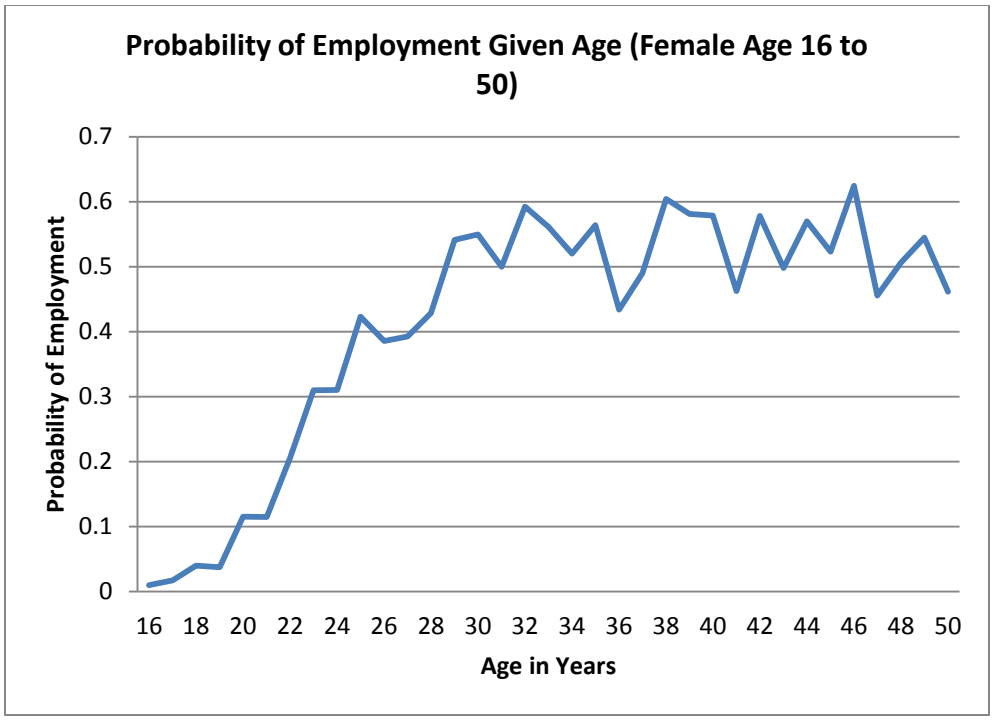

Figure 5: Probability of Employment Given Age (Female Only)

5.2.2 CROSS SECTION REGRESSION RESULTS

Table 5 presents cross-sectional results of the effect of the presence of an age-eligible[11] individual on the employment of prime aged individuals living with the pension eligible individuals. The result only presents the association between two variables and cannot be interpreted as causal. In the table, the coefficient of interest is the Household Eligibility Indicator which takes on the value of 1 if the individual lives in a household with at least one age-eligible individual, and zero otherwise. Columns one to seven present estimates from different regression specifications. In specification one to four, individuals who live with age-eligible individuals are significantly less likely to be employed when compared to those who do not.

[11] In a version of the cross-sectional results not reported here, the regression specifications are run using actual pension receipt as the variable of interest and find that the signs and significance of the coefficients remain the same.

The regression results for the resident members is of primary importance to us as these are most comparable to the panel result, given that data limitations prevent us from estimating the effects on the non-resident population as well in the panel analysis. Column three presents results jointly for men and women, while columns four and five restrict the results to males and females only, respectively. The regression result from the specification in column three implies that resident prime aged members who live with age eligible household members are 11% less likely to be employed compared to those who do not. Similar to the findings of Ardington et al, the study finds that this effect is driven by the male prime aged members of the household as seen from comparing the results in columns four and five. The coefficient in column five becomes very small (-0.0361) compared to the initial coefficient of -0.1114, and insignificant even at the 90% confidence interval. For the male cohort however, the study finds that holding all other factors that affect probability of employment constant, resident men in their prime are 20% significantly less likely to be employed.

Given the nature of the data, ascertaining whether eligibility status is a result of the prime aged individuals moving into or out of a household where an age-eligible individual resides, or a resident household member becoming eligible, moving out of the household or dying becomes difficult. This can present a problem in interpreting the result as it cannot then be said in what direction the association moves. Do unemployed individuals move into households with age-eligible individuals or is it the case that those who reside with age-eligible individuals do not seek/get employment? In one specification of the regression not reported here, a variable for whether the individual is a mover or stayer in the present (third) wave and also for if the individual is a mover or stayer in the previous (second) wave is included. Although the coefficients on these variables return positive and significant, they do not alter the sign, size or

significance of the coefficient of interest. Hence, the angle that the result is driven by the unemployed individuals moving into the age-eligible households can be eliminated and it can be postulated that the more plausible idea is that an already existing household member gains or loses age-eligibility by becoming of age or moving out of the household, or that such an individual moves into the household. The results in columns six and seven are comparable[12] with that of Bertrand et al who consider only households that have at least three-generation living within the same household unit.

They also control for province and household size and restrict their sample to three generational African households although they consider those between the ages of 16 and 50 (Bertrand et al. 2003). The result finds that the coefficient of interest becomes smaller and is not significantly different from zero at the 95% level. The coefficients are however about half of those by Bertrand et al where they have a coefficient of -0.086 compared to -0.044 in this regression result.

It is also interesting to note the coefficients of the age variable. In the specifications in columns *ii* to vii, both age and its quadratic are highly significant. The signs on the coefficients are very similar (approximately 0.05 for age and -0.0006 for age-squared) indicating that the probability of being employed for prime aged individuals follows a parabolic path with a turning point of 83.33[13]. The coefficient on age is however positive, indicating a positive association between age

[12] This study however does not control for pension income, age categories, dummy for whether the individual completed grade 8 and location indicators as is done in Bertrand et al.

[13] This figure is well outside the 22-50 age range and suggests that either this age range does not cover both sides of the peak of the parabola or that there are not enough dummy responses on being employed or not, to delinearise the peak. Whichever the case, this results in this estimate being highly uncertain as the asymptotic estimate is very likely to be unreliable.

and probability of employment for this group of individuals, holding all other factors that determine this probability constant.

Household size is also a significant determinant of the probability of employment and is significant in all specifications of the model except those in columns *vi* and *vii* where the household size is controlled for by restricting the sample to three-generational households. The results show that the higher the size of a given household, the lower the probability of employment of prime aged individuals in such households, all other factors held constant. This coefficient has the same sign as the coefficient of interest which gives an indication that the presence of an age-eligible individual is associated with larger household size.

The coefficients on the education category variable are as expected. Those with some level of education are more likely to be employed compared to those with no schooling at all. This coefficient is significant for the "Bachelor's Degree" and "NTC (National Technical Training) or post-Matric diploma" categories in all model specifications. This suggests that above the attainment of a Matric certificate, the chances of being employed for prime aged individuals are higher for those with a NTC certificate, a post-Matric diploma, or a Bachelor's degree when these chances are compared to those of people with no schooling whatsoever, holding all other factors that affect the probability of being employed constant.

Table 5: Cross-sectional Regression Results

	Residents And Non Residents		Residents Only				
	i	ii	iii	iv	v	vi	vii
				Male Only	Female Only	3 Generation Households Only	African 3 Generation Households Only
Household Eligibility indicator	-0.1354***	-0.1344***	-0.1114***	-0.1987***	-0.0361	-0.0445	-0.0452
	(0.0120)	(0.0199)	(0.0179)	(0.0277)	(0.0237)	(0.026)	(0.0286)
Household Size	-.0123***	-.0125***	-0.0154***	-.0152***	-0.0147***	-0.0013	0.0002
	(0.0030)	(0.0030)	(0.0029)	(0.0042)	(0.0041)	(0.0041)	(0.0043)
Gender	-0.2151***	-0.2152***	-0.2189***	-	-	-0.0056	-0.0629
	(0.0278)	(0.0277)	(0.0281)	-	-	(0.0522)	(0.0920)
Age	0.5211	0.0486***	0.0497***	0.0505***	0.0501***	0.0533***	0.0632***
	(0.4500)	(0.0092)	(0.0091)	(0.0131)	(0.0126)	(0.0143)	(0.0149)
Age^2	-0.0196	-0.0006***	-0.0006***	-0.0006***	-0.0006***	-0.0006**	-0.0007***
	(0.0194)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Age^3	0.0003	-	-	-	-	-	-
	(0.0004)	-	-	-	-	-	-
Age^4	-0.000002	-	-	-	-	-	-
SE	(0.000002)		-	-	-	-	-
Education Category:							
No schooling	-	-	-	-	-	-	-
Less than matric	0.0321	0.0326	0.0362	0.0380	0.1135**	-0.1768	0.1714
	(0.0356)	(0.0353)	(0.0356)	(0.0481)	(0.0403)	(0.2705)	(0.2971)
Less than matric with certificate	0.1583*	0.1598**	0.1548*	0.1931**	0.2834***	0.2525	0.2006
	(0.0621)	(0.0619)	(0.062)	(0.0706)	(0.0820)	(0.1766)	(0.1889)
Matric certificate	0.0468	0.0473	0.0783	0.1612**	0.2310***	1.2570***	0.3030***
	(0.0591)	(0.0588)	(0.0592)	(0.0504)	(0.0461)	(0.1888)	(0.0619)
NTC or post matric diploma	0.1436*	0.1447*	0.1402*	0.1895***	0.4138***	0.4833***	0.4601***
	(0.0736)	(0.0734)	(0.0738)	(0.0538)	(0.0502)	(0.0638)	(0.0692)
Bachelor's degree	0.1727*	0.1731*	0.1747*	0.3025***	0.4835***	0.3744**	0.3212*
	(0.0948)	(0.0945)	(0.0944)	(0.0600)	(0.0701)	(0.1243)	(0.1531)
Post grad	0.1416	0.1443	0.1339	0.2358***	0.5387***	0.6939***	0.6869***
	(0.1039)	(0.1035)	(0.1035)	(0.0591)	(0.0804)	(0.1113)	(0.1105)
Constant	-4.4109	-0.1428	-0.1519	-0.3510	-0.6197**	-0.8815**	-0.9071**

	(3.8389)	(0.1687)	(0.1668)	(0.2423)	(0.2241)	(0.3047)	(0.3099)
N	11129	11129	10575	4507	6068	3864	3212
r2_a	0.1506	0.1500	0.1532	0.1477	0.1259	0.1299	0.0958

legend: * p<0.05; ** p<0.01; *** p<0.001

NOTE: OLS Regression. Dependent Variable is a dummy that takes on the value 1 if employed and zero otherwise.

Standard errors are in parenthesis. Standard errors are robust and clustered to allow for unobservable group effect within clusters. Columns *i* to *vii* are restricted to prime aged individuals (individuals between age 27 and 50 in wave 3 (2012)) in the data set. Column *i* includes a quartic in age. Column *ii* uses only a quadratic instead of a quartic in age since the latter causes the age variable to become insignificant. Column *iii* to *vii* restricts the regression to resident members only for better comparison with panel results. Columns *iv* and *v* further restrict the regression to male and female household members respectively. Column *vi* restricts the analysis to households with at least three generations of family members residing within it and column *vii* further restricts *vi* to African households only. Race is controlled for in all regression specifications except in column *vii* where the sample is restricted to Africans only. An interaction term between gender and education is included all specifications except *iv* and *v* where the sample is restricted to males and females respectively. The entire regressions are weighted.

Source: All variables are from NIDS wave 3 data set (2008)

PANEL PATTERNS IN EMPLOYMENT

Table 6 is based on the cross-sectional model used previously, but allows for the exploitation of the panel structure of the data set using a Pooled Ordinary Least Squares (POLS) model and a Fixed effects (FE) model and to a large extent overcome the duration bias associated with cross-sections. The equation framework remains the same except that time is now taken account of.

The POLS model does not give us much more information than the cross-sectional results except that there are now definitely more data points. With the fixed effects framework, unobserved heterogeneity that could potentially influence the result can now be controlled for. Following (Ardington et al. 2007), these unobservables are modelled as:

$$\varepsilon_{ih,t}^{e} = \alpha_{i}^{e} + u_{ih,t}^{e}$$

Where γ_{i}^{e} captures individual specific effects which vary with *i* individuals, but are constant over time *t* and determine an individual's likelihood of being employed. In effect, these include factors such as the individual's ability, determination/drive, family background which cannot be observed, as well as other observable characteristics which do not change over time amongst which are the individual's sex and racial group and certain other factors that are not expected to change much over the period of interest.

The fixed effects approach generally implies that a change in employment of prime aged individuals is run on changes in their household pension status over time. That is, the following model is estimated:

$$y_{iht}^{e} - \overline{y_{\imath h}^{e}} = \beta(E_{ht} - \overline{E_{h}}) + \gamma(X_{iht} - \overline{X_{\imath h}}) + (u_{iht}^{e} - \overline{u_{\imath h}^{e}})$$

The *X* variables controlled for in the result are the household membership size[14] and a quadratic in age.

The first two columns restrict the sample to residents[15,1] only, while columns *iii* to *x* include the non-resident household members. The results will be interpreted as being for residents only since non-residents do not constitute a significant part of the panel sample in the panel regression results.

The assumption of the fixed effects model is that unobservable characteristics that could confound the result are filtered out. The results gotten from this panel regression are consistent with previous cross-sectional results in that the effect of living with an age-eligible individual reduces the probability that an individual is employed. This result, however, can be interpreted as a causal relationship; pension receipt increases the likelihood that prime aged individuals living with pensioners are unemployed.

The naïve Ordinary Least Squares (OLS) result, is about twice the fixed effects result, hence controlling for individual specific fixed effects, Individuals living with pension-eligible individuals are 5.4% less likely to be employed when compared to their counterparts in non-pension eligible households. The results also suggest that this effect is driven by the males in the sample. Excluding males causes the effect to become very small (1%) and insignificant. However, restricting the sample to males increases the size of the coefficient to 10.4%.

[14] See Ardington et al, 2007 where household size is also controlled for.

[15] In the NIDS dataset, "best" variables which provide best estimates of individual characteristics are only available for resident members. As such, variables such as age and education have to be manually computed from other data.

Table 6: Panel Regression Results; Effects of Change in Pension Age-Eligibility Status on Employment

	Residents Only		Residents And Non Residents							
	All		All		Female Only		Male Only		3 Generation African Households	
	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS
	i	ii	iii	iv	v	vi	vii	viii	ix	x
Household Eligibility indicator	-0.0538*	-0.101***	-0.0538*	-0.101***	-0.014	-0.036*	-0.104**	-0.193***	0.025	-0.029
	(0.022)	(0.012)	(0.022)	(0.012)	(0.025)	(0.015)	(0.038)	(0.018)	(0.033)	(0.020)
Household size	-0.017***	-0.023***	-0.017 ***	-0.023***	-0.013 ***	-0.018***	-0.024***	-0.0210***	-0.015 *	-0.007**
	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)	(0.006)	(0.003)	(0.006)	(0.003)
Age	0.094***	0.058 ***	0.094***	0.058***	0.119 ***	0.057***	0.070***	0.069***	0.114***	0.055***
	(0.013)	(0.006)	(0.013)	(0.006)	(0.016)	(0.008)	(0.020)	(0.009)	(0.021)	(0.011)
Age^2	-0.001***	-0.0007***	-.001***	-0.0007***	-0.001 ***	-0.0007***	-0.0004	-0.0009***	-.001 ***	-.0007***
	(0.0002)	(0.00008)	(0.0002)	(0.00008)	(0.0002)	(0.00011)	(0.0003)	(0.00012)	(0.0003)	(0.00015)
constant	-1.550***	-0.448***	-1.550***	-0.448***	-1.951***	-0.534***	-1.183**	-0.523***	-1.8581	-.575**
	(0.236)	(0.107)	(0.236)	(0.107)	(0.295)	(0.143)	(0.366)	(0.155)	(0.3751)	(0.180)
N	21,417[16]	21,417[a]	21,417[b]	21,417[c]	12,520	12,520	8,882	8,882	6,137	6,137
r2_a	0.043[d]	0.066[e]	0.043[f]	0.066[g]	0.033	0.038	0.065	0.104	0.030	0.024

legend: * p<0.05; ** p<0.01; *** p<0.001

Note: Table presents results of both a fixed effects and pooled OLS model. The regressand in all regressions is a variable that takes on the value of 1 if the individual lives in an age-eligible household. Standard errors are in parenthesis. In all regressions, sample is restricted to prime aged individuals (individuals between 23 years in wave 1 and 50yrs in wave 3, inclusive). All regressions are weighted. The result of a Haussmann specification test with a P-value of 0.0000 strongly suggests that the FE model is appropriate as opposed to the Random Effects Model.
Source: All variables are from NIDS wave 1, 2 and 3 data set (2008, 2010, and 2012)

[17,a,b,c,d,e,f,g] In the panel, only 35 non-residents are prime aged and all 35 people are unemployed, hence no variation to be exploited or reported. This is to be expected given that NIDS only follows resident members over time. This implies that only 35 non-resident prime aged individuals re-appear in all 3 waves. Hence these results do not differ irrespective of whether or not non-residents are excluded.

It could be construed that pension receipt causes more males to remain unemployed instead of searching for employment. This result is consistent with that of the cross-sectional analysis.

This result also does not support the migration story that says pension receipt discourages people from getting employment. What is seen here is more of moral hazard suggestion indicating that prime aged individuals are seemingly discouraged from working when a member of the household is eligible for pension. This result is primarily driven by the male household members of this age category.

RESULTS FOR THREE GENERATIONAL AFRICAN HOUSEHOLDS

When the sample is restricted to three generational African households, the significant effects picked up in the result above disappear. This is consistent with both the cross-sectional as well as the panel regression outputs. In the POLS, Fixed effects and OLS results however, the quadratic in age is highly significant. The pooled OLS result is consistent with cross-section results although the coefficient is about 50% smaller in the POLS. Where there was a coefficient of -0.0458 in the Ordinary Least Squares (OLS) regression indicating that the presence of a pensioner in a three generational African household reduces the probability of prime aged members being employed by about 4.6% ceteris paribus, this result drops to only 2.9% in the pooled OLS regression. The sign and significance however do not change. Controlling for individual fixed effects however, the sign of the coefficient changes, although it remains highly insignificant.

6. CONCLUSION

This study set out to establish if any spillover effects of the Older Persons' Grant on the labour market outcome of prime aged individuals exists, and if it does, in what direction. Empirical analysis provides strong and compelling evidence that show that holding other factors that affect the probability of employment constant, there exists a negative association between the existence of age-eligible individuals in households with prime aged adults, and the probability that these adults are employed. Cross-sectional inferences are consistent with that arrived at by previous studies. However, contrary to findings in previous literature, the panel results uphold instead of contradict the results from cross-sectional analysis and hence suggest that there indeed exists a negative causal relationship between the existence of at least one pension-eligible individual and the probability that prime aged adults living with them are employed. The results also find that consistent with previous research, the males in the household are the major drivers of this effect.

7. APPENDIXES

APPENDX 1: DESCRIPTIVE STATISTICS BY AGE ELIGIBILITY

Table A. 1: Descriptive Statistics by Age Eligibility: HOUSEHOLD CHARACTERISTICS

	Wave One		Wave two		Wave three	
	Eligible	Ineligible	Eligible	Ineligible	Eligible	Ineligible
Number of Unique Households	4,966,114	9,422,313	5,300,974	9,115,189	5,631,614	10,188,462
Average Household size	4.32	2.98	4.55	2.94	4.21	2.80
Median Household size	4	3	4	2	4	2
Average Income Per Household	6,964.95	5,706.11	12,361.87	6,427.96	9,310.12	7,402.65
Household Pension Receipt:						
Does not receive pension (%)	49.74	98.4	47.71	98.27	47.87	99.04
Receives pension (%)	50.26	01.76	52.29	01.73	52.13	00.96

NOTE: The sample includes both residents and non-residents except in the case of the household size variable. Sample refers to the individuals in the data set excluding duplicates. Figures reported are weighted unless otherwise stated. Design weights are applied where weighting is done.
Source: Computation from NIDS wave 1, 2, and 3 data set (2008, 2010, and 2012)

Table A. 2: Descriptive Statistics by Age Eligibility: AGE AND AGE CATEGORIES OF INDIVIDUALS

	Wave One		Wave Two		Wave Three	
	Eligible	Ineligible	Eligible	Ineligible	Eligible	Ineligible
Mean Age of Average Individual in sample	32.06	23.31	31.81	23.49	32.81	23.70
Age 0-5 (%)	11.20	13.65	10.87	13.94	10.54	13.28
Age 6-16 (%)	22.44	22.73	21.77	22.97	22.51	23.27
Age 17-22 (%)	11.90	12.29	12.17	11.30	11.17	11.75
Age 23-50 (%)	23.52	51.34	25.74	51.79	25.96	51.70
Age 51 and above (%)	30.94		29.45		29.82	

NOTE: The sample includes both resident and non-resident household members. Sample refers to the individuals in the data set excluding duplicates. Figures reported are weighted. Design weights are applied where weighting is done.
Source: Computation from NIDS wave 1, 2, and 3 data set (2008, 2010, and 2012).

Table A. 3 Descriptive Statistics by Age Eligibility: LEVEL OF EDUCATION OF PRIME AGED INDIVIDUALS BY HOUSEHOLD

	Wave One		Wave Two		Wave Three	
	Eligible	Ineligible	Eligible	Ineligible	Eligible	Ineligible
No schooling (%)	04.21	04.82	03.99	03.81	04.20	03.43
Less than matric WITHOUT Certificate/Diploma (%)	57.15	52.80	52.54	52.37	53.63	51.44
Less than matric WITH A Certificate/Diploma (%)	02.32	02.04	02.37	02.97	03.33	03.18
Matric Certificate (%)	25.61	24.25	27.14	21.11	23.19	19.23
NTC or post matric Diploma (%)	08.07	11.80	10.65	14.88	13.13	16.89
Bachelor's Degree (%)	01.77	02.42	01.84	02.57	01.82	03.42
Post Graduate Degree (%)	00.87	01.87	01.47	02.28	00.70	02.42

NOTE: The sample includes both resident and non-resident household members. Sample refers to the individuals in the data set excluding duplicates. Figures reported are weighted. Design weights are applied where weighting is done.
Source: Computation from NIDS wave 1, 2, and 3 data set (2008, 2010, and 2012)

Table A. 4: Descriptive Statistics by Age Eligibility: LABOUR MARKET OUTCOME OF PRIME AGED INDIVIDUALS

	Wave One		Wave Two		Wave Three	
	Eligible	Ineligible	Eligible	Ineligible	Eligible	Ineligible
Not Economically Active (%)	21.78	14.50	38.34	23.99	26.10	17.08
Unemployed Discouraged (%)	08.36	05.52	05.91	03.68	05.25	02.32
Unemployed Strict (%)	27.00	16.74	14.47	11.17	21.30	14.02
Employed (%)	42.87	63.24	41.28	0.1.16	47.35	66.59

NOTE: The sample includes both resident and non-resident household members. Sample refers to the individuals in the data set excluding duplicates. Figures reported are weighted. Design weights are applied where weighting is done.
Source: Computation from NIDS wave 1, 2, and 3 data set (2008, 2010, and 2012)

APPENDIX 2: DESCRIPTIVE STATISTICS BY WAVE

The table below is analogous to Table 2 in the main study but neither split the observations into categories nor weights the data.

Table A.5: Descriptive Statistics by Wave (Unweighted Data)

	Wave 1	Wave2	Wave3
Household Characteristics:			
Number of Unique Households	7,296	8,816	9,836
Average Household size(residents only)	3.868695	4.310184	4.118506
Median Household size	3	4	4
Average Individual lives in house hold of size # (including non-residents)	5.569404	6.214474	5.929074
Average Income Per Household(weighted)	6139.555	8730.307	8180.04
Household Pension Receipt:			
Receives pension	1,939	1,979	2,194
%	26.58	22.45	22.31
Does not receive pension	5,357	6,837	7,642
%	73.42	77.55	77.69
Individual Characteristics:			
Number of Individuals In sample	33715	33715	38214
Mean Age of Average Individual in sample	27.22264	27.10579	27.14243
No of Individuals receiving pension in sample	2,346	2,452	2,736
Level of Education of Prime Age Individuals			
No schooling (n)	800	654	642
%	8.16	6.88	6.91
Less than matric without certificate or diploma	5,814	4971	4783
%	59.3	52.28	51.47
Less than matric with Certificate/Diploma (n)	153	161	228
%	1.56	1.69	2.45
Matric Certificate(n)	1,930	1548	1345
%	19.68	16.28	14.47
NTC or post matric Diploma(n)	771	745	966
%	7.86	7.84	10.4
Bachelor's Degree (n)	177	149	187
%	1.81	1.57	2.01
Post Graduate Degree(n)	86	78	103
%	0.88	0.82	1.11
Missing(n)	74	1202	1038
%	0.75	12.64	11.17

Employment Status of Prime age Individuals			
Not Economically Active(n)	1,616	2,380	1,917
%	20.19	34.92	26.18
Unemployed Discouraged(n)	669	371	273
%	8.36	5.44	3.73
Unemployed Strict(n)	1,372	747	1,157
%	17.14	10.96	15.8
Employed(n)	4,347	3,318	3,974
%	54.31	48.68	54.28
Age Categories of Individuals in sample:			
Age 0-5 (n)	3,880	3,842	3,828
%	13.78	14.08	14.34
Age 6-16 (n)	6,994	6,957	6,931
%	24.85	25.49	25.96
Age 17-22(n)	3,458	3,413	3,385
%	12.28	12.5	12.68
Age 23-50 (n)	9,343	9,015	8,793
%	33.19	33.03	32.94
Age 51 and above(n)	4,474	4,069	3,757
%	15.89	14.91	14.07

NOTE: The sample is restricted to prime age individuals where stated and includes both residents and non-residents except in the case of the house hold size variable. Sample refers to the individuals in the data set excluding duplicates. Except otherwise stated, the data is unweighted.
Source: Computation from NIDS wave 1, 2, and 3 data set (2008, 2010, and 2012)

APPENDIX 3: MIGRATION IN THE DATA SET

Given the data limitations of the data set used, migrants are defined as all those who are reported as absent in their household and the reason for their absence is given either as employment, looking for employment, living elsewhere or away on business.

The argument for defining migration in this way that is, including living elsewhere is in the spirit of Dorrit Poesel's 2009 analysis of Migration in South Africa where she concludes that given the trend of increase in the number of non-resident members who's reason for absence is reported to be Living elsewhere and the decrease in those whose reason is employment or looking for job, one can argue that most of the people who migrate for employment related reasons end up settling and starting a new household in their new location .

Also, in the data, it is found that a small percentage of people who are reported to be resident members have reasons for absence for most reasons including those listed above. Given the interest of this study (i.e. to see how fund receipt affects the labour market outcome of prime aged individuals living with pensioners and interest in if per-haps it opportunes them to go out in search for jobs), resident members who are reported absent for the reasons of interest in this study are included.

The NIDS data set however does not record the age for non-resident members and this makes it impossible to isolate prime age individuals. Hence only the migration data as a whole for all age groups for the reasons of absence of interest are looked at and it can be argued that the results are still quite safe as not too many retirees or children are expected to be absent for employment reasons, looking for employment, living elsewhere or away on business. This would however be controlled for this to see if it changes the result significantly.

Correlation between pension receipt or age eligibility a HH reporting an absent member or not is also checked for.

Table A.6: Number of Households reporting absent members, by wave (Unweighted)

	WAVE 1	WAVE 2	WAVE 3
All households that reported an absent member in entire sample	1 522 (20.86%)	86 (0.85%)	684 (6.74%)
Number of non-resident individuals in entire sample	2 915 (9.36)	102 (0.290)	1 305 (3.35)
Number of non-residents in entire sample with imputed values for reason for absence	2 778	87	1 191
Number of residents in entire sample with imputed values for reason for absence	2 006	821	1 089
Total number of people with reasons for absence reported	4 784	908	2 280

Source: Computation from NIDS wave 1, 2, and 3 data set (2008, 2010, and 2012).

Table A.7: Reasons for absence among sample respondents by residency status in each wave (Unweighted)

	WAVE 1			WAVE 2				WAVE 3			
	Yes[17]	No[18]	Total	Yes	No	Deceased	Total	Yes	No	Deceased	Total
Don't Know	3	1	4	-	-	-	-	3	1	0	4
Refused	-	-	-	1	0	0	1	3	0	0	3
Missing	1 416	46	1 462	153	8	0	161	20	0	0	20
Employment	98	1 197	1 295	81	32	0	113	189	239	0	428
Looking for employment	16	311	327	38	5	0	43	81	63	0	144
Schooling	114	261	375	131	11	0	142	233	53	0	286
Student	67	78	145	58	5	0	63	137	12	0	149
Personal reasons	22	85	107	41	3	0	44	38	19	0	57
Escape violence or political problem	2	2	4	2	0	0	2	-	-	-	-
Visiting spouse or family	90	149	239	89	3	0	92	132	44	0	176
8. Visiting friends	12	15	27	19	0	0	19	21	6	0	27
9. Living elsewhere	57	597	654	123	15	0	138	102	750	0	852
10. Prison	19	10	29	26	0	0	26	27	1	0	28
11. Vacation	35	5	40	26	3	0	29	34	2	0	36
12. In hospital or clinic	34	0	34	22	2	0	24	54	0	0	54
13. Away on business	16	10	26	5	0	0	5	12	1	0	13
14. Other (specify)	5	11	16	6	0	0	6	3	0	0	3
Dot Missing Values[19]	26 220	137	26 357	32 792	15	1 017	33 824	35 820	114	718	36 652
Total	28 226	2 915	31 141	33 613	102	1 017	34 732	36 909	1 305	718	38 932

Source: Computation from NIDS wave 1, 2, and 3 data set (2008, 2010, and 2012)

[17] Yes, Individual is a resident.

[18] No, Individual is NOT a resident.

[19] There are many dot missing values for the "yes" category across all waves because clearly, resident members would not answer to the question of reason for absence.

DEFINING LABOR MIGRANTS

Labour migrants are defined broadly as those in the sample who fall into any of the following category; Is reported as non-resident in the sample and the reason for absence is ‘employment’, ‘looking for employment’, ‘leaving elsewhere’ or ‘away on business’ or; Is reported as resident and the reason for absence is ‘employment’, ‘looking for employment’ or ‘leaving elsewhere’.

This is done to accommodate the problem with the wave 2 data set. Labour migrants are then defined loosely as those in the sample who are reported as non-resident in the sample and the reason for absence is ‘employment’, ‘looking for employment’, ‘leaving elsewhere’ or ‘away on businesses.

The strict definition of labour migration is given as those who are reported as non-residents and the reason for absence is ‘employment’, ‘looking for employment’ or ‘away on business’. In the analysis, results for all 3 definition of labour migration are reported.

To check if the receipt of the pension affects migration in any way or affects movements of members of households in any way, migration status is defined in four different ways:

1. The reason for absence is "Employment" "Looking for employment" "Schooling" "Student" "Personal reasons" "Visiting spouse or family" "Visiting friends" "Living elsewhere" "Vacation" or "Away on business" irrespective of their residency status.
2. The province of birth is difference from the province as per listing in the survey.
3. Answers to the question “year of move to current location” are also considered.

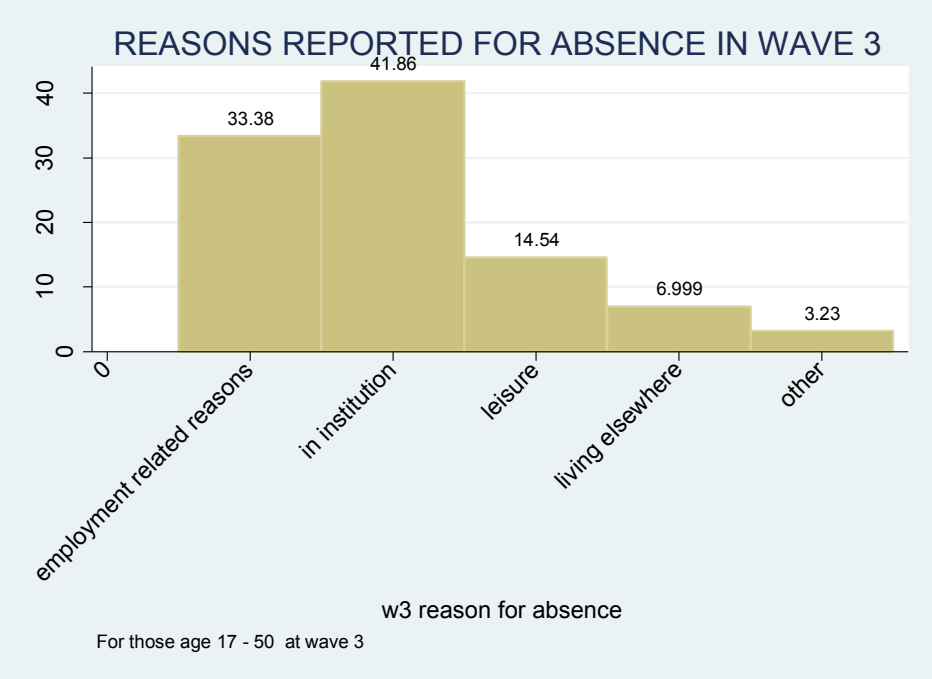

Figure A. 1: Reason for Absence in Wave 3 (Best Age Used)

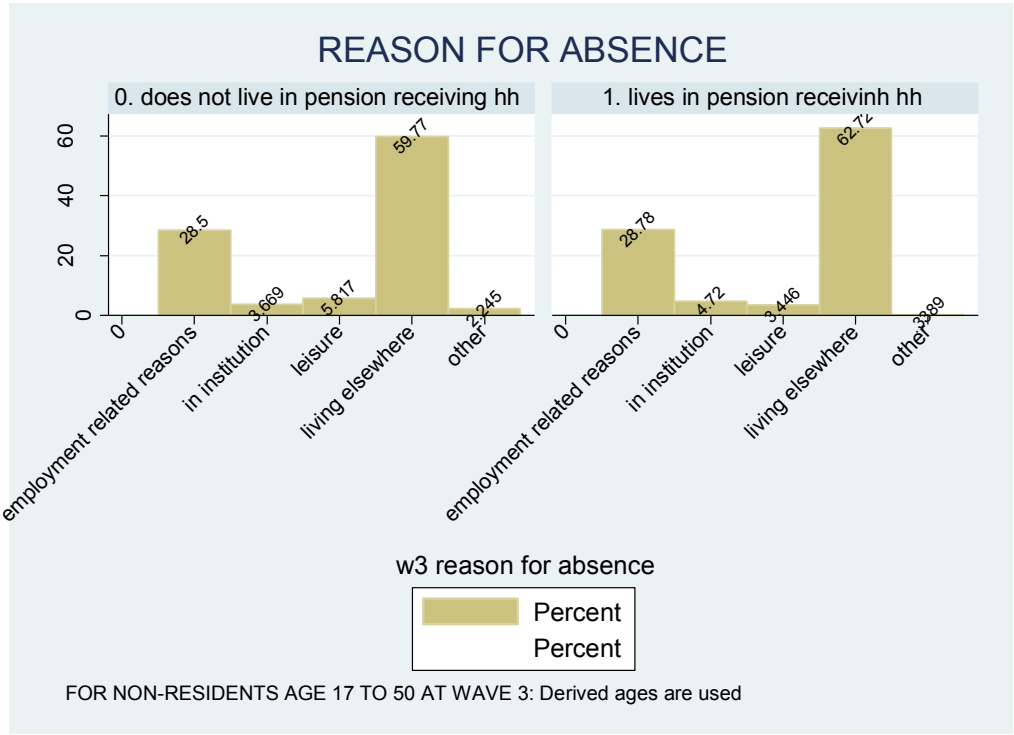

Figure A. 2: Reason for Absence by Household Eligibility (Derived Age Used)

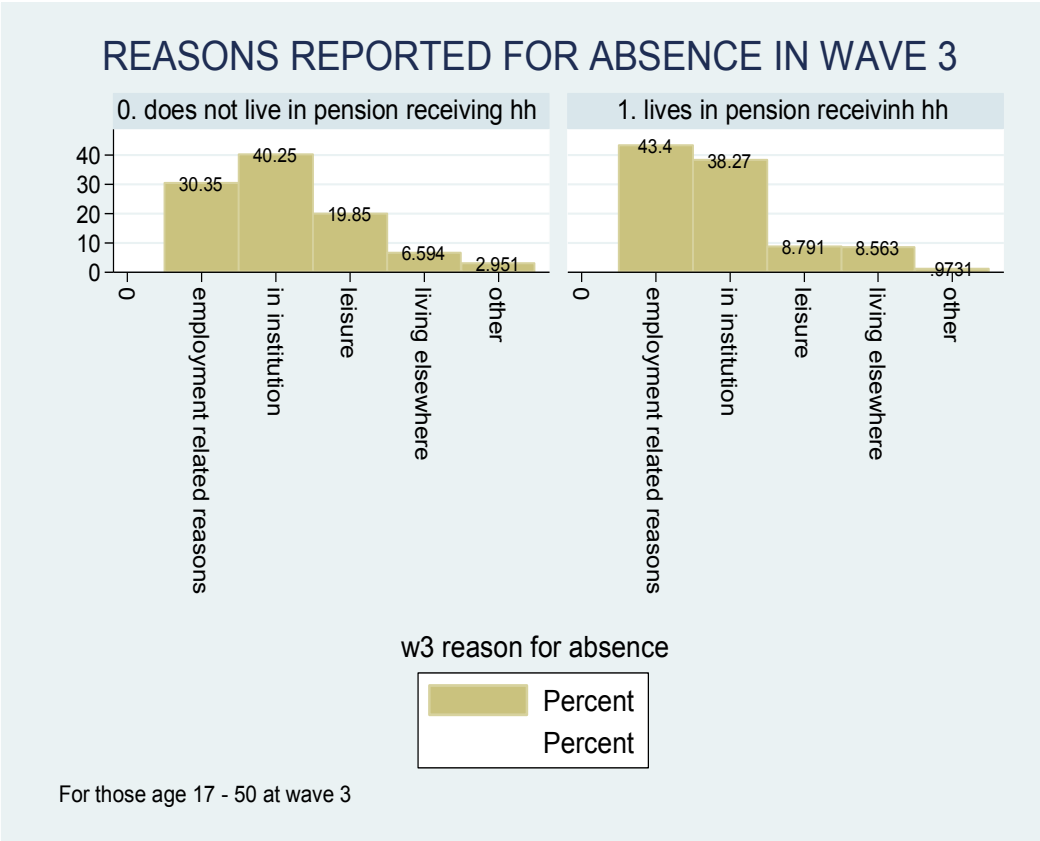

Figure A. 3: Reason for Absence by Household Eligibility (Best Age Used)

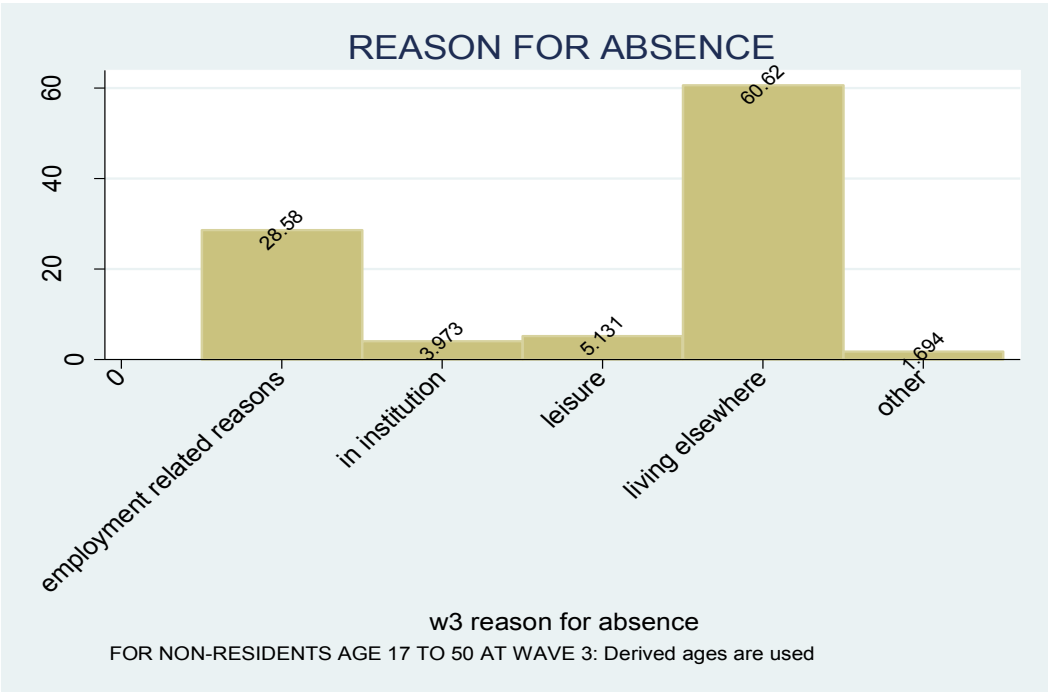

Figure A. 4: Reason for Absence in Wave 3 (Derived Age Used)

APPENDIX 4: CHALLENGES WITH THE WAVE 2 NIDS DATA SET

The wave 2 data set is very poor as regards migration data. The problem begins with the fact that only 102 non-residents are reported in the data- this is less than 0.5% of the entire sample.

Table A.8: Household Residency Status in wave 2

Household Resident?			
	Freq.	Per cent	Cum.
Yes	33,613	99.7	99.7
No	102	0.3	100
Total	33,715	100	

Source: Computation from NIDS wave 2 data set (2010).

Also when asked to report the "*pids*[20]*"* of remitters, cross-checking shows that some of the "*pids"* do not belong to any individual in the data set while some belong to resident members.

When reason for absence is then looked at, 908 sample members are reported to have a reason for being absent. This implies that some absent members were recorded as resident or some of the resident members who were temporarily away were given answers to the question of reason for absence. This might be due to the way in which residency and absenteeism questions were asked.

Table A.9: Reason for absence in Wave 2

	Freq.	Per cent	Cum.
Refused	1	0.11	0.11
Missing	161	17.73	17.84
Employment	113	12.44	30.29
Looking for employment	43	4.74	35.02
Schooling	142	15.64	50.66
Student	63	6.94	57.6

[20] Individual Unique Identification Code used in the NIDS data set.

Personal reasons	44	4.85	62.44
Escape violence or political problem	2	0.22	62.67
Visiting spouse or family	92	10.13	72.8
Visiting friends	19	2.09	74.89
Living elsewhere	138	15.2	90.09
Prison	26	2.86	92.95
Vacation	29	3.19	96.15
In hospital or clinic	24	2.64	98.79
Away on business	5	0.55	99.34
Other (specify)	6	0.66	100
Total	908	100	

Source: Computation from NIDS wave 2 data set (2010).

The above thus constitute a problem when exploring migration issues in the wave 2 data set.

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