University of Alberta

Effects of Social Grants on Labor Supply and Food Security of South African Households: Is There a Disincentive Effect?

by

Patrick Vusumuzi Ndlovu

A thesis submitted to the Faculty of Graduate Studies and Research

in partial fulfillment of the requirements for the degree of

Master of Science

in

Agricultural and Resource Economics

Department of Resource Economics and Environmental Sociology

Spring 2013

Edmonton, Alberta

Dedication

Now thanks be unto God, who always causes us to triumph in Christ, and makes manifest the fragrance of his knowledge by us in every place (2 Corinthians 2:14).

To my wife Patience, and for this exciting new season in our lives.

Abstract

This study assesses impacts of social grants on labor supply and food security of South African households. We use a unique set of data collected in rural Eastern Cape in 2011. We highlight the interaction of two key household endowments, gender and human capital, in catalyzing or retarding the effects of grants on household welfare. First, our inquiry explores whether social grants create disincentives in labor supply. We control for endogeneity of social grants by running a Newey two-step efficient estimator– implemented on an instrumental variable (IV) Tobit regression for labor supply. Using household pension income as the primary measure of social grants, we find that pensions have a disincentive effect on labor supply in off-farm, agriculture, natural resource, and domestic work. However, there is heterogeneity in pension impacts across gender and education profiles. The disincentive effect of pensions is less for men compared to women. On the other hand, pensions have a complementary effect on labor supply amongst individuals with higher education. This complementarity between social grants and human capital overcomes the disincentive effect on labor supply. We also find that other types of grants do not have any impacts on labor supply. Second, we assess whether per capita consumption expenditures on food increase when households receive grants. We use a linear IV regression to analyse impacts on consumption expenditures. We find that pensions have a positive impact on food consumption expenditures. The effect of pensions on food consumption expenditures does not change with gender and education. The inclusion of in-kind consumption in measuring consumption expenditures shows that other types of grants also have a positive impact on consumption expenditures. The marginal propensity to consume out of pensions and other social grant income is higher compared to other income.

Acknowledgment

I am greatly indebted to my supervisors, professors Martin Luckert and Sandeep Mohapatra. Thank you so much for your support from the start, right up to the end of my thesis. It has been an incredible journey! I would like to thank the entire team in the IDRC South Africa project. It has been a great pleasure working with you all. I'm especially grateful for the project's funding of my degree program. A special thanks to Dr Sheona Shackleton and the team at Rhodes University in South Africa, for your support. Many thanks to Monde Ntshudu and the field enumerators for aiding in the collection of the data used in this thesis. To Wijaya Dasanayake, thank you for your input and for those great conversations about our research.

I would like to acknowledge the Department of Resource Economics and Environmental Sociology at the University of Alberta. For the past 2 years, I have felt at home in the department. Many thanks to all the faculty in the department for contributing so significantly to my training and overall experience in graduate school. I also greatly appreciate the support rendered by the administrative staff, on countless times during my degree program. My heart goes out to all my class mates and other graduate students in the department for being such great friends and colleagues. I wish you all great success in your research work, and in your future endeavors.

Table of Contents

List of Tables

Table 4.1: Description of variables and expected signs for labor supply

List of Figures

Chapter 1: Introduction

1.1 Background and objectives

An important aspect of discussions on poverty involves the role that the state may play in social protection (Case et al., 2005). A common form of government social protection is cash transfers which aim to improve welfare outcomes such as food security, nutrition, health and education. Aguero et al., (2009) note that social cash transfer programs have increasingly been integrated into poverty alleviation strategies. For example, governments in South America have implemented large-scale social grants programs (e.g. *Progresa* program and similar programs in Brazil, Honduras and Nicaragua). The successes of the South American social grants programs have generated substantial interest and support for their replication in other countries (Budlender, and Woolard, 2006).

In South Africa, the government's social grants programs are somewhat different, compared to programs in other countries. The South Africa programs consist of an unconditional cash transfer (usually based on an income and assets means test). Unlike conditional cash transfer programs that require recipients to satisfy given conditions, such as sending children to school and participating in nutritional programs, cash transfers in South Africa have no strings attached. These cash grants are given out in various forms, but the two main types are the non-contributory old age pension, targeted at low income elderly citizens, and child grants given to parents/guardians of less privileged children.

The number of social grant beneficiaries in South Africa has drastically risen in the past few years. According to the South Africa Social Security Agency (2012), about 16.1 million people received social grants in 2012, a surge in numbers from the 10.9 million beneficiaries in

2005. The number of beneficiaries is expected to increase to 16.8 million by 2015. In anticipation of further increases in the number of beneficiaries, government spending on social grants is projected to rise further, from R105 billion in 2012 to about R122 billion in 2015 (Government Budget Speech, 2012).

With social grants playing an increasingly important role in South Africa, a pressing policy issue is whether or not the government should continue to target billions of dollars of social expenditure through the current grant schemes. One view is that social cash transfers can promote employment and growth by nurturing the accumulation of human capital and productivity of poor households (see Samson et al., 2008; Surender et al., 2007; Edmonds et al., 2006). For example, amidst imperfect financial markets, transfers can help release credit constraints and trigger complementary entrepreneurial or human capital ability effects on household welfare. A contrasting and more contentious view is that social cash transfers have possible disincentive effects on socio-economic outcomes such as labor market activity and household formation decisions (see Bertrand et al., 2003; Ranchorhod, 2006; Klasen and Woolard, 2009). For example, with perfect markets, transfers may relax household budget constraints and trigger more leisure consumption at the margin, by recipients and/or their household relatives.

There is a large literature on identifying the effects of social grants on welfare in South Africa. However, despite the attention, the results of the studies are mixed. Studies like Case and Deaton (1998), Dufflo (2003), Jensen et al. (2006), Samson et al. (2008), Aguero et al. (2009) report positive impacts of grants on socio-economic outcomes such as household food security; child nutrition and schooling attendance. Others show that social grants create economic disincentives. For example Bertrand et al., 2003, Lam et al., (2005), and Ranchord, (2006)

provide evidence of negative impacts of grants on labor supply of household members. Still others such as Ardington et al. 2009 argue that the reported evidence of negative impacts is misleading, due to data limitations since many studies use cross sectional data which does not adequately capture changes in household economic behavior over time. Further evidence of mixed findings is found in studies that look at household formation. For instance Klasen and Woolard (2009) and Edmonds (2002) provide evidence that social grants cause extended living arrangements since pensioners live with extended family members who benefit from pooling income. On the contrary, Posel et al. (2006) and Ardington et al. (2009) argue that pensions do not necessarily create extended living arrangements but facilitate migration of younger household members into more lucrative job opportunities.

The overall goal of this thesis is to contribute to this literature by examining the effects of social grants on household time allocation and food security of South African households. We look at time allocation, that is hours worked in different activities as a function of a series of individual, household and other characteristics. Henceforth we use the term "labor supply" to describe the time allocation functions. There is a substantial literature on the impacts of grants on labor supply. However, most studies limit their analysis to wage labor sectors that frequently represent only a small amount of household effort amongst poor households. In addition to wage labor, household members also supply labor in home production– typically in areas such as agriculture, natural resources, and domestic chores such as cooking, and taking care of children (Ilahi, 2000). This non-wage aspect of household labor often gets overlooked due to a lack of reliable data on the informal economy and the time allocation of household members. Similarly, many studies that have analyzed the impacts of grants on household level food security (e.g. Case and Deaton, 1998; Maitra and Ray, 2005) commonly look at cash expenditures on food.

However, in-kind measures such as food consumption from agriculture and natural resources are often overlooked, yet they constitute a significant part of economic livelihood amongst poor households. Thus, the inclusion of in-kind measures could provide a broader picture of social grant contributions to household food security. We overcome these shortcomings by exploiting a unique set of data with information on both time use in disaggregated home production activities and in-kind measures of food consumption.

Given the role of market imperfections in credit and labor we highlight the interaction of two key household endowments, gender and human capital, in catalyzing or retarding the effects of grants on household welfare For instance gender norms may restrict women's access to off-farm work opportunities, property rights and credit facilities to engage in on farm work differentially than men (Horrell and Krishnan, 2006; Seebens, 2011). In addition, women's time allocation and tasks are commonly extended to domestic chores, whereas men's are usually not. Consequently, the nature of constraints faced by men and women are likely to be different, and such gender specific differences would suggest the possibility of heterogeneity in the impacts of social grants across gender profiles. Similarly, education has been long emphasized as a key determinant of both labor supply of household members (e.g. Ilahi, 2000) and household food security (e.g. Case and Deaton, 1998; Booysen, 2003). However, in rural settings, the contribution of education is not always clear because education may be negatively associated with participation in income generating activities as a result of unavailability of lucrative jobs for the educated (Alderman and Chishti, 1991; Ilahi and Grimard, 2000). Consequently the interacted effects of education and grants are inherently complex. For example with credit rationing, if social grants are collateral for households, then grants would help release credit constraints on working capital for productive activities. In a production environment, social

grants would be strongly complementary to education i.e. the accumulation of physical capital through the release of credit constraints increases the marginal productivity of human capital. On the other hand, if returns to education are low or negative then social grants simply have disincentive effects (i.e. pure income effects that increase demand for leisure) or educated individuals would have the same income effects as the less educated. The same would happen if there are no entrepreneurial opportunities in the economy or if such opportunities are not intensive in human capital inputs. However, little is known from the empirical literature about the nature of these interaction effects.

We use a unique set of data collected in rural Eastern Cape in 2011. First, we investigate labor supply impacts using a broad definition of labor supply that includes wage labor (i.e. off-farm and on-farm work) and also account for labor allocation in home production (i.e. domestic work). Our inquiry explores whether social grants create disincentives in labor supply. Second, we investigate food security. We assess whether per capita consumption expenditures on food increase when households receive grants. We use cash consumption expenditures and also account for in-kind consumption from on-farm production. Our interests include exploring interactions between household level covariates, such as household head's gender and education, with social grants in terms of the effects on household labor supply and food security.

1.2 Outline of the thesis

The rest of the thesis is organized as follows. In the next section, we conduct a literature review, followed by a description of the study site and data collection. This description is followed by an empirical specification of a labor supply model and results. Next, an empirical specification of a food security model and results is presented. Lastly, we conclude and highlight policy insights.

Chapter 2: Literature review

2.1 Introduction

The literature review gives a brief history of the social grants program in South Africa and a description of grant beneficiary rules. After that, we review impact assessment studies, with a particular focus on pensions and child grants. We also review some concepts and methods for measurement of household economic livelihood and welfare. Next, we present some theoretical models for household resource allocation commonly used in the empirical literature. Lastly, we highlight some insights from the literature review and identify gaps in the literature.

2.2 Overview of Social grants in South Africa

2.2.1 Description and beneficiary rules

The old age pension and the child grant are the two main types of social grants and constitute the largest portion of government spending on social security[1]. Historically, pensions were given to whites and coloureds, and were extended to Indians and blacks in 1943. But the amounts given where highly unequal; and blacks received the least amounts (Devereux 2001). In 1994, all pensions were made equal. A comprehensive review of the history of the old age pension is provided by Lund (1993), Van der Berg (1997), Case and Deaton (1998), and Lam et al. (2005). The child support grant was implemented in 1998 to improve access to social security (Samson, 2008). The age eligibility rule for pensions is 60 years and above for both males and

[1] The other types of grants (in descending order of their magnitude of coverage) are: disability grant, foster child grant, care dependency grant, grant-in-aid, and war veterans' grant.

females[2]. People who apply for the pension grant must also satisfy the income and assets means test in order to be eligible. Age eligibility for the child grant is currently 18 years and below[3]. The child grant is given to the primary care giver, who must meet the requirements of the means test. Child grants have the largest number of beneficiaries (currently about 11 million beneficiaries), followed by old age pension beneficiaries (about 2.7 million). However, the old age pension is larger in monetary value; with beneficiaries currently receiving R1200 per month, whereas child grant beneficiaries receive R280 per month[4].

2.2.2 Impact of grants on economic livelihood and welfare measures in South Africa

2.2.2.1 Impacts of pensions

Case and Deaton (1998) is one of the first economics papers that sought to evaluate impacts of social grants in South Africa. Their paper explores behavioural effects of the pension, and show that pensions have a positive effect on household cash expenditures on food, schooling, transfers to other family members, and household savings. Similar findings are reported by Ardington (1988) and Case (2001) who finds that pensions improve household food security, and health. The impact of pensions on food expenditures is also reported by Maitra and Ray (2003), Moller and Ferreira (2003), Booysen and Van der Berg (2005), who also find evidence that pensions increase consumption expenditures on food.

Some studies have focused their analysis on the direct recipients of the pensions. Lam et al., (2005) investigates effects of pensions on labor force withdrawal of the elderly and they find

[2] Age eligibility for males used to be 65 years. The new age rule took effect in 2012. Our study was carried out before the new age eligibility took effect.

[3] The cut off age was seven years in 2002 but increased to 14 years in 2005 and further increased to 18 years in 2012.

[4] Our study was carried out when pension and child grant beneficiaries received R1140 and R260 respectively.

that the age of pension eligibility is associated with increased rates of retirement, which implies a decrease in labor supply amongst pension recipients. Ranchhod (2006) also finds a significant decrease in employment rates and labour supply amongst pension recipients, and a shift to more flexible working hours for the elderly who remain employed. Lam et al., (2005) also note that when older workers retire from formal employment, they usually return to homesteads in rural areas to do flexible work such as in agriculture.

Other studies have taken an interest in investigating whether pensions create disincentives on labor market participation amongst working age individuals living with pensioners. Bertrand et al. (2003) find a sharp drop in working hours of prime age individuals when the elderly in the households reach the pension eligibility age. They also find that the reduction in labor supply is greater if the pensioner is a woman. Results from Ardington et al. (2009) conflict with Bertrand et al. (2003). Unlike Bertrand et al. (2003), their study uses longitudinal data, and they find that pensions lead to increased employment among prime-aged members of their households. Ardington et al. (2009) argue that these results are masked in cross-sectional analysis because of differences between pension and non-pension households.

Household formation decisions have also been the subject of interest amongst some studies that evaluate impacts of pensions. Breslin et al. (1997) note that pensions are associated with an extended family support structure that bonds grandparents with grandchildren. Edmonds et al. (2002) corroborate these findings showing that there are more children younger than five and young women of childbearing age in pension households. Lam et al., (2005) note that many pension recipients live in three-generation or skip-generation households; hence the extended household structure may in part be a response to the pension, which is available to support large numbers of children and working age adults. Klasen and Woolard (2009) suggest that the

household formation response to pensions creates a disincentive effect on labor market participation of younger persons. They find that the availability of pensions draws young unemployed people away from employment opportunities that are away from their homes.

Some studies have looked at the role of pensions in facilitating migration. Dinkelman (2004) finds that having a female pensioner increases the probability of a young female getting a job, but having a larger proportion of men and women of pension age in the household reduces the chances of getting a job for men. Posel et al. (2006) also find that rural women are more likely to be migrant workers when they are members of a household with a female recipient of a pension. Ardington et al. (2009) also find that pensions have a positive effect on labor migration.

Jensen (2004) investigates whether pensions having a crowding out effect on household remittance income. Results from this study show that pension income leads to a reduction of remittances. The author also argues that failure to account for the crowding out of remittances leads to an overestimation of the distributional effects of pensions, hence models assessing pension impacts should control for remittances.

In the literature, not many studies have explored impacts of social grants on the agricultural sector. One empirical study is by Lovo (2011); who explores complementarities of pension income with technical efficiency of agricultural households. Results show a positive effect of the pension on farm household technical efficiency. These results suggest that this cash transfer can improve households' ability to make use of the best available technologies.

Another group of studies have evaluated effects of pensions on aspects of child welfare. Edmonds (2006) assesses the impact of pensions on child labour supply and schooling attendance. He finds that the presence of males who are pension eligible leads to a significant

decline in child labour, coupled with an increase in schooling attendance and attainment. Duflo (2000) and Dufflo (2003) find that there is an increase in children's 'height for age' and 'weight for height' respectively when households receive pensions. These two studies also find that if pensioners are females, children become healthier, but if pensioners are males, children become more educated. Samson et al. (2001) suggest that the positive impact of pensions on children implies the possibility of greater impacts with more directly targeted child grants.

2.2.2.2 Impact of child grants

Studies that evaluate the impacts of child grants commonly look at the contribution of these grants towards improving child welfare. Earlier studies on child grants generally provided qualitative and descriptive analysis using case studies and focus groups (e.g. Kola et al., 2000). Subsequent studies employed quantitative techniques in order to address the selection problems that are inherent in the evaluation of programs which have no randomised assignment of control and treatment groups. Samson et al. (2004) find positive impacts on child education, and nutrition. Similarly, Williams (2007) provided evidence of positive effects of child grants on school attendance, decreasing child hunger, and improving some aspects of labor supply. Samson et al., (2008) also reports evidence that child grants reduce child hunger and improve school attendance for pre-school and early grades. Aguero et al., (2009) find positive impacts of child grants on children's "height-for-age" if they are received early in life, particularly for children living with women caregivers.

While most of the literature on child grants tends to focus on child outcomes, a study by Eyal and Woolard (2011) quantifies the effect of child grants on mothers' labor force participation. Results from the study show a positive relationship between having an age eligible

child and the mother's labor force participation, more so for younger mothers who are in their twenties.

2.3 Measurement of household economic livelihood and welfare

In this section, we briefly review measures of household economic livelihood and welfare commonly used in developing countries, and relevant to our analysis of labor supply and food security.

2.3.1 Income and expenditures

Common measures of household welfare are income and consumption (O'Donnell et al., 2008). In developing countries, consumption based measures are frequently preferred over income measures to reflect current living standards (Deaton and Grosh, 2000). Consumption measures may be preferred because income may be received sporadically (for example due to seasonality on crop incomes), whereas consumption can be smoothed over time (Deaton, 2000). Households also tend to have multiple and continually changing sources of income, and formal employment is less common. However, income data can be important in analyzing household welfare, particularly if seasonality in incomes is accounted for in data collection. Income data provides useful information about a household's portfolio of productive economic activities and livelihoods. Collecting data on both consumption and income allows for a more comprehensive analysis of household welfare.

2.3.2 Time- use data

According to Deaton and Zaidi (1999), the availability of time-use data provides a valuable complement to consumption data for studying household welfare. Theoretical models

that analyze time allocation traditionally focus on labor supply in income earning activities[5]. As a result, most empirical analysis of labor supply focuses on income earning work activities. Becker (1965) and Gronau (1977) however argued that theoretical and empirical analysis of household time use should be within a home production framework that accounts for time allocation in domestic work. The home production framework analyzes time allocation in domestic work in a way similar to market work. Time use in domestic work is seen as being able to respond to economic incentives such as changes in market wages, increases in unearned income and improved productivity of work at home.

Studies on household time use also show that socio-economic factors such as gender often play important roles. Time allocation between men and women may be significantly different, resulting in different welfare outcomes between men and women. Gender norms may restrict women's time allocation in certain types of work; for example working off-farm (Horrell and Krishnan, 2006; Seebens, 2011). Women's time allocation and tasks may also be extended to activities such as collecting water and firewood, and preparing food, whereas men's time use is not (Ilahi and Grimard, 2000). Consequently, gender becomes an important factor in the analysis of time use data.

Education is another factor that can play an important role in household time use (Huffman, 1992). In theory, education increases the returns to labor by augmenting human capital. However, in developing economies there is ambiguity on the impact of education as some studies find that education is negatively associated with participation in income generating activities, particularly amongst females (e.g. Alderman and Chishti, 1991; Ilahi and Grimard, 2000). Although surprising, this result would seem plausible in rural areas where there are fewer

[5] We present these theoretical models in a later section.

employment opportunities that attract the educated. Credit constraints may further prevent the educated from pursuing other livelihood options. If credit constraints are relaxed, the educated would be expected to respond positively and increase their participation in productive work.

2.4 Theoretical models for household resource allocation

In this section we review theoretical models for household resource allocation. We explore models that analyze labor supply and consumption expenditures using a utility maximization framework. Consumption expenditures relate to our analysis of food security impacts. We include models that analyze broader resource allocation patterns in market and non-market contexts, and discuss how changes in household income affects labor supply and consumption expenditures.

2.4.1 Models for household labor allocation and consumption demand

Typically, three approaches have been taken by theoretical analysts in studying household resource allocation (i.e. allocation of labor time and consumption demand). These approaches are: unitary models (i.e. common preference models); non-unitary models (e.g. collective approach and bargaining models); and the static model of labor supply. The unitary models describe households as jointly maximizing a single utility function (Samuelson, 1956; Becker 1981). In its simplest form, the common preference model considers a two-member household, where each member has an individual utility function that depends on his or her private consumption of goods. The household members agree to maximize a social welfare function of their individual utilities, subject to a joint budget constraint that pools the income received by the two household members. The household's income consists of wage income and non-wage income. When non-wage income increases in the household, reservation wages increase and time allocated to work decreases. This result is a pure income effect. Since income

is pooled, individual consumption and leisure are not affected by which household member gets the income. The model assumes that there are no within-household differences in the allocation of resources when non-wage income increases. Within a household, labor supply responses to an increase in non-wage income will not be influenced by who receives the non-wage income. For example, the gender of the recipient of social grant income would have no effect on the household's allocation of labor. The assumption of this model would have similar implications for the household's consumption behavior. That is, the consumption demand for household members would be the same. Since household members pool income from different sources, income from different sources would each have the same effect on consumption. For example, wage income from labor activities and income from social grants would have the same effect on household consumption demand.

The non-unitary models describe the distinct preference amongst household members and look at intra-household resource allocation as a bargaining process amongst household members (Lundberg and Pollak, 1993; Chaippori,1992). Non-unitary models relax the restrictive assumption of perfect income pooling. The assumption of these models is that household members have distinct preferences in determining family consumption, and there is a Pareto efficient process between the household members (see Manser and Brown, 1980; Chiappori, 1992). Like in unitary models, labor supply response to non-wage income is a pure income effect. When the amount of non-wage income increases in the household, the amount of time allocated to work decreases. However, non-labor income of one individual may result in a different consumption pattern than that of the other individual. The non-unitary models identify within-household differences in resource allocation when there are changes in non-wage income. For example when the households' non-wage income increases, male household members may

benefit more than female household members, because males may have greater bargaining power than females. Regarding consumption demand, the non-unitary models assume that income from different sources will have different effects on consumption. For example, the effect of social grants versus wage income would have different effects on consumption expenditures. Maitra and Ray (2003) note that social grants and non-social grant income may come from different individuals and these individuals may belong to different generations, and have different preferences. Thus, the effect of these alternative sources of income on consumption expenditures would be different.

The static model of labor supply (Killingsworth, 1983) looks at labor supply decisions within the framework of a single individual with a utility function, where the individual's consumption of leisure has an impact not only on utility directly via consumption, but also indirectly via its impact on the budget set. The individual also has non-wage income and can also allocate time to wage labor. In this simple static model, an increase in non-wage income leads to an increase in consumption of all goods including leisure, which implies a decrease in wage labor. When non-wage income is high and the wage rate is low it becomes optimal not to work at all. This model provides a simple framework for analyzing changes in an individual's labor supply when non-wage income increases.

2.4.2 Incorporating home production in resource allocation models

With regards to allocation of labor, the three models discussed above focus on wage labor activities. However, such labor activities frequently represent only a small amount of household effort amongst poor households. Aside from employment for wage labor, household members also supply labor to home production. As mentioned earlier, the home production framework extends the typical models of household labor allocation by incorporating home production as a

labor activity (Becker, 1956, Gronau, 1977). An individual has labor time consisting of market work and home production. At the optimum the person may choose a combination of consumption and leisure associated with market work or they may choose to allocate their time into leisure and home work. If the individual allocates their time to market work, the pure income effect from the increase in non-labor income is such that leisure time increases and market work decreases. In this case, home production does not change. If the decrease in market work is substantial enough, this results in a drop in labor supply. On the other hand, if the individual does not work in the market, the increase in non labor income leads to an increase in leisure time and a decrease in work at home.

2.4.3 Adapting the theoretical models to our study

The theoretical models reviewed provide a useful conceptual understanding of how household labor time and consumption respond to changes in non-wage income. In the unitary models (i.e. income pooling models), the assumptions about households pooling their income are too restrictive, as shown by empirical tests in the literature. The non-unitary models allow for analysis of within-household differences in resource allocation; for example, gender differences in labor supply outcomes in response to an increase in social grant income, and differences in consumption expenditures due to different income sources. However, common preference, bargaining, and static models restrict their analysis to wage labor activities. The home production models provide a broader analytical framework for labor allocation amongst poor households by including household's time use in domestic work. For our study, we include domestic work in our analysis of labor supply, and also test assumptions of the non-unitary model of within-household differences in labor allocation and differences in impacts of alternative income sources on consumption expenditures.

2.5 Insights from the literature review

There is evidence from the literature that pensions and child grants in South Africa have a positive impact on welfare outcomes such as food security, child nutrition and education. However, the literature also provides evidence of disincentive effects in the labor market when households receive grants. Conflicting results on labor market outcomes are due to factors such as: use of longitudinal versus cross sectional data; and omission of variables that capture household composition.

We note some gaps in the current literature. There are few empirical studies that have analyzed impacts of social grants on household level food security. The available studies often limit their focus to cash food expenditures but overlook in-kind values such as food consumption from agriculture and natural resources. Theoretical models for household resource allocation typically analyze labor allocation in income earning work. Similarly, most empirical studies that employ time use data in analyzing impacts of grants on labor supply tend to focus on income earning work and don't consider non-wage work (e.g. domestic work). Leaving out non-wage work may overlook some important aspects of household resource allocation and impacts of social grants therein. In addition, household level covariates such as gender and education, play important roles in household resource allocation, but little is known about their interactions with social grants. As a result, our study seeks to further explore impacts of social grants and test impacts on broader aspects of labor supply that include non-wage work, and interactions of social grants with gender and education.

Chapter 3: Study site and data collection

3.1 Study site: Eastern Cape Province, South Africa

Our study is based at Lukanji and Mbashe, which are two local municipalities in the Eastern Cape Province of South Africa. The Eastern Cape, with a population of approximately seven million, is the poorest province in South Africa. This province has the lowest rates of access to services and infrastructure. For example, about 35% of the population has no access to electricity, 30% have no piped water and 25% have no access to sanitation facilities, and only 8.5% of adults are employed off-farm (Census, 2001). The poorest municipalities in the Eastern Cape are situated in the former 'homeland' areas of the Transkei and Ciskei, where access to basic services remains far lower than the rest of the province. Lukanji and Mbashe municipalities are recognized as having some of the highest levels of poverty and vulnerability in the Eastern Cape (Statistics South Africa, 2007). One site was selected in each of the two municipalities. Lessyton is the site for Lukanji municipality and Willowvale is the site for Mbashe municipality.

3.2 Data collection

The data used in this study is based on household survey interviews. Two rounds of surveys were carried out during 2011. Collecting data over two periods gives us a broader picture of household economic behavior across different periods of the year since household economic activities may be affected by seasonality. Enumerators were recruited and trained on the survey questionnaire. The author of this study also participated in the enumeration. The enumerators were fluent in both English and Xhosa, which is the local language spoken at the study sites. The enumerators practiced asking the survey questions in Xhosa. Pretests were conducted in each of the study sites to ensure that survey questions were clear and to provide practice for the

enumerators. The pretest interviews were conducted on households who were not part of the final survey sample.

In each of the study sites, villages were randomly selected, and households were randomly selected within the villages stratified by the percent of the population in each village. In Lessyton, households from a total of six villages were interviewed. In Willowvale, households from a total of eight villages were interviewed. The first survey was done during the summer rain season (during January/February, 2011). Data was collected on household time use, incomes and expenditure plus a baseline survey that captured demographic and asset information. The second survey was carried out in the winter season (during June/July, 2011) and re-interviewed households from the first survey. In the first survey, 340 households were interviewed. In the second survey there were 30 cases of attrition, hence 310 households were interviewed. The reason for attrition is that household members were not present at the time of the second survey period. There were also some instances were households had permanently moved from the village. In each household, the survey aimed to interview a male and female adult who were the primary decision makers. However, it was difficult to find two adults (male and female) present at the same time in the same household during the survey period. Only 7.4% of the survey interviews had both male and female adults from the same household present when the interview was conducted.

3.3 Data used to generate key variables

The household questionnaire collected a broad range of socio-economic data (See questionnaire in appendix A). Descriptive statistics on key variables used in the empirical analysis are presented later in the empirical specification and results sections. We present below more details on how these variables were collected and constructed.

3.3.1 **Labor supply**-*household time use data*

To obtain our measure of labor supply we use household time use data. In each household, the survey aimed to ask a male and female adult about their time use for the previous day from the time they woke up to the time they went to bed. Time use consists of leisure time and work time. Work time is categorized into four broad types of labor activities: off farm work; agricultural work; natural resources work; and domestic work. Off-farm work includes formal or casual employment, and work in a small business owned by the household. Natural resource work includes collecting firewood (most common natural resource activity), collecting poles, wild fruits, fishing, and other natural resource products. Agricultural work refers to time spent in cropping and livestock activities; working in the garden or fields, herding cattle, feeding cattle, and milking cows. Domestic work includes cleaning the house and cooking, bathing the children, laundry, fetching water, doing house and sanitation repairs, helping children with homework, and taking children to and from school. These four broad types of labor activities are used in the labor supply analysis. Leisure time consist of any other activities that are not part of labor time. This includes resting, watching TV and visiting neighbors. We do not incorporate leisure time into the empirical analysis because we are only interested in analyzing labor time allocation.

3.3.2 **Household food security**-*food expenditures data*

We collected data on household expenditures on food to provide a measure of household food security. Food expenditures consist of cash expenditures and in-kind food consumption. In-kind food consumption is based on crop, livestock, and natural resource products; produced or collected and consumed by the household. Values for these in-kind foods are based on average prices from survey responses. Data on cash food expenditures were collected by asking households how much money they spend on average every month on food. In-kind food

consumption is expressed as monthly consumption based on a three month average. The reason for using a three month average is explained in next section on household income data.

3.3.3 Household income data -*social grants and other income*

We collected data on the amount of social grants received per month, including specific details on the types of grants and number of beneficiaries in a household. We also collected data on other household income acquired within three months of the survey period. Collecting incomes spanning a three month period allows us to capture households' production, particularly in irregular income sectors such as agriculture and natural resources, which may be undervalued if we collect incomes from one month. Income data consists of wage income earned by household members (on farm and off-farm) and non-wage income (social grants and remittances). Wage income sources include formal and casual employment, small businesses, crops, livestock, and natural resource products. Income from crop, livestock and natural resource products consists of the cash value of any products sold and values of produce that the household does not sell but consumes[6]. The values of consumed products are based on average product prices obtained from survey responses. These income data are then averaged over the three month period to obtain average monthly income values for each round of the survey. Besides social grants, non wage income includes remittances received over the three months period. Remittance income consists of the cash value of remittances received by a household plus values for food, clothes, and other in-kind items received. We assign monetary values for in-kind remittances based on estimates given by households receiving remittances. Remittance values are also averaged over the three months period to get monthly remittances.

[6] Later in the empirical analysis of food expenditures that include in-kind consumption, the value of products consumed as food is removed from the income variables but appears as part of the food expenditures dependent variable.

3.3.4 Household level covariates-*demographic and asset data*

An important component of this study is to understand the roles of household level covariates in influencing labor supply and food security through interactions with social grants. We also use some household level covariates as control variables in the empirical estimations. We collected household demographic and asset data during the baseline survey. Demographic data includes household size, age and gender composition, and education levels of household members. We account for changes in household size due to movements of individuals into or out of the household between the two survey periods. Asset data includes information on households' financial, natural, physical and social capital. The amount of household financial savings is used as a measure of financial capital. Size of agricultural land owned in acres is used as a measure of natural capital. For the other types of capital, we have multiple attributes that we combine into indices.

Chapter 4: Empirical specification and results for a labor supply model.

4.1 Outline of chapter

The objective of our empirical approach is to quantify the effects of social grants on labor supply. We use the number of hours worked by individuals as our measure of labor supply. Labor supply consists of hours worked in off farm; agriculture; and natural resources work, as well as hours worked in domestic work. Although domestic work is often excluded in labor supply studies, we include it in our labor supply measure because domestic work frequently represents a significant amount of household effort amongst rural households. We begin by specifying an empirical model for the labor supply of household members. Next, we describe the main variables used in the empirical analysis and discuss their expected signs. We then explain how different variables that are used in the regression were constructed. After that, we discuss econometric problems associated with measuring the impact of social grants, and how the literature addresses the issues. Finally, we identify appropriate estimators to correct for the potential problems (e.g., endogeneity) and present the labor regression results.

4.2 Empirical specification of labor supply model

We seek to estimate the effect of grants on labor supply using the following specification:

$$\boldsymbol{Y} = \boldsymbol{A\beta}_{\mathrm{J}} + \boldsymbol{G\beta}_{\mathrm{G}} + \boldsymbol{I\beta}_{\mathrm{I}} + (\boldsymbol{G} \times \boldsymbol{A})\boldsymbol{\beta}_{\mathrm{GJ}} + (\boldsymbol{G} \times \boldsymbol{I})\boldsymbol{\beta}_{\mathrm{GI}} + \boldsymbol{H\beta}_{\mathrm{H}} + \boldsymbol{X\beta}_{\mathrm{X}} + \boldsymbol{\varepsilon} \qquad (4.1)$$

In equation 4.1, the outcome variable, represented by a vector $\boldsymbol{Y}$, is the number of hours worked in one day by individual *i*, living in household *h*, engaged in labor activity *j* in time period *t* ($Y \geq 0, j = 1 \ldots 4,$ and $t = 1,2$). Hours worked is specified as a function of a set of labor activity fixed effects, social grants and socioeconomic and demographic characteristics of individuals. Labor activity fixed effects are represented by a matrix of dummy variables, $\boldsymbol{A}$; *s*ocial grants are

represented by a matrix $\boldsymbol{G}$, which indicates amounts of different types of social grants income received by the household; socioeconomic and demographic characteristics of individuals are represented by the matrix $\boldsymbol{I}$. These sets of explanatory variables are each associated with conformable vectors of coefficients: $\boldsymbol{\beta}_{\mathbf{J}}$, $\boldsymbol{\beta}_{\mathbf{G}}$ and $\boldsymbol{\beta}_{\mathbf{I}}$, respectively. For example $\boldsymbol{A}$ is a $n \times J$ matrix associated with coefficient vector $\boldsymbol{\beta}_{\mathbf{J}}$, a $J \times 1$ vector. We interact $\boldsymbol{G}$ with $\boldsymbol{A}$ to measure the effect of social grants on each type of labor activity. To test our main hypothesis on interaction effects of grants with gender and education, we interact $\boldsymbol{G}$ with $\boldsymbol{I}$. Finally, we also include in equation 4.1 $\boldsymbol{H}$, a set of variables that represent household characteristics (such as household size and capital stocks) and $\boldsymbol{X}$, a set of other control variables (such as time period and site location).

4.3 Description of explanatory variables and expected signs

Table 4.1 describes the dependent variable for the labor supply regression, explanatory variables and their expected signs. The dependent variable is derived from time use data of household members. We calculate the dependent variable as hours of labor worked, segmented into four labor activities: off-farm, agriculture, natural resources, and domestic work (column 1, under dependent variable, rows 1-4). Leisure time is excluded from the analysis since our interest is in measuring labor time allocation. We explicitly include, however, domestic time use which is frequently excluded in empirical work analyzing labor supply. We do so because our field work consistently revealed that home production is a significant part of the livelihood of household members. Table 4.1 shows that average hours of labor supplied for the entire sample of adults are generally low for off-farm, agriculture and natural resource activities. This is primarily due to low participation. Only 8.4% of adults participated in off-farm work, while agriculture and natural resources had 16.1% and 12.8% participation respectively (not shown in table 4.1). However, almost all adults participate in domestic work (97% participation) and the

average hours worked in domestic work are much higher. For adults participating in off farm work, the average number of hours worked per day is 6.9 (not shown in table 4.1), while agriculture and natural resources average 2.3 and 2.9 respectively. Domestic hours worked averages 4.8 hours per day.

Table 4.1: Description of variables and expected signs for labor supply

Variables	Variable Description	Mean	Std. Dev	Expected sign
Dependent variable				
off-farm	hours worked off-farm in one day	0.58	2.14	
agriculture	hours worked in agriculture in one day	0.39	1.22	
nat. resources	hours worked in natural resources in one day	0.35	1.06	
domestic	hours worked in domestic work in one day	4.69	3.27	
Type of labor activity (*A*)				
off-farm work	1= off-farm, 0= otherwise			+/-
agriculture work	1= agriculture, 0= otherwise			+/-
natural resource work	1= natural resources, 0= otherwise			+/-
domestic work	1= domestic work, 0= otherwise			+/-
Social grants income (*G*)				
pensions	monthly household pension income	675.12	826.64	-
other grants	monthly household income from other grants	565.12	659.04	-
Individual characteristics (*I*)				
gender of adult	1= male adult, 0 = female adult	0.47	0.50	+/-
education of adult	1= completed grade 7, 0 = did not	0.58	0.49	+/-
age of adult	1= below 50 years, 0 = above	0.32	0.47	+/-
Grant interaction effects (*GA* and *GI*)				
G × off-farm	grant income × off-farm work			+/-
G × agriculture	grant income × agriculture work			+/-
G × natural res	grant income × natural resource work			+/-
G × domestic	grant income × domestic work			+/-
G × gender	grant income × gender of individual			+/-
G × education	grant income × individual education			+
G × age	grant income× age of individual			+/-
Household characteristics (*H*)				
household size	total number of people	5.07	2.75	+/-
children	1=at least one child, 0= none	0.74	0.44	+/-
land ownership	total agricultural land in acres	0.62	1.06	+

Table 4.1: Description of variables and expected signs for labor supply

(continued)

physical assets	physical asset index	0.01	1.01	+
social capital	social capital index	0.00	1.00	+
Remittances	monthly household remittance income	114.47	327.31	+/-
financial savings	1=household has savings, 0= no savings	0.17	0.38	+/-
Control variables (*X*)				
time period	1= second survey, 0=first survey	0.47	0.51	+/-
location	1= Willowvale, 0= Lessyton	0.50	0.50	+/-
day of work	1= weekend ,0 = during week	0.09	0.29	-

In table 4.1, ***A*** is comprised of four dummy variables (*J*) which are specific to each labor activity (column 1, under type of labor activity, rows 1-4). Since our dependent variable is comprised of work hours stacked across each of the four work activities, the *J* dummies control for heterogeneity or mean shifts across the activities. Since these are not participation dummy variables, but simply control for activity fixed effects, we do not provide any descriptive statistics for the ***A*** dummy variables, and we do not have *a priori* expectations on their signs.

To test our hypotheses on impacts of social grants, we incorporate ***G***, which measures the baseline effect of social grants before incorporating interaction effects with household covariates. ***G*** consists of both pensions, and other types of grants. Together, pension income and other social grant income constitute more than half of households' income (i.e. 55%; not shown in table). For other types of grants, the majority are child grants. To measure impacts of social grants, we use household pension income as the main variable since pension income is significantly greater in value compared to other types of social grants, and is often used in the empirical literature as the primary measure of social grant impacts on household labor supply and other livelihood outcomes. As already mentioned in the literature review in chapter 2, theoretically, social grants and other non-wage income are expected to raise reservation wages, leading to a reduction in

labor supply, and an increase in consumption of leisure (e.g. see Manser and Brown, 1980; Becker, 1981). Hence we would expect ***G*** to have a negative sign.

We include a gender variable in the labor supply equation. In table 4.1, the proportion of male versus female individuals is almost equal; with 47% of the sample being males (column 3, under ***I***, row 1). Gender differences in labor supply may arise from gender norms which restrict women's prospects to engage in livelihood activities (Horrell and Krishnan, 2006; Seebens, 2011). However, it is not always the case that females face discrimination. Some studies have shown that females may freely pursue livelihood options and achieve similar outcomes as males (Chant, 2003; Buvinic and Gupta, 1997). In addition, women's time allocation may be higher in non market work, due to extended tasks in domestic work (Ilahi, 2000). The reported effects of gender in the literature are ambiguous. Given these mixed findings from the literature, we have no *a priori* expectations for the sign on the gender variable.

We include education in our model to represent human capital, which has been shown to be an important livelihood factor amongst rural households (e.g. Huffman, 1992). The effect of education is not always clear because education may be negatively associated with participation in labor activities as a result of unavailability of lucrative jobs for the educated (Alderman and Chishti, 1991; Ilahi and Grimard, 2000). Individuals with higher levels of education may also be less willing to participate in non-market work. Given the ambiguity in the effect of education, we do not have *a priori* expectations on the sign of the education variable.

We also include an age variable that captures whether the individual is of prime working age (below 50 years) or elderly (above 50). Labor allocation may differ amongst prime age and elderly individuals. For both the elderly and prime age individuals, the labor supply effect can go

in either direction (i.e. a positive or a negative impact). For example, the elderly are more likely to engage in flexible work activities rather than in fixed off-farm formal employment (Lam et al. (2005). Therefore, the elderly would be more likely to spend more time in agriculture, natural resources, and domestic work as these activities have flexible hours. If the amount of time spent in flexible work activities is more than the amount of time spent elsewhere, the elderly would on average have greater supply (i.e. a positive impact). Conversely, if the amount of time spent in flexible work activities is low, the elderly would on average have less labor supply (i.e. a negative impact). For prime age individuals, labor supply in off-farm work is likely to be greater than that of the elderly. In this case, if hours spent in formal employment is more than hours spent by the elderly in flexible work activities, prime age individuals would on average have greater labor supply (i.e. a positive impact). However, participation in the formal employment market may be limited by unavailability of jobs, or other entry barriers. Prime age individuals may also be less keen to participate in on-farm work. In this case, prime age individuals would on average have less labor supply (negative impact). In the regression, the sign of the age variable will depend on which effect is greater; hence we do not have *a priori* expectations.

G is interacted with ***A*** to measure effects of social grants in each labor activity (column 1 in table 4.1, under grant interaction effects, rows 1-4). If increasing social grants in a household relaxes credit constraints, thus helping individuals to pursue livelihood options such as investing in small businesses and agriculture, or searching for jobs, we would expect a positive sign for "grant income × off-farm work" and "grant income × agriculture work" (for example, see Eyal and Woolard, 2011, Lovo, 2011). If social grants cater to individuals' needs such that they have reduced incentives to work, we would expect negative signs on the above mentioned interaction terms, and a negative sign for "grant income × natural resource work" (for example, see

Bertrand et al, 2003, Lam et al, 2005). Theoretical models that measure home production suggest that an increase in non-wage income (e.g. social grant income) would not affect time allocation in domestic work, assuming that household members participate in market work (e.g. off-farm and on-farm work). If household members do not participate in market work, theoretical models suggest that non-wage income would lead to a decrease in domestic work and an increase in leisure (Gronau, 1977, Becker, 1956). Therefore, the effect of non-wage income in the domestic sector is dependent on whether household members allocate part of their time to market work. Empirical data in developing economics often shows overlaps in time allocation between market work and home production. In such cases, the effect of non-wage income on either market work or domestic work is ambiguous. Consequently, we have no *a priori* expectation on the 'grant income × domestic work' interaction.

Pursuant to our specific interest of measuring interaction effects of grants with household covariates, we interact ***G*** with ***I***. Our main interest is to measure interaction effects of grants with gender and education (column 1, under grant interaction effects, rows 4-5 in table 4.1). As explained earlier, the effect of gender is ambiguous in the literature. Similarly, we have no *a priori* expectations on the interaction effect of gender with social grants. Based on earlier discussions on impacts of education, if educated individuals cannot find off-farm work and face credit constraints to invest in small businesses, we expect social grants to relax credit constraints and allow the educated to search for jobs or start small businesses. Hence the interaction effect of grants with education is expected to be positive with respect to hours of labor supplied.

We also measure interaction effects between grants and age of individuals. The elderly are likely to reduce their supply of labor as a result of receiving pensions (Lam et al, 2005, Ranchord, 2006). But if prime age individuals have access to pension income, there may be

disincentives to work amongst the prime age (Betrand et al, 2003). Social grants would reduce labor supply for either age group, rendering the expected sign for grant-age interaction to be ambiguous.

In the labor supply regression, we also incorporate other household characteristics, whose variables are presented under ***H*** in table 4.1. Lam et al (2005) and Case and Deaton (1998) suggest that variables that measure household composition must be included in the analysis of social grant impacts because both social grant variables and household outcome variables may be driven by household composition. In the labor supply regression, we include presence of children, and household size to control for household composition (rows 1-2 under ***H***). We do not have *a priori* expectations on the signs of these variables.

To further characterize households, we include measures of capital stocks. Measures of capital stocks have been shown in the literature to be important livelihood factors in developing economies (Scoones, 1998). We include measures of natural capital, physical capital, social capital, and financial capital under household characteristics. Index variables are used to express physical and social capital. The construction of these indices is explained in a later section. The size of agricultural land owned is used as a measure of natural capital. Remittances and household savings are used as measures of financial capital. Empirical studies commonly find that capital stocks have a positive effect on labor supply and other livelihood outcomes (e.g. see de Janvry, 1997, Matshe and Young, 2004, Beegle et al., (2006). Remittances also function as a control variable because social grants and labor supply may both be correlated to remittances; thus excluding remittances in the labor supply equation may lead to biased estimates (e.g. see Cox and Jimenez, 1992, Jensen, 2004). Our expectation is that land ownership, physical and

social capital will have a positive effect on labor supply. We do not have *a priori* expectations on the signs of remittances and financial savings.

Table 4.1 also shows control variables, denoted by ***X*.** To control for seasonal effects, we include a time period variable. Households' economic activities and livelihood outcomes may vary by season. For example, time allocation in on-farm work will vary in different periods of the year due to seasonal factors such as rainfall and temperature (Deaton and Grosh, 2000, Khandker, 2012). The first period coincides with the summer rainfall season, which is the main period for crop production. Hence we expect labor supply in agricultural activities to be higher in the first period. The second time period coincides with the off-season (i.e. the period after summer crops have been harvested). In this period, we would expect a shift in labor supply from agricultural activities, particularly in crop production, to other activities. For example, Ellis (2000) notes that household members may seek seasonal wage earning opportunities, such as doing off-farm work in the off-season (Ellis, 2000). The sign on the time period variable will depend on which season has higher labor supply levels. We do not have *a priori* expectation on which season will have more labor supply.

We also control for location differences between the two study sites (i.e. Willowvale and Lessyton) by adding a location dummy variable. Differences between the two locations include: agro ecological conditions, access to markets and access to basic amenities such as electricity and water. These differences may influence labor allocation patterns amongst individuals. We do not have *a priori* expectations on the location control variable. We also control for day of work, because part of our time use data captures individuals' labor supply on weekend days (i.e. 9% of the sample). We believe that labor supply may be different for week days and weekend days as

individuals may work more on weekdays and choose to rest on weekends. We expect weekends to be negatively associated with labor supply.

4.4 Construction of indices for household capital stocks

Index variables for physical and social capital are derived using principal component analysis (PCA). The physical assets index is derived from 17 physical asset characteristics (see table 4.2). The PCA generates factor scores for each asset characteristic. The factor scores are computed by assuming a regression method based on uncorrelated rotated factors. The 17 factors are standardized to zero mean and unit variance (i.e. normality assumption). Table 4.2 shows factor scores from factor 1, which is the factor that explained most of the variation in the asset characteristics. Factor 1 is used to generate the physical asset index. The physical asset index is generated by weighting the asset characteristics with the scoring coefficient and adding them up.

Table 4.2: Descriptive statistics and scoring coefficients for retained factors of the variables included in the PCA model for physical assets

physical asset characteristics	N	Mean	Std. Dev.	Min	Max	Factor 1 scores
do you have a kraal?	340	0.900	0.296	0	1	0.378
do you have a car?	340	0.056	0.230	0	1	0.365
do you own a bicycle?	340	0.02	0.152	0	1	-0.104
do you own a cell?	340	0.879	0.326	0	1	0.514
do you own a TV?	340	0.506	0.501	0	1	0.82
do you own a radio?	340	0.524	0.500	0	1	0.397
do you own a DVD?	340	0.344	0.476	0	1	0.697
do you own a stove?	340	0.591	0.492	0	1	0.699
do you own a fridge?	340	0.468	0.451	0	1	0.792
do you own a plough?	340	0.132	0.340	0	1	-0.327
do you own a cart?	340	0.062	0.241	0	1	-0.2
do you own a bed?	340	0.982	0.132	0	1	0.007
do you own a solar panel?	340	0.065	0.246	0	1	0.035
do you own a sewing machine?	340	0.068	0.623	0	11	-0.101
do you own a jojo tank?	340	0.206	0.404	0	1	-0.13
do you own a wheelbarrow?	340	0.294	0.456	0	1	0.131
do you own a generator?	340	0.282	0.451	0	1	0.561

The social capital index is generated using the same procedure as for the physical assets index. The social capital index is derived from 21 variables that measure social capital. Table 4.3 presents descriptive statistics for the scoring coefficients for retained factors of the variables included in the PCA model for social capital.

Table 4.3: Descriptive statistics and scoring coefficients for retained factors of the variables included in the PCA model for social capital

Social capital factors	N	Mean	Std. Dev.	Min	Max	Factor 1 scores
how long have you been established in this village?	340	4.61	1.522	1	7	-0.129
does anyone in this household take part in community decision making?	340	2.37	0.858	1	3	0.135
is household involvement in community activities compared to 10 yrs ago?	340	1.76	0.97	1	3	0.186
do you have free access to human rights advice?	340	0.19	0.389	0	1	0.444
do you have free access to legal advice?	340	0.18	0.384	0	1	0.311
do you have free access to medical advice?	340	0.62	0.487	0	1	0.409
do you have free access to veterinary advice?	340	0.2	0.403	0	1	0.542
do you have free access to medical advice?	340	0.22	0.417	0	1	0.569
do you have free access to building advice?	340	0.12	0.326	0	1	0.519
do you have free access to schooling advice?	340	0.21	0.407	0	1	0.588
do you have free access to moving/relocating advice?	340	0.04	0.192	0	1	0.448
do you have free access to market/business advice?	340	0.1	0.296	0	1	0.592
do you have free access to credit/financial advice?	340	0.17	0.374	0	1	0.494
people around here are willing to help their neighbours	340	3.21	0.751	1	4	0.291
this is a close-knit or 'tight' neighbourhood where people generally know one another	340	3.19	0.914	1	4	0.389
if I had to borrow R50 in an emergency, I could borrow it from a neighbor.	340	3.1	1.036	1	4	0.22
people in this neighborhood generally get along with each other	340	3.14	0.822	1	4	0.241
people in this neighborhood can be trusted	340	2.71	0.983	1	4	0.209
if I were sick I could count on my neighbours to shop for groceries for me	340	3.14	0.787	1	4	0.236
people in this neighborhood share the same beliefs, culture and values	340	2.94	1.143	-5	4	-0.202

A summary of the PCA scoring criteria used to generate the physical and social capital indices is presented in table 4.4. As mentioned, the indices are based on component one scores, which explain the greatest amount of variation in factors.

Table 4.4: Components extracted from Principal Component Analysis and proportion of variation in factors explained by components.

	Physical capital Index			Social capital Index		
Component	Eigen value	Proportion	Cumulative %	Eigen value	Proportion	Cumulative %
1	3.215	17.863	17.863	2.821	14.104	14.104
2	2.078	11.547	29.411	2.318	11.588	25.692
3	1.677	9.314	38.725	2.008	10.04	35.732
4	1.573	8.738	47.463	1.583	7.917	43.648
5	1.33	7.39	54.852	1.42	7.098	50.746
6	1.242	6.9	61.753	1.143	5.714	56.459

4.5 Econometric problems associated with measuring impact of social grants

Empirical studies that assess impacts of social grants frequently encounter endogeneity problems related to social grants variables. The estimated effect of grants on household outcomes such as labor supply and food expenditures might be biased because these outcome variables and social grants variables may both be driven by unobservables. Bertrand et al., (2003) note that pension recipients may be systematically different from non recipients such that the measured effect of pensions on labor supply may be driven by some unobserved characteristics. According to Dufflo (2003), and Lam et al (2005), pensions can lead to changes in household composition, resulting in correlation between pensions and unobserved household characteristics. As a result, the measured effect of pensions on labor supply may be driven by household composition factors rather than by the pension itself. Case and Deaton (1998) note that pensions can be endogenous if there are unobserved household characteristics that affect both food expenditures and the likelihood of receiving a pension. In all the cases mentioned above, the endogeneity of social grants arises from the simultaneous determination of social grant variables and household outcome variables by unobserved factors.

Studies implement various strategies to address the problem of endogeneity of social grants. Table 4.5 presents a summary of econometric strategies used in the literature.

Table 4.5: Summary of econometric strategies for identifying effects of grants on various household measures

Authors	Grant	Impact on	Econometric strategy
Case & Deaton (1998)	pensions	food expenditure, schooling, household transfers and savings.	Instrumental variables used for pension income
Bertrand et al (2003)	pensions	labor supply of prime age persons	instrumental variables used for pension income; age eligibility used to measure pensions effects; sample restricted to three generational households
Posel et al (2006)	pensions	labor supply and migration of prime age persons	instrumental variables used for pension income; sample restricted to three generational households
Lovo (2011)	pensions	agricultural technical efficiency	age eligibility dummy variable used to measure pensions effects
Ranchhod (2006)	pensions	labor supply of elderly	age eligibility dummy variable used to measure pensions effects
Lam (2005)	pensions	labor force withdrawal of the elderly	age eligibility dummy variable used to measure pensions effects; control for household composition;
Edmonds et al (2002)	pensions	household formation	regression discontinuity design using eligibility cut off.
Eyal & Woolard (2011)	child grants	mother's labor force participation	regression discontinuity design using eligibility cut off.
Aguero (2009)	child grants	child height for age	continuous treatment method applied to propensity scores.

Source: Studies cited in the table.

Studies like Case and Deaton (1998); Bertrand et al., (2003); and Posel et al (2006) use instrumental variable (IV) estimators. These studies instrument for pension income using number of pension eligible men and number of pension eligible women as the main instruments. Ranchhod (2006) and Lam (2005) use age eligibility instead of the amount of pensions received. By using age eligibility rather than the amount of pensions received, these studies argue that

pension take-up is an endogenous household choice whereas an individual's age is not. The coefficients on the age eligibility dummy variables measure the effect of receiving a pension. This measured effect is valid if take-up of the pension by age eligible people is incomplete or does not coincide exactly with eligibility. Other approaches used to deal with endogeneity include regression discontinuity designs (Eyal and Woolard, 2011) and continuous treatment methods, used in the absence of randomized control trials (Aguero et al., 2009).

In this study, we follow the literature cited above by using instrumental variables to correct for endogeneity of social grants. That is, we identify instruments that have zero covariance with the dependent variable, but non-zero covariance with the endogenous explanatory variables, conditional on the other covariates. These instruments are presented in the next section.

4.6 Choice of estimator for labor supply regression

Because 66.6% of observations have $\boldsymbol{Y} = 0$, the dependent variable is censored at zero. With a limited dependent variable, OLS is biased. We therefore seek to estimate equation 4.1 using a Tobit model. Note that the estimator for equation 4.1 should not only account for censored outcomes (i.e. large number of zero observations), but should also correct for the endogeneity of grants. Our initial strategy was to run an IV Tobit regression which uses a full information maximum likelihood estimator (Tobin, 1958). However, in running the IV Tobit, we had to consider that $\boldsymbol{G}$ was not the only endogenous variable in the model. The interaction terms $\boldsymbol{G} \times \boldsymbol{A}$ and $\boldsymbol{G} \times \boldsymbol{I}$ are also endogenous. Under these conditions, the full information maximum likelihood estimator could not converge. Consequently, we considered an alternative estimator– Newey's two-step efficient estimator (Newey, 1987). The Newey-estimator uses a limited information procedure that allows for specification of multiple endogenous variables within a

limited dependent variable framework. Standard errors for Newey's estimator are based on Amemiya's (1978, 1979) derivations of the efficient variance-covariance matrices using Generalized Least Squares (GLS). These derivations allow for validation of the chosen instruments for each endogenous variable through an Amemiya-Lee-Newey test for over-identification (Lee, 1992). Based on Case and Deaton (1998) and Bertrand et al (2003), the instruments that we use are: number of females above 60 years, number of males above 65 years, and presence of orphans in household. Following Newey (1987) and StataCorp, 2009, we rewrite equation 4.1 as:

$$y_{1i}^{*} = \boldsymbol{y}_{2i}\boldsymbol{\beta} + \boldsymbol{x}_{1i}\boldsymbol{\gamma} + u_i \quad (4.3a)$$

$$\boldsymbol{y}_{2i} = \boldsymbol{x}_{1i}\boldsymbol{\Pi}_1 + \boldsymbol{x}_{2i}\boldsymbol{\Pi}_2 + \boldsymbol{v}_i \quad (4.3b)$$

where y_{1i}^{*} is the number of hours worked by individual i; and i =1,…,N; $\mathbf{y}_{2i}$ is a 1x p vector of endogenous variables; $\boldsymbol{x}_{1i}$ is a 1 x k_1 vector of exogenous variable; $\boldsymbol{x}_{2i}$ is a 1 x k_2 vector of instrumental variables; and the equation for $\boldsymbol{y}_{2i}$ is written in reduced form. We assume that $(u_i, \boldsymbol{v}_i) \sim N(\mathbf{0})$. In the model, $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$ are vectors of structural parameters and $\boldsymbol{\Pi}_1$ and $\boldsymbol{\Pi}_2$ are matrices of reduced-form parameters. For simplicity, we can rewrite equations 4.3 as

$$y_{1i}^{*} = \boldsymbol{z}_i\boldsymbol{\delta} + u_i \quad (4.4a)$$

$$\boldsymbol{y}_{2i} = \boldsymbol{x}_i\boldsymbol{\Pi} + \boldsymbol{v}_i \quad (4.4b)$$

where $\boldsymbol{z}_i = (\boldsymbol{y}_{2i}, \boldsymbol{x}_{1i}), \boldsymbol{x}_i = (\boldsymbol{x}_{1i}, \boldsymbol{x}_{2i}), \boldsymbol{\delta} = (\boldsymbol{\beta}', \boldsymbol{\gamma}')'$ and $\boldsymbol{\Pi} = (\boldsymbol{\Pi}_1', \boldsymbol{\Pi}_2')'$. We do not observe y_{1i}^{*}; instead, we observe

$$y_{1i} = \begin{cases} a, & \text{if } y_{1i}^{*} < a \\ y_{1i}^{*}, & \text{if } a \le y_{1i}^{*} \le b \\ b, & \text{if } y_{1i}^{*} > b \end{cases}$$

This model is derived under the assumption that $(u_i, \boldsymbol{v}_i)$ is independent and identically distributed multivariate normal with mean zero for all i. The covariance matrix for $(u_i, \boldsymbol{v}_i)$ is

$$\mathrm{Var}(\mathrm{u_i}, \boldsymbol{v_i}) = \sum = \begin{bmatrix} \delta_u^2 & \sum_{21}' \\ \sum_{21} & \sum_{22} \end{bmatrix} \qquad (4.5)$$

The model assumes that $\sum$ is not block diagonal between $\mathrm{u_i}$ and $\boldsymbol{v}_\mathrm{i}$; otherwise $\boldsymbol{y}_{2\mathrm{i}}$ would not be endogenous. Using the properties of the multivariate normal distribution, the $(\mathrm{u_i}, \boldsymbol{v}_\mathrm{i})$ covariance matrix is expressed as: $\mathrm{Var}(\mathrm{u_i} \mid \boldsymbol{v}_\mathrm{i}) \equiv \delta_{\mathrm{u|v}}^2 = \delta_\mathrm{u}^2 - \sum_{21}' \sum_{22}^{-1} \sum_{21}$ and $\mathrm{u_i}$ is expressed as: $\mathrm{u_i} = \boldsymbol{v}_i'\boldsymbol{\alpha} + \varepsilon_\mathrm{i}$, where $\boldsymbol{\alpha} = \sum_{22}^{-1} \sum_{21}$; $\varepsilon_\mathrm{i} \sim \mathrm{N}(0; \delta_{\mathrm{u|v}}^2)$, where $\delta_{\mathrm{u|v}}^2 = \delta_\mathrm{u}^2 - \sum_{21}' \sum_{22}^{-1} \sum_{21}$, and ε_i is independent of $\boldsymbol{v}_i, \boldsymbol{z}_i,$ and $\boldsymbol{x}_i$. Estimates of the reduced form coeficients are obtained by using reduced form residuals as additional explanatory variables. The estimator is then calculated by applying GLS to estimates of the reduced form coefficients. The likelihood function is derived from the joint density function:

$f(y_{1i}, \boldsymbol{y}_{2i} \mid \boldsymbol{x}_\mathrm{i})$ as $f(y_{1i}, \boldsymbol{y}_{2i} \mid \boldsymbol{x}_\mathrm{i}) f(\boldsymbol{y}_{2i} \mid \boldsymbol{x}_\mathrm{i})$.

If our model has one endogenous regressor, the likelihood function is written as:

$$\ln f(y_{2i} \mid \boldsymbol{x}_\mathrm{i}) = -\frac{1}{2}\left\{\ln 2\pi + \ln \delta_\mathrm{v}^2 + \frac{(y_{2i} - \boldsymbol{x}_i \boldsymbol{\Pi})^2}{\delta_v^2}\right\}$$

and

$$\ln f(y_{1i} \mid y_{2\mathrm{i}}, \boldsymbol{x}_i) = \begin{cases} \ln\left\{1 - \Phi\left(\frac{m_i - a}{\delta_{\mathrm{u|v}}}\right)\right\} & y_{1i} = a \\ -\frac{1}{2}\left\{\ln 2\pi + \ln \delta_{\mathrm{u|v}}^2 + \frac{(y_{1i} - m_i)^2}{\delta_{\mathrm{u|v}}^2}\right\} & a < y_{1i} < b \\ \ln \Phi\left(\frac{m_i - a}{\delta_{\mathrm{u|v}}}\right) & y_{1i} = b \end{cases}$$

where $m_\mathrm{i} = \boldsymbol{z}_\mathrm{i}\boldsymbol{\delta} + \alpha(y_{2i} - \boldsymbol{x}_i \boldsymbol{\Pi})$

and $\Phi(\cdot)$ is the normal distribution function so that the log likelihood for observation i is

$$\ln L_i = w_i f\{\ln f(\, y_{1i} \mid y_{2i}, \boldsymbol{x}_i\,) + lnf(\, y_{2i} \mid \boldsymbol{x}_i\,)\} \qquad (4.6)$$

where w_i is the weight for observation i or one if no weights are specified. Instead of estimating $\sigma_{\mathrm{u|v}}$ and σ_v directly, we estimate their logarithmic expressions $\ln\sigma_{\mathrm{u|v}}$ and $\ln \sigma_\mathrm{v}$. However, since our empirical model has multiple endogenous regressors, a different likelihood function is written. The likelihood function is:

$$\ln f(\boldsymbol{y}_{2i} \mid \boldsymbol{x}_i) = -\frac{1}{2}(\ln 2\pi + \ln \sum_{22} + \boldsymbol{v}_1' \sum_{22}^{-1} \boldsymbol{v}_i) \qquad (4.7)$$

$\ln f(y_{1i} \mid \boldsymbol{y}_{2i}, \boldsymbol{x}_i)$ is the same as before, expect that now

$$m_{\mathrm{i}} = \boldsymbol{z}_{\mathrm{i}}\boldsymbol{\delta} + (\boldsymbol{y}_{2i} - \boldsymbol{x}_i\boldsymbol{\Pi})\sum_{22}^{-1}\sum_{21}$$

Instead of maximizing the log-likelihood function with respect to the covariance matrix $\sum$, we maximize with respect to the Cholesky decomposition of $\sum$. The Cholesky decomposition has a lower triangular matrix $\boldsymbol{S}$, where

$$\boldsymbol{S} = \begin{bmatrix} s_{11} & 0 & 0 & \cdots & 0 \\ s_{21} & s_{22} & 0 & & 0 \\ s_{31} & s_{32} & s_{33} & & 0 \\ \vdots & & & \ddots & \vdots \\ s_{p+1,1} & s_{p+1,2} & s_{p+1,3} & \cdots & s_{p+1,p+1} \end{bmatrix}$$

Matrix $\boldsymbol{S}$ has a maximization property $\boldsymbol{SS}'=\sum$ which yields an asymptotically efficient estimator with a positive definite covariance matrix $\sum$.

4.7 Results

Table 4.6 presents results of alternative specifications of the Newey Tobit regression with instrumental variables. In all specifications, the dependent variable is log of hours worked in one day[7]. In the regression estimation, variables for pension income and other grants income are rescaled by multiplying by 1000 in order to ease the interpretation of the coefficients[8]. The specification in model 1 only identifies interaction effects of pensions with household level covariates (gender, education, and age). Model 2 identifies the same interaction effects as in model 1 but also includes interaction effects of pensions with type of work activities. Model 3 is similar to model 2 but omits measures of capital stocks in the labor supply regression. The three

[7] Using the log of the dependent variable addresses heteroskedasticity of standard errors, which is a common problem in Tobit models.

[8] The Newey estimator does not calculate marginal effects but reports percentage changes in the latent propensity to supply labor. However, in our foregoing discussion, we regard the regression coefficients as measuring changes in labor supply.

models yield similar results for the main variables of interest (pensions, and pension interaction terms). However, tests for over identifying restrictions in the IV regressions indicate that models 2 and 3 have suitable instruments whereas model 1 does not. For the rest of this section, we interpret and discuss the regression results with reference to model 2, since this model has significant results for the instrument validity test, and has the full specification of the labor supply regression.

Table 4.6: Impacts of pensions on labor supply: IV Tobit using Newey 2 step estimator

	model 1	**model 2**	**model 3**
Dependent variable : log of hours worked in one day	coefficient	coefficient	coefficient
constant	2.536***[9]	2.444***	2.254***
	(0.341)[10]	*(0.351)*	*(0.305)*
Activity fixed effects (*A*)			
off farm work	-2.793***	-2.672***	-2.670***
	(0.097)	*(0.142)*	*(0.142)*
agricultural work	-2.684***	-2.565***	-2.563***
	(0.093)	*(0.135)*	*(0.135)*
natural resource work	-2.532***	-2.502***	-2.498***
	(0.088)	*(0.129)*	*(0.129)*
Social grants income[11] (*G)*			
pension amount x 1000	-0.856***	-0.757**	-0.682**
	(0.312)	*(0.326)*	*(0.309)*
other grants	-0.147	-0.133	-0.178
	(0.166)	*(0.168)*	*(0.174)*
Individual characteristics (*I)*			
gender of person (1=male, 0=female)	-0.202*	-0.196*	-0.166
	(0.124)	*(0.122)*	*(0.119)*
education (1=completed 7th grade, 0=otherwise)	-1.081***	-0.999**	-0.897**
	(0.415)	*(0.422)*	*(0.404)*
age of person (1=below 50, 0=above)	0.179	0.155	0.095
	(0.175)	*(0.177)*	*(0.173)*
Grant interaction effects[12] (*GA* and *GI*)			
pensions × off farm activities		-0.109	-0.115
		(0.152)	*(0.152)*

[9] Stars indicate statistical significance levels: * for the 10 %, ** for the 5 %, and ***for the 1 % significance.
[10] Standard errors are in parenthesis.
[11] Pension income and other grant income are instrumented with: number of males above 65, number of females above 60, presence of children who are orphans (father and/or mother deceased).
[12] Pension interaction terms are instrumented with interaction variables that are obtained by multiplying the main instruments with: gender, age of person, off-farm, agriculture, and natural resources.

Table 4.6: Impacts of pensions on labor supply: IV Tobit using Newey 2 step estimator

(continued)

pensions × agricultural activities		-0.148	-0.151
		(0.147)	*(0.147)*
pensions × natural resources activities		-0.151	-0.016
		(0.137)	*(0.137)*
pensions × gender of person(1=male, 0=female)	0.327**	0.323**	0.285*
	(0.159)	*(0.162)*	*(0.154)*
pensions ×education(1=completed 7th grade, 0=otherwise)	1.493***	1.374**	1.197**
	(0.570)	*(0.582)*	*(0.545)*
pensions × prime age(1=below 50, 0=above)	-0.559	-0.536	-0.335
	(0.389)	*(0.394)*	*(0.379)*
Household characteristics (*H*)			
household size (number of people)	0.041	0.036	0.051
	(0.062)	*(0.063)*	*(0.064)*
children in household (1=yes, 0=no)	-0.196*	-0.190*	-0.120
	(0.105)	*(0.105)*	*(0.106)*
plot size (in acres)	0.107**	0.104**	
	(0.046)	*(0.047)*	
physical assets index	-0.084	-0.076	
	(0.065)	*(0.065)*	
social capital index	0.121***	0.113**	
	(0.047)	*(0.047)*	
remittances	0.025	0.029	
	(0.111)	*(0.112)*	
savings (1=has savings, 0=no savings)	-0.198**	-0.182**	
	(0.094)	*(0.094)*	
Control variables (*X*)			
season (1=second season, 0=first season)	-0.052	-0.058	-0.046
	(0.087)	*(0.087)*	*(0.089)*
site (1=Willowvale, 0=Lessyton)	-0.121	-0.098	0.124
	(0.175)	*(0.177)*	*(0.091)*
day of work (1=weekend, 0=otherwise)	-0.009	-0.004	-0.016
	(0.114)	*(0.114)*	*(0.115)*
N	2744	2744	2744
left censored	1827	1827	1827
Prob>Chi	0.000	0.000	0.000
Chi test of exogeneity[13]	0.052	0.060	0.055
Test of overidentifying restrictions[14]	0.423	0.032	0.025

[13] The test statistic for the Chi test of exogeneity is significant, which means that there is sufficient information in the sample to reject the null hypothesis of no endogeneity.

[14] Tests of over-identifying restrictions are significant for model 2 and 3, which means these models have valid instruments.

4.7. 1 Pension effects

To illustrate pension effects, we start by identifying labor supply of a set of benchmark individuals, who we use as a reference or comparison group. As is standard in evaluating models with dummy variables, the benchmark corresponds to the magnitude of the intercept term which in our case represents the labor supply of the omitted categories of individuals in the regression model specified in equation 4.1. Given the specification of the model, our base category comprises of females who are less educated, supplying labor in domestic work, who live in households with no pensions, children or savings[15]. Thus, the reference group we use, arguably, consists of individuals with relatively low amounts of productive assets.

To simulate the effect of pensions and how individual attributes such as being female and education levels accelerate or dampen the effects, we calculate expected labor supply functions across a grid of pension values, using the regression coefficient estimates for model 2 in table 4.6 and the raw data on pensions. The expected labor supply function, conditional on covariates, is calculated using:

$$E(Labor\ Supply|Pension, Z_i) = \beta_o + \beta \times Pension + \delta_i Z_i + \gamma_i Pension \times Z_i \quad (4.8)$$

where β_o is the expected labor supply for individuals in the base or benchmark group; β is the change in expected labor supply in the benchmark if they were to receive pensions; δ_i captures the *shift* in the labor supply-pension relationship for benchmark individuals when they are endowed with an individual specific attribute Z_i. If δ_i is not statistically significant, then the addition of attribute Z_i does not shift the labor supply function, *ceteris paribus*. Finally, γ_i represents the *pivot* in the labor supply-pension relationship for benchmark individuals when they are endowed with an individual or household specific attribute Z_i. If γ_i is not statistically

[15] For the benchmark, age, season, site, and day of work are set to zero for the sake of comparability with other groups.

significant, then the addition of attribute Z_i does not change the effect of pensions on labor supply. With respect to the set of Z_i that we consider, although our primary interest is to explore heterogeneity in pension effects by gender and human capital levels (as mentioned in the objective section), we also examine pension impacts by type of work. We present the analysis in the next section, starting with pension effects by type of work, followed by gender, and lastly education.

4.7.1.1 Pension effects by work activities

First, we simulate the effect of pensions on the labor supply of the benchmark households. Recall that these individuals are all engaged in domestic work. Using equation 4.8, we plot the expected labor supply function in Figure 4.1. The graphic reveals a distinct negative effect of pensions on labor supply. Specifically, if pensions increase from zero to R1140 (i.e. if one person receives pensions in household), the expected log of hours worked changes from 2.444 to 1.58, which represents a 35% decrease in labor supply. Thus, for the least productive individuals, we find evidence of a disincentive effect of pensions on labor supply.

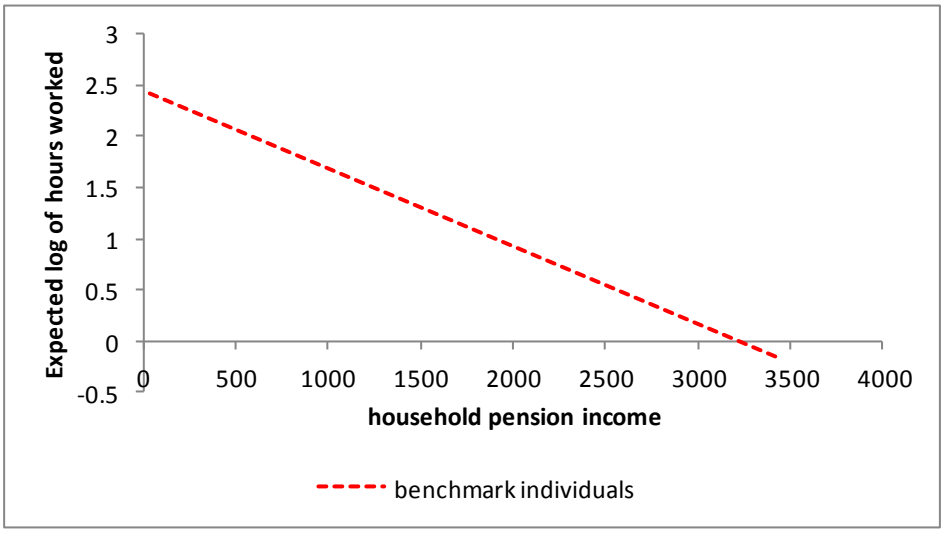

Figure 4.1 Labor supply in domestic work for benchmark individuals

Second, we examine whether or not pension effects are work activity-specific. To do so we simulate the effect of pensions on the labor supply of individuals who are identical in their attributes to the benchmark, but work outside the domestic sector. We calculate these work activity-specific labor supply functions by sequentially setting Z_i in equation 4.8 to dummy variables corresponding to off-farm, agriculture and natural resources. For each of these categories we find a downward shift in the intercepts of the expected supply functions relative to base households (compare Figures 4.1 and 4.2). The labor supply for off-farm, agriculture, and natural resource work is 209%, 205%, and 202% lower than in domestic work respectively. These downward shifts reflect innate differences in the amount of time allocated in the different sectors (regardless of pensions). However, the disincentive effects identified earlier are exactly the same as in the case of the benchmark individuals (i.e. all three expected labor supply functions in figure 4.2 and in 4.1 have identical slopes). From this finding we conclude that the disincentive effect of pensions on labor supply is not work activity- specific, holding other factors constant.

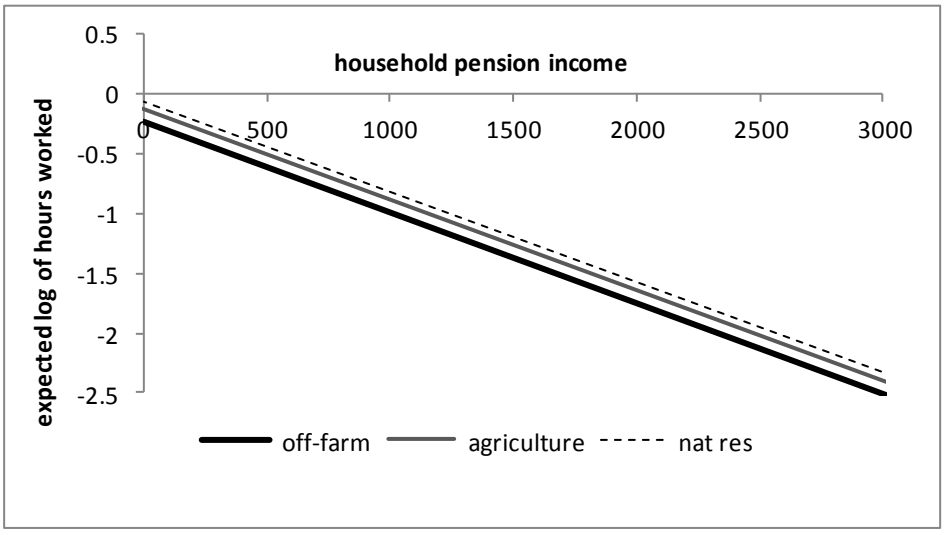

Figure 4.2 Labor supply by non-domestic work activities

Before continuing on with our simulation exercise it is important to note that the lower labor supply levels for off-farm, agriculture and natural resource work apparent above are consistent with sector participation averages in our sample. Only 8.43% of individuals participated in any income earning work, whereas almost everyone participated in domestic work (96.7%). For off-farm work, a possible reason for low participation is the limited availability of off-farm jobs within the community or nearby towns. Unemployment averages from the national census data (Census, 2001) indicate that only 8.5% of individuals have off-farm employment. In cases where people do get off-farm jobs, they may be underemployed, for example in casual work programs which often come on a part time basis. People may also face credit constraints in establishing small businesses. Such constraints may create entry barriers in off-farm work leading to lower labor supply levels. According to sample participation averages, participation in agriculture is low (16.13% of individuals). Our field observations indicate that households have gradually reduced their agricultural activities over the years; particularly in crop production. Possible reasons for this reduction in agricultural activities include: cash constraints in purchasing farming inputs; and increased variability in rainfall seasons, which increases risk in agriculture. Households who still grow crops have reduced scale of production, and have moved from large crop fields to smaller gardens closer to their homesteads. Natural resource work, despite having low capital requirements, is also associated with low labor supply. According to our sample averages, firewood collection, which is the most common natural resource activity, is only done once or twice a week. Occasionally, households will also collect wild fruits and herbs, or poles for making kraals or repairing homestead fences, but these activities tend to be seasonal or short lived.

4.7.1.2 Pension effects by gender

Our third simulation examines whether or not pensions effects are gender specific. To do so we simulate separately, the effect of pensions on the labor supply of males and females in the sample. As earlier, to hold constant other intervening factors, we examine this effect for our benchmark individuals. That is, we calculate the gender-specific labor supply functions by defining Z_i in equation 4.8 as a dummy variable corresponding to gender. Without pensions, males supply less labor compared to females (Figure 4.3). The difference is shown by the arrow on the vertical axis (males supply 8% less time). Though the reason for this result is unclear, a possible reason is that gender norms make men more likely to engage in work that has greater capital constraints than females. Hence, without pension income to relax the credit constraint, males would have constrained work opportunities. On the other hand, labor supply for females is likely to be extended to domestic tasks; which would represent a significant amount of labor time, thus resulting in higher labor supply averages for females.

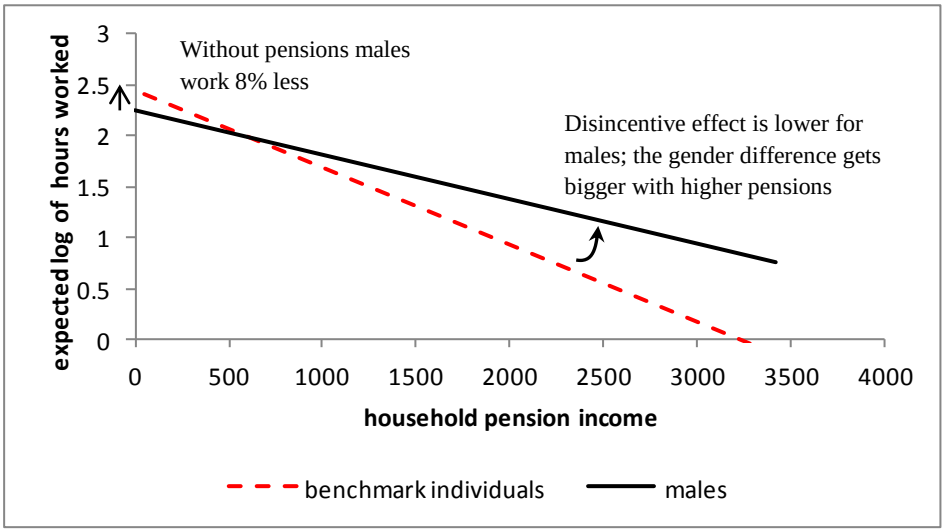

Figure 4.3 Labor supply –the effect of gender

When household pension income increases, the disincentive effect of pensions on labor supply still exists but it is lower for males than for males. For example, when pension income increases from zero to R1140, labor supply for females decreases by 35% whereas the decrease for males is 22%. At the new labor supply levels, males are supplying 11% more labor compared to females[16]. The gender difference in labor supply becomes greater with further increases in pension income (shown by curved arrow in figure 4.3). For example, if household pension income increases from zero to R2280 (i.e. two household members receive pensions), males supply 75% more labor than females. These results suggest that men are more responsive to pension income than females. Perhaps females would be less responsive to the pension income due to gender related constraints in participating in wage labor, as suggested by studies that we reviewed in previous sections.

4.7.1.3 Pension effects by education

Our final simulation regards the complementarity between human capital and pensions. The effect of pensions with and without higher education is shown in Figure 4.4. Without pensions, more educated individuals supply less labor compared to less educated individual (41% less, as shown by the arrow on the vertical axis in figure 4.4). This result supports other empirical studies that have shown that the unavailability of lucrative off-farm jobs for the educated may reduce labor supply. Moreover, people with higher education levels may be less willing to participate in on-farm or domestic work, hence their low supply of labor.

[16] The percentage differences is calculated using expected log hours worked when pensions=1140. The expected log hours are 1.58 and 1.75 for females and males respectively. Based on these values, males have 11% more hours worked than females.

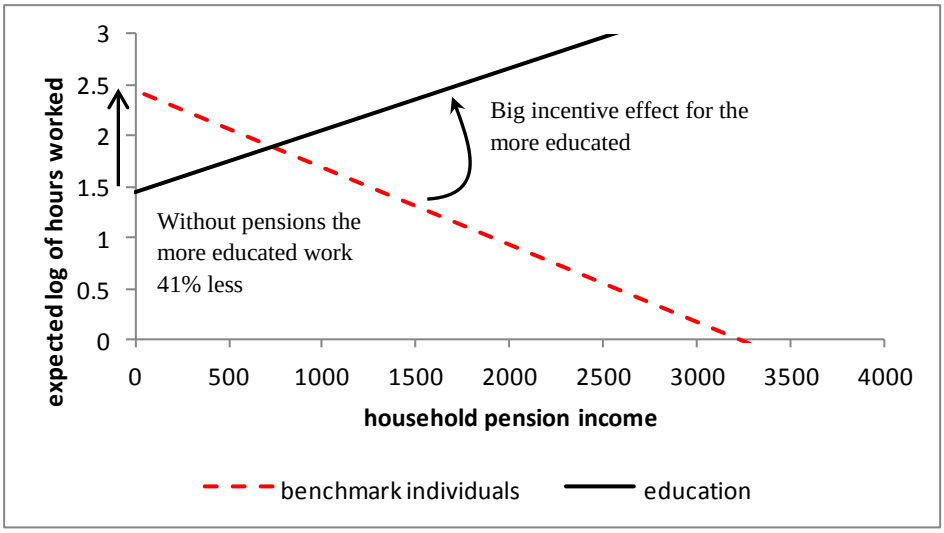

Figure 4.4 Labor supply –the effect of education

When pension increases, there is a striking reversal that results in a dramatic increase in labor supply for the more educated and a drastic decrease for the less educated. If one household member receives pensions, the labor supply for the educated increases by 49%. On the other hand, the labor supply for less educated individuals decreases by 35%. This incentive effect for the educated results in a 36% difference in labor supply between the educated and less educated (in favor of the educated). These results indicate that pensions are strongly complementary to human capital. The complementarity effect between pensions and human capital overcomes the disincentive effect on labor supply, resulting in a net increase in labor supply amongst educed individuals. Pensions appear to help relax credit constraints on working capital for productive activities. Thus in a production environment, accumulation of physical capital through the release of credit constraints may result in an increase in the marginal productivity of human capital.

4.7.2 Impact of other grants

The coefficient for other types of grants represents the effect of the aggregated income from non pension grants. The regression results show that these non pension grants have no impact on labor supply. Non-pension grants are generally smaller in value compared to pensions. Although some types of non-pension grants can be almost equal to pensions (for example care dependency grants), less than 1% of household in our sample receive such grants. Overall, the results suggest that non-pension grants are not large enough to cause behavioral changes in labor supply amongst household members.

4.7.3 Impact of other variables in the labor supply regression

The effect of age on labor supply is not statistically significant. The Interaction between age and pensions also has no impact on labor supply. Although there is a possibility that there may be age differences in labor supply for specific labor activities, our model specification does not test for these differences as this is not the main focus of the paper. For example, prime age individuals could be supplying more labor in the off-farm sector but the elderly are likely to be also supplying more labor in home production. However, the average effect indicates no statistical difference in labor supply between prime age and elderly individuals.

The regression results show that household size has no effect on labor supply of individuals. The presence of children in a household is associated with a 19% decrease in the labor supply of an adult household member. A possible reason for this result is that some labor activities, such as domestic, agricultural and natural resource work can be shared between adults and children. Hence adult labor time allocation may be reduced in such cases. Social capital and natural capital have a positive effect on labor supply. A one unit increase in the social capital index increases labor supply by 11.2%, whereas a one acre increase in agricultural land owned

increases labor supply by 10.4%. These results reflect the importance of social networks and access to natural capital in the livelihoods of rural households. Physical asset ownership has no significant effect on labor supply. We find that if households have financial savings, individuals tend to supply less labor (18.2% reduction in labor supply). The regression results also show that seasonality has no effect on labor supply, and there is no statistical difference in labor supply between the two study locations, and the day of work.

4.7 Summary and conclusions

Household members allocate more time to non-income earning work (i.e. domestic work) compared to income (i.e. cash and in-kind) earning work (off-farm, agriculture, and natural resources). We assess pension effects on these labor activities and further explore heterogeneity in pension impacts across gender and education profiles of individuals. Based on a benchmark of individuals who are relatively poor, we find evidence that pensions have a disincentive effect on labor supply for all labor activities. If one household member receives pensions, labor supply for an individual household member decreases by 35% for all the labor activities. This decrease in labor supply becomes greater as household pension income increases. There is evidence of heterogeneity in pension impacts across gender and education profiles. Pensions have a less negative impact on males' labor supply compared to females. If one household member receives a pension, male individuals supply 11% more labor compared to females. As a result, the disincentive effect of pensions is less for males. The gender difference in labor supply becomes greater with further increases in pension income. We also find that pensions have a strong complementary effect on education. Without pension income in the household, educated individuals supply 41% less labor than the less educated. When household pension income increases, for example when one household member receives a pension, the educated individuals

supply 36% more labor than the less educated. These results suggest that pensions relax credit constraints, resulting in an increase in the marginal productivity of human capital. The complementary effect between pensions and human capital overcomes the disincentive effect on labor supply.

Our analysis shows that non pension grants have no impact on labor supply, indicating that non-pension grants are not large enough to cause behavioral changes in labor supply amongst household members. We also find that other household characteristics play important roles in labor supply. For example, households with higher levels of social and natural capital supply more labor. Households with children are associated with lower labor supply levels. The regression results show no significant seasonal or location differences in labor supply.

Chapter 5: Empirical specification and results for a food security model.

5.1 Outline of chapter

In this chapter we start by specifying the empirical model for food security of household members. We use household expenditures on food as our measure of household food security. Food expenditures are a common measure of household food security used in the empirical literature, but we also incorporate in-kind measure of food consumption in our analysis. The objective of our empirical approach is to quantify the effects of grants on household food security. After that, we describe the main variables used in the empirical analysis and expected signs. Next, we highlight some econometric problems associated with measuring impact of social grants, and identify an estimator for our empirical model. We then present results from the empirical estimation and discuss the results.

5.2 Empirical specification of food expenditures model

To evaluate food security impacts of social grants, we estimate food expenditure regressions. We use two household level food expenditure variables: monthly per-capita cash expenditures on food, and monthly per-capita cash and in-kind expenditures on food:

$$\boldsymbol{FE} = \boldsymbol{H\beta_H} + \boldsymbol{G\beta_G} + \boldsymbol{G} \times \boldsymbol{H\beta_{GH}} + \boldsymbol{L\beta_L} + \boldsymbol{X\beta_X} + \boldsymbol{\varepsilon} \qquad (5.1)$$

Per-capita food expenditures ($\boldsymbol{FE}$) of household *h*, in time period $t = \{t_1, t_2\}$ are dependent on a matrix of household characteristics, $\boldsymbol{H}$. To test our hypothesis of effects of grants on household expenditures, we incorporate a matrix $\boldsymbol{G}$, which indicates amounts of different types of social grants income received by the household. These sets of explanatory variables are each associated with conformable vectors of coefficients, $\boldsymbol{\beta_h}$, and $\boldsymbol{\beta_G}$ respectively. For example $\boldsymbol{H}$ is a $n \times H$

matrix associated with coefficient vector $\boldsymbol{\beta}_{\mathbf{h}}$, an $H \times 1$ vector. We are also interested in identifying interaction effects between grants and household specific characteristics, so we include the interactions between ***G*** and ***H***. Finally, we also include in equation 5.1 ***L***, a matrix of household's local labor income ***L,*** and ***X***, a matrix of control variables, ***X***.

5.3 Description of explanatory variables and expected signs

Table 5.1 describes the dependent variables for the food expenditures regressions, explanatory variables and their expected signs. The majority of households' food consumption is shown to come from cash purchases. However, in-kind food expenditures do contribute approximately 30% of household food consumption. Crops and livestock products are the primary source of in-kind consumption.

Table 5.1 Description of variables and expected signs for per-capita monthly food expenditures

Variables	Variable Description	Mean	Std. Dev	Expected sign
Dependent variables				
cash	cash food expenditures	654.59	343.58	
cash and in-kind	cash and in-kind food expenditures	924.16	910. 48	
Household characteristics (*H*)				
gender of head	1=male, 0= female	0.51	0.50	+/
education of head	1=completed grade 7, 0 = did not	0.55	0.51	+/
age of head	1=below 50, 0= above	0.27	0.44	+/
household size	Total number of people	5.07	2.75	+
children	1=at least one child, 0= none	0.74	0.44	+/-
land ownership	total agricultural land in acres	0.62	1.06	+
physical assets	physical asset index	0.01	1.01	+
social capital	social capital index	0.00	1.00	+
remittances	monthly household remittance income	114.47	327.31	+
financial savings	1=household has savings, 0= no savings	0.17	0.38	+
Social grants income (*G*)				
pensions	monthly household pension income	675.12	826.64	+
other grants	monthly household income from other grants	565.12	659.04	+

Table 5.1 Description of variables and expected signs for per-capita monthly food expenditures

(continued)

Grant interaction effects (*GH*)				
G × gender	grant income × gender of household head			+/-
G × education	grant income × education of household head			+/-
Local labor income (*L*)				
off-farm income	monthly income from off-farm work	576.92	1123.17	+
agriculture income	monthly cash and in-kind agriculture income	253.36	761.07	+
natural resources income	monthly cash and in-kind natural resource income	179.15	268.89	+
Control variables (*X*)				
time period	1=second survey, 0=first survey	0.47	0.51	+
location	1=Willowvale, 0= Lessyton	0.50	0.50	+/-

Under household characteristics (***H***), we include gender of the household head. The proportion of male versus female headed households is almost equal; with 51% of households being male heads. If there are gender differences in access to opportunities to pursue livelihood activities, we would expect food expenditures to be different between male and female headed households. Studies in developing economies show that household livelihood outcomes, such as food expenditures, may differ between male and female heads if women face restrictions in engaging in livelihood activities. Women may have limited access to: off-farm work opportunities, property rights and credit facilities to engage in on farm work (Horrell and Krishnan, 2006; Seebens, 2011). In such cases, female headed households would be likely to have lower food expenditures. However, some studies provide empirical evidence to suggest that household headship has no effect on livelihood outcomes such as household expenditures on food. Such studies report that female headed households can achieve similar livelihood outcomes as males (for example see Chant, 2003; Buvinic and Gupta, 1997). In such cases, food security levels would be expected to be the same for male and female headed households. Some studies

show that gender differences in food expenditures may come from differences in how men and women allocate their income towards food purchases. For example Deaton (1998) notes that some studies find that income controlled by women tends to favor food expenditures over other types of expenditures. Dufflo (2003) similarly finds that women will allocate more resources towards child nutrition than males do. Overall, there are mixed findings on the effect of gender of household head. The sign of the gender variable will ultimately depend on which of the factors discussed above is more dominant. Therefore, we have no *a priori* expectations for the sign on the headship variable.

Under ***H***, we also include education of the household head. Almost half (45%) of household heads have below primary education. The effect of education on food expenditures is expected to be positive if household heads with higher education levels can engage in higher income earning work, which would allow for higher food expenditures compared to the less educated. For example, Huffman, (1992) provided evidence of this positive effect of education on household livelihood outcomes. However, in developing economies, the effect of education is not always positive because educated people may fail to find lucrative jobs (for example see Alderman and Chishti, 1991; Ilahi and Grimard, 2000). In such cases, there may be no significant income difference between the educated and less educated, hence the expected sign for the education variable becomes ambiguous and we do not have *a priori* expectations on the sign of the education variable.

An age variable is also included under ***H***, primarily as a control variable. The age variable captures whether the household head is of prime working age (below 50 years) or elderly (above 50). Most elderly household heads receive old age pensions through the government's social grants program. The pensions would be expected to significantly improve

food expenditures amongst the elderly. Thus there is a correlation between age and pension income. It is therefore important to include the age variable in the model to avoid biased estimates for social grant impacts. We do not have *a priori* expectations on the age variable.

H also includes household composition variables; namely household size and presence of children in the household. These variables primarily act as controls in the estimation of social grant impacts. For example, household size increases the likelihood of receiving pension income and also increases food expenditures. We do not have an *a priori* expectation for the effect of child presence on labor supply and food expenditures. Under ***H***, we also include measures of capital stocks. We use size of agricultural land owned as a measure of natural capital. About 75% of households own agricultural land. However, most of this land is small plots, commonly used as gardens. Only 24% of households have plots which are greater than one acre. Households with bigger plots are expected to engage more in agricultural work, producing food which they can sell or consume. Hence, we expect the size of agricultural land to have a positive effect on food expenditures. We use indices as measures of household physical and social capital. The construction of these indices is explained in the previous chapter. Physical and social capitals are expected to facilitate the pursuing of livelihood options amongst household members. Therefore we expect households with greater physical and social capital to have greater food expenditures. Remittances and financial savings are used as a measure of financial capital. Based on the empirical literature (for example Jensen, 2004; Beegle et al., 2006), we expect remittances to have a positive effect on food expenditures. Maitra and Ray (2003) also note the importance of including private transfers (i.e. remittances) as a control variable since pensions may crowd out remittances. Hence, the effect of pensions may be overestimated if private transfers are not

accounted for. Regarding financial savings, we expect households with some financial savings to be better off, and thus have higher food expenditures.

To test our main hypothesis, we incorporate ***G***, which tests for impacts of social grant on food expenditures. To measure impacts of social grants, we use household pension income as the main variable. We control for other types of grants and make inferences on their impact as well. Empirical studies commonly find social grants to improve household food security. For example, Case and Deaton (1998), Case (2001), and Maitra and Ray (2003) find that pensions significantly improve food expenditures and food availability in households. Based on the empirical literature, we expect ***G*** to have a positive effect on food expenditures. We are also interested in identifying interaction effects between social grants and household covariates ***H***. To do this, we interact ***G*** with gender and education, which are the main household covariates of interest in our study. If female headed households are less food secure before receiving social grants (due to discriminatory gender roles), then the interaction effect of social grants and gender can be expected to have a positive effect on food expenditures amongst female headed households. The interaction effect of ***G*** with gender would also be positive for female headed households (negative for male heads) if women favor food expenditures over other types of expenditures more than men. However, if before interacting with ***G***, male headed households have higher food expenditures than female heads, then the interaction of gender with ***G*** will have a positive effect for female heads only if the increase in females' food expenditures is large enough to offset men's higher expenditures. Thus the expected sign is ambiguous. If the less educated are poorer than the educated, we would expect their expenditures on food to be lower. In such a case, we would expect the interaction of ***G*** with education to yield a bigger marginal change in expenditures for the less educated. The expected sign on the pension × education interaction

would depend on the extent to which the pension income offsets the expenditure difference between the educated and uneducated. We do not have *a priori* expectations on this interaction.. Table 5.1 also presents income amounts from local labor sources (***L)***, which are: off-farm, agriculture and natural resources. These are cash and in-kind incomes. Of these three income sources, off-farm income has the largest income share (20% of total household income). Agricultural and natural resource contributions to total household income are much lower (8% and 11% respectively). We expect income from all sources to have a positive impact on food expenditures.

Table 5.1 also shows control variables, denoted by ***X.*** Included in ***X*** is a time period dummy variable, controlling for seasonal effects. We expect seasonal differences in households' incomes, hence expenditures, as livelihood activities may vary by season. For example, in the second time period, household may have more food available as this is the post harvest period. Availability of own produced food would increase in-kind food expenditures. If households sell their agricultural produce, we would also expect an increase in cash expenditures on food in the second time period. Under ***X***, we also control for location differences between the two study locations (Willowvale and Lessyton) using a location dummy variable. Location differences such as: agro ecological conditions, access to markets, and access to basic amenities such as electricity and water may have an effect on cash and in-kind income earning opportunities. Differences in household incomes would in turn lead to different food expenditure levels. Agro-ecological conditions would favor Willowvale with respect to agriculture and natural resource income. On the other hand, Lessyton has better access to markets and other amenities, thus has a higher likelihood of having better off-farm opportunities. Therefore, the effect of location would depend

on the extent to which such location differences influence food expenditures. We do not have *a priori* expectations on the location control variable.

5.4 Econometric problems and identifying an appropriate estimator

Empirical studies that assess impacts of social grants frequently encounter endogeneity problems related to social grants variables. Pensions can be endogenous if there are unobserved household characteristics that affect both food expenditures and the likelihood of receiving a pension. The endogeneity of social grants arises from the simultaneous determination of social grant variables and household food expenditures by unobserved factors. Using an ordinary linear regression such as OLS, would produce biased and inconsistent estimates. Case and Deaton (1998) use instrumental variable (IV) estimators as a strategy to address the problem of endogeneity of social grants. Their study instruments for pension income using number of pension eligible men and number of pension eligible women as instruments. We adopt these instruments for our study as well. In addition, we include instruments that capture presence of orphans in the household. The instruments we use do not belong in the explanatory equation and have zero covariance with the dependent variable, but non-zero covariance with the endogenous explanatory variables, conditional on the other covariates. We use the two-stage least squares estimator in our regression estimation.

5.5 Results

Table 5.2 shows results of food expenditure regressions estimated using instrumental variables. We present results for cash food expenditures, and results for food expenditures that include in-kind food consumption. Our main objective is to measure the impact of social grants on food expenditures. We use pension income as the main variable to capture social grant impacts. Other types of social grants are also included in the model. The amount of pension

income, income from other types of grants, and all other income sources are rescaled by multiplying by 1000 for ease in interpreting the regression coefficients. For both cash, and cash and in-kind regressions, we present two alternative specifications. Model 1a and 2a incorporate pension interactions with household covariates (gender and education of household head). Model 1b and 2b do not incorporate these interaction effects. Tests of over-identifying restrictions are carried out to check the validity of the instruments used in the regressions. The tests indicate that all models have valid instruments. Model 1b and 2b also show strong evidence of endogeneity of the social grants variables.

Table 5.2: Effect of pensions on food security: IV linear regression with robust standard errors

Dependent variable: log of monthly food expenditures	**cash expenditures**		**cash and in-kind**	
	model 1a	**model 1b**	**model 2a**	**model 2b**
	coefficient	coefficient	coefficient	coefficient
constant	5.280***[17]	5.345***	5.361***	5.360***
	(0.104)[18]	**(**0.088)	*(0.110)*	**(**0.096)
Effects of grants[19] (*G*)				
pension amount[20] x 1000	0.276***	0.201***	0.237**	0.224***
	(0.084)	**(**0.060)	*(0.093)*	**(**0.065)
pensions amount x gender	-0.119		-0.105	
	(0.078)		*(0.091)*	
pensions amount x education	-0.067		0.064	
	(0.083)		*(0.099*)	
other grants	0.159	0.275	0.220*	0.301*
	(0.115)	**(**0.172)	*(0.120)*	**(**0.176)
Income sources (*L*)				
off farm income	0.034*	0.046**	0.038*	0.043**
	(0.019)	**(**0.021)	*(0.020)*	**(**0.021)
agricultural income[21]	0.013	0.005	0.464	0.457***
	(0.026)	(0.028)	*(0.075)*	**(**0.074)
natural resources income[5]	0.058	-0.074	0.044***	0.034
	(0.070)	(0.074)	*(0.092)*	(0.092)
Household characteristics (*H*)				
gender of head (1=male, 0=female)	0.091	0.017	0.117*	0.041
	(0.065)	(0.043)	*(0.071)*	(0.047)
education of head(1=completed grade 7, 0=no)	0.075	0.034	-0.009	0.045
	(0.074)	(0.044)	*(0.081*)	(0.052)
age of head age (1=below 50, 0=above)	0.101**	0.116**	0.067	0.059
	(0.058)	(0.059)	*(0.066)*	(0.065)

[17] Stars indicate statistical significance levels: * for the 10 % significance, ** for the 5 % significance, and ***for the 1 % significance.

[18] Standard errors are in parenthesis.

[19] Pension income and other grant income are instrumented with: number of males above 65, number of females above 60, presence of children with both parents deceased (dummy variable), presence of children with a deceased father (dummy variable).

[20] Pension interaction terms are instrumented with interaction terms of the main instruments with gender, and education of household head.

[21] In models 1a and 1b, agricultural and natural resource income includes cash income and the value of consumed products. In models 2a and 2b, agricultural and natural resource income excludes the value of consumed products, since these values are part of the dependent variable.

Table 5.2:Effect of pensions on food security: IV linear regression with robust standard errors

(continued)

household size	-0.136***	-0.152***	-0.143***	-0.154***
	(0.018)	**(**0.024)	*(0.018)*	**(**0.025)
children in household (1=yes, 0=no)	-0.203**	-0.216**	-0.202***	-0.207***
	(0.082)	**(**0.087)	*(0.075)*	**(**0.077)
social capital	0.005	0.003	-0.010	-0.013
	(0.022)	(0.023)	*(0.024)*	(0.025)
physical assets	0.154***	0.153***	0.164***	0.175***
	(0.033)	**(**0.033)	*(0.039)*	**(**0.039)
plot size	-0.022	-0.019	0.029	0.024
	(0.022)	(0.022)	*(0.026)*	(0.026)
remittance income	0.173**	0.181**	0.198**	0.197**
	(0.072)	**(**0.078)	*(0.081)*	**(**0.084)
savings (1=has savings, 0=no savings)	-0.012	0.000	0.068	0.082
	(0.053)	(0.055)	*(0.057)*	(0.059)
Control variables (*X*)				
season (1=second season, 0=first	-0.106***	-0.120***	-0.066	-0.083*
	(0.042)	**(**0.046)	*(0.047)*	**(**0.051)
site (1=Willowvale, 0=Lessyton)	0.308***	0.308***	0.376***	0.400***
	(0.075)	**(**0.075)	*(0.083)*	**(**0.083)
N	639	639	639	639
Prob>Chi	0.000	0.000	0.000	0.000
R squared	0.378	0.354	0.404	0.391
F test of exogeneity[22]	0.134	0.105	0.176	0.062
Test of overidentifying restrictions[23]	0.019	0.069	0.081	0.081

[22] The test statistic for the F test of exogeneity is significant only for model 1b and 2b, which means that there is sufficient information in the sample to reject the null hypothesis of no endogeneity only for these two models.
[23] Tests of overidentifying restrictions are significant for all the models which means these models have valid instruments.

5.5.1 Impact of social grants on cash food expenditures

We use models 1a and 1b to evaluate the impact of social grants on monthly per-capita cash expenditures on food. Both models show positive impacts of pensions on food expenditures. In model 1a, an increase in pension by R1000 leads to a 27.6% increase in food expenditures. In model 1b, the estimated increase in food expenditures is 20.1%. These results suggest that pensions are an important income source for households' food security. In addition, compared to other income sources (under ***L*** in the regression), the marginal propensity to consume food from pension income is significantly higher. For the other income sources, only off-farm income has a significant impact on cash food expenditures (3.4% and 4.6% increases, in models 1a and 1b respectively). Income from agriculture and natural resources do not influence cash food expenditures.

Models 1a and 1b show no evidence of interaction effects between pensions and household covariates; namely interactions with gender and education. Regarding gender, the results suggest that there is no difference in how male headed and female headed households allocate their pension income towards food expenditures. Even before accounting for an increase in household pension income, the models show no gender difference in food expenditures (i.e. the gender coefficient is not significant). Similarly, the education level of the household head does not influence food expenditures. The result for education holds both before and after household pension income increases (i.e. both education and pension $\times$ education coefficients are not significant). Regarding other types of grants, there is no evidence of a significant impact on cash food expenditures.

5.5.2 Impact of social grants on cash and in-kind food expenditures

The second set of models (2a and 2b) incorporate in-kind values for food consumption into the dependent variable of the food expenditures regression. These in-kind expenditures are monetary values of own produced food or natural resource products harvested for food consumption. Note that in models 2a and 2b, agricultural and natural resource income excludes the value of consumed products, since these values are part of the dependent variable. Results from both models show that pensions have a positive impact on cash and in-kind food expenditures. The marginal propensity to spend on food (cash and in-kind) increases by over 22% when pension income increase by R1000. The marginal propensity to spend on food out of pension income is significantly greater compared to off-farm and natural resources income, but is less compared to agricultural cash income. A R1000 increase in cash agricultural income leads to a 45.7% increase in cash and in-kind food expenditures.

Pension interactions with household covariates are not statistically significant. These results are similar to those of models 1a and 1b, where there was no evidence of pension interaction effects with the gender and education of household head. Similarly, the individual effect of gender and education before, accounting for increases in pension income, are not significant (except for gender in model 2a). The gender coefficient in model 2a suggests that food expenditures are 11% greater for male household heads than female household heads. Both models also show positive impacts of other types of grants on household food expenditures. When household income from other types of grants increases by 1000, food expenditures increase by 22% and 30% in model 2a and 2b respectively.

5.5.3 Impact of household covariates and other control variables

Larger households and households with children are associated with lower food expenditures per capita (negative coefficients for all models). The regression models also show the importance of some types of capitals on households' food expenditure. Higher levels of physical assets are associated with higher per capita consumption expenditures. Remittances have a positive impact on food expenditures. Social capital and natural capital have no effect on food expenditures. Per capita consumption expenditures are affected by seasonality and site location. Per capita consumption expenditures are higher in the first season compared to the second season, and higher in Willowvale compared to Lessyton.

5.5.4 Differences between cash expenditures versus cash and in-kind expenditures

We notice some interesting differences between the cash expenditures model and the cash and in-kind model. First, other types of grants (which are relatively smaller compared to pensions) have no impact on cash food expenditures (models 1a and 1b). If in-kind consumption is accounted for (models 2a and 2b), the impact of other types of grants becomes significant. This contribution of other types of grants perhaps comes through improved productivity in agriculture and natural resources sectors due to these grants, resulting in increased output, hence increased in-kind consumption.

We also find differences in the impacts of agricultural and natural resource income between the alternative models. In the cash expenditures model, agricultural and natural resource income has no impact on food expenditures. In the cash and in-kind model, the inclusion of in-kind consumption in the dependant variable allows for the identification of some important impacts. Models 2a and 2b show that cash agricultural income has a positive impact on

household food expenditures[24]. The reason for this result is perhaps that households with more cash agricultural income are likely to be producing significant amounts of food such that they achieve a marketed surplus. Cash sales of agricultural produce would enable these households to increase their cash purchases on food. As a result, households with more cash agricultural income will have higher cash and in-kind consumption of food. Similarly, households that are able to sell natural resource products have higher food expenditures. However, the contribution of natural resources is much less compared to the contribution of agriculture.

If only cash food expenditures are included, we find that younger household heads (less than 50 years) have higher cash expenditures on food compared to older household heads. However, when in-kind food consumption is accounted for, then there is no age difference in food expenditure levels. These results show the importance of in-kind food consumption in the household's food security, particularly for households with older household heads as they would be more likely to utilize agriculture and natural resources for food.

5.6 Summary and conclusions

Using the amount of household pension income as the primary measure of impact of social grants, we find that social grants have a positive impact on food security. The regression models show that 'cash food expenditures' and 'cash plus in-kind food expenditures' rise when household pension income increases. For all regression specifications estimated, pensions increase food expenditures by over 20%. Compared to other income sources, the marginal propensity to consume out of pension income is significantly higher. Income from off-farm, agriculture or natural resource work increases food expenditures by less than 5%. We find that

[24] Recall that in models 2a and 2b, in-kind values are excluded from agricultural income and are part of the dependent variable.

the impact of pensions is no different between male and female headed households. We also find no differences in the pension effect between educated and less educated household heads.

The inclusion of in-kind food consumption in measuring food expenditures allows us to notice some differences in comparison to the commonly used cash measures of food expenditures. When in-kind consumption is not included, the impact of other types of grants is not significant. But the inclusion of in-kind food consumption shows that other types of grants also have a significant impact on food expenditures. The inclusion of in-kind consumption also shows that agricultural and natural resource income has a significant impact on food expenditures. We also find that in-kind consumption is important amongst households with older household heads. These households would otherwise have lower food security if only cash expenditures were being accounted for.

The regression results also show that some household characteristics play important roles in household food security. For example, households with high levels of natural capital, physical capital, and remittances have higher food expenditure levels. Seasonality also has an impact on household food expenditures.

Chapter 6: Concluding Remarks

The objective of this study was to assess the impact of social grants on labor supply and food security of South African households. Our inquiry explored whether social grants create disincentives on labor supply in income earning and domestic work. We also assessed whether per capita consumption expenditures on food increase when households receive grants. Our interest was to also explore interactions between social grants and socio-economic characteristics of household members such as gender and education in terms of labor supply and food security outcomes. This chapter presents our closing remarks regarding the impact of social grants. We start by summarizing the empirical approach used and the results of the study. We then provide some policy insights, limitations of the study, and recommendations for further research.

6.1 Summary

We employed an empirical approach that used household pension income as the main variable identifying impacts of social grants on labor supply of household members and food security. We used number of hours worked in one day as the measure of labor supply, and used per-capita consumption expenditures as the measure of food security. We controlled for endogeneity of social grant income by running a Newey two-step efficient estimator– implemented on an instrumental variable (IV) Tobit regression for labor supply. A linear IV regression was used to analyze impacts on consumption expenditures.

The results of the study indicate that pensions have a disincentive effect on labor supply in off-farm, agriculture, natural resource, and domestic work. When household pension income increases by R1140 (i.e. the average amount of pensions), the labor supply in all types of work activities decreases by 35%. However, there is evidence that the impact of pensions on labor

supply differs by gender and education of individuals. For example, the disincentive effect is less for men compared to women; that is, the R1140 increase in pension income only decreases labor supply by 11% for men. As household pension income further increases, the gender difference in labor supply becomes larger. We find striking differences in the labor supply response between educated and less educated individuals. Without pension income in the household, educated individuals supply 41% less labor than the less educated. As household pension income increases, we find that pensions and education are complements, thus labor supply increases for the educated. For example, when household pension income increases by R1140, the educated individuals supply 36% more labor than the less educated. Our results show that other types of social grants (non-pension grants) have no impact on labor supply. Most of the non-pension grants are much smaller in value compared to pensions. As such, these grants do not cause behavioral changes in labor supply.

Social grants have a positive impact on food security. Per capita expenditures on food increase by over 23% when a person in a household receives pensions. The marginal propensity to consume out of pension income is greater than the marginal propensity to consume from labor income. The inclusion of in-kind food consumption in measuring food expenditures sheds more light on impact of social grants on food expenditures. With this broader measure of food security, we find that other types of grants have a positive impact on food expenditures. The impact of agricultural and natural resource income also becomes significant if in-kind consumption is being accounted for. In-kind consumption is also important amongst households with older household heads.

Some household characteristics play important roles in labor supply and food security. Household capital stocks significantly influence labor supply and food security outcomes.

Households with higher levels of natural capital supply more labor. Social capital has a positive impact on labor supply, whereas physical capital and financial capital increase food expenditures.

6.2 Policy insights

The results of the study indicate that social grants have a disincentive effect on labor supply. The disincentive effect is less for males. If individuals are more educated, social grants will have a positive impact on labor supply. With regards to food security, social grants have a positive impact. Based on these results, we draw the following policy insights.

i. Social grants provide disincentives in the labor market. Evidence suggests that education has a complementary effect with social grants regarding labor supply. Hence, promotion of education policy is one strategy that has the potential to reverse negative impacts of social grants.

ii. Men respond less, compared to women, regarding reductions in labor supply as a result of social grants. We hypothesize that the reason behind this result is that men have better access to labor markets, because gender norms commonly limit women's participation in labor markets. This gender difference in labor supply suggests the need to improve women's opportunities in labor markets. Therefore, it may be important for social grant programs to be accompanied by education programs that augment the accumulation of human capital for women, thus potentially improving women's participation in labor markets.

iii. There is evidence of strong complementarities between social grants and human capital. The positive labor supply impacts amongst more educated individuals when they receive grants underscores the importance of education policy as a strategy to alleviate poverty.

Positive livelihood outcomes can be achieved through complementarities of social grant policy and education policy.

iv. The positive impacts of social grants on food consumption expenditures highlight the important contribution that these programs make in improving household food security. Since improving food security is a direct objective of government's social protection programs, the evidence of positive impacts indicates the success of the program in achieving food security objectives.

v. In-kind sources of food such as agriculture and natural resource products play an important role in ensuring the food security of households. Households that would otherwise be food insecure can be able to offset their lack; for example by growing their own food, and/or consuming food from natural resources. Thus, development policy should promote such sectors as they contribute significantly to household food security.

6.3 Limitations

Our study focuses on pensions as the main measure of social grants. An analysis of impacts of other types of grants, such as child grants would shed some more light on social grant impacts on a broader range of household outcomes. Such analysis would require a broader set of outcomes, such as consumption expenditures on children, child education measures, and anthropometric indicators of child welfare. Data limitations hinder us from doing such analysis. In the analysis of consumption expenditures, we only focus on food expenditures and do not account for other types of expenditures. However, expenditures on food may be correlated to other types of expenditures, such as expenditures on health, clothing, transport, etc. Thus the estimation of consumption expenditures would be more efficient if these different types of expenditures were estimated simultaneously as a system. Another shortcoming that we face is

that our study has a limited time dimension as we only use data from a one year period. Use of longitudinal data may reveal more nuances in the impact of social grants. Some studies in the literature note that the absence of longitudinal data may mask some household behavioral responses that occur over longer periods of time.

References

Aguero, J.M., Carter, M.R., and Woolard, I. (2009). The Impact of Unconditional Cash Transfers on Nutrition: The South African Child Support Grant: International Policy Centre for Inclusive Growth.

Alderman, H., and Chishti, S. (1991). Simultaneous Determination of Household and Market oriented Activities of Women in Rural Pakistan Research. *Population Economics*.7, 245-265.

Amemiya, T. (1978). The Estimation of a Simultaneous Equation Generalized Probit Model. *Econometrica.* 46(5), 1193-1205.

Amemiya, T. (1979). The Estimation of a Simultaneous Equation Tobit Model. *International Economic Review.* 20(1), 169-181.

Ardington, E. (1988). Nkandla Revisited: A Longitudinal Study of Strategies Adopted to Alleviate Poverty in a Rural Community. Working Paper No. 16, Rural Urban Studies Unit, University of Natal, Durban.

Ardington, C., Case, A., and Hosegood, V. (2009). Labor Supply Responses to Large Social Transfers: Longitudinal Evidence from South Africa. *American Economic Journal: Applied Economics.* 1(1), 22-48.

Bertrand, M. B., Sendhil, M., and Douglas, M. (2003). Public Policy and Extended Families: Evidence from Pensions in South Africa. *World Bank Economic Review.* 17(1), 27-50.

Becker, Gary S., 1965. A Theory of Allocation of Time. *Economic Journal*. 75, 493-517 Blundell, R., and Meghir, C. (1987) Bivariate Alternatives to the Univariate Tobit Model. *Journal of Econometrics.* 34, 179-200.

Breslin, E. D., Delius, P., and Madrid, C. (1997). Strengthening institutional safety nets in South Africa: Sharing operation hunger's insights and experiences. *Development Southern Africa.* 14(1), 21-41.

Booysen, F. 2004. The role of social grants in mitigating the socio-economic impact of HIV/AIDS: Evidence from the Free State Province. CSSR Working Paper No. 56. University of Cape Town: Cape Town.

Booysen, F., and Van der Berg, S. (2005). The role of social grants in mitigating the socio-economic impact of HIV/AIDS in two Free State communities. *South African Journal of Economics.* 73, 545-563.

Budlender, D., and Woolard, I. (2006). The impact of the South African Child Support and Old Age Grants on children's schooling and work. Geneva, International Labour Office.

Case, A., and Deaton, A. (1998). Large cash transfers to the elderly in South Africa. *Economic Journal*. 108 (450),1330-1361

Case, A. (2001). Does Money Protect Health Status? Evidence from South African. National Bureau of Economic Research Working Paper Series, No. 8495.

Case, A., Victoria, H., and Lund, F. (2005). The reach and impact of Child Support Grants: evidence from KwaZulu-Natal. *Development Southern Africa.* 22(4), 467-482.

Chiappori, P. A. (1992). Collective labor supply and welfare. *The Journal of Political Economy*, 100, 437-467.

Deaton, A. (1997). The analysis of household surveys : a microeconometric approach to development policy. The World Bank. Johns Hopkins University Press, Baltimore.

Deaton, A., and Zaidi, S. (1999). Guidelines for Constructing Consumption Aggregates for Welfare Analysis: Princeton, Woodrow Wilson School - Development Studies.

Deaton, A., and Grosh, M. (2000), Consumption, Chapter 5 in Margaret Grosh and Paul Glewwe, eds., Designing household survey questionnaires for developing countries: lessons from 15 years of the Living Standards Measurement Study, Volume 1, Washington, DC. The World Bank.

Deere, C. D., and de Janvry A. (1981). Demographic and Social Differentiation Among Northern Peruvian Peasants. *The Journal of Peasant Studies*. 8 (3), 335-366.

Devereux, S. (2001). Social pensions in Namibia and South Africa. Institute of Development Studies Discussion Paper 379. IDS, University of Sussex. Available at: http://www.ids.ac.uk/files/Dp379.pdf, accessed May 2012

Dinkelman, T. (2004). How Household Context Affects Search Outcomes of the Unemployed in Kwazulu-Natal, South Africa. *South African Journal of Economics*, 72(3), 484-521.

Dorman, P. (2008). Child labour, education and health: A review of the literature. Geneva: International Labour Office (ILO).

Duflo, E. (2000). Grandmothers and Granddaughters. Old Age Pension and Intra-household Allocation in South Africa. National Bureau of Economic Research Working Paper No. 8061.

Duflo, E. (2003). Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa. *The World Bank Economic Review*. 17(1), 1-25.

Edmonds, E., Mammen K and Miller DL. (2002). Rearranging the Family? Household Composition Responses to Large Pension Receipts. *Journal of Human Resources.* 40(1), 186-207

Edmonds, E. V. (2006). Child labor and schooling responses to anticipated income in South Africa. *Journal of Development Economics.* 81(2), 386-414.

Edmonds, V. E., Kristin, M., and Douglas, L. M. (2005). Rearranging the Family?: Income Support and Elderly Living Arrangements in a Low-Income Country. *Journal of Human Resources. 40*(1).

Eyal, K., and Woolard, I. (2011).Female labour force participation and South Africa's Child Support Grant. Paper presented to the CSAE's 25th Anniversary Conference 2011: Economic Development in Africa, Oxford.

Gelbach, J.B. (1999). TOBITIV: Stata module to perform instrumental variables tobit. Statistical Software Components. S371402, Boston College Department of Economics. Available at http://ideas.repec.org/c/boc/bocode/s371402.html, accessed May 2012,

Government Budget speech (2012). Minister of Finance Pravin Gordan Budget Speech, February 2012. Available at http://www.treasury.gov.za/, accessed May 2012,

Greene, W.H. (2003). Econometric Analysis.5th Edition. Upper Saddle River, N.J. Prentice Hall.

Gronau, R.(1977). Leisure, Home Production and Work. The Theory of the Allocation of Time Revisited. *Journal of Political Economy*. 85, 1099-1123.

Heckman, J. (1979). Sample selection bias as a specification error. *Econometrica* 47 (1), 153–61.

Ilahi, N. (1999). Gender and the Allocation of Adult Time: Evidence from the Peru LSMS Panel Data. The World Bank, mimeograph.

Ilahi N. (2000). The intra-household allocation of time and tasks: What have we learnt from the empirical literature? WorkingPaper 13, Policy Research Report on Gender and Development. New York: The World Bank.

Jensen, R. T. (2004). Do private transfers 'displace' the benefits of public transfers? Evidence from South Africa. *Journal of Public Economics.* 88(1–2), 89-112.

Khandker, Shahidur R.. (1988). Determinants of Women's Time Allocation in Rural Bangladesh,.*Economic Development and Cultural Change*, 37, 111-126.

Killingsworth, Mark R. (1983). Labor Supply. Cambridge University Press. Cambridge Books

Klasen, S., and Woolard, I. (2009). Surviving Unemployment Without State Support: Unemployment and Household Formation in South Africa. *Journal of African Economies.* 18(1), 1-51.

Kola S, Braehmer S, Kanyane M, Morake R., and Kimmie Z. (2000). Phasing in the Child Support Grant: A social impact study. Community Agency for Social Enquiry, Johannesburg

Lam, D., Murray, L., and Ranchord, V. (2005). Labour Force Withdrawal of the Elderly in South Africa. Center for Social Science Research, University of Cape Town, working paper No. 118.

Lung-Fei, L.(1992). Amemiya's Generalized Least Squares and Tests of Overidentification in Simultaneous Equation Models with Qualitative or Limited Dependent Variables. Econometric Reviews 11(3), 319-328.

Lund, F. (1993). State social benefits in South Africa. *International Social Security Review, 46.*

Lundberg, Shelly and Pollak, R.A. (1993). Separate Spheres Bargaining and the Marriage Market.*Journal of Political Economy.* 6, 988-1010.

Maitra, P., and Ray, R. (2003). The effect of transfers on household expenditure patterns and poverty in South Africa. *Journal of Development Economics*. 71, 23-49.

Lovo, S. (2011). Pension Transfers and farm household technical efficiency: Evidence from South Africa. *American.Journal of Agricultural Economics*. 93 (5), 1391-1405.

Møller V, Ferreira M. Getting by: Benefits of noncontributory pension income for older South African households. Cape Town, South Africa: Institute of Ageing in Africa, University of Cape Town; 2003. :http://idpm.man.ac.uk/ncpps, accessed November 2012

Newey, W, K. (1987). Efficient Estimation of Limited Dependent Variable Models with Endogenous Explanatory Variables. *Journal of Econometrics*. 36, 231-250.

O'Donnell, O, van Doorslaer., E., Wagstaff A,, and Lindelow, M. (2008). Analyzing health equity using household survey data: A guide to techniques and their implementation. The World Bank Washington, D.C.

Posel, D., Fairburn, J. A., and Lund, F. (2006). Labour migration and households: A reconsideration of the effects of the social pension on labour supply in South Africa. *Economic Modelling.* 23(5), 836-853.

Samson, M., Babson, O., Haarman, C., Haarman, D., Khathi, G., MacQuene, K., and van Niekerk, I. (2001). The Impact of Social Security on School Enrolment in South Africa. Research. Paper No. 25. Economic Policy Research Institute: Cape Town:EPRI

Samson, M., Lee, U., Ndlebe, A., MacQuene, K., van Niekerk, I., Gandhi, V., Harigaya, and T., Abrahams, C. (2004). The Social and Economic Impact of South Africa's Social Security System. Commissioned by the Directorate: Finance and Economics, Department of Social Development, Pretoria. http://www.sarpn.org.za/documents/d0001041/index.php, accessed May 2012

Samson, M., Heinrich, C., Williams, M., Kaniki, S., Muzondo, T., Quene, K. M. and Van Niekerk, I. (2008). Quantitative Analysis of the Impact of the Child Support Grant'. United Nations Children's Fund.

SASSA (South Africa Social Security Agency). 2012. http://www.sassa.gov.za , accessed May 2012)

Shackleton, C.M., and S.E. Shackleton. (2004). The importance of non-timber forest products in rural livelihood security and as safety-nets: evidence from South Africa. *South African Journal of Science.* 100, 658–664.

Shackleton, C.M., and S.E. Shackleton. (2006). Household wealth status and natural resource use in the Kat River valley, South Africa. *Ecological Economics.* 57 (7), 306–317.

Skoufias, E. (1993), Labor Market Opportunities and Interfamily Time Allocation in Rural Households in South Asia. *Journal of Development Economics*. 40, 277-310.

Smith, R., and R. Blundell. (1986) An Exogeneity Test for a Simultaneous Equation Tobit Model with an Application to Labor Supply. *Econometrica*, 54, 679-685.

StataCorp. 2009. Stata: Release 11. Statistical Software. College Station, TX: StataCorp LP.

Statistics South Africa (2007). Community Survey 2007. http://www.statssa.gov.za/community_new/content.asp, accessed March 2012.

Statistics South Africa (2001). Census (2001). http://www.statssa.gov.za/census01/html/C2001publications.asp , accessed March 2012

Lovo, S. (2011). Pension Transfers and farm household technical efficiency: Evidence from South Africa. *American Journal of Agricultural Economics. 93*(5), 1391-1405.

Surender, R., and Ntshongwana, P. (2007) .Social Security Policy in South Africa: Historical Developments and Current Debates. Policy World, Autumn.

Rachord, V. (2006). The Effect Of The South African Old Age Pension On Labour Supply Of The Elderly. *South African Journal of Economics. 74*(4), 725-744.

Tobin, J. (1958) Estimation of Relationships for Limited Dependent Variables, *Econometrica.* 26, 24-36.

Williams, M. (2007): The social and economic impacts of South Africa's child support grant. Economic Policy Research Institute Working Paper #39.

Zeller, M., Sharma, M., Henry, C.J., and Lapenu, C. (2006). An operational method to assess the poverty outreach performance of development policies and projects: Results of Case Studies in Africa.

Appendix A1: Household survey questionnaire

Annual household survey 1 (A1)

Control information

Task	Date(s)	By who?	Status OK? If not, give comments
Interview			
Checking questionnaire			
Coding questionnaire			
Entering data			
Checking & approving data entry			

Household Selection

1. Map page & generated grid number	
2. North-most household interviewed? Y/N If yes move to 5.	
3. If 'no': Reason for not interviewing North-most household?	1. No houses in grid block (go to nearest house) 2. Refused to be interviewed – too busy 3. Refused to be interviewed – other 4. Never at home 5. Premises empty 6. Deaf/foreign language 7. Other - specify
4. Final grid number of household interviewed	
5. Is interviewed hh neatly marked on map? Y/N	

Starting time _____ **Finishing time** _____

A. Identification

1. Household name & code (Map page & grid no.)	*(name)	(HID)
2. Village name and code	*(name)	(VID)
3. Name and PID (see B. below) of primary respondent	*(name)	(PID)
4. Name and PID (see B. below) of secondary respondent	*(name)	(PID)
5. GPS reference point of household (UTM format)		

Household code _____

B. HOUSEHOLD COMPOSITION AND HUMAN CAPITAL

1. Please give the details of anyone living in the household, and anyone in the household who passed away in the past ten years.

1. Personal Identification number (PID)	*** Name of household member**	**2. Relation to household head[1)]**	**3. Year born** *(yyyy)*	**4. Sex** *0=male* *1=female*	**5. If deceased: What year did s/he pass away?**
1	Include surname of household head	Household head = code 0			
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

1) Codes*: spouse (legally married or cohabiting)=1; son/daughter=2; son/daughter in law=3; grandchild=4; mother/father=5; mother/father in law=6; brother or sister=7; brother/sister in law=8; uncle/aunt=9; nephew/niece=10; step/foster child=11; other family=12; not related (e.g., friend)=13.*

Yes	**No**

1.b. Are there other households living on this property?

1.c. If yes, how many other people, aside from those in your household, are living on this property?

_____

2. Please could you provide more details about the employment status and skills of everyone that has just been recorded in the previous table as part of the household (anyone living in the household and anyone who has passed away in the past ten years):

1. Name/PID	**2. *Employment status*[1)]** ***(Can have more than one, list in order of importance)***	**3. Level of education[2)]**	**4. Other formal or informal training or skills.** **(Probe – employment or self-employment skills, eg. Welding, nursing, artisan, etc.)**	**5. What languages can this person speak, other than Xhosa? List all responses** None = 0 English = 1 Afrikaans = 2 Other = 3
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

CODES: 1) Employed full-time = 1; employed part-time = 2; self-employed (farmers in this category) = 3; unemployed = 4; in school or some form of training (apprentice, course) = 5; retired = 6; doesn't work or go to school (eg. disabled, too young) = 7;

2) Illiterate = 1, literate without formal schooling = 2, literate: below primary = 3, primary = 4, middle secondary (grade 9) = 5, secondary (matric) = 6, diploma/course with certificate = 7, graduate = 8, post-graduate = 9.

Please take a moment to remember life in this household ten years ago – when Mandela's presidency came to an end and Mbeki became president and we entered the New Millennium

3. Overall, is the household able to do more, less or the same amount of work (formal or around the homestead) compared to <u>ten years ago</u>?

Less	**The same**	**More**

3.b. If more or less, why the change? _____

C. SOCIAL CAPITAL

1. a. How long ago was this household first established in the village?

< 2 years 1	2 - 6 years 2	6 – 10 years 3	11 – 20 years 4	21 – 50 years 5	51 – 100 years 6	>100 years 7

1.b. If less than ten years, **why did the household move?**

_____

2.a . Do household members participate in any groups in the community? If yes, ask details of the group/organization. If more than one person from the household is a member of the same group, record all of their names.

1. Type of group	**2. Name of group**	**3. Who in the household is part of this group? List names**	**4. How many hours a week/month does household member participate?**	**5. Is household member part of a committee for the group? Y/N (List name/s if yes)**	**6. Has the household ever received any cash benefits from the group? Y/N**	**7. Has the household ever received any other type of support from the group? Y/N**
Church						
Savings						
Farming						
Volunteer						
Sports/ dance/ music						
Health, care or support						
Women's group						
School group						
Lobbying						
Development/ income generating						
Other (specify)						
Other (specify)						

3. Does anyone in the household know anyone who could advise you/them on the issues below without charging? This can be formal (e.g. an organisation) or informal (e.g. a friend). If not, do you feel that the household would benefit from knowing where to get advice on these issues?

Area of expertise	Is free advice available to household? Y/N	If no, would it benefit? Y/N	Area of expertise	Is free advice available to household? Y/N	If no, would it benefit? Y/N
Human rights			Building/construction		
Legal advice			Schooling		
Medical advice			Relocate/ move elsewhere		
Veterinary advice			Market and self-employment		
Crop farming advice			Credit and financial advice		

4. How strongly do you agree or disagree with the following statements?

4.1 a. People around here are willing to help their neighbours

1. Strongly disagree	2. Disagree	3. Agree	4. Strongly Agree

4.1 b. This is a close-knit or 'tight' neighbourhood where people generally know one another

1. Strongly disagree	2. Disagree	3. Agree	4. Strongly Agree

4.1 c. If I had to borrow R50 in an emergency, I could borrow it from a neighbour.

1. Strongly disagree	2. Disagree	3. Agree	4. Strongly Agree

4.1 d. People in this neighbourhood generally get along with each other

1. Strongly disagree	2. Disagree	3. Agree	4. Strongly Agree

4.1 e. People in this neighbourhood CAN be trusted

1. Strongly disagree	2. Disagree	3. Agree	4. Strongly Agree

4.1 f. If I were sick I could count on my neighbours to shop for groceries for me

1. Strongly disagree	2. Disagree	3. Agree	4. Strongly Agree

4.1 g. People in this neighbourhood share the same beliefs, culture and values

1. Strongly disagree	2. Disagree	3. Agree	4. Strongly Agree

5. Does this household, or anyone in the household, take part in community decision making (in ward meetings, community meetings, etc.)?

No / never 1	Sometimes 2	Yes / often 3

Please take another moment to remember life in this household ten years ago/ when you first moved here – when Mandela's presidency came to an end and Mbeki became president and we entered the New Millennium

6. Overall, is the household's current involvement in community groups, events and meetings more, less or the same amount compared to <u>ten years ago</u> OR <u>when you first moved here</u>? *(circle appropriate)*

Less	The same	More

6.b. If more or less, why the change? _____

D. PHYSICAL CAPITAL AND SERVICES

1. Please indicate the type of main house you have?

1. Number of buildings	
2. *Enumerator:* What is the approx. area of the main building?	M^2
3. What are the walls of the main building mostly made of? 1)	
4. What is the roof of the main building mostly made of? 2)	

***1) Codes**: mud/soil=1; wooden (boards, trunks)=2; iron (or other metal) sheets=3; bricks or concrete=4; reeds/straw/grass/fibers/bamboo=5; other, specify :*

***2) Codes**: thatch=1; wooden (boards)=2; iron or other metal sheets=3; tiles=4; other, specify:*

2. Do you have a kraal?

Yes	No

3. Please indicate the number of implements and other large household items that are owned by the household. Please estimate the current value of these items.

	1. Number of units owned	**2. Total value (current sales value of all units, not purchasing price)**
1. Car/truck		
2. Tractor		
3. Motorcycle		
4. Bicycle		
5. Cellphone/phone		
6. TV		
7. Radio		
8. Cassette/CD/ VHS/VCD/DVD/ player		
9. Stove for cooking (gas or electric only)		
10. Refrigerator/freezer		
11. Chainsaw		
12. Plough		
13. Trailer		
14. Shotgun/rifle		
16. Wooden cart or sledge		
17. Bed/s		
18. Water pump		
19. Solar panel		
20. Sewing machine		
21. Jo-jo tank		
22. Geyser		
23. Wheelbarrow		
24. Generator		
99. Others (worth more than approx. R500 purchasing price)		
Other		

4.a. Do you have electricity?

Yes	No

Household code _____

4.b Do you receive free basic electricity?

Yes	No

4. c. How much do you spend on electricity each month? R _____

Please take another moment to remember life in this household ten years ago/ when you first moved here – when Mandela's presidency came to an end and Mbeki became president and we entered the New Millennium

5. Overall, has the infrastructure on and around the household's homestead improved, worsened or stayed the same compared to ten years ago OR when you first moved here? *(circle appropriate)*

Improved	The same	Worsened

5.b. If improved or worsened, why the change?

_____

6.a. Where does the household get most of its water from? 1)	
6.b. Is this source ever inadequate for all of the household's need? Y/N	
6.c. Does the household have access to alternative sources of water? If so, what are they?1)	
6.d. Has there ever not been enough water at all? Y/N	

(CODES: 1) *rainwater tank provided by govt=1; rainwater tank owned/purchased by household=2; tap on property=3; community taps=4; borehole=5; reservoir=6; dam=7; river=8; truck = 9; bought=10, other = specify*

8. a. Does the household recycle/ re-use any water?

Yes	No

8. b. If yes, from which activity/activities is water re-used/recycled, and how is it re-used/recycled?

_____

E. NATURAL CAPITAL

1. Do you have a garden or fields for growing or grazing? If yes, how large is the area and do you use it?

	1. Area (RECORD UNIT - meter, hectare, etc) *Measure if unknown*	**2. Is it fenced? Y/N**	**3. Is it used? Yes, no or partly**	**4. If any part is not used, why is it not used?**	**5. If partly used, approx. how much (1/2, ¼, etc.) is used?**
1. Garden on homestead					
2. Fields for cultivation					
3.Community grazing land					
4. Grazing land belonging to household					

2. Does the household use the following? If it is not used by the household, is there anything preventing the household from using the resource if they did want to use it, and would the household ever use it?

	1. Is it used by the household? Y/N	**2. If not used, is there anything preventing the household from using the resource if they wanted to? Explain if yes.**	**3. If not used, is there ever a situation where you might use it? Y/N**
1. River or dam for freshwater fishing, recreation or cultural activities			
2. Community garden			
3. Grazing land			
4. Forests and trees			
5. Wildlife/bushmeat			
6. Wild fruit and vegetables			
7. Medicinal plants			
8. *Willowvale only:* Marine products (fish, mussels..)			

Less	**The same**	**More**

Please take another moment to remember life in this household ten years ago/ when you first moved here – when Mandela's presidency came to an end and Mbeki became president and we entered the New Millennium

3.a. Overall, does the household currently use more, less or the same amount of the natural resources mentioned in the two previous questions compared to ten years ago OR when you first moved here? *(circle appropriate)*

3.b. If more or less, why the change? _____

Worsened	The same	Improved

4.a. Has the quality of agricultural land (grazing land, soil fertility) worsened or stayed the same compared to ten years ago OR when you first moved here? *(circle appropriate)*

4.b. If it has improved or worsened, why the change?

_____

F. FINANCIAL CAPITAL

1.a. How much does the household have in savings? (in banks, credit associations, savings clubs or any other place)

R_____

1. b. Is the household saving for anything specific? If yes, what specifically?

_____

Less	The same	More

1.c. Is the household currently saving more, less or the same amount compared to ten years ago?

2. a. Do you owe money to anyone? To who, and how much is owed? Can have more than one

Don't owe money	Local money-lender	Bank or formal credit institution	Neighbour or friend	Family	Savings club	Loan sharks	Hire purchase (furniture, appliances, etc.)	Other (specify)
R	R	R	R	R	R	R	R	R
								TOTAL R

Yes	Don't know	No

3.a. Could the household access credit for a farming or self-employment venture if it needed to?

3.b. If yes, where from?

_____

Household code _____

3.c. Has anyone in the household accessed credit in the last ten years?

Yes	No

Please take another moment to remember life in this household ten years ago – when Mandela's presidency came to an end and Mbeki became president and we entered the New Millennium

4.a. Is it currently easier, harder or the same to meet all the household's needs each month compared to ten years ago ?

Easier	The same	Harder

4.b. If easier or harder, why the change? _____

G. RESPONSES TO SHOCKS:

1. In the past 12 months, has the household faced any of the following shocks? If so, how severe was the shock and how did the household cope with this shock?

Household code

Event	1. Y/N?	2. How severe? 0 = no crisis 1= yes, moderate crisis 2 = yes, severe crisis	3. How did you cope with the income loss or costs? Tick column/s [1)]											
			1. Harvest more	2. Changed farming	3. Spent savings	4. Sold Assets	5. Extra work	6. Friend Assist	7. Org. Assist	8. Loan	9.Reduce consump	10. Rented out	11. D id Nothing	12. Other, specify
1. Serious crop failure														
2. Serious illness in family (productive age-group adult unable to work for more than one month during past 12 months, due to illness, or to taking care of ill person; or high medical costs)														
3. Death of productive age-group adult														
4. Land loss (expropriation, etc.)														
5. Major livestock loss (theft, drought, etc.)														
6. Other major asset loss (fire, theft, flood, etc.)														
7. Lost wage employment														
8. Initiation, wedding or other costly social events														
9. Payment for sale of hh products arrive later than expected														
10. Other, specify:														

1) *Codes coping:*

1. *Harvest more natural/wild products or agricultural products*
2. *Changed farming/agricultural techniques*
3. *Spend cash savings or retirement money*
4. *Sell assets (land, livestock, etc.)*
5. *Do extra casual labour work/self-employment initiative*
6. *Assistance from friends and relatives*
7. *Assistance from NGO, community org., religious org. or similar*
8. *Get loan from money lender, credit association, bank etc.*
9. *Tried to reduce household consumption (food and/or goods)*
10. *Rented out land or rooms*
11. *Did nothing in particular*
12. *Other, specify:*

H. HEALTH

1. Please could you provide more details about the health of everyone that has just been recorded in the previous table as part of the household (anyone living in the household and anyone who has passed away in the past ten years):

1. Name/PID	**2.** For under 19's only (born after 1992): **Where are his/her parents?**[1)]	**3.a. Health status**[2)]	***3.b. If deceased: Was he or she chronically sick or sick for 3 or more months before he/she passed away? Y/N***	***If chronically ill (4 or 6 in 3.a.):***	
				3.c.Is he/she receiving care or treatment from a clinic?	***3.d.If yes, is the care or treatment free?***
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14.					

CODES:1) Alive, both living in house=1; alive, but both away=2; mother in house, father away=3; mother in house, father deceased=4; father in house, mother away=5; father in house, mother deceased=6; both parents deceased=7.

2) Excellent health = 1; occasional illness = 2; frequent illness = 3; chronic/long term illness (over three continuous months) = 4; disabled = 5; both chronic illness and disabled = 6; deceased = 7.

I. Welfare perceptions

1. All things considered, how satisfied are you with your life over the past 12 months? *Codes: 1=very unsatisfied; 2=unsatisfied; 3=neither unsatisfied or satisfied; 4=satisfied; 5=very satisfied*	
2. Do you feel the household's situation is better, worse or about the same today than it was ten years ago? *Codes: 1=worse off now; 2=about the same; 3=better-off now*	
3. If worse or better off, what caused this change?	
5. Do you consider your village (community) to be a good place to live? *Codes: 1=no; 2=partly; 3=yes*	
6. Has the household's food production and income over the past 12 months been sufficient to cover what you consider to be the needs of the household? *Codes: 1=no; 2=reasonable (just about sufficient); 3=yes*	
7. Compared with other households in the village (or community), how well-off is your household? *Codes: 1=worse-off; 2=about average; 3=better-off*	

F: Climate change perceptions

1. Compared to <u>ten years ago</u> OR <u>when you first moved here</u>? *(circle appropriate),* have the following extreme events become more or less severe? Tick

Event type	More severe	Same	Less severe
Storms			
Droughts			
Veld fires			
Floods			
Heat waves			
Cold snaps			
***Willowvale:* Snow**			
***Lesseyton:* Frost**			

1. How would you rate the weather's impact on the following aspects of the household? Tick columns

Impact	High impact	Moderate impact	Low impact	No impact
Ability of crops to survive				
Ability of livestock to survive				
Abundance of useful plant and animal species in the area				
Availability of water for the livestock and crops				
Availability of water for the household				
Food security				
Human health				
Damage caused by extreme events				

J. HIV/Aids perceptions

1. How would you rate the impact of HIV/Aids on the following aspects in this community, and has this impact resulted in an increase or decrease of these aspects?

Impact	Inc or dec?	High impact	Moderate impact	Low impact	No impact
Willingness of neighbours to help each other					
Trust					
Food security (people's ability to get enough food every day)					
Labour to undertake activities					
Remittances					
Migrancy					

2. What do you think is needed the most by households living with HIV or Aids?

_____

ENUMERATOR ASSESSMENT

1. Based on your impression, how content/happy would you say the respondent is on a scale of 1 to 10 (with 1 being not content at all and 10 being very content)	
2. Based on your impression and what you have seen (house, assets, etc.), how well-off do you consider this household to be compared with other households in the village? Worse-off = 1; About average = 2; better off = 3	
3. How reliable is the information **generally** provided by this household? Poor = 1; reasonably reliable = 2; very reliable = 3	

QUARTERLY HOUSEHOLD SURVEYS

Note: Incomes from formal employment, own business and grants are asked for the past month, for income from casual employment, remittances, rent, crops, livestock and other income sources the recall period is 3 months.

Control information

Task	**Date(s)**	**By who?**	**Status OK? If not, give comments**
Interview			
Checking questionnaire			
Coding questionnaire			
Entering data			
Checking & approving data entry			

A. Identification

1. Household number		
2. Village	**(name)*	*(village ##)*
3. Name and PID of household head	**(name)*	*(PID)*
4. Name and PID of adult male (M)	**(name)*	*(PID)*
5. Name and PID of adult female (N)	**(name)*	*(PID)*

Personal identification numbers (PIDs) should be the same as used in the baseline survey.

Starting time _____ **Finishing time** _____

B. CHANGES IN HOUSEHOLD COMPOSITION

1. Has anyone left the household in the last 3 months? If yes, who? Why did they leave?

Who	Reason for leaving the household
1.	
2.	
3.	

2. Has anyone joined the household in the last 3 months? If yes, who? Why did they come here?

Who	Reason for joining the household
1.	
2.	
3.	

3. *NB only if information has not yet been recorded – refer to baseline & previous quarters* - Please could you provide some personal details for anyone who has joined or left the house in the past 3 months:

1.Name	2. Relation to household head[1)]	3. Year born *(yyyy)*	4. Sex 0=male 1=female	5. For under 19's only: Where are his/her parents?[1)]	6.a. Health status[2)]
1.					
2.					
3.					

CODES:1) Alive, both living in house=1; alive, but both away=2; mother in house, father away=3; mother in house, father deceased=4; father in house, mother away=5; father in house, mother deceased=6; both parents deceased=7.

2) Excellent health = 1; occasional illness = 2; frequent illness = 3; chronic/long term illness (over three continuous months) = 3; disabled = 4; both sick and disabled = 5; deceased = 6.

1. Name	*6.b. If chronically ill: Is he/she receiving free care or treatment from a clinic ?Y/N*	7. *Employment status[1)]* *(Can have more than one, list in order of importance)*	8. Level of education[2)]	9. Other formal or informal training or skills.	10. What languages can this person speak, other than Xhosa? List all responses None = 0 English = 1 Afrikaans = 2 Other = 3
1.					
2.					
3.					

CODES: 1) Employed full-time = 1; employed part-time = 2; self-employed (farmers in this category) = 3; unemployed = 4; in school or some form of training (apprentice, course) = 5; retired = 6; doesn't work or go to school (eg. disabled, too young) = 7;

2) Illiterate = 1, literate without formal schooling = 2, literate: below primary = 3, primary = 4, middle secondary (grade 9) = 5, secondary (matric) = 6, diploma/course with certificate = 7, graduate = 8, post-graduate = 9.

BENEFITS

C. PERMANENT EMPLOYMENT

1. Is anyone a permanent employee (full- or part-time)? Please provide details about this employment.

1. Who? Name	2. Full- or part-time?	3. Type of work	4. How long has he/she worked there?	5. How much does he/she earn each month?

D. CASUAL EMPLOYMENT

1. Has anyone had any casual work <u>over the past 3 months</u>? Please provide details about this employment.

1. Who? Name	2. Type of work	3.a. Was it part of public works programme? Y/N	3.b. If Yes, which public works programme? (e.g. Working for Water, Road Care, etc.)	3. Wage rate *(NB indicate daily or hourly rate)*	4. Number of days or hours worked *(NB record unit)*	5. Total income (3x4)

E. INCOME FROM OWN BUSINESS (not natural resources or agriculture)

1. Are you involved in any types of business that are not related to agriculture, livestock or natural resources, and if so, what are the gross income and costs related to that business <u>over the past month</u>? For example, hairdressing, spaza, shebeen, lending, child care, taxi or transport service, etc.

	1. Business 1	2. Business 2	3. Business 3
1. What is your type of business?			
2. Gross income (sales)			
Costs:			
3. Purchased inputs			
4. Hired labour			
5. Transport and marketing cost			
6. Other costs			
7. **Net income (2- items3-8)**			
8. Current value of business assets			
9. Is this business permanent or temporary? P/T			
10. **<u>Over the average year</u>**, what are the input costs in terms of purchasing, maintaining and repairing assets?			

2.a. If products are sold in the business, are they mostly sold to family, friends, or strangers?

Family	Friends	Strangers

F. SOCIAL PROTECTION, GRANTS AND PENSIONS

1. Does anyone in the household receive a monthly grant or pension? Please provide details

	1. Number of grants?	**2. Who receives it?**	**3. Total amount each month?**
1. Child grant			(R250 p/month)
2. Disability grant			(R1080 p/month)
3. Care dependency grant			(R1080 p/month)
4. Foster care Grant			(R 710 p/month)
5. Government pension			(R1080 p/month)
6. Private/other pension			
Other			

2.a. In the past three months, has the household received any non-cash regular welfare support, such as meals at school for children or free paraffin? If yes, please what did the household receive?

_____

2.b. What was the approximate value of this support? R_____

G. REMITTANCESAND GIFTS

1. Has anyone living away from the household sent any cash, food, clothing, gifts or other goods to the household over the past 3 months? Please provide details and the approximate value.

	1. How many times over past 3 months?	**2. How much each time? List each approximate value for each time**	**3. Who sent/gave it?**	**4. Where did it come from? (e.g. within village, city)**	**5. Who was it sent to?**
1.Cash					
2. Food					
3. Clothing					
4. Other					

H. RENT

1. Has the household earned income from renting out rooms or land over the past 3 months? If yes, how much did the household earn in total?

R_____

AGRICULTURAL BEEFITS AND COSTS

I. Income from agriculture – crops

1. What are the quantities and values of crops that household has harvested during the past 3 months?

Crops *(code-product)*	**1. Y/N?**	**2. Total production (4+5)**	**3. Unit (for production)**	**4. Own use (incl. gifts)**	**5. Sold (incl. barter)**	**6. Price per unit**	**7.Total value (2*6)**
Cabbage							
Spinach							
Lettuce							
Mielie							
Tomatoes							
Beans							
Sweet potatoes							
Pumpkin							
Onions							
Carrots							
Peppers							
Turnips							
Beetroot							
Butternut							
Other (specify)							
Other (specify)							

1.b. If products were sold, were they mostly sold to family, friends, or strangers?

Family	Friends	Strangers

2. What are the quantities and values of inputs used in crop production over the *past 3 months* (this refers to agricultural cash expenditures)?

Note: Take into account all the crops in the previous table.

Inputs	1. Used? Y/N	2. Quantity	3. Unit	4. Price per unit	5. Total costs (2*4)
1. Seeds					
2. Fertilizers					
3. Pesticides/herbicides					
4. Manure					
5. Draught power/ animals					
6. Hired labour					
7. Hired machinery/tractor					
8. Transport/marketing (only use total)					
9. Payment for land rental (only use total)					
10. Other, specify:					

3. If any crop failed in the last 3 months, how much of it failed and why? Write the crop on the left, the proportion of the crop that failed, and indicate why it failed by ticking a column.

1. Crop type	2. Proportion of crop that failed (¼, ½, all, etc.)	Disease 1	Pests 2	Drought 3	Too hot 4	Weeds 5	Too cold 6	Soil fertility 7	Don't know 8	Other (specify) 9

J. Income from livestock

1. What is the number of ADULT animals your household has now, and how many have you sold, bought, slaughtered or lost during *the past 3 months*?

Livestock	1. Own? Y/N	2. Number owned now	3. Sold (incl. barter), live or slaughtered	4. Slaughtered for own use	5. Lost (theft, died…)	6. Bought or gift received	7. Births	8. Beginning number (3 months ago) (2+3+4+5-6-7)	9. Price per adult animal	10. Total end value (2x9)
1. Cattle										
2. Goats										
3. Sheep										
4. Pigs										
5. Donkeys										
6. Ducks										
7. Chicken										
8. Horses										
9. Other, specify										

2. If any livestock was sold, why was it sold?

_____

3. What are the quantities and values of animal products and services that you have produced <u>during the past 3 months?</u>

Product/ service	1. Y/N?	2. Production (4+5)	3. Unit	4. Own use (incl. gifts)	5. Sold (incl. barter)	6. Price per unit	7. Total value (2x6)
1. Meat[1]							
2. Milk[2]							
3. Eggs							
4. Hides and wool							
5. Manure							
6. Draught power							
7. Milk products							
Other, specify							

1) Make sure this corresponds with the above table on sale and consumption of animals.

2) Only milk consumed or sold should be included. If used for making, for example, cheese it should not be reported (only the amount and value of milk products).

4. If products were sold, were they mostly sold to family, friends, or strangers?

Family	Friends	Strangers

5. What are the quantities and values of inputs used in livestock production during the past 3 months (cash expenditures)?

Note: The key is to get total costs, rather than input units.

Inputs	1. Used? Y/N	2. Unit	3. Quantity	4. Price per unit	5. Total costs (3*4)
1. Feed/fodder					
2. Rental of grazing land					
3. Medicines, vaccination, dips and other veterinary services					
4. Costs of maintaining barns, enclosures, pens, etc.					
5. Hired labour					
9. Other, specify:					

6. In the past 3 months, did you receive any agricultural inputs, public relief or inputs from a development project?

Yes	No

6.b. If yes, what did you receive? _____

6.c. What was the estimated value? R_____

6.d From who or from what organization did this come from? _____

K. NATURAL RESOURCE HARVESTING

1. Were any of these products bought or collected by anyone in the household in the past three months?
Enumerators attach a page (NATURAL RESOURCE USE) for each resource used or collected

Resource	**Bought Y/N**	**Collected Y/N**	***If yes for bought OR collected: page no. ___ of____***
1. Fuelwood			
2. Wild fruits			
3. Wild herbs/spinach (not vegetables such as cabbage etc.)			
4. Wild animals or birds for food (Bushmeat - NB. Tell them answer is secret)			
5. Fish			
6. Mussels			
7. Oysters			
8. Lobsters and crabs			
9. Other marine products (specify)			
10. Insects for food			
11. Birds eggs			
12. Poles for housing (note if use poles from plantation)			
13. Poles for fencing (gardens/fields/home) or kraals			
14. Wood for household items such as spoons, axe handles, etc (see list)			
15. Wood for carvings to sell			
16. Wood for furniture			
17. Thatch grass			
18. Grass for hand sweepers			
19. Twigs for hand sweepers			
20. Reeds for weaving (mats etc.)			
21. Reeds for construction (buildings & roofing, etc.)			
22. Wild honey			
23. Honey beer			
24. Medicinal plants			
25. Mushrooms			
26. Umuncwane			
27. Traditional beer			
28. Sand/Soil/Clay/Termite mounds			

29. Roots or tubers			
30. Seeds			
31. Other (specify)			

L. EXPENSES

1. How much does the household spend on its monthly expenses? If there are other monthly expenses (i.e. buy/pay *every* month), please provide details

Expense	Amount spent each month	Expense	Amount spent each month
1. Groceries		7. Cell/phone	
2. Transport		8. Furniture/appliance payments	
3. Vehicle installments		9. . Money sent to support others	
4. Savings accounts or clubs		10. Alcohol	
5. Insurance policies		11. Cigarettes	
6. Funeral plans		12. Other (specify)	

2. Has the household had any other irregular expenses or contributions over the past 3 months? How much did they cost? If there were any other large expenses over the past 3 months, please provide details

Expense	Amount	Expense	Amount
1. School fees and uniforms		6. Agricultural implements	
2. University/technikon fees		7. Clothing	
3. Medical bills		8. Money or gifts sent to support others	
4. Funeral		9. Other (specify)	
5. Traditional event/ ceremony (initiation, wedding, etc.)		10. Other (specify)	

M & N. ***ADULT MALE AND FEMALE TIME USE - REFER TO PAGES 10 - 12.***

O. As part of this research, group workshops and individual interviews will also be taking place over the next few months. People will be asked if they would like to participate in these based on certain profiles such as age, gender, source of income, etc. If you or someone in your household match these profiles, do you think that person would like to take part? Please note that if you answer yes, there is no guarantee that this person will be contacted to participate, and if they are contacted that person can still choose whether to participate or not.

Yes	No

Remember to thank anyone who participated for their time, input, and patience!

Questions for individual household members

***** RECORD PID NUMBER OF ADULT MALE RESPONDENT _____**

M. Adult Male – Time Use

Household code _____

*We are trying to understand how you spend your time from the time you wake to the time you go to bed. Could you describe what you did **yesterday**?*

Activity	**Code**	**Time begun**	**Time end**	**Total Time**
Total Time				

***** RECORD PID NUMBER OF ADULT FEMALE RESPONDENT _____**

N. Adult Female – Time Use

Household code _____

*We are trying to understand how you spend your time from the time you wake to the time you go to bed. Could you describe what you did **yesterday**?*

Activity	**Code**	**Time begun**	**Time end**	**Total Time**
Total Time				

Remember to thank anyone who participated for their time, input, and patience!