

# Child Grants and Time Use of Single Parents in South Africa

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## Abstract

This paper is the first to evaluate the gendered effects of child grants on patterns of time allocation across SNA (System of National Accounts) production work, household maintenance, care work, leisure, self-care, and other non-work activities. SNA production work includes paid market work, subsistence and informal work, job search, and other production activities which standard labor market indicators generally fail to capture. I use data from the 2010 South Africa Time Use Survey on grant-eligible single parents aged 20-54 years to estimate a system of equations describing the time allocation of single parents. I address the endogeneity of the key grant receipt parameter using a probit model with an originally-constructed instrumental variable, regional median travel time to the welfare office. I find that single fathers living in grant recipient households reduce SNA production work by 22.5 percent (61.5 minutes per day) and single mothers by 61.5 percent (116.3 minutes per day). Single parents primarily redistribute their reduced SNA production work time to household maintenance and care work. Single fathers increase their time in household maintenance and care work by 72.2 percent (81.8 minutes per day) and single mothers by 62.8 percent (142.1 minutes per day), respectively. This rise in household maintenance and care work leads to an overall increase in total work time, especially of single mothers. Single mothers living in grant recipient households increase their total work time by 5.4 percent, which is an increase of 25.8 minutes per day. A series of robustness checks confirms the results.

*JEL Classification:* H81, J29, J22, J13

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# Child Grants and Time Use of Single Parents in South Africa

## 1. Introduction

Child grants and subsidies have been widely used to support families with children. Existing studies show mixed evidence of child grants and subsidies on the labor force participation and market work of household members (for example, see: Gustafsson and Stafford 1992; Ribar 1995; Press, Fagan, and Laughlin 2006; Williams 2007; Lefebvre, Merrigan, and Verstraete 2009; Eyal and Woolard 2011; Tanga and Gutura 2013a). In assessing the labor market effect of child grants and subsidies, many papers have focused on the employment outcomes of single parents (for example, see: Berger and Black 1992; Kimmel 1995; Connelly and Kimmel 2001; Meyers, Heintze, and Wolf 2002; Tekin 2005; 2007a; Blau and Tekin 2007; Tekin 2007b; Ahn 2012). However, to the best of my knowledge, this is the first study to assess the effect of child grants on overall time allocation of individuals.

To measure the extent to which child grants change the time allocation of individuals across activities, in this paper, I go beyond a labor-leisure time allocation framework. In the time allocation framework, I incorporate time spent by individuals in System of National Accounts (SNA) production work, household maintenance, care work, leisure, self-care and other activities. SNA production work includes a broad range of productive economic activities. In addition to paid market work, it also includes job search activities, subsistence and informal work, such as farming, hunting, informal street trading, and irregular employment. The analysis of time allocation in this paper incorporates these broad economic activities that poor, especially women mostly participate in, yet the standard labor force indicators generally fail to capture (Floro and Komatsu 2011).

Understanding the pattern of time allocation over various work and non-work activities is vital; if individuals spend more time on work, be it paid or unpaid, they have less time to spend on leisure and rest, potentially reducing welfare (Floro 1995). Existing feminist discussion argues that social welfare grants or public support can impact time spent in household and care work and reduce work intensities of caregivers (Folbre 2006). Nonetheless, social safety net programs aimed at child welfare may also reinforce the roles of caregivers (Chant 2008). Child grants may push the

caregivers to spend additional time in care work and spend less time in SNA production activities, such as participating in paid market work, looking for jobs, or working on the farm.

The challenge of time allocation is particularly critical for poor single parents, who face substantial resource and time constraints. It is not only difficult for the poor single parents to pay for food, health, and school expenditures of children, but also for them to balance their time between childcare and their respective livelihoods. Single parents face substantial challenges in monitoring and supervising children's behavior and progress in school, and most importantly, providing emotional support to them (Mugove 2017). Therefore, in this paper, I examine the effect of child grants on gendered time allocation of single parents across various work and non-work activities in South Africa.

The government of South Africa has prioritized the reform of the child welfare system to address widespread poverty and ensure the quality of the labor force since 1998. The primary focus of the unconditional child grants, Child Support Grant (CSG), Foster Care Grant (FCG) and Care Dependency Grant (FCG), is to improve the welfare of the children living in poor households. Nevertheless, these grants also have other secondary purposes: improving the welfare of household members, especially caregivers, and increasing the resilience of the poor against shocks. In the process, the child grants are expected to affect the labor force participation and time allocation of the adults through higher rates of school attendance and better health of children (Department of Social Development, South African Social Security Agency, and The United Nation's Children Fund 2012, 6).

In South Africa, the issue of time use is important given the high unemployment rate and unequal distribution of work among men and women. In 2019, the unemployment rate was around 29 percent in South Africa (Statistics South Africa 2019). Furthermore, the jobs that are available are mostly low-paying, low-quality and lack job security (Floro and Komatsu 2011). The weak labor market in South Africa is likely to affect individual preferences of time allocation; individuals may end up doing more informal and subsistence activities. In addition, gender is an essential marker of time allocation in South Africa. In South Africa, women's labor supply is lower than that of men; yet, women aged 10 years and older spend 29 percent more time in work activities (SNA

production work, household maintenance and care work) than those of men (Wodon and Blackden 2006). In a given day, women spend 343 minutes per day in doing SNA production work, household maintenance and care work. The work burden of women arises from their larger share of household maintenance and care work than those of men. Women's share of household maintenance and care work is three times larger than men, with women spending about 228 minutes in those activities. As such, women in South Africa end up spending less time on leisure and self-care as compared to men (Wodon and Blackden 2006).

Furthermore, the incidence of single parenting in South Africa is high and increasing. The percentage of children (aged under 18 years) living with both parents declined from 39 percent in 2002 to 34 percent in 2017 (Hall and Sambu 2018). Meanwhile, 44 percent of all children live with single parents; 41 percent live only with their mothers, while 3 percent live only with their fathers. Overall, the prevalence of unemployment, unequal work distribution and the rise of single parenting make South Africa a suitable case to study the gendered impact of child grants on time allocation of single parents.

In assessing the impact of child grants on time use, this paper uses the 2010 South African Time Use Survey (SA TUS) focusing on the sample of single parents aged 20-54 years. I estimate a series of regressions describing time allocation over different activities. Time allocation is jointly estimated with a probit selection model, which addresses the endogeneity of child grant receipt. To strengthen model identification, I use an originally-constructed instrumental variable, regional median travel time to the welfare office. I use an additional cross-sectional dataset, the 2008 South African Generalized Household Survey (GHS), to construct this instrument.

The empirical model estimates suggest that single fathers and mothers living in grant recipient households spend 64.9 minutes and 116.3 minutes (22.5 percent and 61.5 percent) less time in SNA production work per day, respectively, than those residing in grant non-recipient households. The time allocation framework beyond the labor-leisure trade-off model reveals how single parents living in grant recipient households mainly reallocate their SNA production work time to household maintenance and care work. Single fathers and mothers living in the grant recipient

households increase the time spent in household maintenance and care work by 81.1 minutes and 142.1 minutes (72.2 percent and 62.8 percent), respectively.

Furthermore, I find that child grants increase the total work time of single parents. The resultant reduction in SNA production work time is accompanied by a disproportionate increase in household maintenance and care work. Hence, even though the time spent on SNA production work reduces, single parents, especially single mothers, living in grant recipient households end up having a higher overall workload than those of grant non-recipients. The child grants increase the total work time of single mothers by 25.8 minutes per day, which constitutes of 5.4 percent increase in their total work time. Additionally, I find evidence of gendered impacts of child grants on time allocation. Single mothers increase their time in household maintenance and care work by 61 minutes more than single fathers. To compensate, single mothers reduce the time from SNA production work by 51.4 minutes more than single fathers. A series of robustness tests confirm the findings, indicating that child grants reinforce the role of caregiving by increasing caregivers time in household maintenance and care work.

The paper is organized as follows: Section 2 discusses the background of child grants in South Africa. Section 3 provides a conceptual framework for understanding the potential channels through which child grants may affect the time allocation of the caregivers. Section 4 discusses the data and methodology and presents the findings. Section 5 concludes the paper.

## **2. Child grants in South Africa**

The government of South Africa has established an extensive social safety net to support poor households with children, with the objective of reducing poverty and enhancing child welfare outcomes to ensure an adequate supply of high-quality labor. There are three types of child grants in South Africa. The Child Support Grant (CSG) is available for all poor children, hence is the most general and widespread of the public social safety net programs. The Care Dependency Grant (CDG) is for the children with disabilities and the Foster Care Grant (FCG) is available only for adopted children. From the inception of unconditional child grants, the government has undertaken

various awareness-raising policies to encourage higher take-ups of the grants (Williams 2007). In South Africa, government spending on unconditional child grants constitutes 42 percent of total spending in safety net programs, rendering it an important component of government social policy (Statistics South Africa 2016).

There are three main criteria which largely determine eligibility for the grants. Table A1 in Appendix A summarizes the eligibility criteria by type of grants. The eligibility criteria for CSG are: (i) age thresholds for children (ii) income threshold for primary caregivers depending on their marital status and (iii) nationality and residency of the child. Because CSG is one of the more general child grants, the age eligibility for CSG has changed over the years to incorporate a larger number of children. As of 2010, the program had expanded to include children through the age of 17.

Along with age eligibility of the children, the government (or South African Social Support Administration) assesses the income of the CSG applicants (the child's biological parent or primary caregiver) by their marital status. If the marital status of the caregiver is single, then only the individual income of the caregiver him/herself is taken into account. If the caregiver is married, the combined income of individual and his/her spouse are assessed to determine grant eligibility. Eligibility consideration is based solely on this individual or combined income irrespective of total household income. For an applicant to qualify as eligible, the individual or combined income must fall below a threshold that is adjusted every year. In 2010/11, the income test eligibility threshold for the CSG was set at R2,500 per month (equivalent to USD 2000<sup>1</sup> per annum) for a single caregiver and R5,000 per month (equivalent to USD 4000<sup>1</sup> per annum) for a married caregiver. Finally, the child has to live with the primary caregivers to receive the grant.

The CSG income eligibility threshold of R2500 (equivalent to USD 2000<sup>1</sup> per annum) or below for single parents ensures that only poor caregivers are selected for grant receipt. In 2010, the average per capita income in South Africa was USD 7329.<sup>2</sup> A caregiver receives R250 per month

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<sup>1</sup> Exchange rate used 1 USD ≈ 15 RAND, accessed October 07, 2019 from <https://walleinvestor.com/converter/zar/usd/30000>.

<sup>2</sup> GDP per capita in current USD retrieved from, accessed October 11, 2019 from <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=ZA>.

(approximately USD 16) for one child as a Child Support Grant, which is equivalent to at least 10 percent of the income of single parents. A caregiver can receive child grants for up to six children.

### **3. Conceptual framework**

In the analysis of welfare program, government grants enter as an injection of non-labor income in the income constraint of the household. By now, there is a vast literature on the income effect of the injection of non-labor income, i.e. the effect of grants on the labor force participation or market work of the household members (e.g. Bastagli et al. 2016; Banerjee et al. 2017; Baird, McKenzie, and Özler 2018). In addition to the income effect related to government grants via changing participation of the household members in SNA production work, an injection of the non-labor income may also affect time allocation through other channels. These channels include social transformation via changes in bargaining power and relationship dynamics of the household members, the market substitution of goods and services, and human capital accumulation of the household members via better health of the household members and an increasing rate of children attending school.

While an unconditional grant targeted at child welfare generally can be qualified as non-labor income, its effect on parents' time allocation might be specific and different from the effects of other types of grants. The child grants are specifically targeted to caregivers and households with children. Other grants available in South Africa, such as disability grants, target individuals with disability aged 18 years and older, and old age grants targets women aged 60 years and older and men aged 65 years and older (Hagen-Zanker, Morgan, and Meth 2011). The household composition and needs of the distinctive groups vary for other types of grants. Hence, the spending pattern of the grants may be different. Child grants are provided to enhance the welfare of the children; the recipients are expected to use the grants mostly on the benefit of children. Child grants therefore are most likely to affect the needs in child rearing, more so than any other cash transfer programs. Furthermore, in South Africa, child grants target the primary caregivers of the children. Since women are usually the main providers of unpaid care in the household, child grants

are expected to change the outcomes of women more so than men. By extension, they are also likely to affect the intrahousehold division of labor among men and women.

The following discussion focuses on the four anticipated effects of child grants on time allocation, namely, income effect, social transformation effect, market good substitution effect, and human capital accumulation effect.

### *Income effect*

There is a vast debate on the effect of grants on the participation of the household members in market work. Based on the standard labor-leisure time allocation framework, a part of the existing findings and arguments suggest that non-labor cash transfers serve as disincentives for the individuals to participate in the market work (e.g. Bertrand, Miller, and Mullainathan 2000; Lam, Leibbrandt, and Ranchhod 2006; Banerjee et al. 2017). These findings indicate that grants have negative income effects. Hence, non-labor cash transfers may also discourage household members from searching for jobs, doing subsistence production or informal work, thus, reducing their participation in overall SNA production activities. Nevertheless, another strand of the literature argues that non-labor cash transfers have positive effects on labor supply. Non-labor cash transfers assist household members in absorbing the costs of searching for employment, thus increasing their labor force participation (e.g. Samson et al. 2004; Williams 2007; Eyal and Woolard 2011; Salehi-Isfahani and Mostafavi-Dehzooei 2018). Household members may also use the grant money for informal businesses, increasing their participation in SNA production activities. In South Africa, Eyal and Woolard (2011) and Tanga and Gatura (2013a) find evidence of increased labor force participation of mothers due to CSG receipt. But Williams (2007) indicates mixed evidence of such labor market effects in South Africa.

Moreover, the choice of time allocation varies between men and women. Women usually perform most of the household and care work. Non-labor grant transfers may have a negative effect on women's labor supply if women choose to reduce their time from paid work or broadly from SNA production work and stay at home instead in accordance with this gender norm. Nonetheless, even if grant receipt leads to an increase in the time that women spend in SNA production work, it also

is likely that women may decrease their time in leisure and self-care. In this case, women may be constrained by gender norms to maintain their regular hours spent in household maintenance and care work in addition to spending time in SNA production work.

### *Social Transformation Effect*

Social transformations refer to changes in bargaining power and relationships. Grant receipt may directly increase bargaining power through the provision of non-labor income. They also may provide indirect increases to bargaining power by increasing labor market participation. This is especially true for women. As women are more likely to be the primary caregivers, they have a greater likelihood of receiving child grants. Patel and Hochfeld (2011) and Patel et al. (2012) find that women in South Africa indeed have more control over the grant income and can decide on spending the grant money. This control over the grant income may help in generating welfare-enhancing outcomes which are crucial to individual quality of lives. For instance, the recipient of the grant may choose to reduce her part of household and care work.

Relationship dynamics may also change in response to grant receipt. Existing studies in South Africa find that in some cases, teenage mothers use the grant money on personal care, leaving the child to the grandmothers. Grandmothers taking care of the children reduces teenage mothers' time in childcare (The South African Social Security Agency, Department of Social Development, The United Nation's Children Fund 2011; Zembe-Mkabile et al. 2015). Furthermore, Tanga and Gutura (2013b) suggest that CSG also leads to withdrawal of fathers from their childcare obligations. Fathers' withdrawal from childcare leads to a reduction in fathers' time in care work. However, withdrawal of fathers from childcare obligations may increase the unpaid care burden of the mothers.

### *Market Good Substitution Effect*

Additionally, child grants may decrease household or care work if caregivers spend the cash grant on time-saving technologies or on paid care support which supplement or replace their own unpaid work time. Existing evidence shows that some of the caregivers, mothers, or household members

spend grant money in daycare (South African Social Security Agency, Department of Social Development, and The United Nation's Children Fund 2011; Zembe-Mkabile et al. 2015).

By spending the grant money on daycare, the caregiver can have more time to her/himself, which s/he can reallocate to other activities. A caregiver can also reallocate his/her freed time from household maintenance or childcare to SNA production work. Caregivers also may do additional household and care work more efficiently as a result, depending on their preferences and obligations. Furthermore, spending more time in SNA production work also means more income. As time and money are directly substitutable, caregivers can buy additional time by spending further on market substitutes.

#### *Human Capital Accumulation Effect*

Non-labor income also can be used to meet basic household needs like food and clothing. Spending the grant money on foods and clothing may reduce caregivers time in subsistence production. Existing evidence suggests that the majority of CSG grant recipients spend the grant money on food and clothing, as well as in meeting the needs of the children, especially on school-related expenses (Patel and Hochfeld 2011; South African Social Security Agency, Department of Social Development, and The United Nation's Children Fund 2011). Existing evidence also suggests that CSG receipt increases children's rates of school attendance, makes them healthier, and reduces child labor (Case, Hosegood, and Lund 2005; Williams 2007; South African Social Security Agency, Department of Social Development, and The United Nation's Children Fund 2011; Department of Social Development, South African Social Security Agency, and The United Nation's Children Fund 2012). Children going to school and remaining healthier may reduce the time needed for unpaid care work. However, the time spent on childcare also determines the quality of care and welfare of the children. Hence, the positive outcome of children may require more time from the caregivers spent in childcare and domestic work.

The overall effect of child grants on the time allocation of individuals depends on who controls the grant money and how caregivers choose to allocate their time. Due to the multiple mechanisms detailed above, the effects of child grants on time spent in SNA production work, household

maintenance, care work, leisure, self-care and other-activities are ambiguous, activity-specific, and gender asymmetric. The empirical analysis in Section 4 quantifies the net effects of these mechanisms and tests whether the reallocation of time is more prominent for women than for men.

#### **4. Empirical Analysis**

To understand the manner in which receipt of child grants affects time allocation, I compare the time allocation of eligible single parents living in grant recipient households with that of eligible single parents living in grant non-recipient households. I specifically examine how these two groups organize their daily lives by allocating the available time of 1440 minutes a day across various activities.

##### *4.1. Data*

This paper uses the second round of South Africa Time Use Survey (SA TUS) conducted in 2010 (Statistics South Africa 2013). SA TUS collects the detailed time use of two (one male and one female) randomly selected household members aged 10 years and above. The interviews are conducted face-to-face to record the time use of the selected respondent for one day. Time-diaries record the activities of the individuals in 30-minute intervals starting at 0400 hour over the next 24 hours. As an individual may perform certain activities at the same time, up to three simultaneous activities can be recorded over a 30-minutes slot. The locations of the activities are also recorded in the diary. Alongside the time use, the SA TUS records socio-demographic and labor market information of the individual time diary respondents. The SA TUS also collects information on household assets and income.

The SA TUS 2010 surveyed a total of 22,484 households from all nine South African provinces: Western Cape, Eastern Cape, Northern Cape, Free State, KwaZulu-Natal, North West, Gauteng, Mpumalanga and Limpopo. The sample is representative by province, geography type (urban formal, urban informal, rural formal and tribal areas) as well as metro or non-metro areas within each province. A two-stage stratified sampling design was followed. In the first stage, probability proportional to size (PPS) sampling of the PSUs was conducted. In the second stage, systematic

sampling of the dwelling units (DUs) was applied over the 80,787 enumeration areas (EAs). Data was collected over 3,080 PSUs.

The SA TUS constructs survey weights to ensure that the sample is indeed representative of the population surveyed. These weights represent the civilian population of South Africa. They also adjust for household selection probabilities, non-response and benchmark to known population estimates of the Demographic Division of Stats SA. The calibrated weights assign all persons in the household the same weight. Nevertheless, because SA TUS selects two people in the households (one male and one female) aged 10 years and older for the completion of the time diaries, the household weights are further adjusted for individual level selection probability and non-response (Statistics South Africa 2013). I use these sample weights throughout the time use analysis.

#### *4.2. Sample*

In this paper, after imposing the grant eligibility criteria, the sample consists of eligible single parents aged 20 to 54 years who have individual income of at most R2500 (income eligible) and have a child aged 17 years and younger living with them (age eligible). Eligible single parents are those who are never married, widowed, separated, divorced or individuals living with a partner but not married. It can be safely assumed that parents generally are the primary caregivers of the children. Figure 1 below presents the stepwise selection of the eligible single parents from the 21,382 SA TUS respondents aged 20-54 years.

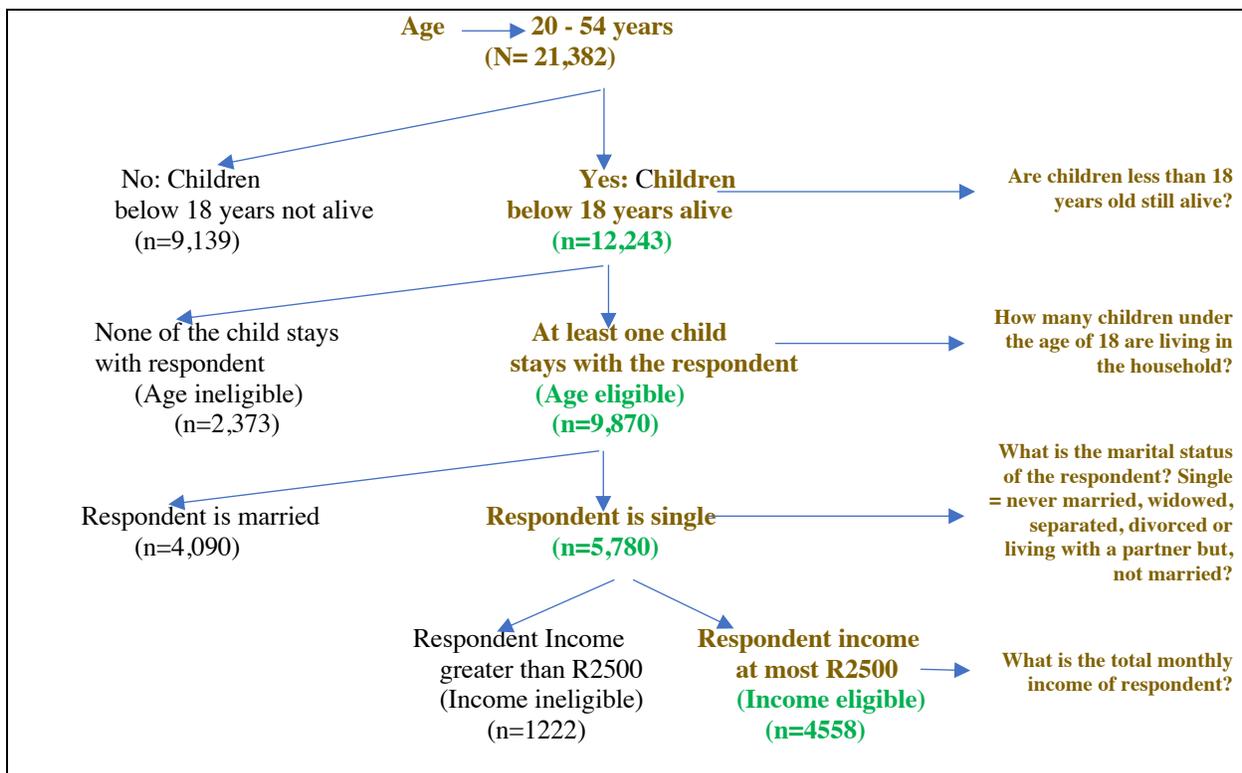


Figure 1. Stepwise identification of the eligible parents aged 20 to 54 years

Furthermore, I limit the age of the eligible single parents to the working age of 20 to 54 years. The working age parents, including those who are entering the labor market and those in their prime working age, face the highest constraint in their time allocation. They not only need to participate in SNA production work, but their participations in activities such as household maintenance, cooking and caregiving usually remain substantially high as compared to other age groups. Eyal and Woolard (2011) use the age group of 20 to 45 years to assess the effect of child support grant on the labor force participation of the mothers in South Africa, but this omits several prime working years. I therefore expand to include parents through age 54 to capture prime working age in its entirety. Finally, because children must be 17 years old or younger to be eligible for the grant, the sample of single parents (caregivers) aged 20 years and older does not overlap with children's age requirement.

The eligible single parents are further divided into two groups – grant recipients (R) and grant non-recipients (NR). Grant receipt status of the single parent household is identified by combining the household and individual sources of income. Figure 2 shows the distribution of the eligible single parents by their grant receipt status. The grant recipient group includes the ones whose households, or diary respondents in the household, who reported receiving income from child support, foster care or care dependency grants. Hence, the grant non-recipient group includes those whose households, or diary respondents in the household, did not report any grant receipt.<sup>3</sup>

Figure 2 shows, there are 4,558 eligible single parents in the sample aged 20 to 54 years. Out of all the eligible single parents, 67.8 percent of the parents live in grant recipient households (R). The remaining 32.2 percent of the eligible single parents live in the grant non-recipient households (NR).

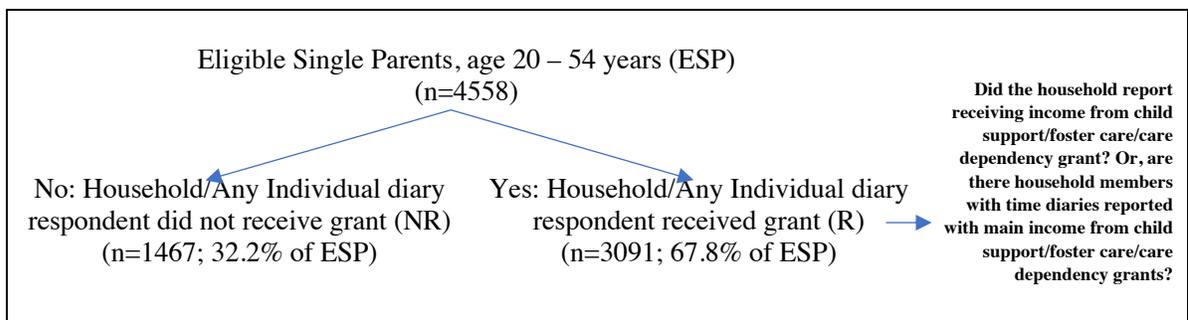


Figure 2. Distribution of eligible single parents aged 20 to 54 years by grant recipient status

There are certain limitations in mainly using the household level sources of income in identifying grant receipt. First, grant receipt detection may have a certain level of error because the household module respondent may not be aware of all of the sources of household income. To minimize the grant receipt identification error, I also take into account information from the time diary module on their individual sources of income. However, individual diary respondents only report their

<sup>3</sup> SA TUS does not directly identify the grant receipt of the individuals. Rather SA TUS lists all sources of household income. For the individual diary respondents, SA TUS only collects the information on the main sources of income. For minimizing the error in grant receipt identification, both the individual and household sources of income are combined.

main source of income. Individuals may not consider the grant as their main source of income; thus, a certain level of identification error is expected. Second, even though households receive income from child grants, eligible single parents in the sample may not be the direct recipients of such grants. Rather, other members in the household may have received the funds. This leads to some bias in the analysis as the sample consists of both the direct and indirect grant recipients.

Nevertheless, these measurement errors are expected to be lower for single parent households. It is likely that single parents are also the main respondents of the household module given their household composition. It is also possible that single parents are the direct recipients of the grant money. However, the possibility of the presence of other household members in a single parents' household cannot be fully eliminated. Single parents may live with their families, and so there may be other household members present.

Table 1 provides the summary characteristics of the sample of eligible single parents aged 20 – 54 by their grant receipt status. There are significant differences in the characteristics of the eligible single parents living in the grant recipient households as compared to the ones living in the grant non-recipient households. Women in general are more likely to end up being a single parent, hence, not surprisingly the sample constitutes of more women than men. Because women tend to be poorer than men, grant recipients more often are single mothers than single fathers. More than 80 percent of single mothers live in grant recipient households, and around 66 percent reside in the non-recipient households. Table 1 also shows that the rate of grant receipt is higher for single parents without formal education, and for the ones only with secondary education (class 8 to 11). Grant receipt is more frequently observed for the single parents with less available support, i.e. a single parent who has not been married (62.1 percent), and for the single parents living in poorer households than the rest in the sample.

Table 1. Characteristics of sample respondents aged 20-54 years by grant receipt status (percent of total)

	Living in the grant recipient household (R)	Living in the grant non-recipient household (NR)	R vs. NR (ttest)
Sex			
Single father	20.0	34.1	-14.1***
Single mother	80.0	65.9	14.1***
Average age (in years)	32.0	32.8	-0.8**
Educational Level			
No school	4.5	2.2	2.3***
Class 1 to 7	20.0	21.4	-1.4
Class 8 to 11	54.1	46.7	7.3***
Above class 11	21.4	29.7	-8.3***
Marital Status			
Never married	62.1	57.5	4.6**
Widowed/divorced/separated	9.6	9.5	0.07
Living with a partner, but not married	28.3	33.0	-4.7**
African=1	94.2	90.1	4.1***
Individual had a typical day =1	91.4	94.2	-2.8***
Family Income (in RAND)			
0 to 500	12.1	11.6	0.5
501 to 1500	39.4	37.8	0.2
1501 to 2500	25.4	21.1	4.3**
2501 to 4500	18.3	15.9	2.3
4501 to 8000	4.2	8.3	-4.2***
8001 and above	0.7	5.3	-4.6***
Average of normalized wealth index	0.33	0.37	-0.05***
Household has income from remittance	9.4	6.3	-3.0***
Household has income from unemployment fund	0.5	0.4	0.05
Household has income from other state welfare grant	29.5	24.1	5.3***
Average number of children aged 0 to 5 years	1.26	0.70	0.6***
Average number of children aged 6 to 10 years	0.86	0.43	0.4***
Average number of children aged 11 to 17 years	0.94	0.55	0.4***
Average female household members of age 18 years and older	1.11	1.12	-0.01
Average male household members of age 18 years and older	2.00	1.53	0.5***
Household has given interview in			
English/Afrikan/Zulu/Xhosa	57.4	60.7	-3.3
Has bus/train/taxi within 30 minutes (2 kilometer)	91.6	91.9	-0.3
Has primary/secondary school within 30 minutes (2 kilometer)	83.9	84.0	-1.1
Has hospital/clinic within 30 minutes (2 kilometer)	57.4	61.3	-3.9*
Has shop within 30 minutes (2 kilometer)	77.7	78.7	-0.06
Metropolitan area = 1	21.2	40.2	-19.0***
Geography Types			

	Living in the grant recipient household (R)	Living in the grant non- recipient household (NR)	R vs. NR (ttest)
Urban formal	37.5	52.2	-14.7***
Urban informal	11.5	14.4	-2.9**
Tribal areas	46.6	27.9	18.7***
Rural formal	4.4	5.4	-1.0
Observations	3091	1467	4558

<sup>a</sup>\*\*\*, \*\* and \* denote level of significance at 1%, 5% and 10% respectively.

<sup>b</sup> Statistics are survey weight adjusted.

#### 4.3. Time allocation patterns by grant receipt and gender

On any given day, individuals allocate 1440 minutes across various activities. Table 2 compares the time allocation patterns of grant recipients (eligible single parents living in the household which received grant - R) and non-recipients (NR) across six main activity categories: SNA production work, household maintenance, care work, leisure, self-care, and other activities. Statistics South Africa follows the time use classification of the United Nations (UN) for identifying SNA and non-SNA activities (Statistics South Africa 2013). In this paper, SNA production work includes employment for establishment such as, paid work, travel to and from work, job search activities, and travel related to looking for employment. It also includes activities related to primary production such as subsistence farming and other production of goods and services not for establishment, such as informal street trading. Household maintenance includes cooking, cleaning, care for textiles, activities related to household management such as paying bills, shopping for own household, and time spend on collection of water, fuel, firewood, and dung. Care work includes time spent on caring for children, the sick, elderly and disabled for own household members as well as caring for and informally helping the non-household children and adults. Leisure includes mass media use and doing nothing. Self-care includes sleeping, eating and drinking, personal hygiene and health as well as individual religious practices and medication. Finally, other-activities includes time spent on learning, social and cultural activities, and community services.

Table 2. Time allocation of eligible single parents living in grant recipient and non-recipient households

Activities	Living in the grant recipient household (R)		Living in the grant non-recipient household (NR)		t-test Differences in average minutes (R - NR)
	Average minutes (minutes/per day)	% of total <sup>a</sup>	Average minutes (minutes/per day)	% of total <sup>a</sup>	
<b>A. Single mothers</b>					
SNA production work <sup>b</sup>	95.1	6.6	189.0	13.1	-93.9***
Household maintenance <sup>c</sup>	270.8	18.8	226.1	15.7	44.7***
Care work <sup>d</sup>	73.1	5.1	63.8	4.4	9.3*
Leisure <sup>e</sup>	165.0	11.5	171.6	11.9	-6.6
Self-care <sup>f</sup>	703.7	48.9	686.7	47.7	17.0***
Other activities <sup>g</sup>	132.3	9.2	102.8	7.1	29.5***
Total time	1440	100.0	1440	100.0	
<b>B. Single fathers</b>					
SNA production work <sup>b</sup>	258.2	17.9	288.9	20.1	-30.8
Household maintenance <sup>c</sup>	108.2	7.5	112.3	7.8	-4.2
Care work <sup>d</sup>	14.5	1.0	16.4	1.1	-1.9
Leisure <sup>e</sup>	173.9	12.1	174.5	12.1	-0.6
Self-care <sup>f</sup>	721.4	50.1	699.6	48.6	21.8*
Other activities <sup>g</sup>	163.7	11.4	148.2	10.3	15.6
Total time	1440	100.0	1440	100.0	
<b>C. Differences in average minutes (Single mothers – Single fathers): t-test</b>					
SNA production work <sup>b</sup>	-163.1***	...	-99.9***	...	...
Household maintenance <sup>c</sup>	162.6***	...	113.7***	...	...
Care work <sup>d</sup>	58.5***	...	47.4***	...	...
Leisure <sup>e</sup>	-8.9***	...	-2.9***	...	...
Self-care <sup>f</sup>	-17.7***	...	-12.9***	...	...
Other activities <sup>g</sup>	-31.4***	...	-45.4***	...	...

<sup>a</sup> Percentage of total time in a given day. Respondents allocate 1440 minutes (100%) across different activities.

<sup>b</sup> SNA production work includes employment for establishment such as, paid work, travel to and from work, job search activities, travel related to looking for employment, activities related to primary production such as subsistence farming, and other production of goods and services not for establishment, such as informal street trading (Statistics South Africa 2013).

<sup>c</sup> Household maintenance activities include cooking, cleaning, care for textiles, activities related to household management such as paying bills, shopping for own household, and time in collection of water, fuel, firewood, and dung (Statistics South Africa 2013).

<sup>d</sup> Care work activities include time spent on caring for children, the sick, elderly and disabled for own household members as well as caring for and informally helping the non-household children and adults (Statistics South Africa 2013).

<sup>e</sup> Leisure include mass media use and doing nothing (Statistics South Africa 2013).

<sup>f</sup> Self-care include sleeping, eating and drinking, personal hygiene and health and religious practices and medications (Statistics South Africa 2013).

<sup>g</sup> Other activities include time spent in learning, social, and cultural and community services (Statistics South Africa 2013).

<sup>h</sup> \*\*\*, \*\* and \* denote level of significance at 1%, 5% and 10% respectively.

<sup>i</sup> Statistics are survey weight adjusted.

Table 2 shows that eligible single mothers living in grant recipient households spend 95.1 minutes on average per day in SNA production work as compared to the 189 minutes by the ones in the grant non-recipient households (Panel A). Nevertheless, as the single parents living in the grant recipient households spend less time performing SNA production work, they spend 44.7 minutes more in household maintenance and 9.3 minutes more performing care work, which take 23.5 percent of their time. These single mothers also spend more time in other activities and self-care (36.5 minutes extra) in comparison to the single mothers living in the grant non-recipient households. For single fathers, in general, no significant differences in time allocation can be observed by their grant recipient status (Panel B).

Furthermore, Table 2 highlights the gender differences in time allocation across activities. As expected, single mothers living in both grant recipient and non-recipient households spend less time in SNA production work than single fathers (Panel C). Single mothers living in the grant recipient and non-recipient households spend 163.1 and 99.9 fewer minutes on average per day, respectively, doing SNA production work than single fathers. The opposite trend is observed for household maintenance and care work. In South Africa, women, especially poor women, are generally known to spend long hours in household maintenance (Wodon and Blackden 2006). In the grant recipient households, single mothers spend 162.6 minutes more doing household maintenance and 113.7 minutes more in grant non-recipient households than single fathers. Single mothers' time spend on care work also shows a similar pattern. They spend significantly more time in care work than single fathers. Looking at the overall time allocation, it is crucial to note that single mothers have longer workdays than single fathers. Spending significantly more time in household maintenance and care work reduces their time available for leisure, self-care and other activities by 58 minutes per day in grant recipient households and 61.2 minutes per day in grant non-recipient households as compared to single fathers.<sup>4</sup>

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<sup>4</sup> I also analyze time allocation of single mothers and fathers living in grant recipient and non-recipient households by participation. An individual must perform a given activity for at least ten minutes on the diary day to be counted as a participant. The average minutes are calculated conditional on participation in the given activity. The findings show that participation of single mothers is low in SNA production work, but high in household maintenance and care work as compared to single fathers. Single mothers who do participate in SNA production work also spend less time in SNA production work. The opposite trend is observed for household maintenance and care work. The results are provided in Appendix B, Table B1.

#### 4.4. Econometric models

I empirically test the effect of grant receipt on time allocation by estimating a series of regressions describing SNA production work, household maintenance, care work, leisure, self-care, and other activities.

The key parameter associated with grant receipt is likely to be endogenous. In other words, it is also possible that individuals not in the labor force or not doing much of SNA production work, or who have more personal care or free time are more likely to apply for child grants. To address this possibility, the time allocation equations (1) are completed by a probit selection equation (2) describing the probability of receiving grant. In this model, individuals jointly decide on grant receipt/application and their time allocation. Identification of the model is achieved first by nonlinearity of the probit part, and second, by using an instrumental variable (IV),  $Z$ , to instrument the grant receipt status  $R$ . The estimation is run by full information maximum likelihood.

The general specification of the empirical model is as follows:

$$H_{iagpd} = \beta_{a0} + \beta_{a1}R_i + \beta_{a2}F_i + \beta_{a3}(F_i \times R_{igp}) + \beta_{aX}X_i + \mu_{1ag} + \gamma_{1ap} + d_{ad} + \varepsilon_{ia} \quad (1)$$

$$R_{igp}^* = \alpha_0 + \alpha_1Z_i + \alpha_2F_i + \alpha_3(F_i \times Z_i) + \alpha_X X_i + \mu_{2g} + \gamma_{2p} + \eta_i$$

$$R_{igp} = \mathbb{I}(R_{igp}^* > 0); \quad (2)$$

$H_{iagpd}$  refers to the number of minutes per day spent by individual  $i$  living in geography type  $g$  of province  $p$  on activity  $a = 1, 2, \dots, 6$  (corresponding to SNA production work, household maintenance, care work, leisure, self-care, and other activities respectively) on day  $d$ ;

$R_{igp}$  refers to grant receipt status of individual  $i$  living in geography type  $g$  of province  $p$ , taking the value of 1 for eligible single parents living in grant recipient households and 0 for the ones living in grant non-recipient households;

$F_i$  refers to the sex of respondent, in which single mother takes the value of 1 and single father is 0;

$F_i \times R_i$  accounts for the gender-specific effect of the child's grant on parent's time allocation with an interaction of sex and grant receipt. The presence of gender norms in household division of labor and the persistence of gender-based discrimination in labor markets are likely to lead to different outcomes for single mothers and fathers. The coefficients associated with the interaction variable ( $F_i \times R_i$ ) enables testing for differences in time spent in a given activity between single mothers and single fathers in grant receiving households.

$Z_i$  and  $F_i \times Z_i$  in the selection equation (2) helps to identify the impact of grant receipt on time allocation. The female dummy interacted with the instrumental variable ( $F_i \times Z_i$ ) allows the effect of IV on grant receipt to differ between single mothers and single fathers.

$X_i$  is a vector containing individual, household, and regional control variables. The model includes the following individual level control variables: lifecycle stage (age and age squared), level of education categories, race/ethnicity, and marital status. Individual level control in (1) also includes whether individual has a typical day on the day the time diary is collected. Household level controls include annual household income based on six categories (Rand 0 to 500, 501 to 1500, 1501 to 2500, 2501 to 4500, 4501 to 8000 and 8001 and above). While single parents must earn less than R2500 per month to be eligible, they may reside in a household with substantially higher overall income. The empirical model also contains other household control variables, namely: normalized wealth index of the household,<sup>5</sup> binary control variables for other sources of household income (remittance, unemployed, and old age welfare grant), household composition (number of children in the household aged 0 to 5, 6 to 10, and 11 to 17 years, number of male adults 18 years and older, and number of female adults 18 years and older) and whether the household conducted the interview in English, African, or Xhosa. The model also includes regional binary controls

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<sup>5</sup> Wealth Index is constructed using Principal Component Analysis (PCA) using information on household ownership of assets (washing machine, vacuum cleaner, refrigerator, telephone, cellphone, television, radio, car, clock, microwave, decoder, dishwasher, and computer), access to facilities (internet, improved energy for cooking, heating and lightening, and piped water) and their dwelling types.

indicating whether there are bus/train/taxi, primary/secondary school, hospital/clinic, and shops within 30 minutes (i.e. 2 kilometers) of the household, and a binary variable for the residency in the metropolitan area.

$\beta$  and  $\alpha$  are the coefficients to be estimated;

$\mu$  and  $\gamma$  are vectors of geography types and provincial fixed effects, respectively of (1) and (2)

$d$  is vector of diary day fixed effects of (1);

$\varepsilon_a$  and  $\eta$  represent the error terms of (1) and (2), respectively.

Under the time constraint in (1), variations in the amount of time in one activity triggered by a change in an exogenous variable must be compensated by changes in the time spent in the other activities, holding constant other control variables. This reduces the degrees of freedom of the system and implies restrictions on the system coefficients. Given the time-constraint of 1440 minutes (total for all activities in a given day, the estimated coefficients of the time equations must satisfy the following conditions:

$$\sum \beta_{a1} = 0; i. e., \quad \beta_{31} = 0 - \delta_{11} - \delta_{21} - \delta_{41} - \delta_{51} - \delta_{61}$$

$$\sum \beta_{aX} = 0; i. e., \quad \beta_{3X} = 0 - \beta_{1X} - \beta_{2X} - \beta_{4X} - \beta_{5X} - \beta_{6X}$$

and,

$$\sum \beta_{a0} = 1440; i. e., \quad \beta_{30} = 1440 - \beta_{10} - \beta_{20} - \beta_{40} - \beta_{50} - \beta_{60}$$

The fixed effects in the model  $\mu_{1a}$ ,  $\gamma_{1a}$  and  $d_a$  also follow the same rule of having the coefficients sum to zero. I drop the equation of other-activities during the full information maximum likelihood estimation to impose the restrictions on the system coefficients. I compute the coefficients related to other-activities using the conditions discussed above.

Errors  $\varepsilon_{ia}$  of activity equations and  $\eta_i$  follow joint normal distribution:

$$\begin{pmatrix} \eta \\ \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \\ \varepsilon_5 \end{pmatrix} \Big| Z, F, X, \mu, \gamma, d \sim N \left[ \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho_{r1} & \rho_{r2} & \rho_{r3} & \rho_{r4} & \rho_{r5} \\ \rho_{r1} & 1 & \sigma_{12} & \sigma_{13} & \sigma_{14} & \sigma_{14} \\ \rho_{r2} & \sigma_{12} & 1 & \sigma_{23} & \sigma_{24} & \sigma_{25} \\ \rho_{r3} & \sigma_{13} & \sigma_{23} & 1 & \sigma_{34} & \sigma_{35} \\ \rho_{r4} & \sigma_{14} & \sigma_{24} & \sigma_{34} & 1 & \sigma_{45} \\ \rho_{r5} & \sigma_{15} & \sigma_{25} & \sigma_{35} & \sigma_{45} & 1 \end{pmatrix} \right]$$

where,  $\rho_{ra}$  represent the correlation coefficients of the selection equation with the unobservables in time allocation equations and  $\sigma_{ae}$  represent the covariances between different activities  $a$  with other regression of activities  $e$  ( $a$  and  $e=1, \dots, 5$  and  $a \neq e$ ).

### *Instrumental Variable (IV)*

In selecting the instrumental variable,  $Z$ , I take into account that the IV must satisfy the following conditions: it is exogenous and not affected by other variables ( $\text{Cov}(Z, \varepsilon_a) = 0$ ), and it is correlated with grant receipt, which is the endogenous explanatory variable ( $\text{Cov}(Z, R) \neq 0$ ).

The South African Social Security Agency, Department of Social Development, and The United Nation's Children Fund (2011) and Mutasa (2012) find distance to the welfare office as a major obstacle for grant application, especially for households living in remote areas. Mutasa (2012) uses the distance to the welfare office as the instrument for identifying the effect of a disability grant on labor force participation in South Africa. The cost of grant application with distance increases. The costs of application also increase with multiple visits to the welfare office. Mitra (2005) argues that long distance to the welfare office also deter the households from getting proper information on the grant application, hence reduce their likelihood of grant receipt/application.

Unfortunately, the SA TUS does not contain information on distance to welfare office. I therefore originally construct a measure of median travel time (distance) to the nearest welfare office by province and geography type (urban formal, urban informal, rural formal and tribal areas) using the General Household Survey (GHS) 2008 of South Africa. The median travel time to welfare office measures the travel time required for grant application. The median travel time instrument is expected to have a negative correlation with grant receipt. If travel time increases from a region

to welfare office, then it is costlier for the residence of the regions to apply for the grant, and they are less likely to receive the grant as a result.

The GHS is an annual household survey designed to measure the living condition of the households in South Africa. The sample design of the GHS 2008 is compatible with the sample design of SA TUS 2010. Both are based on the 2001 Population Census conducted by Statistics South Africa and so have the same regional classifications. As with the SA TUS 2010, the design for the GHS 2008 follows the master sample of the Quarterly Labor Force Survey. The sample in the GHS 2008 is representative of provinces, metropolitan areas, and geography types: urban formal, urban informal, rural formal and tribal areas. I construct the instrumental variable, median travel time to the welfare office, from the geography type ( $g$ ) of province ( $p$ ).

The GHS 2008 asks the household members regarding the time (in minutes) it would take to reach the nearest welfare office using the usual means of transport. The GHS dataset records the travel time in interval  $I$ ,  $[t_{gp}, t_{gp} + \Delta t_{gp}]$ . The travel time to the welfare office varies by households. The GHS registers the travel time in 14-minute gaps ( $\Delta$ ) over five-intervals (0 to 14, 15 to 29, 30 to 44, 45 to 59 and 60 minutes or more)<sup>6</sup>. For analytical purpose, I top code the open interval, 60 minutes and more, also to reflect a 14-minute gap (60 to 74 minutes).

To estimate the median travel time to welfare offices from geography type  $g$  of province  $p$  (region), I first calculate the frequency distribution over the intervals within each region. For each  $g$  of  $p$ , I calculate the frequency  $f_I$  of the travel time interval, for  $I=1, \dots, 5$ .

Next, based on the frequency table,  $f_I$ , I determine the position of the median in geography type  $g$  of province  $p$  by:

$$[\text{Position of median}]_{gp} = \left[ \frac{n+1}{2} \right] = \left[ \frac{(\sum_{I=1}^5 f_I)_{gp}}{2} \right]^{th} \text{ value} \quad (2)$$

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<sup>6</sup> Missing responses are dropped from the estimations.

Then, once the position of the median is determined, the interval  $I$  which contains the median in  $g$  of  $p$  is identified. Let  $I$  denote the interval which contains the median as  $m$ .

Finally, I estimate the median travel time to welfare office of  $g$  of  $p$  as follows:

$$Median_{gp} = t_{gp} + \frac{(\sum_{l=1}^5 f_l)_{gp} - (\sum_{l=1}^{m-1} f_l)_{gp}}{2(\sum_{l=1}^m f_l)_{gp}} \times \Delta_{gp} \quad (3)$$

However, this instrumental variable has some limitations. First, it is constructed using survey data from 2008. Neither the GHS 2009 nor 2010 asked travel time information to the welfare office. As such, the GHS 2008 is the closest available information for the construction of the instrument. But the median travel time estimates of 2008 may not be precise for the SA TUS survey data used for analysis otherwise was collected in 2010. Nevertheless, since setting up or relocating the welfare offices require rigorous administrative process, the travel time approximation of 2008 is expected to hold for 2010. I verify that the instrument constructed from the GHS 2008 is a good proxy for travel time to welfare offices in 2010 by constructing the same instrument using the GHS 2007. The GHS 2007 is comparable to GHS 2008 as it follows a similar sampling procedure. I find the comparable effect of the regional median travel time to the welfare office on the grant receipt using the measure of the GHS 2007 and the GHS 2008 (see: Table C1, Appendix C). The findings indicate that there may have been little change in regional median travel time to the welfare offices between 2008 to 2010, but that this change was minimal.

Second, the instrumental variable is constructed from the interval data. Interval data leads to lower precision in the measurement of the regional median travel time to the welfare offices. However, 50 percent of the households of geography type  $g$  of province  $p$  have a travel time less than or equal to the median travel time of that region.

The potential strength of the instrument is tested by the estimation of equation 2 using the probit model with and without the control variables. The results are given in Table C1 in Appendix C. The marginal effects of the probit model without control variables show median travel time to welfare offices actually increases the probability of receiving the grant. Because grant recipients generally live in rural or remote areas, a probit model without regional controls captures the main

effect of the geography types rather than the effect of distance. As expected, once I add the regional controls (Table C1, Column 3), the marginal effects of the relationship between the regional median travel time to the welfare office with the grant receipt turns out to be negative. Column 3 of Table C1 in Appendix C shows that if the median travel time to the welfare office from a region increases by 1 minute, the probability of grant receipt of the single parents living in that region decreases by 1 percentage point. The estimate is statistically significant at 1% level of significance. Figure C1 in Appendix C also illustrates the strength of the effect of the IV on probability of grant receipt. The probability of grant receipt falls from above 0.8 to less than 0.4 as the regional median travel time to the welfare office increases from 20 to 70 minutes.

In addition to the relevance of the instrument, it is essential that the instrument is exogenous. The travel time (distance) to the welfare office satisfies the exogeneity condition of the instrument because the location of the welfare offices is generally determined by the government. Therefore, the distance to the office cannot be influenced by the households or any individual single parent in the sample.

The instrument also requires affecting the time allocation only through selection into grant receipt to satisfying the exclusion restriction. One can argue that the travel time to welfare offices may just reflect community effect on time allocation. Travel time to welfare offices may also reflect the poor infrastructure in the regions which affects time allocation of the residents. To account for these possibilities, I first group the median travel time to welfare offices in a moderately aggregate level - by geography types and provinces - leading to a less concentrated community arrangement. For instance, the Western Cape province has 36 enumeration areas identified as urban formal. Hence, the enumeration areas are more likely to be dispersed within the province. The dispersed enumeration areas ensure that the IV neither reflects any community effects nor the infrastructural problem of any specific area. Second, the model estimations in the paper extensively control for regional characteristics which includes availability of bus/taxi/train, shop, primary/secondary school and hospital/clinic within 30 minutes (2 km) of the household, dummy for metropolitan areas, and geography types and provincial fixed effects. Additionally, as an infrastructural control, the household wealth index considers the availability of infrastructure to the households, such as piped water, improved fuel like gas and electricity for cooking, lighting and heating. The extensive

use of community level control variables is expected to minimize the effect of community level unobservables through IV.

Moreover, it can be argued that regional median travel time to welfare offices does not determine the everyday time allocation of individuals *unless* the individuals decide to apply for the grant. Individuals have no reason to go to welfare offices regularly. However, individuals may go to welfare office if they apply for other state welfare grants such as old age and disability grants. Therefore, travel time to welfare office may influence individuals' time allocation through receipt of other welfare grants. Nonetheless, in the model estimations, I control for receipt of state old age, disability, or other state welfare grants at the household level.

#### *4.5. Empirical results*

The estimates of the empirical model are reported in Table 3. The marginal effects estimate of the selection model on the likelihood of receiving grants are provided in Table 3, Column 1.

Table 3. Marginal effects of probit selection model and SUR estimates of the impact of child grants on time allocation of eligible single parents aged 20 to 54 years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Probit model (marginal effects)	SNA production work <sup>a</sup>	Household maintenance <sup>a</sup>	Care work <sup>a</sup>	Leisure <sup>a</sup>	Self-care <sup>a</sup>	Other activities <sup>a,b</sup>
Median regional distance to welfare office	-0.01*** (0.003)	-101.0***	125.6***	43.9***	-11.2	0.6	-57.8***
Single mother=1	-0.01 (0.06)	(21.6)	(12.8)	(6.4)	(11.6)	(11.3)	(12.5)
Median regional distance to welfare office X Single mother	0.003* (0.002)						
Grant receipt =1		-64.9* (38.0)	50.9** (24.9)	30.2** (14.9)	-4.9 (37.2)	-47.6 (32.9)	36.3 (37.0)
Grant receipt X Single mother		-51.4** (24.9)	45.4*** (14.3)	15.6** (6.8)	2.4 (12.9)	-18.4 (12.4)	6.4 (14.2)
Age	0.02** (0.01)	17.6*** (4.2)	2.6 (2.9)	-5.4*** (1.6)	-5.2* (2.7)	-0.7 (2.2)	-8.9*** (2.6)
Age-squared	-0.0002** (0.0001)	-0.2*** (0.1)	-0.04 (0.04)	0.05** (0.02)	0.1** (0.04)	-0.002 (0.03)	0.1*** (0.04)
<i>Educational Level (Ref: No school)</i>							
Class 1 to 7	-0.1** (0.05)	59.6*** (18.5)	-0.02 (16.4)	-2.9 (8.8)	-31.9* (16.6)	-17.7 (12.6)	-7.0 (15.7)
Class 8 to 11	-0.04 (0.04)	64.9*** (17.6)	3.3 (15.6)	-5.0 (8.2)	-18.2 (15.6)	-33.8*** (12.3)	-11.2 (14.9)
Above class 11	-0.08* (0.05)	96.0*** (20.1)	3.9 (16.7)	-1.2 (9.3)	-25.5 (16.5)	-52.9*** (13.4)	-20.4 (15.8)
<i>Marital Status (Ref: Never married)</i>							
Widowed/divorced/separated	0.004 (0.03)	-2.0 (14.0)	1.2 (10.1)	-0.4 (6.6)	-11.4 (9.1)	5.8 (9.6)	6.8 (10.9)
Living with a partner, but not married	0.01 (0.02)	-7.1 (11.5)	17.0** (7.2)	9.2** (4.3)	6.0 (6.5)	-1.5 (6.6)	-23.6*** (6.8)
African=1	0.1 (0.04)	1.3 (25.1)	-1.9 (16.5)	0.7 (7.7)	-27.1** (12.4)	22.4 (14.4)	4.7 (13.4)
Individual had a typical day =1		80.9***	27.6**	-1.4	-4.6	-80.8***	-21.6*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Probit model (marginal effects)	SNA production work <sup>a</sup>	Household maintenance <sup>a</sup>	Care work <sup>a</sup>	Leisure <sup>a</sup>	Self-care <sup>a</sup>	Other activities <sup>a,b</sup>
Family Income (Ref: R0 to 500)		(12.9)	(10.7)	(9.8)	(9.8)	(13.1)	(11.5)
501 to 1500	-0.04 (0.03)	67.9*** (11.9)	-6.7 (9.1)	-2.2 (5.8)	-10.1 (7.8)	-25.1*** (8.0)	-23.5*** (9.8)
1501 to 2500	-0.01 (0.03)	119.6*** (14.4)	-26.2*** (9.5)	-11.2* (6.2)	-14.5* (8.7)	-41.2*** (8.8)	-26.5*** (9.8)
2501 to 4500	-0.04 (0.04)	101.7*** (16.8)	-14.6 (11.4)	-10.0 (7.2)	-17.3* (10.4)	-30.6*** (10.3)	-29.1*** (11.2)
4501 to 8000	-0.2*** (0.05)	88.6*** (27.3)	27.0 (16.8)	6.8 (11.4)	-29.1* (15.7)	-75.2*** (17.9)	-18.1 (16.9)
8001 and above	-0.4*** (0.1)	-2.5 (31.7)	52.4** (21.4)	30.9 (21.0)	-27.2 (25.3)	-43.0 (28.3)	-10.6 (28.7)
Average of normalized wealth index	-0.1** (0.1)	-44.2 (40.6)	-34.5 (22.6)	8.1 (12.9)	187.8*** (18.6)	-87.5*** (19.9)	-29.6 (23.6)
Household has income from remittance	-0.1*** (0.03)	-121.4*** (12.8)	51.6*** (11.2)	8.2 (6.4)	29.9*** (9.3)	2.8 (11.0)	28.9** (13.8)
Household has income from unemployment fund	0.04 (0.1)	-61.9 (66.9)	92.5* (50.9)	17.7 (24.9)	-67.6*** (25.1)	-53.3** (22.6)	72.6 (57.7)
Household has income from other state welfare grant	-0.04* (0.02)	-73.0*** (11.6)	26.7*** (7.7)	6.5 (4.3)	10.8 (6.8)	10.9 (6.6)	18.0** (7.2)
Average number of children aged 0 to 5 years	0.1*** (0.01)	-4.9 (5.7)	-5.4 (3.6)	15.5*** (2.6)	-4.5 (3.9)	0.8 (4.2)	-1.6 (4.1)
Average number of children aged 6 to 10 years	0.1*** (0.01)	-7.5 (6.2)	7.1* (3.9)	-4.3* (2.4)	2.1 (4.3)	2.0 (3.8)	0.7 (4.5)
Average number of children aged 11 to 17 years	0.1*** (0.01)	-0.6 (5.6)	-1.5 (3.8)	-6.1*** (2.2)	-0.1 (3.5)	3.3 (3.2)	4.9 (3.9)
Average female household members of age 18 years and older	0.02* (0.01)	11.6* (6.1)	-22.0*** (3.6)	-7.6*** (2.3)	5.4 (3.3)	9.1*** (3.4)	3.5 (3.5)
Average male household members of age 18 years and older	0.02 (0.01)	-14.3*** (5.4)	2.1 (3.2)	4.5 (3.2)	3.1 (2.9)	2.4 (3.3)	2.2 (3.5)
Household has given interview in English/Afrikan/Zulu/Xhosa	-0.01 (0.03)	-16.0 (19.1)	10.7 (9.9)	7.4 (6.9)	6.3 (10.3)	16.7* (8.8)	-25.1** (10.0)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Probit model (marginal effects)	SNA production work <sup>a</sup>	Household maintenance <sup>a</sup>	Care work <sup>a</sup>	Leisure <sup>a</sup>	Self-care <sup>a</sup>	Other activities <sup>a,b</sup>
Has bus/train/taxi within 30 minutes (2 kilometer)	0.04 (0.03)	39.3** (17.3)	-7.4 (11.5)	-5.5 (6.6)	-12.7 (9.5)	-5.1 (8.8)	-8.6 (11.0)
Has primary/secondary school within 30 minutes (2 kilometer)	0.01 (0.03)	-33.1** (13.8)	7.9 (8.9)	2.2 (5.1)	12.0 (7.6)	5.4 (6.9)	5.6 (8.7)
Has hospital/clinic within 30 minutes (2 kilometer)	0.01 (0.02)	12.5 (10.8)	-6.7 (6.6)	-12.3*** (4.1)	-3.0 (6.3)	5.9 (6.0)	3.5 (6.3)
Has shop within 30 minutes (2 kilometer)	0.005 (0.02)	-1.1 (11.6)	-9.7 (7.9)	6.2 (4.1)	3.5 (6.3)	-0.2 (6.3)	1.3 (7.3)
Metropolitan area = 1	-0.1*** (0.03)	1.2 (17.2)	3.4 (11.1)	15.4*** (5.5)	23.1** (9.1)	0.2 (9.8)	-43.3*** (10.5)
Constant	...	-212.2** (88.4)	9.6 (61.6)	117.2*** (33.8)	228.0*** (54.5)	896.5*** (49.3)	400.8*** (54.1)
Observations	4,558	4,558	4,558	4,558	4,558	4,558	4,558
Geography type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diary day FE	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>Correlation of errors, <math>\rho</math>:</i>							...
Probit selection model	1	0.1	-0.2**	-0.2**	0.04	0.3**	...
SNA production work	...	1	-0.5***	-0.2***	-0.4***	-0.3***	...
Household maintenance	...	...	1	0.1***	-0.03	-0.1***	...
Care work	...	...	...	1	-0.1***	-0.2***	...
Leisure	...	...	...	...	1	-0.03	...
Self-care	...	...	...	...	...	1	...

<sup>a</sup> For definition of activities check footnote in Table 2.

<sup>b</sup> The equation for other-activities is dropped during the full information maximum likelihood estimation to impose the restrictions on the system coefficients. The coefficients related to other activities are calculated using the conditions discussed in the section of empirical model. Hence,  $\rho$  estimates for the other activities are also not available.

<sup>c</sup> Standard errors are in parentheses.

<sup>d</sup> \*\*\*, \*\* and \* denote level of significance at 1%, 5% and 10% respectively.

<sup>e</sup> Estimates are survey weight adjusted.

Table 3, Column 1 shows that distance to the welfare office is significant in determining the likelihood of successful grant application. As expected, the longer travel time (distance) makes the grant application expensive and is likely to reduce the likelihood of grant receipt. The regional median travel time to the welfare office decreases the likelihood of grant receipt by 1 percentage points. The marginal estimates of probit model also suggests that the likelihood of getting the grant is higher for single mothers than single fathers. This result indicates, single mothers are more likely the primary caregivers of the children and hence, more likely to apply for grants. The significance of the interaction ( $F \times Z$ ) shows single mothers are 0.3 percentage points more likely to receive grant even with increasing travel time to the welfare office as compared to single fathers.

In the system of joint estimation of time allocation equations and probit selection model, the disturbances capture the unobservables and are correlated by  $\rho_{ae}$  and  $\rho_{ra}$ . The correlation coefficients,  $\rho_{ae}$ , in Table 3 shows that the disturbances across the activities are all negatively correlated, except for the positive correlation between the disturbances of household maintenance and care work. The negative correlations of the disturbances across activities indicate that any unobservables increasing the time spent on one activity must be compensated by decreasing the time spent on other activities. As such, the negative  $\rho_{ae}$  aligns with the time trade-off model. Instead, household maintenance and care work go hand in hand; any unobservables increasing time in household maintenance is likely to increase time in care work. Single parents performing household maintenance may do more care work because they are trying to meet the needs of the household members entirely.

Furthermore, the correlation coefficients,  $\rho_{ra}$ , in Table 3 shows that the disturbance of the selection equation is correlated with disturbances of the equations describing the time spend in household maintenance, care work and self-care (Col, 3,4, and 6). The correlations of disturbances of grant receipt with household maintenance and care work are negative 0.2. But, the correlation of disturbances of grant receipt with self-care is positive 0.3.

The correlation coefficients related to household maintenance and care work indicate that unobservables increasing the time in household maintenance and care work reduces the likelihood of grant receipt. In case of self-care, the unobservables which increases the time in self-care also

leads to an increase in successful grant application. There are various reasons for grant non-application such as, lack of right documentation (e.g. birth certificate), misinformation regarding the application process, lack of knowledge regarding child grants as well as grant application are complicated and time-consuming (Zembe-Mkabile et al. 2012; South African Social Security Agency, Department of Social Development, and The United Nation's Children Fund 2011; Department of Social Development, South African Social Security Agency, and The United Nation's Children Fund 2016; Godfrey et al. 2016).

Some primary caregivers fail to apply due to their demanding work schedule. Successful grant application may require multiple visits to the grant office, which makes it harder for the parents or caregivers to apply and succeed when they lack effective childcare support at home. If parents are time constrained from lack of household and childcare support it is likely that the higher the time the caregiver allocate to household maintenance and childcare, the likelihood of grant receipt reduces. Moreover, the caregiver who allocates less time in work and have additional time to spend in self-care are likely to be less time constrained than the caregivers who have higher work burden and hence, are time squeezed. Due to availability of flexible time, the caregivers who has more time to be allocated in self-care can manage to gather information on grant application and successfully finish the application process.

The key results are the estimates of the equations describing the time allocation presented in Table 3, Column 2-7. The results in Table 3 suggest some interesting patterns. The estimates show a strong negative income effect of child grants - receiving a grant reduces the SNA production work of the single parents. I find that the grant receipt decreases mean SNA production work by 64.9 minutes per day of single fathers and 116.3 minutes per day of single mothers. These correspond to 22.5 percent and 61.5 percent reduction respectively.

By contrast, the results in Table 3 suggest a reinforcing effect of grant receipt on caregiving. The grant receipt mainly increases the time allocated to household maintenance and care work. More specifically, single fathers and mothers living in grant recipient households increase time allocated to household and care work by 81.1 minutes and 142.1 minutes per day, respectively. In other words, single fathers and mothers in the grant recipient households spend 72.2 percent and 62.8

percent more time in household maintenance and care work than those in grant non-recipient households.

Interestingly, even though grant receipt reduces the mean time from SNA production work, receiving child grants increases the total mean work time of single parents. The estimates in Table 3 show that, for single fathers and mothers, the net effect of grant receipt on work burden is an increase in work time of 16.2 and 25.8 minutes per day, respectively. This increase in work time is equivalent to an increase of 3.4 percent and 5.4 percent of work time for single fathers and mothers, respectively. The single parents balance their net increase in work time by distributing their time-cut in small magnitude across other non-work activities. The time-cuts in small magnitudes lead to no significant reduction of time from any particular non-work activities.

From the analysis of this paper, it is not possible to identify the channels for the negative effect of child grants on SNA production work and rather, a positive effect of child grants on household maintenance and care work time of single parents. One possibility may be that given that the primary focus of the unconditional child welfare grant is to boost the human capital of children in poor families, caregivers receiving a grant may prefer to stay at home and provide quality care. They would rather not work in informal jobs or subsistence production as those jobs are low-paid, low-quality and mostly lack job securities. Caregivers spending more time in household production or spending time with children is likely to increase children's wealth through improved nutrition, hygiene, and health. Existing evidence shows that CSG improves children's educational and nutritional outcomes and reduces the likelihood of child labor (see: Case, Hosegood, and Lund 2005; Williams 2007; South African Social Security Agency, Department of Social Development, and The United Nation's Children Fund 2011; Department of Social Development, South African Social Security Agency, and The United Nation's Children Fund 2012). In the grant recipient households, primary caregivers may then regard it as a high priority to invest time in attending to the needs of children and help them succeed in the future. Hence, caregivers' meticulous supervision of the children increases their time in household maintenance and care work. However, it is beyond the scope of this study to explore this channel.

Lastly, the results in Table 3 also show a disproportionate effect of child grants on the time-use of single mothers vis-a-vis fathers. Even though, in general grant receipt reduces single parents' time in SNA production work, the reduction in market time is 51.4 minutes more for single mothers than single fathers. Additionally, mothers and fathers disproportionately redistribute the additional time from lower SNA production work to household maintenance and care work. Due to grant receipt, single mothers increase their domestic work time by 45.4 minutes and care work time by 15.6 minutes more than single fathers. This difference may reflect the effect of gender norms; evidence suggests that even given the additional benefits provided by CSG, women remain largely responsible for domestic work in South Africa (Patel and Hochfeld 2011).

### *Robustness and Sensitivity Analysis*

I perform robustness tests to confirm the results in Table 3 based on two subsamples. First, I limit the sample of eligible single parents to include the singles who are never married, widowed, separated and divorced (R=2160 and NR=1004). In this sample I do not consider the individuals who are living together as partners but are not married. The individuals living together as partners can help each other in taking care of household and care work, as well as can share the income. Instead, the individuals who are raising children as never married, widowed, separated or divorced are vulnerable and have less help available in raising their kids. Second, I limit the sample to younger cohort of age 20 – 45 years who are likely to face the highest time constraints (R=2770 and NR=1283). In both the cases, I expect, because the first subsample of individuals has little available help from partners and the second subsample of the individuals are young and have higher time constraint, the effect of the grant on SNA production work, household maintenance and care work maybe more pronounced in the restricted subsamples.

Table 4 presents the result of the robustness tests. The findings in Table 4 in two subsamples is quite consistent. The results show a similar pattern as in Table 3, grant receipt leads to a significant decrease in SNA production work, and an increase in household maintenance and care work. The net effects of grant receipt on work time of never married, widowed, separated and divorced single fathers and single mothers are an increase of 10.5 and 60.1 minutes per day, respectively (Panel A). The substantive increase in work time for single mothers of 60.1 minutes indicates that in the

absence of any help from a partner, single mothers end up doing more work. They not only do more SNA production work, but also do more household maintenance and care work than those who have partners living with them.

Additionally, the net effects of grant receipt on work time of single fathers and single mothers of age 20-45 years are an increase of 19.8 and 25 minutes per day, respectively (Panel B). The single parents balance their increase in work time by reducing their time across various non-work activities, leading to no significant negative effect on any particular activity. Additionally, the effect of child grants on SNA production work and, household maintenance and care work are disproportionate by single fathers and mothers. Single mothers living in the grant recipient household spend less time in SNA production work and more time in household maintenance and care work as compared to the single fathers. Overall, the net effect of grant receipt on the time allocation is consistent across Table 3 and 4.

Table 4. Summary of the robustness test results - marginal effects of probit selection model and SUR estimates of the impact of child grants on time allocation

	(1)	(1)	(2)	(3)	(4)	(5)	(5)
	Probit selection model (marginal effects)	SNA production work <sup>a</sup>	Household maintenance <sup>a</sup>	Care work <sup>a</sup>	Leisure <sup>a</sup>	Self-care <sup>a</sup>	Other activities <sup>a</sup>
<b>A. Limit eligible single parents sample to those who are never married, widowed, separated and divorced<sup>b</sup></b>							
Regional median distance to welfare office	-0.01*** (0.003)						
Single mother=1	0.06 (0.07)	-34.0 (31.1)	77.9*** (16.9)	32.1*** (9.6)	-15.1 (17.2)	3.2 (14.2)	-64.0*** (19.5)
Regional median distance to welfare office X Single mother	0.002 (0.002)						
Grant receipt =1		-123.8** (61.8)	82.7*** (29.1)	51.6*** (19.4)	10.7 (41.4)	-50.2 (34.3)	28.9 (51.2)
Grant receipt X Single mother		-49.2 (33.5)	32.8* (19.4)	16.8* (9.4)	10.0 (18.5)	-12.2 (15.9)	1.8 (20.5)
Observations	3164	3164	3164	3164	3164	3164	3164
Geography type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diary day FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>B. Limit age of the eligible single parents sample to 20 to 45 years<sup>c</sup></b>							
Regional median distance to welfare office	-0.01*** (0.003)						
Single mother=1	-0.03 (0.1)	-110.7*** (23.6)	134.3*** (12.9)	47.9*** (7.3)	-4.5 (13.9)	0.5 (12.7)	-67.5*** (13.6)
Regional median distance to welfare office X Single mother	0.003* (0.002)						

	(1)	(1)	(2)	(3)	(4)	(5)	(5)
	Probit selection model (marginal effects)	SNA production work <sup>a</sup>	Household maintenance <sup>a</sup>	Care work <sup>a</sup>	Leisure <sup>a</sup>	Self-care <sup>a</sup>	Other activities <sup>a</sup>
Grant receipt =1		-75.8* (41.6)	63.5** (24.7)	32.1* (18.0)	-18.8 (54.7)	-42.6 (42.0)	41.6 (44.3)
Grant receipt X Single mother		-55.7** (26.9)	44.1*** (14.4)	16.8** (7.6)	3.2 (14.0)	-15.8 (13.4)	7.5 (15.1)
Observations	4053	4053	4053	4053	4053	4053	4053
Geography type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diary day FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

<sup>a</sup> For definition of activities check footnote in Table 2.

<sup>b</sup> Full results are provided in Appendix D, Table D1.

<sup>c</sup> Full results are provided in Appendix D, Table D2.

<sup>d</sup> Standard errors are in parentheses.

<sup>e</sup> \*\*\*, \*\* and \* denote level of significance at 1%, 5% and 10% respectively.

<sup>f</sup> Estimates are survey weights adjusted.

## 5. Conclusion

This study examines the impact of unconditional child grants on gendered time allocation of single parents across SNA production work, domestic work, care work, leisure, self-care, and other activities in South Africa. SNA production work includes not only paid market work, but also takes into account job search, informal work and subsistence production. While the labor market effect of child grants and subsidies has been studied extensively, to the best of my knowledge, no study has examined the impact of grants and subsidies on time allocation, a factor critical to individuals' welfare. Additionally, it is important to study the time allocation of child-rearing single parents, who are particularly resource and time constrained.

The results using 2010 South African Time Use Survey suggest that the receipt of child grants has a strong negative effect on SNA production work and a reinforcing positive effect on caregiving. Interestingly, the findings highlight that a reduction in SNA production work is nonetheless associated with an overall increase in the total work time of single parents. However, the increase in total work time does not have any significant negative impact on leisure, self-care and other activities as single parents distribute their time-cuts in small portion across different non-work activities. Additionally, the results also show, single mothers living in the grant recipient households reduce their time in SNA production work and increase their time in household maintenance and care work more so than single fathers.

Finally, the findings in this paper reveal that the evaluation of welfare grants should not be limited to assessing the variation only in income and consumption. From the analysis of this paper it is evident that child welfare programs certainly have the potential to shift caregivers' time allocation. However, it is crucial to understand the pattern of this time redistribution to minimize any adverse effects of social grants on individual well-being. The reinforcing effect of the child grants on caregiving and the overall increase in work time not only increases stress and fatigue but also may worsen the intrahousehold inequalities inherent to division of labor. Women may end up increasing their household maintenance and care work and decreasing SNA production work more so than men. Therefore, care grants and subsidies need to be carefully designed considering not only its

effect on labor supply and catchall leisure, but also looking into other possible time allocation effects.

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## Appendix A

Table A1. Eligibility Criteria for receiving Child Support, Foster Care and Child Dependency Grants in 2010

Qualification	Child Support Grant	Care Dependency Grant	Foster Care Grant
Primary Caregiver	E.g. parent, grandparent or a child over 16 heading a family	A parent, primary caregiver or a foster parent appointed by the court	Orphaned, Abandoned, Neglected, Abused or Child at risk are placed in your custody by court
Citizenship	South African citizen/permanent resident	A South African citizen or permanent resident	Must be a South African citizen, permanent resident or refugee
Income as of 01 April, 2010	Single: Annual Earning less than R30000 (R2500 per month) Married: Combined income less than R60000 (R5000 per month)	Single: Annual earning less than R129600 (R10850 per month) Married: Combined Annual earning less than R259200 a year (R21600 per month) <i>**Income limit does not applied to foster parents</i>	-----
Child Age	Under 18	Under 18	Under 18 (under 21 if student)
Child enrollment/care status	Not be cared for in a state institute	Not be cared for permanently in a state institution	Legally placed in the care of caregiver
Child accommodation	Stay with caregiver who is not paid for looking after the child	Have a severe disability and need full-time and special care. The child must be cared for at home.	Must remain in the care of caregiver in South Africa
Support Amount as of 01 April, 2016	R250 per month	R1080 per month	R710 per month
Note:	Cannot get this grant for more than six children who are not recipient/applicant's biological or legally adopted children.	Both you and the child must live in South Africa.	-----

Source: South African Social Security Agency (Statistics South Africa 2013) and Social Security Administration and International Social Security Association (2011)

## Appendix B

Table B1. Participation rates and average time spent (conditional on participation) of eligible single parents living in the grant recipient households, by sex

Activities	Single mothers		Single fathers		t-test	
	Participation rate <sup>a</sup>	Average minutes <sup>b</sup> (minutes/per day)	Participation rate <sup>a</sup>	Average minutes <sup>b</sup> (minutes/per day)	Differences in participation rate <sup>a</sup> (Single mothers – Single fathers)	Differences in average minutes <sup>b</sup> (Single mothers – Single fathers)
<b>A. Living in the grant recipient household (R)</b>						
SNA production work <sup>c</sup>	30.6	310.3	57.1	451.8	-26.4***	-141.5***
Household maintenance <sup>c</sup>	96.8	279.7	73.1	148.0	23.7***	131.7***
Care work <sup>c</sup>	61.3	119.3	14.8	97.8	46.4***	21.5**
Leisure <sup>c</sup>	87.8	188.0	88.9	195.6	-1.1	-7.6
Self-care <sup>c</sup>	100.0	703.7	100.0	721.4	0.0	-17.7**
Other activities <sup>c</sup>	70.2	188.4	74.7	219.1	-4.5*	-30.6***
<b>B. Living in the grant non-recipient household (NR)</b>						
SNA production work <sup>c</sup>	43.4	435.3	60.4	477.8	-17.1***	-42.5***
Household maintenance <sup>c</sup>	95.3	237.2	77.2	145.5	18.1***	91.7***
Care work <sup>c</sup>	50.2	126.9	14.8	110.4	35.4***	16.6***
Leisure <sup>c</sup>	86.9	197.4	86.2	202.5	0.7***	-5.1***
Self-care <sup>c</sup>	100.0	686.7	100.0	699.6	0.0	-13.0***
Other activities <sup>c</sup>	62.8	163.7	72.7	203.8	-9.9***	-40.1***

<sup>a</sup> The percentage of grant recipient single mothers and fathers who have performed at least 10 minutes of the activity on the diary day.

<sup>b</sup> The average minutes are calculated conditional on participation, i.e. for those who have performed at least 10 minutes of the activity on the diary day.

<sup>c</sup> For definition of activities check footnote in Table 2.

<sup>d</sup> \*\*\*, \*\* and \* denote level of significance at 1%, 5% and 10% respectively.

<sup>e</sup> Statistics are survey weight adjusted.

## Appendix C

Table C1. Marginal effects of the probit model testing the relationship between IV and grant receipt

	(1)	(2)	(3)	(4)	(5)
	IV constructed from GHS 2008			IV constructed from GHS 2007	
	Without control	With individual controls	With individual and household controls	All controls (individual, household and regional)	Grant receipt (R)
Regional median travel time to welfare office	0.01*** (0.001)	0.01*** (0.001)	0.003*** (0.001)	-0.01*** (0.002)	-0.01*** (0.003)
Observations	4558	4558	4558	4558	4558
Geography type FE	No	No	No	Yes	Yes
Provincial FE	No	No	No	Yes	Yes
Diary day FE	No	No	No	No	No

<sup>a</sup> Standard errors are in parentheses.

<sup>b</sup> \*\*\*, \*\* and \* denote level of significance at 1%, 5% and 10% respectively.

<sup>c</sup> Estimates are survey weights adjusted.

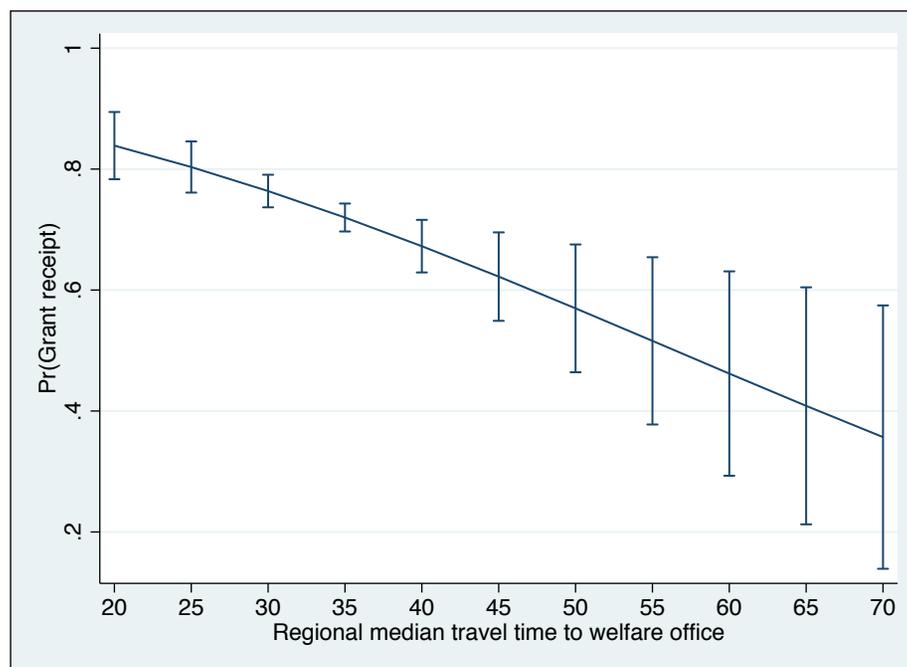


Figure C1. Adjusted Predictions with 95% confidence interval of the impact of the instrument (constructed from GHS 2008) on grant receipt

## Appendix D

Table D1. Marginal effects of probit selection model and SUR estimates of the impact of child grants on time allocation of eligible single parents (never married, widowed, separated and divorced) aged 20 to 54 years

	(1) Probit model (marginal effects)	(2) SNA production work <sup>a</sup>	(3) Household maintenance <sup>a</sup>	(4) Care work <sup>a</sup>	(5) Leisure <sup>a</sup>	(6) Self-care <sup>a</sup>	(7) Other activities <sup>a,b</sup>
Regional median distance to welfare office	-0.01*** (0.003)						
Single mother=1	0.06 (0.07)	-34.0 (31.1)	77.9*** (16.9)	32.1*** (9.6)	-15.1 (17.2)	3.2 (14.2)	-64.0*** (19.5)
Regional median distance to welfare office X Single mother	0.002 (0.002)						
Grant receipt =1		-123.8** (61.8)	82.7*** (29.1)	51.6*** (19.4)	10.7 (41.4)	-50.2 (34.3)	28.9 (51.2)
Grant receipt X Single mother		-49.2 (33.5)	32.8* (19.4)	16.8* (9.4)	10.0 (18.5)	-12.2 (15.9)	1.8 (20.5)
Age	0.01 (0.01)	15.7*** (4.8)	7.9*** (3.0)	-5.5*** (1.9)	-5.4* (3.2)	0.3 (2.3)	-13.0*** (3.1)
Age-squared	-0.0002* (0.0001)	-0.2** (0.1)	-0.1*** (0.04)	0.1** (0.03)	0.1* (0.05)	-0.03 (0.03)	0.2*** (0.04)
<i>Educational Level (Ref: No school)</i>							
Class 1 to 7	-0.1* (0.05)	61.2*** (20.3)	3.7 (20.6)	-2.3 (10.6)	-46.5** (20.7)	-11.7 (15.2)	-4.5 (19.6)
Class 8 to 11	-0.1 (0.05)	75.2*** (18.5)	3.9 (19.6)	-4.0 (9.9)	-27.8 (19.2)	-39.4*** (14.9)	-8.0 (18.6)
Above class 11	-0.1** (0.05)	106.3*** (22.3)	2.5 (20.8)	5.0 (11.4)	-34.8* (20.1)	-59.7*** (16.2)	-19.3 (20.0)
<i>Marital Status (Ref: Never married)</i>							
Widowed/divorced/separated	0.02 (0.03)	-10.8 (14.8)	-1.8 (10.2)	-1.2 (6.9)	-8.1 (9.6)	11.2 (9.6)	10.7 (11.3)
African=1	0.1*** (0.04)	23.0 (28.0)	-14.6 (20.4)	-18.6* (9.6)	-19.1 (14.8)	24.1 (16.0)	5.1 (17.2)
Individual had a typical day =1		65.8***	29.0**	2.5	2.7	-85.2***	-14.8

	(1) Probit model (marginal effects)	(2) SNA production work <sup>a</sup>	(3) Household maintenance <sup>a</sup>	(4) Care work <sup>a</sup>	(5) Leisure <sup>a</sup>	(6) Self-care <sup>a</sup>	(7) Other activities <sup>a,b</sup>
		(14.5)	(12.5)	(11.9)	(11.3)	(15.6)	(13.4)
Family Income (Ref: R0 to 500)							
501 to 1500	-0.04 (0.03)	50.1*** (13.6)	-10.8 (10.8)	1.1 (5.6)	0.1 (8.5)	-25.9*** (8.7)	-14.6 (11.0)
1501 to 2500	-0.03 (0.03)	113.1*** (17.1)	-35.8*** (11.6)	-7.3 (6.3)	-8.0 (9.8)	-43.4*** (9.8)	-18.5 (11.8)
2501 to 4500	-0.05 (0.04)	102.9*** (20.2)	-29.6** (14.0)	-15.7** (7.5)	-5.8 (12.0)	-30.3*** (11.4)	-21.5 (13.5)
4501 to 8000	-0.1** (0.05)	93.4*** (34.8)	12.7 (19.9)	13.2 (14.4)	-19.0 (18.8)	-73.0*** (20.0)	-27.3 (19.1)
8001 and above	-0.3*** (0.1)	-40.8 (40.1)	35.9 (24.5)	35.7 (26.6)	-0.9 (27.6)	-23.2 (30.8)	-6.6 (35.5)
Average of normalized wealth index	-0.1 (0.01)	-53.2 (48.2)	-29.6 (28.2)	13.2 (14.0)	162.6*** (22.4)	-76.4*** (22.5)	-16.6 (30.4)
Household has income from remittance	-0.1*** (0.03)	-121.5*** (16.4)	56.3*** (13.4)	8.0 (6.5)	41.3*** (10.5)	10.0 (11.7)	5.9 (16.1)
Household has income from unemployment fund	0.07 (0.1)	-12.9 (81.2)	93.9* (52.1)	24.2 (26.6)	-82.8*** (24.8)	-47.2* (25.3)	24.8 (58.6)
Household has income from other state welfare grant	-0.03 (0.02)	-62.8*** (13.6)	21.4** (8.5)	5.5 (4.7)	15.7** (7.8)	8.7 (6.5)	11.6 (7.9)
Average number of children aged 0 to 5 years	0.1*** (0.01)	-0.6 (7.3)	-6.0 (4.0)	13.6*** (3.0)	-4.4 (4.0)	1.0 (4.1)	-3.6 (5.0)
Average number of children aged 6 to 10 years	0.1*** (0.01)	-7.5 (7.6)	4.8 (4.2)	-4.8* (2.9)	2.1 (4.7)	1.9 (3.9)	3.5 (5.3)
Average number of children aged 11 to 17 years	0.1*** (0.01)	2.6 (6.9)	-2.6 (4.0)	-9.6*** (2.5)	0.1 (3.9)	3.7 (3.4)	5.8 (4.6)
Average female household members of age 18 years and older	0.02 (0.01)	10.5 (6.9)	-17.9*** (4.0)	-7.3*** (2.3)	1.7 (3.6)	8.4** (3.6)	4.6 (4.1)
Average male household members of age 18 years and older	0.02 (0.01)	-5.7 (6.1)	-4.1 (3.5)	4.1 (3.8)	2.9 (3.3)	3.1 (3.5)	-0.2 (3.9)
Household has given interview in English/Afrikan/Zulu/Xhosa	-0.01 (0.04)	0.3 (23.9)	5.1 (12.6)	1.8 (8.7)	-2.8 (12.4)	17.6* (10.5)	-22.0* (13.1)

	(1) Probit model (marginal effects)	(2) SNA production work <sup>a</sup>	(3) Household maintenance <sup>a</sup>	(4) Care work <sup>a</sup>	(5) Leisure <sup>a</sup>	(6) Self-care <sup>a</sup>	(7) Other activities <sup>a,b</sup>
Has bus/train/taxi within 30 minutes (2 kilometer)	0.02 (0.04)	65.7*** (19.0)	-15.1 (14.0)	-11.7 (7.7)	-18.8 (11.8)	-4.5 (10.0)	-15.7 (13.8)
Has primary/secondary school within 30 minutes (2 kilometer)	0.01 (0.03)	-28.1* (16.0)	2.2 (11.1)	11.6** (5.6)	7.3 (9.2)	0.1 (8.1)	6.9 (10.6)
Has hospital/clinic within 30 minutes (2 kilometer)	0.02 (0.02)	2.3 (12.9)	-10.0 (7.9)	-13.5*** (4.7)	-2.7 (7.9)	13.4* (6.9)	10.6 (7.8)
Has shop within 30 minutes (2 kilometer)	0.001 (0.02)	1.8 (13.6)	-8.5 (9.0)	8.3 (5.1)	2.7 (7.8)	-10.7 (7.5)	6.4 (8.8)
Metropolitan area = 1	-0.1*** (0.03)	7.4 (19.9)	14.8 (13.0)	23.8*** (6.4)	23.6** (11.3)	-20.4* (10.6)	-49.2*** (13.2)
Constant	...	-258.8*** (100.2)	-26.0 (66.0)	118.2*** (41.6)	234.3*** (66.7)	914.6*** (55.1)	457.7*** (65.3)
Observations	3164	3164	3164	3164	3164	3164	3164
Geography type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diary day FE	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>Correlation of errors, <math>\rho</math>:</i>							
Probit selection model	1	0.2	-0.3***	-0.4***	-0.04	0.3**	...
SNA production work	...	1	-0.5***	-0.2***	-0.3***	-0.3***	...
Household maintenance	...	...	1	0.1***	-0.03	-0.1***	...
Care work	...	...	...	1	-0.1	-0.2***	...
Leisure	...	...	...	...	1	-0.04	...
Self-care	...	...	...	...	...	1	...

<sup>a</sup> For definition of activities check footnote in Table 2.

<sup>b</sup> The equation for other-activities is dropped during the full information maximum likelihood estimation to impose the restrictions on the system coefficients. The coefficients related to other activities are calculated using the conditions discussed in the section of empirical model. Hence,  $\rho$  estimates for the other activities are also not available.

<sup>c</sup> Standard errors are in parentheses.

<sup>d</sup> \*\*\*, \*\* and \* denote level of significance at 1%, 5% and 10% respectively.

<sup>e</sup> Estimates are survey weight adjusted.

Table D2. Marginal effects of probit selection model and SUR estimates of the impact of child grants on time allocation of eligible single parents aged 20 to 45 years

	(1) Probit model (marginal effects)	(2) SNA production work <sup>a</sup>	(3) Household maintenance <sup>a</sup>	(4) Care work <sup>a</sup>	(5) Leisure <sup>a</sup>	(6) Self-care <sup>a</sup>	(7) Other activities <sup>a,b</sup>
Regional median distance to welfare office	-0.01*** (0.003)						
Single mother=1	-0.03 (0.1)	-110.7*** (23.6)	134.3*** (12.9)	47.9*** (7.3)	-4.5 (13.9)	0.5 (12.7)	-67.5*** (13.6)
Regional median distance to welfare office X Single mother	0.003* (0.002)						
Grant receipt =1		-75.8* (41.6)	63.5** (24.7)	32.1* (18.0)	-18.8 (54.7)	-42.6 (42.0)	41.6 (44.3)
Grant receipt X Single mother		-55.7** (26.9)	44.1*** (14.4)	16.8** (7.6)	3.2 (14.0)	-15.8 (13.4)	7.5 (15.1)
Age	0.03** (0.01)	18.9*** (6.5)	1.1 (4.3)	-7.9*** (2.6)	1.9 (4.0)	-0.2 (3.8)	-13.8*** (4.4)
Age-squared	-0.0004** (0.0002)	-0.2** (0.1)	-0.02 (0.1)	0.1** (0.04)	-0.03 (0.1)	-0.01 (0.1)	0.2*** (0.1)
<i>Educational Level (Ref: No school)</i>							
Class 1 to 7	-0.06 (0.06)	63.7*** (23.0)	-2.7 (16.9)	-6.8 (11.6)	-21.9 (15.8)	-22.8 (15.7)	-9.6 (18.2)
Class 8 to 11	0.002 (0.05)	69.8*** (21.5)	3.9 (16.2)	-10.4 (10.8)	-8.2 (14.8)	-39.3*** (14.9)	-15.8 (17.2)
Above class 11	-0.04 (0.06)	97.2*** (23.4)	6.2 (17.2)	-5.8 (11.5)	-15.2 (15.9)	-56.9*** (15.8)	-25.4 (18.0)
<i>Marital Status (Ref: Never married)</i>							
Widowed/divorced/separated	-0.004 (0.03)	-11.2 (16.2)	7.4 (11.4)	-3.1 (8.5)	-11.9 (9.7)	8.6 (12.0)	10.2 (12.3)
Living with a partner, but not married	0.01 (0.02)	-2.1 (12.2)	17.2** (7.2)	7.4 (4.6)	4.3 (6.8)	-4.2 (6.9)	-22.6*** (7.1)
African=1	0.05 (0.03)	-7.4 (27.6)	10.7 (15.7)	2.3 (8.5)	-24.2* (13.3)	16.3 (15.0)	2.4 (13.8)

	(1) Probit model (marginal effects)	(2) SNA production work <sup>a</sup>	(3) Household maintenance <sup>a</sup>	(4) Care work <sup>a</sup>	(5) Leisure <sup>a</sup>	(6) Self-care <sup>a</sup>	(7) Other activities <sup>a,b</sup>
Individual had a typical day =1		77.1*** (14.0)	31.3*** (11.2)	-1.1 (11.4)	-7.6 (10.9)	-79.3*** (14.9)	-20.4* (12.1)
Family Income (Ref: R0 to 500)							
501 to 1500	-0.04 (0.03)	67.1*** (12.6)	-1.5 (9.8)	-1.6 (6.7)	-5.3 (7.9)	-25.1*** (9.0)	-33.6*** (9.7)
1501 to 2500	-0.03 (0.03)	113.8*** (15.1)	-21.0** (10.3)	-11.4 (7.1)	-9.7 (8.7)	-40.5*** (9.7)	-31.2*** (10.4)
2501 to 4500	-0.05 (0.04)	104.7*** (17.9)	-12.6 (12.1)	-11.2 (8.1)	-13.5 (11.2)	-32.9*** (11.3)	-34.5*** (11.9)
4501 to 8000	-0.1*** (0.05)	87.2*** (28.2)	33.2* (17.5)	6.1 (12.6)	-29.0* (16.6)	-79.0*** (19.4)	-18.6 (18.0)
8001 and above	-0.4*** (0.1)	3.9 (33.2)	55.5** (22.3)	33.5 (23.2)	-34.9 (31.8)	-39.5 (31.9)	-18.6 (32.1)
Average of normalized wealth index	-0.1** (0.1)	-44.9 (43.0)	-31.0 (23.5)	7.5 (13.9)	190.1*** (19.7)	-84.0*** (21.2)	-37.6 (24.3)
Household has income from remittance	-0.1*** (0.03)	-115.9*** (13.9)	49.1*** (12.2)	8.3 (7.0)	24.8** (11.5)	0.9 (12.1)	32.7** (14.1)
Household has income from unemployment fund	0.02 (0.1)	-62.8 (70.1)	112.3** (47.8)	22.5 (26.7)	-66.4*** (25.6)	-57.9** (22.9)	52.2 (56.6)
Household has income from other state welfare grant	-0.04* (0.02)	-59.2*** (12.4)	22.0*** (8.0)	7.2 (4.7)	7.3 (7.4)	4.5 (7.0)	18.2** (7.6)
Average number of children aged 0 to 5 years	0.1*** (0.01)	-2.1 (6.0)	-6.3* (3.7)	16.4*** (2.9)	-5.7 (5.2)	0.7 (5.0)	-3.0 (4.7)
Average number of children aged 6 to 10 years	0.1*** (0.01)	-9.8 (6.5)	6.5 (4.1)	-4.9* (2.7)	3.4 (5.1)	2.3 (4.3)	2.6 (4.8)
Average number of children aged 11 to 17 years	0.1*** (0.01)	3.8 (6.0)	-4.8 (3.8)	-7.0*** (2.5)	0.4 (4.4)	4.0 (3.7)	3.7 (4.3)
Average female household members of age 18 years and older	0.02 (0.01)	11.8* (6.5)	-21.7*** (3.7)	-8.2*** (2.5)	4.8 (3.6)	9.1** (3.6)	4.2 (3.7)
Average male household members of age 18 years and older	0.02 (0.01)	-19.4*** (5.6)	3.7 (3.3)	5.7 (3.5)	5.0 (3.1)	3.9 (3.6)	1.2 (3.7)
Household has given interview in	-0.01	-7.9	8.8	7.5	1.3	16.4*	-26.2**

	(1) Probit model (marginal effects)	(2) SNA production work <sup>a</sup>	(3) Household maintenance <sup>a</sup>	(4) Care work <sup>a</sup>	(5) Leisure <sup>a</sup>	(6) Self-care <sup>a</sup>	(7) Other activities <sup>a,b</sup>
English/Afrikan/Zulu/Xhosa	(0.03)	(20.6)	(10.2)	(7.5)	(10.5)	(9.4)	(10.4)
Has bus/train/taxi within 30 minutes (2 kilometer)	0.04 (0.04)	43.2** (18.7)	-15.0 (12.3)	-6.5 (7.3)	-13.0 (10.4)	-0.8 (9.5)	-7.9 (11.8)
Has primary/secondary school within 30 minutes (2 kilometer)	0.01 (0.03)	-32.2** (14.8)	7.5 (9.2)	2.5 (5.6)	12.4 (8.2)	5.9 (7.3)	3.9 (9.3)
Has hospital/clinic within 30 minutes (2 kilometer)	0.01 (0.02)	19.5* (11.5)	-9.0 (6.8)	-13.8*** (4.5)	-5.3 (6.4)	3.7 (6.4)	5.0 (6.5)
Has shop within 30 minutes (2 kilometer)	-0.0004 (0.02)	-3.2 (12.3)	-7.6 (7.8)	7.7* (4.6)	2.4 (6.9)	-1.1 (6.7)	1.8 (7.6)
Metropolitan area = 1	-0.1*** (0.03)	0.9 (18.5)	10.9 (11.6)	16.1*** (6.2)	19.1* (10.1)	1.2 (10.4)	-48.2*** (10.9)
Constant	...	-223.9* (116.3)	4.9 (77.5)	152.7*** (45.2)	122.9* (66.2)	887.6*** (66.5)	495.7*** (72.7)
Observations	4053	4053	4053	4053	4053	4053	4053
Geography type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diary FE	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>Correlation of errors, ρ:</i>							
Probit selection model	1	0.1	-0.3***	-0.3**	0.1	0.3	...
SNA production work	...	1	-0.5***	-0.2***	-0.4***	-0.3***	...
Household maintenance	...	...	1	0.1***	-0.04	-0.1***	...
Care work	...	...	...	1	-0.1**	-0.2***	...
Leisure	...	...	...	...	1	-0.02	...
Self-care	...	...	...	...	...	1	...

<sup>a</sup> For definition of activities check footnote in Table 2.

<sup>b</sup> The equation for other-activities is dropped during the full information maximum likelihood estimation to impose the restrictions on the system coefficients. The coefficients related to other activities are calculated using the conditions discussed in the section of empirical model. Hence,  $\rho$  estimates for the other activities are also not available.

<sup>c</sup> Standard errors are in parentheses.

<sup>d</sup> \*\*\*, \*\* and \* denote level of significance at 1%, 5% and 10% respectively.

<sup>e</sup> Estimates are survey weight adjusted.