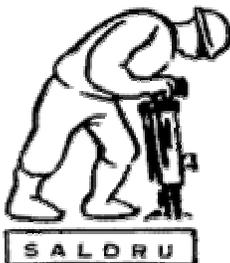University of Cape Town

CENTRE FOR
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INTEGRATION INTO THE SOUTH AFRICAN CORE ECONOMY – HOUSEHOLD LEVEL COVARIATES

Sten Dieden

CSSR Working Paper No. 54

SALDRU

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Integration into the South African Core Economy – Household Level Covariates

Abstract

The aim of this paper is to further improve the understanding of income generation among the formerly underprivileged and often impoverished majority of households in South Africa. This study uses household survey data for the analysis of households' integration into the South African core economy. The emerging picture of household income generation is one that disputes common perceptions of the multitude of means by which African households are assumed to generate their income. The majority of households rely to a large extent on one income source and one income earner. Verbal contextual information and descriptive statistics justify the estimation of separate multinomial logit models for urban and non-urban households with the probabilities for having either of five main income source categories as outcomes. Results from the regression analyses indicate that prominent covariates of low core-economy integration are earners who are female, either old or young earners of working-age, who have low levels of education. A non-urban household's location in either a former "homeland" or in an agriculturally or commercially developed area yields disparate implications for the main income source probabilities. The study also finds associations between main income sources and households' demographic compositions which are compatible with findings in previous research on both private transfer behaviour and endogenous household formation in South Africa.

1. Introduction

This paper analyses variation in South African households' income sources as a process associated with households' location, income earner characteristics and demographic composition. The relevance of income sources to South African household welfare can be illustrated by two findings that often recur in research on poverty and inequality in the country. Firstly, it is widely recognised that, compared to less destitute households, poor households derive larger shares of their income from transfer incomes, which are often found to be either remittances sent by migrant family members or public pensions (Van der Berg 2000). Secondly, access to *wage* income has been found to be a powerful catalyst in avoiding poverty and is a crucial explanatory factor in income inequality

(Carter and May 1999; Leibbrandt, Woolard, and Woolard 2000; Leibbrandt and Woolard 1999; Leibbrandt, Woolard, and Bhorat 2000; Van der Berg 2000).

Perhaps the most common route to the microeconomic analysis of household income generation in less developed countries is through some version of the "Agricultural household model" (Nakajima 1970; Singh, Squire and Strauss 1986). In the basic model, prices and household endowments of land and labour enter as givens and output encompasses *inter alia* the household's optimal allocation of its labour-time between farming activities and freely available off-farm employment opportunities.[1]

The applicability of that approach to South Africa is questionable, given the country's legacy of apartheid era policies which generated spatially uneven economic development with *inter alia* institutionalised labour migration in the African population. The same population group was, as of 1914, also denied rights of landownership outside of "reserves" (Wilson and Ramphele 1989). Consequently, peasant agriculture in the rural non-White population became virtually absent (Bundy 1988). As places of work and permissible permanent residence for the African population were often separated by large distances, many African rural dwellers were also barred from labour market participation (Klasen 2000). Hence, the agricultural household model's assumptions regarding unrestricted allocations of labour do not adequately match the conditions of South Africa.[2]

This paper does not seek to articulate a complete model for the allocation of income sources in the South African setting; rather it seeks to identify characteristics of households that can explain variation in their modes of income generation. In a country where dependence on, for example, transfer or wage income appears to vary with income levels (Leibbrandt, Woolard, and Bhorat 2000; Van der Berg 2000), the identification of the aforementioned characteristics would facilitate the targeting of public transfers for poverty alleviation, as well as provide empirical guidance for the development of theories that attempt to explain why some households are constrained in their generation of income.

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[1] Neither intra-household sharing of resources nor the question of the exact nature of the decision process that underlies the optimal allocation of household labour to various activities are trivial. Gary Becker's (1965) representation of the "unitary" household presupposes a benevolent household head that induces members to act so as to maximise the combined welfare. Objections to such notions have been raised by Varley (1996). Seminal work on intra-household resource allocation has been completed by Haddad and Kanbur (1990) and Thomas (1990).

[2] Versions of the agricultural household model that incorporate circumstances specific to agricultural households in Southern Africa have been developed by Low (1986).

While the study is not entirely dissimilar in scope from other investigations (May *et al* 1995; Lipton, de Klerk, and Lipton, 1996; Carter and May, 1999; Posel, 2001; Leibbrandt and Woolard, 2001), it augments previous research in several ways. Firstly, the quantitative analyses draw on the finding that a considerable fraction of households derive the bulk of their income from one income source. The historical legacies referred to previously also justify this study's core-periphery approach to household income generation, whereby households' income sources are classified according to their association with the South African core economy. Secondly, the concentration and classification of income sources warrants an approach whereby households' allocation of income source *categories* is analysed, rather than the more common investigation of households' average shares of income from various origins (see Ellis 2000).

Methodology is the final means by which this analysis contributes to the literature. The process of allocating income sources is analysed through the estimation of the probability of households holding main income sources from each specific category, as associated with a group of household level explanatory variables. Probability models are further estimated separately for households in rural and urban areas through two multinomial logit regression frameworks.

The paper proceeds in the following manner. The next section introduces Statistics South Africa's 1995 *October Household Survey* (OHS 95) data and explains how this study's sample is constructed based on the applied definition of a main income source. There exist several historical reasons to expect households' access to wage income or dependence on transfer incomes to be related to microeconomic factors.

Section 3 therefore provides information about the context in which household characteristics would have assumed their impact on main income variation in South Africa. Section 4 relates the agricultural household model to the previous section, presents and explains the classification of main income source categories. A discussion based on descriptive statistics in Section 5 provides an informal assessment of the representivity of the main income source concept and provides an income level and labour market context. Section 6 then discusses determinants and considerations from previous research. Section 7 introduces the empirical model and the explanatory variables that will be used to compute the probabilities for households of holding a particular main income source. The results from regression analyses and simulations are presented in Section 8. Finally, conclusions are drawn in Section 9.

2. The data, sample delimitation and main income source definition

In October 1995, Statistics South Africa conducted questionnaire-based interviews on a wide range of living standard issues with almost 30 000 households, representing all households in the country and containing nearly 131 000 inhabitants. Two months later, almost 28 585 of the same households were revisited in a more detailed investigation of their incomes and expenditures. These two surveys are often referred to as the *October Household Survey* and *Income and Expenditure Survey 1995* (henceforth "OHS/IES 95"). In the two surveys, a household is defined as "a person or a group of people dependent on a common pool of income who normally occupy a dwelling unit or a portion thereof and who provide themselves with food or the necessary supplies or arranged for such provision." A member resides four nights a week in the household. All analyses in this study, subsequent to Table 1, are furthermore conducted with the supplied IES95 household weights renormalised to sum to unity (see Deaton 1997).[3]

For the multivariate analyses in this study, a sub-sample consisting of 15 441 households that met three criteria was selected. As a first criterion, only African and coloured households are examined, as these are over-represented among low-income households and would face similar historical legacies.[4] Since the quality of the information on individuals' labour market characteristics were greater in the OHS module than in the IES module, it was deemed desirable to extract that information from the former. Households in the two data sets are easily matched, but individuals are not. The second criterion therefore requires that all earners in a household must be identified in both surveys. By this criterion, 6.9% of the households that met with the first criterion were dropped from analyses.

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[3] The sample for the two surveys was stratified by province, urban and non-urban area and population group. Altogether, 3 000 enumerator areas (EAs) were drawn as primary sampling units, within each of which ten households were visited. The data concerning households were weighted by the estimated number of households in each stratum and, in accordance with instructions from Statistics South Africa, the set of weights with the Income and Expenditure Survey are applied here, as the two surveys are being linked. (Statistics South Africa 1996, 1997a, 1997b).

[4] Apartheid policies defined four main "racial classifications"; African, coloured, Asian/ Indian and white. The discrimination by race ran through all aspects of life and had tremendous effects on everyone's living standards. For these reasons official statistics in South Africa still apply "racial" categories, and here the same approach will be followed (referring to the same categories as "population groups").

Table 1 Delimited sample after selection criteria

Sample	Number of households	Share of total revisited sample	Share of African and Coloured revisited households
Total OHS/IES sample	28 585	100.0	
Above African and Coloured	22 366	78.2	100.0
Above with all earners identified	20 834	72.8	93.1
Above with a main income source	15 441	54.0	69.0

Source: OHS/IES95, own computations, unweighted figures.

Finally, the focus will be on the households that have a *main income source*. A main income source can be defined by the fraction of total income originating from that source. A main income source will be defined by a cut-off contribution set at 66.7%. The sample delimitation process is illustrated in Table 1. Table 2 shows households with numbers of main income earners by main income definitions by various cut-off contribution levels.

Table 2 Households with numbers main income earners by main income definitions, various cut-off contributions levels

Main income's contribution to total household income	Share of households with a main income source	Number of contributors to main income			Total
		1	2	3 or more	
50%	89.2	72.7	22.8	4.5	100.0
66.7%	74.1	71.9	23.3	4.8	100.0
75%	67.1	71.5	23.6	4.9	100.0
90%	48.8	72.2	23.2	4.6	100.0
100%	27.1	74.6	21.7	3.7	100.0

Source: OHS/IES95, own computations, weighted figures.
Note: n= 20 834

The second row of Table 2 shows that almost 75% of the households that met criterion 2 (identification in both data sets) had an income source that contributes 66.7% or more to total monthly income. From the right hand side of the table it can be seen that in more than 70% of the households, the main income is earned by one member, and in almost 25% of the households, two earners jointly raise

the main income. The consecutive rows also show that the latter fractions are quite robust to where the cut-off line is drawn.

Two other observations are especially noteworthy. Firstly, the figures in the second column show that almost half the households raise 90% or more of their income from one source category and secondly, more than one-quarter of the households derive *all* their income from one source. Thus, almost regardless of the defining contribution of a main income source, households seem to rely to a large extent on *a single source of income* and on *one or very few earners*.

The magnitude of the fraction of households that do *not* rely on a main income source, but are *diversified* in terms of pecuniary income sources, obviously also depends on how such reliance is defined. One important typology in the literature revolves around whether diversification takes place out of necessity ("for survival") or arises out of opportunities for choice ("for accumulation") - see Ellis (2000) for an extensive review of diversification-related research. Analogously, the issue arises whether reliance on a main income source is associated with constraints to expanding income generation among destitute households or whether it is a deliberate choice among better-off households. This issue is not analysed here but Dieden (2004) using the same data set, analyses the impact of main income sources on household income levels as compared to diversified households. The literature recognises a multitude of motives for livelihood diversification (Ellis 2000), but the identification of such motives is not the objective of this paper.

3. Contextual information and income sources

Compared to the rest of the continent, perhaps the most divergent features of income generation among African and coloured households in South Africa are the generally very small contributions from agricultural income and the historically entrenched, widespread dependence on transfer incomes among rural African families (Reardon, 1997; Jooma, 1991). This section introduces briefly, the historical setting in which complex interlinkages originate between current geographical locations, institutional legacies, and households' demographic and assets endowments, all of which could relate strongly to modes of income generation.

3.1 The migration labour system and land policy

Income generation among large parts of South Africa's non-white population cannot be explained outside of the historical context of racial segregation, dispossession of land rights, and forced removals inherent in what came to constitute the "migrant labour system" under the apartheid era (Nattrass 1981; Wilson and Ramphele 1989; Lester 2000). At the heart of the system was a predominating 'closed-compound system', the roots of which extend back to the vast mineral discoveries in the 1860s, whereby mine workers were required to live in closed and guarded barracks on the mining premises, without their families and with few opportunities for leave. Similar practices soon spread to other migrant-receiving sectors and as a consequence, cash remittances from migrant workers is an historically entrenched and an important source of income for rural African families (Jooma 1991).

The components of the migrant labour system were however complemented by a battery of laws that further inhibited the landownership and settlement rights of Africans. By virtue of the *1913 Natives Land Act*, the bulk of South African land was reserved for white ownership only. By the same act, Africans were denied rights of residence except during work contracts outside designated "reserves" which were the only areas where Africans were allowed to farm their own land. Massive forced relocation of Africans took place in these mostly non-developed areas, amounting to 13% of the total land area, where initially agricultural conditions were often absent or soon deteriorated due to high population densities (Wilson and Ramphele 1989).[5]

As time passed, the exclusionary land practices became an all-encompassing system in both rural and urban areas. When the apartheid programme was instituted by the *Afrikaner National Party* in 1948, "influx control" into the urban areas of "white" South Africa became even tighter and from the 1960s, Africans were officially considered citizens of the "reserves" (by that time relabelled "tribal areas", "homelands" or "Bantustans"). The general economic and environmental degradation of the former "homelands" ensured that households there became even more dependent on remittances and continued to send members to provide cheap labour for the major employers elsewhere in South Africa (Lester 2000; Bundy 1988).

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[5] In the early twentieth century commercial forms of labour tenancy and sharecropping still prevailed in some instances. However, in the course of the first half of the century, commercialisation of white farming and increasing land segregation led to the demise of these practices (Lester 2000).

The migration of many of the working-age men from the "tribal areas" also resulted in a "peculiar (and quite unnatural) household structure" (Wilson and Ramphele 1989: 41), where children, the elderly and women were vastly overrepresented.[6] Interlinked with many of the migrants spending most of their earnings in the economy's core areas, the process was one of increasing spatially uneven economic development with a highly inequitable distribution of employment opportunities (Wilson and Ramphele 1989).[7]

3.2 Labour market performance and earnings towards the end of the apartheid era

Coupled with the migration and settlement regulations, a battery of laws also undermined the African and coloured population's access to education, ability to increase their wages, and their upward mobility in the labour market. These obstacles rendered the population group confined to poorly paid, low-skilled employment. Following a series of strikes in the early 1970s, an official recognition of African labour rights came to signify an important shift in economic power, in the wake of which followed some improvements in the wages for African workers (Bhorat *et al* 2001).

The first oil shock in 1973 caused a period of economic decline from which the South African economy is still trying to recover. Economic growth rates fell below population growth rates and *per capita* income declined by 15% from 1974 to 1993. Due to the economic stagnation, unemployment rates increased and were further augmented by distorted relative costs of (often subsided) capital and labour, which led to increased mechanisation, the consequences of which were particularly grave for rural African wage employment in agriculture (Bhorat, Hodge and Dieden 1998; Bhorat *et al* 2001) Accordingly, analyses of microdata from the early 1990s attest to high poverty and unemployment rates as well as widespread dependence in both urban and rural areas on transfer incomes (SALDRU 1994*;* World Bank 1995).

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[6] Wilson and Ramphele (1989) refer to a study of a migration-wise not very intensive area in KwaZulu-Natal where 81% of the residents aged 20-50 were women.

[7] The persistence of oscillating migration and sustained residence by large fractions of the African population group in the formerly designated areas after the abolition of migration regulations in 1986 appears puzzling. A variety of explanations have however been offered among which one finds lack of employment opportunities in rural areas, high costs of relocation to areas of employment, poor access to the urban labour markets, and shortage of housing in the "black" urban residential areas (Murray 1987; Jooma 1991).

4. Theory and South African households' sources of income

To a large extent it was apartheid that strangled opportunities for the non-white population to raise non-remuneration income from land, capital and entrepreneurship. While both private and public transfers were and are common, it should be kept in mind that private remittances are directly related to economic growth; and public transfers at any point in time would depend on government policies of redistribution (Bhorat *et al* 2001). The South African literature consequently distinguishes, by one set of labels or another, between at least four broad groups of household income sources: private transfers, public transfers, self-employment, and wage income (May *et al* 1995; Carter and May 1999; Leibbrandt, Woolard, and Woolard 2000; Leibbrandt and Woolard 1999; Leibbrandt, Woolard, and Bhorat 2000; Van der Berg 2000).

For an illustration of the relationship between the South African macroeconomic performance, employment generation, and income distribution, Bhorat *et al* (2001) suggest a decomposition of the South African *labour force* into three categories by sector of employment as defined according to access to the "modern consumer economy", i.e. those employed in the core consumer economy, the marginal modern sectors and the peripheral labour force. The first category consists of "the dominant high-wage modern sectors of manufacturing, government services, and other industries and services" excluding mining. The "marginal modern sector" includes "the low wage sectors of commercial agriculture and domestic services, as well as mining"; the authors acknowledge that mining is no longer a low-wage sector. The "peripheral labour force" encompasses those raising their livelihoods from subsistence agriculture, the informal sector and the unemployed.

The above discussion suggests that income generation opportunities for South African households may be portioned along a core-periphery dimension. Given the large dependence on one or few income earners among the households in the sample, the labour force category of household's (main) income earners will be considered tantamount to the origin of the household's main income source. Hence, through the application of a classification similar to the above, households' main income source categories are classified as either the "core" sectors, the "marginal" sectors or of a "peripheral" nature.[8]

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[8] For analyses of the relationship between rural South African households' entitlements and choices of resource allocations, May *et al* (1995) use a different household data set and apply nine different "livelihood strategy classes", some of which resemble the main income source categories applied here.

Conceptual deviations from the classification by Bhorat *et al* (2000) are that wage income from the mining sector is considered "core", as are "capital income" and "self-employment income", while "peripheral income" is raised by earners that are not employed, of which the unemployed are a subset. The two non-core origins are furthermore each divided into two subcategories. Thus, here, the "core" sectors include all sectors *except the primary sectors and domestic services*, each of which constitute separate subcategories under "marginal sectors", whereas "private transfers" and "public transfers" are the two subcategories of "peripheral" income sources. The details on the income source categories follow in as close approximation as possible to the wording in the IES95 questionnaire:[9]

Income originating from the core economic sectors (henceforth "core sector income")**:** Salaries and wages[10] from secondary sectors, including mining and quarrying, private services, public services, and residual "other" sectors. *Self-employment income* in the form of net profit from business or professional practice/activities conducted on a full time basis. *Capital income* from the letting of fixed property, royalties, interests, dividends and annuities is also included.

Primary sector income: salaries and wages as above from agriculture, fishing, and forestry.

Domestic services income: salaries and wages from private households.

Private transfers: alimony, maintenance and similar allowances from divorced spouses or family members living elsewhere and regular allowances from family members living elsewhere.

Pensions and public transfers: pensions resulting from own employment, old age and war pensions, social pensions or allowances in terms of disability grants, family and other allowances, or from

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[9] The category of households without a main income are defined by none of their income sources contributing 66.7% or more to their total household incomes. The same category also includes households relying on "indirect income" derived from [i] hobbies, side-lines, part-time activities, or the sales of vehicles, property etc; [ii] payments received from boarders and other members of the household; [iii] the pecuniary value of goods and services received by virtue of occupation; [iv] gratuities and lump sum payments from pension, provident and other insurance or from private persons; [v] 'other income' withdrawals, bursaries, benefits, donations and gifts, bridal payment or dowries and all 'other income'.

[10] The "salaries and wages" concept includes bonuses and income from over time, commissions and directors fees, part-time work and cash allowances in respect of transport, housing and clothing.

funds such as e.g. the Workmen's Compensation, Unemployment Insurance, Pneumoconioses and Silicosis funds.

5. Main income sources in an earnings and labour market context

To provide rationale for the impending multivariate analyses, this section discusses four aspects of the social relevance of the main income concept based on descriptive statistics. Firstly it is shown how the distribution of main income sources differs in *urban and non-urban areas*. Secondly, the relationship between households' main income sources and *the income distribution* is discussed. Thereafter, there is a discussion of the extent to which the main income source is *representative of households' total income generation activities*. Finally, *individuals' labour market statuses* are related to their households' main income source.

5.1 Urban and non-urban main income sources

For the historical reasons referred to in the previous section, one would expect access and the distribution of households across main income sources to differ between the rural and urban samples, but not due to a higher prevalence of agricultural activities in rural areas, as is the case elsewhere in sub-Saharan Africa. On that subject, it has been noted by Leibbrandt *et al* (2000) that the IES95 data do not adequately capture agricultural activities for own consumption. In this study's sample, 8.3% of all households were recorded with either slaughtered domestic animals or harvested crops in the year preceding the interview. Profit from agricultural activities should be registered in the IES questionnaire under "self-employment", but only 1.1% of the households that had slaughtered animals or harvested crops had records of *any* self-employment profits at all.

The above figures presumably understate the importance of agriculture, which according to May (1996), assumes several important functions as *inter alia* a supplementary source of nutrition and as a safety net for vulnerable households in South Africa. But left with little choice other than taking the data at face value, agricultural production is not treated as a separate source of income.

Since the term "rural" has an intuitive connotation of agricultural activities, which is thus quite misleading in this context the term "non-urban" will henceforth be applied to areas not within municipal boundaries or that by other

means fail to meet the Statistics South Africa definition of "urban".[11] Table 3 shows the distribution of main income sources in the two sub-samples. As can be seen, *core sector income is much more prevalent in the urban than in the non-urban sample*, with 75.8% and 41.6% of the households in each sample respectively. Further, urban main income sources are considerably more *concentrated* around either core sector or public transfers main incomes, which together account for more than 90% of the households. Rural households are more reliant on public sector and private sector transfers than their urban counterparts; with the respective rural shares being 27.5% and 14.4%. These are nearly twice and four times as large as their counterparts in urban areas. Clearly, location is a key factor in explaining core sector integration.

Table 3 Distribution of main income source categories in the sample, by location

Main income source category	Urban	Non-urban	Total
Core sectors	75.8	41.6	58.7
Primary sectors	1.4	13.6	7.5
Domestic services	3.6	2.9	3.3
Public transfers	15.2	27.5	21.3
Private transfers	4.0	14.4	9.2
Total	100.0	100.0	100.0
N	7893	7548	15441

Source: IES/OHS 95, own computations, weighted figures.

5.2 Main income sources and the income distribution

The positions of this study's households in the income distribution are illustrated in Tables 4 and 5. These tables show the separate distributions of non-urban and urban households across ten household income brackets according to the households' main income sources. The brackets are defined by the cut-off income levels of the *full* IES95 sample's household income deciles. Accordingly, the figures in the tables can be read as for example 22.1% of this study's non-urban households that have a primary sector main income, fall into the first decile of the income distribution in the full population of households (as represented by the IES95 sample). Before turning to the analyses of the figures in these two tables, it

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[11] In addition, the sometimes very high population densities found in "rural" areas of South Africa raises doubts as to the appropriateness of the terminology. On this matter, Mabin (1989) defines "rural slums" as the many areas that were 'urban' in respect of their population densities but 'rural' in respect of [the absence of] proper urban infrastructure or service".

should be noted that the fraction of households in the four lower deciles in the non-urban areas is nearly twice that of the urban.

Table 4 Distribution of main income source categories among non-urban households, by household income deciles

Non-urban households	Main income source category					All non-urban households
Income bracket	Marginal sources		Peripheral sources		Core sectors	
	Primary Sectors	Domestic service	Public transfers	Private Transfers		
1	*22.1*	*33.7*	*24.4*	*34.3*	3.7	17.2
2	*19.1*	*18.9*	*35.5*	*21.1*	3.6	17.4
3	**23.9**	**17.4**	**13.3**	**20.0**	7.1	13.2
4	13.6	13.1	18.8	10.3	10.2	13.1
5	11.0	9.4	5.1	6.8	**17.8**	11.6
6	5.8	4.1	1.6	4.9	**17.7**	9.4
7	3.3	1.6	0.8	2.2	**15.9**	7.6
8	1.0	1.6	0.2	0.2	**13.0**	5.7
9	0.2	0.0	0.3	0.2	7.5	3.3
10	0.0	0.4	0.0	0.0	3.3	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: IES/OHS 95. Own computations. Weighted figures. Note: N=7845

Table 5 Distribution of main income source categories among urban households, by household income deciles

Urban households	Main income source category					All urban households
Income bracket	Marginal sources		Peripheral sources		Core sectors	
	Primary Sectors	Domestic service	Public transfers	Private transfers		
1	**20.6**	**27.6**	**26.8**	**39.2**	1.7	8.2
2	**18.2**	**15.1**	**24.8**	**17.3**	2.3	7.0
3	**14.8**	**20.7**	**14.6**	**18.0**	5.0	7.7
4	14.5	17.0	19.7	10.4	7.5	9.9
5	12.6	9.3	7.0	7.0	**12.7**	11.5
6	6.7	7.2	2.8	3.4	**16.1**	13.1
7	10.4	2.8	2.0	2.8	**17.7**	14.1
8	0.2	0.4	0.9	0.5	**17.5**	13.4
9	1.0	0.0	1.0	1.0	13.5	10.4
10	1.0	0.0	0.3	0.3	6.3	4.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: IES/OHS 95, own computations, weighted figures. Note: N=7893

A common trend in both areas is that roughly 65% of the households with core sector main income sources are found in the fifth to eighth deciles, whereas similar or larger fractions of households with other main income sources are found in the first to third deciles. Moreover, the concentration of non-core households in the two lower deciles is higher in non-urban areas and especially dense for the peripheral main income sources. We see that clear links seem to exist between low household income levels and low core economy integration as assessed by main income sources.

5.3 Main income sources as representative of households' income generation

Tables 6 and 7 provide impressions of how representative the main income source is of a household's total income generation. The first table shows the distribution of the number of additional, *non*-main income sources in the final sample and Table 7 displays the distribution of the number of contributors to individual households' main income earners in the sample.

Table 6 Number of additional, regular sources of income, by main income source category

Number of additional regular sources of income	Main income source category					
	Core sector	Marginal sources		Peripheral sources		Total
		Primary sector	Domestic services	Public transfers	Private transfers	
0	84.2	92.8	90.3	92.5	96.4	88.0
1	13.7	7.0	9.5	7.0	3.5	10.7
2	1.8	0.2	0.0	0.4	0.1	1.2
3 or more	0.2	0.1	0.2	0.0	0.0	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source OHS/IES95, own computations, weighted figures.
Note: N= 15 442

As can be seen in Table 6, *the vast majority of households do not have another source of regular income*. The only noteworthy deviations are found among households in the core sector and domestic service categories, where additional income are found in 13% and 10% of households respectively. As shown in Table 7, in approximately 70% of the households, the main income is earned by one individual, but deviations from the one-earner pattern are found in the domestic services and private transfers categories, where the corresponding figures are 84% and almost 93% respectively.

Table 7 Number of contributors to main income, by main income source

Number of earners	Main income source category					
	Core sector	Marginal sources		Peripheral sources		Total
		Primary sector	Domestic services	Public transfers	Private transfers	
1	68.8	69.9	84.2	69.9	92.7	71.9
2	25.1	24.4	13.6	27.3	5.9	23.3
3 or more	6.1	5.7	2.2	2.8	1.4	4.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: OHS/IES95, own computations, weighted figures.
Note: n= 15 442

5.4 Labour force participation and the main income source categories

Table 8 shows the distribution of adults across labour market statuses by the main income source of the households in which they live.[12] The left-hand side of the table focuses on the non-participants whereas the right-hand side shows the distribution of participants across the statuses "unemployed", "self-employed" and "employed".

Table 8 Adults' labour force status, by households' main income source

Main income source	Non-participants in labour force				Labour force status among participants				Share of all adults
	Enrolled	Retired	Other	Total	Un-employed	Employed	Self-employed	Sum	
Core	22.7	3.3	13.2	39.2	22.8	72.2	4.9	100.0	60.0
Primary	15.4	0.6	15.9	31.9	15.7	83.9	0.4	100.0	6.2
Domestic	23.5	1.4	8.7	33.7	28.5	71.3	0.2	100.0	2.8
Public tr	23.1	27.5	24.9	75.5	90.7	7.5	1.9	100.0	23.3
Private tr	37.5	1.8	24.7	63.9	94.8	3.6	1.6	100.0	7.6
Total	23.5	8.6	16.9	48.9	33.9	62.2	3.9	100.0	100.0

Source: OHS/IES95, own computations, weighted figures.
Note: n=46514

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[12] This study follows the official Statistics South Africa (1997b) definitions of expanded unemployment (including "discouraged seekers") and economically non-active (henceforth "inactive"). A "child" is defined as 14 years old or younger and the definition of an "adult" follows. The term "working-age" refer to adults below the gender-specific retirement ages (see the section on "Public transfers" below). A "retired" individual is above working age and has been captured with labour force activity status "retired" in the OHS 1995 questionnaire.

The concentration of adults to either core or public transfer households is high at just over 83%. With respect to labour force participation, very large fractions of adults in households with peripheral main income sources do not participate, but the reasons for non-participation differ between the two groups. More than one-third of the adults in the private transfers category are enrolled compared to somewhat less than one-quarter for the public transfers category. The fraction of retired members is of a similar size to that of the enrolled in the latter category but very small in all other main income categories in this sample.

The right-hand side of the table shows evidence of very high (wide) unemployment rates in all households in the sample. The small fraction of labour force participating adults from peripheral income households display dramatically higher unemployment rates – at 90-95% –than do the participants from other households. Also the relatively *low* unemployment rate in primary sector households is noteworthy.

Table 9 Distribution of individuals across households' main income source category, by labour force status

Main income source category	Children	Enrolled	Retired	Other non-participating	Un-employed	Employed	Self-employed	All
Core	56.7	58.1	22.8	47.1	48.1	83.0	91.3	59.5
Primary	5.4	4.1	0.4	5.9	3.8	11.2	0.9	6.1
Domestic	2.8	2.8	0.5	1.4	3.0	4.2	0.2	2.8
Public tr	22.6	22.9	74.7	34.4	29.9	1.4	5.4	23.2
Private tr	12.5	12.2	1.6	11.2	15.1	0.3	2.2	8.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: OHS/IES95, own computations, weighted figures.
Note: n=55464

In order to facilitate the interpretation of the later results, Table 9 displays the distribution of children and adults in the various labour force statuses across their households' main income sources. The shares of children in the various household categories follow closely the distribution of all individuals in the sample. The only exception here is private transfer households where children's share is one-and-half times their fraction of all individuals. The distribution of enrolled adults is similar to that of children, whereas the employed and self-employed are vastly over-represented among households with core sector main incomes.

Retired adults are under-represented everywhere except in households that rely on public transfers, where their fraction is three times that of their share of all individuals, suggesting that households would form around pensions. The under-

representation of retired adults in households that depend on private transfers could imply that such dependence arises in households without neither employed nor elderly among their members. The "Other" category of non-participating adults and unemployed are slightly under-represented among core sector households, whereas the non-participants are over-represented at fractions of one-and-half to two times the fractions of all adults in households with peripheral income sources. Finally, the fraction of unemployed is twice that of the adults in households with private transfers but only slightly larger than the same fraction in public transfer households.

In conclusion thus far, the use of households' main income sources as indicators of integration yields a picture of integration as a partly spatially driven phenomenon, where low integration is associated with low household incomes, low labour force participation and high unemployment rates. Further, while one-quarter of the households that met the first two criteria (population group and identification) did *not* have a main income source, the main income source is of considerable relevance to income generation among the approximately 75% of households that *do* have one. Few households in the latter category have other income sources or other members that derive regular income, making the households also extremely vulnerable to the loss of main income earners or incomes.[13]

6. Determinants and considerations from previous research

In the labour economics literature, the microeconomic determinants of an *individual's* allocation into employment and economic sectors is usually attributed to individual characteristics (see Willis 1986). The same is true for the eligibility for transfer incomes, the targeting of which is often driven by age, disability or parenthood. Given the high reliance on a single individual for the generation of a household's main income, the implications are thus that the *characteristics of household's individual main income earner* (henceforth "earners") are intuitively appealing explanatory factors for variations in main income sources.

In the above descriptive statistics, among different categories of households, the distribution of non-participants in the labour force displayed dissimilar deviations

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[13] In a dynamic perspective, Ardington and Lund (1996) raise a valid objection to the use of a "dominant source of income" for the analysis of rural livelihoods since such sources may be of a temporary nature.

from the overall distribution of individuals. This was particularly true for inactive adults and the unemployed, but also to some extent in the distribution of children. A search for explanatory factors appears warranted also in *the composition of members labour force characteristics in households* as these may reveal varying associations with the probabilities for the different main income sources.

As will be discussed below, the findings from the analyses of the descriptive statistics above, match well with those of the previous literature on income generation in South Africa and elsewhere. A growing body of literature however also suggests that the living arrangements of South African households alter in response to the economic circumstances of individual members, such as access to certain sources of income (Klasen and Woolard 2001; Edmonds, Mammen, and Miller 2003; Keller 2003).

While no attempts are made here to draw inference as to the nature of such intra-household processes, analytical complications may arise if explanatory household size and composition variables are not *statistically* exogenous. For the above reasons, the remainder of this section first reviews some of the relevant determinants of access to certain income sources that have been recognised in previous research. Following that discussion, some findings from research on South African household formation will provide the background for a short discussion of the relevance of statistical endogeneity ("simultaneity") and where it may be expected.

6.1 Unemployment, non-participation, and peripheral income sources

This section examines whether *dependence* on transfer income sources is related to higher unemployment and/or economically non-active statuses among household members. The use of household members' unemployment status as an explanatory factor for main income sources implicitly suggests that unemployment is considered involuntary. In light of the extremely high unemployment rates among households with transfer main income sources and the high concentration of those income sources at the very bottom of the income distribution, the assumption of involuntary unemployment appears reasonable.

As opposed to what will be assumed about unemployment, a healthy working-age adult's *non-participation* in the labour force is assumed an outcome of pre-meditated choice. As pointed out by Sahn and Alderman (1988), an estimated probability of labour force participation is often interpreted as the probability that a wage offer exceeds an individual's reservation wage. That reservation wage

may be subject to influence from *inter alia* household composition variables, such as the number of children in the household. Presumably the relationship between the number of children in the household and the amount of non-employed household labour available to assume responsibilities would also affect the participation decision. Hence, the fractions of children in the household enter as explanatory variables, juxtaposed to the fractions of unemployed and inactive adult non-contributors (henceforth "non-earners") to the total number of adults.[14]

6.2 Employment, core and peripheral sector wage income

Several studies of labour force participation, employment, and earnings have been conducted on South African data that attest to determinants of employment being found among age, experience, gender, education, marital status, and race. (Mwabu and Shultz 2000; Naudé and Serumaga-Zake 2001).A crucial process for this study is the allocation of employed individuals into core and marginal economic sectors. The channels through which individual characteristics would influence this allocation occur through individual expected earnings and reservation earnings (Wambugu 2003). The former would differ across sectors by for example skills requirements.

Economic activities may differ across regions and thereby affect the economic sectors accessible to the household, due to such factors as varying search or commuting costs. Thus in addition to all of the aforementioned determinants and given the spatial discrimination legacies discussed in Section 3, one would also expect location variables to explain variation in main income sources. In addition to the nine provinces of South Africa[15], this study also applies two non-urban "subregions", where economic conditions may differ substantially from each other. The definitions follow official definitions from Statistics South Africa (1997b) and relate to "tribal areas", which should overlap with the former

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[14] Similarly, Sahn and Alderman also draw attention to the fact that the more productive assets (often landholdings) the household possesses, the less likely are household members to engage in wage labour. As mentioned previously, little evidence exists in the data for households' involvement in agricultural production. Variation in access to productive assets is therefore assumed absent across households.

[15] The empirical analyses use dummy variables for all provinces except KwaZulu-Natal which serves as the baseline.

"homelands" referred to in the previous section, and "agricultural or amenities areas".[16]

6.3 Remittances

Income remitted between relatives and friends is known to be common throughout the developing world (Cox and Jimenez 1990) and economic theory encompasses a variety of motives for transfer behaviour (Stark 1995). Much theory around transfers builds on Becker's (1965, 1973, 1974) seminal representations of the "unitary household", in which altruism is a fundamental driving force and both income and resources are allocated so as to maximise the combined welfare of the household.

Posel (2001) highlights however, that over the past two decades a large number of studies have compiled evidence that household relations and allocations are not driven purely by altruism and that household members differ both in interests and powers to implement ambitions. One informative classification of motives for remitting may be divided into "altruism" vs. "trade in an exchange of service with the receivers" (de la Brie *et al* 2002), but several other reasons for remitting that would fall into either one or both of these categories jointly have also been put forward.[17]

Further to South African remittance behaviour, two studies have found a negative impact on private transfers from access to public pensions (Jensen 2002; Case and Deaton 1998). Posel (2001) tests several hypotheses about remittances and estimates the impact on remitted amounts in sole migrant households, from factors such as the resource base of the household (including access to pensions), the composition of the receiving household according to migrant kinships, as well as characteristics of the sender, that reflect the migrant's earnings potential and attachment to the household. The results indicate that a variety of motives spur the sending of remittances. Recognising that remittances are outcomes of highly complex processes, this study restricts explanatory variables to the fraction of

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[16] The label for this sub-region is not official but is intended to abbreviate the Statistics South Africa (1997b) definition "area with farms, agricultural holdings, holiday resorts, agricultural schools and colleges and other rural areas".

[17] De la Brie *et al* (2002) provide a dense review of analyses on various remittance motives such as: insurance motives; the desire to refund the household's past expenditures; investments for the future in prospective inheritance, status or social capital; and the social security motive to remit which is largely driven by parent's age and income. Work discussed by the same authors also show that motives to remit vary between the genders.

children out of household size and earner age which proxy strong covariates in Posel's study.[18]

6.4 Public transfers[19]

The South African social security system is quite unique to the continent. While there are social support programmes to cover other circumstances, the *Old Age Pensions* (OAP) system encompass some 60% of the total social security budget (Budlender 2000). While a means test for eligibility does apply in practice, it is claimed to have little effect or not be binding to African households, and the receivers usually collect the maximum amount (Case and Deaton 1998; Jensen 2002; Ardington and Lund 1995; Bertrand, Miller, and Mullainathan 2000). In order to capture pensioners as prospective earners, the cut off-lines for earner age categories have been drawn to capture the gender specific thresholds for OAP eligibility at 60 years for women and 65 years for men.

6.5 Endogenous household formation

In analyses of the relationship between household formation and income, common practise has until recently been to chiefly perceive living arrangements as exogenous. Several recent findings however suggest that two-way causality may apply to South African household formation and income sources. Edmonds *et al* (2003) provide a number of findings that suggest impacts from income sources on household structures. The first relates to migration, where absent members constitute a defining characteristic of households that rely on private transfers (see also Wilson and Mamphele 1989). However, a process that transplants and expands these demographic characteristics among consecutive generations in the household may arise if younger members are encouraged to migrate due to successful outcomes of the households' previous migration histories. Secondly, Edmonds *et al* (2003) have also found that the income from an OAPs-eligible person in the household may serve to finance younger members' migration.

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[18] Posel finds that the presence of children and grandchildren of the migrant have positive impacts, while the presence of parents has a negative impact on remitted amounts.

[19] Details regarding the historical background, institutional characteristics and practical implementation of the South African OAP can be found in Lund (1992), Van der Berg (1994) and Case and Deaton (1998).

Keller (2003) reports higher prevalence of multi-generational demographic household structures among the poorest forty percent of households, as measured by *per capita* income. On the same note, Edmonds *et al* (2003) find that female, pensions-eligible household heads are more likely to reside with their adult children than with certain other relations. Thus, to the extent that the poor households in Keller's study overlap with the large fraction of households that rely on public transfers in the four lowest *household* income deciles discussed in this study's Section 7, these three findings may jointly suggest that OAPs could instigate multi-generational household formations, especially when pensioners are female.

A growing international literature exists on unemployment and patterns of household formation[20], most studies of which take household formation as exogenous. Klasen and Woolard (2001) use two-stage least squares regression techniques in order to control for causality running from unemployment to household formation around a non-labour income source. The authors find that access to state transfers increases the likelihood of attracting unemployed persons to a household and that unemployed adults reside with their parents longer than do the employed. Consistent with findings also by Bertrand *et al* (2000), Klasen and Woolard furthermore find that households' collection of remittance income, pensions and other non-wage private income is correlated with lower shares of working age adults in labour force participation and employment.[21]

If living arrangements are endogenous to income generation, a reasonable assumption is that the household's income level is a determinant of the number of members the household is capable to support. The exploratory analyses of main income sources in Section 7 again suggest a relationship between households' type of main income source and their income levels. Thus, if income levels determine household size and/or composition and income levels differ with income *sources*, the empirical investigation must involve tests of the simultaneity between income sources and *household size*. Taking into account the suggested generational relationships between private transfers and pensions (public transfers) respectively, there may exist reasons to believe that the *fractions of*

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[20] For example, Atkinson and Mickleright (1991) as well as Arulampulam and Stewart (1995) focus on issues such as the effects on reservation wages among unemployed from the availability of other household resources and Gregg and Wadsworth (1996) and OECD (1998) provide analyses of polarisation of employment and unemployment as a consequence of concentration of unemployed individuals in households with few or no members in employment.

[21] The authors do not apply the main income source concept, but find that 60% of the unemployed in their study live in households where someone is employed and 20% live in households receiving remittances.

children and *unemployed* are endogenous, as well as the fractions of *inactive* members that would contain *inter alia* caretakers of young children.

7. Empirical modelling and explanatory variables

The identification of characteristics of households with different main income sources proceeds through the use of two, five-way multinomial logistic models. It is thus assumed that the probability of a given household, *i*, holding a specific income source, *m*, is a function of its endowment vector of *S* explanatory variables, X_i, and a vector of *income-source specific* parameters, β_m, according to:[22]

$$(1) \qquad \Pr(y_i \cong main\ \ income\ \ category\ \ m) = \frac{\exp(X_i \beta_m)}{\sum_{m=1}^{4} \exp(X_i \beta_m) + 1}$$

$$i = 1,2,...,n \qquad m = 1,...,4$$

where *n* is the sample size. In order for the expression to be uniquely defined, one set of *β*'s (for the core sector category in this case) is normalised to zero. By the vector of explanatory variables, the ensuing probabilities are thus functions of the characteristics that influence a household's access to various types of income.[23] It follows from equation (1) that the marginal effect of explanatory variables on the probability that household *i* has main income source m is given by

$$2) \qquad \frac{\partial \Pr(y_i = m \mid X_i)}{\partial x_s} = \Pr(y_i = m \mid X_i) \left[\beta_{sm} - \sum_{k=1}^{4} \beta_{sk} \Pr(y_i = k \mid X_i) \right]$$

The marginal impact depends thus not only on the change in variable and the coefficient for that variable, but on the level of all other variables as well all the other slope parameters. Consequentially, marginal effects will vary with the variable values at which they are estimated and the sign of the marginal effect

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[22] Long (1997) shows that this model may be derived either as a probability model or a discrete choice model.
[23] Long (1997) refers to Amemiya (1985) who has shown that "under conditions which are likely to apply in practice the implied likelihood function is globally concave, ensuring the uniqueness of ML estimates".

need not match that of the slope parameter. Hence, the individual slope parameters convey little information *per se*. The regression results are therefore presented in marginal effects format for a certain hypothetical household. The output is thereafter complemented with simulation exercises that illustrate the impacts from variables on estimated probabilities for holding the various main income sources.

Based on the exploratory analyses in Section 4 and the discussion of previous findings in the former section, the explanatory variables encompass three sets of variables. The included *earner characteristics* are age, gender and education, where households with several individuals contributing to the main income are incorporated by the use of fractions of earners in each age, gender and education category. *Household characteristics* include race, the number of household members and the fractions of children, unemployed and non-active in labour force out of total household size. Finally, two sets of *geographical variables* capture the provincial differences in economic endowments and the possible impact from residence in the two non-urban "subregions". Summary statistics of the explanatory variables are found in Table 10.

8. Empirical results and simulations

This section consists of two subsections. The first section discusses the regression output and focuses on the general fit of the two estimated models and on the significance of the estimated marginal effects on the probabilities for holding main incomes from the various categories. The marginal effects are computed for a household of six, with two children, one unemployed and two inactive members (in which case the sixth member could be an employed or retired non-main income earner). The household is assumed to reside in KwaZulu-Natal, in a "tribal area" for the non-urban household, with a male earner in the age category 35-69 assumed to have primary education as his highest educational achievement. Strictly speaking the marginal effects of the two models are not directly comparable, since in the rural specification two dummy variables are included for subregions not defined for the urban model.

In the above results, the discrete changes in predicted probabilities that would follow authentic changes in earner or household composition characteristics are not well conveyed.[24] The direction and strength of impact, as well as the absolute

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[24] For instance, if the number of children in a household of five changes from one to two, the fraction of children changes from 20% to 40%, which is more than a marginal change. The change furthermore takes place at the expense of some other household composition fraction, and the total effect is not directly conceivable.

predicted probabilities, associated with changes of the aforementioned nature will therefore be demonstrated by three simulation exercises in the second subsection.

Table 10 Summary statistics of explanatory variables

Variable		Non-urban subsample n=7548		Urban subsample n=7893	
		Mean	*Std.dev*	*Mean*	*Std.dev*
Geography	W Cape	0.04	0.19	0.16	0.37
	E Cape	0.26	0.44	0.13	0.34
	N Cape	0.03	0.17	0.03	0.17
	Free State	0.05	0.23	0.10	0.30
	KwaZulu-Natal	0.21	0.41	0.12	0.32
	NW Province	0.10	0.30	0.07	0.25
	Gauteng	0.02	0.15	0.33	0.47
	Mpumalanga	0.13	0.34	0.03	0.18
	Limpopo	0.17	0.38	0.03	0.17
	"Tribal area"	0.57	0.49	Not defined for urban areas	
	"Agricultural/amenities area"	0.22	0.42		
Earner characteristics	Share of earners female	43.02	44.70	41.19	41.93
	Share of earners in education category: None	28.01	43.61	10.48	29.55
	Share of earners in education category: Primary	45.52	47.92	38.06	45.89
	Share of earners in education category: Secondary	14.76	33.88	24.35	39.69
	* Share of earners in education category: Matric	6.10	22.53	15.85	33.61
	Share of earners in education category: Tertiary	5.63	22.31	11.19	29.79
	Share of earners in age category: ≤24 yrs	3.84	19.22	2.50	15.61
	Share of earners in age category: 25-34 yrs	21.02	38.74	27.33	41.43
	Share of earners in age category: 35-59 yrs	48.81	47.75	53.90	46.56
	* Share of earners in age category: 60-64 yrs	7.08	23.91	4.43	19.29
	Share of earners in age category: ≥ 65 yrs	15.67	34.99	8.24	26.51
Household characteristics	African	0.94	0.24	0.79	0.40
	Household size	4.88	2.72	4.24	2.41
	Share children	30.34	24.38	24.75	22.63
	Share unemployed	9.92	17.29	11.06	18.65
	Share non-active	25.91	24.50	20.38	23.01

* In both samples, the matriculated education category and the 60-64 years old earner category are left out of the regression analyses in order to avoid multi-collinearity

8.1 Regression results and marginal effects

Tables 11 and 12 display the estimated marginal effects on the probabilities for holding main incomes from the various categories. Equation 2) showed that the marginal effects are partly based on estimated slope parameters and on the values of households' explanatory variables. With respect to the estimation of the slope coefficients (see Tables A1 and A2 for detail), Hausman–tests support the assumption of *Independence of Irrelevant Alternatives* for both models and Wald-tests do furthermore not support that combining any two of the defined outcome categories will improve the fit of either model. The pseudo-coefficient of determination in the estimation of the slope parameters take on a larger value for the non-urban subsample at almost 0.46 compared to 0.40 for urban areas.[25]

A further impression of the model's general fit can be derived by studying the estimates in either **bold** or *italics* in the first four columns of Tables 11 and 12 (with at least one addition symbol or asterisk), the *parameter estimates* of which were significant at the 10% level or higher. Just over half the parameter estimates were significant in both subsamples by the aforementioned measure. In both cases, significant estimates were more concentrated in the peripheral main income source categories and in the non-urban core sector households.

In the vertical dimension, the variables in the output are divided into three sections. The middle section of both tables contains the earner characteristics and has the highest prevalence of significant parameter estimates, attesting to the high relevance of earner gender, age and education levels. Based on the hypothetical characteristic endowments of these households, the positive association between non-core income categories and female earners is found among estimated marginal effects for all non-core main income source categories, except for the primary sector in both subsamples. The effects are strongest for the non-urban peripheral sources.

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[25] The R^2 values may to some extent exaggerate explanatory powers, since the null hypothesis that the variable may have no effect on the outcome cannot be rejected for four variables at the 10% level in each model.

Table 11 Multinomial logit marginal effects on estimated probabilities for having main income from categories, non-urban sample

Explanatory variables	Primary Sectors	Domestic Services	Public Transfers	Private Transfers	Core Sectors
Predicted probability	1.5%	0.7%	16.1%	12.0%	69.7%
Geography					
W Cape (d)　　　(x)	0.0097	-0.0039	-0.0418	-0.0744	0.1103
	(0.013)	(0.003)	(0.052)	(0.039)	(0.069)
E Cape (d)	*0.0056 +++*	-0.0033	**0.1100 *****	**0.1902 *****	**-0.3025*****
	(0.008)	(0.002)	(0.037)	(0.053)	(0.040)
N Cape (d)　　　(x)	0.0112	-0.0032	-0.0747	-0.0239	0.0906
	(0.012)	(0.003)	(0.042)	(0.061)	(0.074)
Free State (d)　(xx)	-0.0036	-0.0012	**-0.0694 ****	0.0221	0.0521
	(0.005)	(0.002)	(0.033)	(0.048)	(0.061)
NW Province (d)	0.0059	**-0.0050 ***	**-0.0930 *****	0.0424	0.0497
	(0.007)	(0.003)	(0.032)	(0.028)	(0.042)
Gauteng (d)	**-0.0081 ***	0.0023	-0.0666	**-0.1197 *****	**0.1922 *****
	(0.005)	(0.005)	(0.046)	(0.036)	(0.054)
Mpumalanga (d)	**0.0514 ****	0.0041	**-0.0924 *****	**-0.0577 ****	**0.0945 ****
	(0.025)	(0.003)	(0.030)	(0.026)	(0.046)
Limpopo (d)　　(xx)	*0.0217 ++*	-0.0032	0.0114+	**0.1030 ****	**-0.1330 *****
	(0.020)	(0.002)	(0.030)	(0.045)	(0.048)
Tribal area(d)	**-0.0406 ****	-0.0017	**0.0513 ***	**0.0794 ****	**-0.0884 ***
	(0.018)	(0.003)	(0.027)	(0.032)	(0.049)
Agr/Amnts area (d)	*0.1015 +++*	*0.0138 +++*	*0.0776 ++*	-0.0332	**-0.1598 ****
	(0.084)	*(*0.013)	(0.065)	(0.030)	(0.078)
Earner characteristics					
Share female	-0.0001	**0.0002 ****	**0.0013 *****	**0.0015 *****	-0.0029
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share w/no educ	**0.0003 ****	**0.0001 ****	**0.0039 *****	**0.0013 *****	**-0.0056 *****
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Share w/prim educ	**0.0003 ****	**0.0001 ****	**0.0030 *****	**0.0008 *****	**-0.0042*****
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Share w/ sec educ	**0.0001 ***	**0.0001 ***	**0.0019 *****	**0.0007 ****	**-0.0029 *****
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Share w/ trtry educ	*-0.0003 ++*	*-0.0001 +*	*-0.0007 +*	**-0.0019 *****	**0.0030 *****
	(0.000)	(0.000)	*(*0.001)	(0.001)	(0.001)
Share ≤ 24 years	**0.0001 ***	0.0000	**-0.0028 *****	**0.0016 *****	0.0010
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Share 25-34 years	**0.0002 ****	0.0000	**-0.0060 *****	*-0.0001 +++*	0.0059
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Share 35-59 years	*0.0000 +*	0.0000	**-0.0037 *****	*-0.0001+++*	**0.0039 *****
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Share ≥ 65 years	-0.0002	-0.0001	**0.0021 *****	**-0.0014 ***	-0.0005
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)

Table 11 – continued

Household characteristics					
African(d) (xx)	-0.0063 (0.009)	-0.0059 (0.007)	-0.0646 (0.067)	0.0555 (0.040)	0.0212 (0.078)
(∧) Household size	*-0.0008 +* (0.001)	*-0.0011+++* (0.001)	-0.0032 (0.005)	**-0.0209 ***** (0.005)	**0.0260 ***** (0.006)
(∧) Share children	0.0000 (0.000)	0.0000 (0.000)	*0.0004 +* *(0.001)*	**0.0026 ***** (0.001)	-0.0030 (0.001)
(∧) Share unmp (x)	**-0.0018 ***** (0.001)	-0.0002 (0.000)	*0.0120 ++* 0.008)	*0.0113 ++* (0.008)	-0.0213 (0.011)
(∧) Share inac (xx)	**0.0005 *** (0.000)	0.0001 (0.000)	*-0.0038 +* *(0.003)*	*-0.0038 +* (0.003)	0.0070 (0.004)

Significance levels are based on standard errors that take the clustered nature of the sample into account.

Symbols:
(d)   Marginal effect for dummy variable represented by discrete change 0 -> 1
***/**/* Marginal effect significant at 1%/5%/10% level and coefficient estimate significant at 10% or higher
··· / ·· / · Coefficient estimate significant at 1%/5%/10% level
(x)/(xx) Wald test H(0): Variable's all coefficients = 0, not rejected at 5 / 10%
(∧)   Endogenous, observed variable replaced by prediction.

Source: OHS/IES95, own computations, weighted data.

Table 12 Multinomial logit marginal effects on estimated probabilities for having main income from categories, urban sample

Explanatory variables	*Primary Sectors*	*Domestic Services*	*Public Transfers*	*Private Transfers*	*Core Sectors*
Predicted probability	0.2%	2.7%	6.5%	0.7%	89%
Geography					
W Cape (d) (x)	*0.0353 +++*	-0.0019	-0.0042	-0.0076	-0.0215+++
	(0.0283)	(0.0034)	(0.0111)	(0.0065)	(0.0311)
E Cape (d)	0.0060	0.0017	**0.0540 ***	**0.0276 ***	-0.0893
	(0.0053)	(0.0035)	(0.0140)	(0.0085)	(0.0184)
N Cape (d)	**0.0291 ***	**0.0110 ***	**0.0759 ***	**0.0454 ***	**-0.1614 ***
	(0.0173)	(0.0062)	(0.0240)	(0.0168)	(0.0360)
Free State (d) (xx)	0.0003	*0.0064 +*	**0.0413 ***	**0.0341 ***	-0.0821
	(0.0046)	(0.0042)	(0.0132)	(0.0092)	(0.0184)
NW Province (d)	0.0144	-0.0025	0.0023	-0.0007	-0.0135
	(0.0128)	(0.0036)	(0.0137)	(0.0089)	(0.0227)
Gauteng (d)	-0.0037	-0.0013	**-0.0314 ***	-0.0147	0.0510
	(0.0037)	(0.0036)	(0.0092)	(0.0059)	(0.0131)
Mpumalanga (d) xx)	*0.0287++*	-0.0002	-0.0161	-0.0100	*-0.0024++*
	(0.0185)	(0.0048)	(0.0127)	(0.0073)	(0.0252)
Limpopo (d)	**0.1456***	-0.0054	-0.0084	0.0002	*-0.1320+++*
	(0.0823)	(0.0035)	(0.0168)	(0.0093)	(0.0811)
	Earner characteristics				
Share female	0.0000	**0.0003 ***	**0.0006 ***	**0.0004 ***	-0.0012
	(0.0322)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Share w/ no educ	*0.0001 +++*	**0.0003 **	**0.0016 ***	**0.0003 ***	**-0.0023 ***
	(0.0001)	(0.0001)	(0.0004)	(0.0001)	(0.0004)
Share w/ prim educ	*0.0001 +++*	**0.0002 **	**0.0011 ***	**0.0002 ***	**-0.0017 ***
	(0.0001)	(0.0001)	(0.0003)	(0.0001)	(0.0003)
Share w/ sec educ	*0.0001 ++*	**0.0001 ***	**0.0007 ***	**0.0001 ***	**-0.0011 ***
	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0003)
Share w/ tertry educ	*-0.0058 +++*	-0.0001	0.0005	*-0.0003 +++*	*0.0055 +++*
	(0.0040)	(0.0001)	(0.0003)	(0.0002)	(0.0037)
Share ≤ 24 years	*0.0000 +*	*0.0001 ++*	**-0.0007 ***	**0.0003 ***	*0.0002 +*
	(0.0000)	(0.0001)	(0.0003)	(0.0001)	(0.2687)
Share 25·34 years	0.0000	0.0001	**-0.0015 ***	No effect	0.0014
	(0.0015)	(0.0001)	(0.0003)		(0.0003)

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Table 12 – continued

Share 35·59 years	0.0000 (0.0001)	**0.0001 *** (0.0001)	**-0.0010 ***** (0.0002)	0.0000 (0.0001)	0.0009 (0.0002)
Share ≥ 65 years	0.0000 (0.0001)	0.0000 (0.0001)	**0.0013 ***** (0.0003)	0.0001 (0.0001)	-0.0013 (0.0004)
Household characteristics					
African (d)	0.0016 (0.0046)	0.0008 (0.0027)	-0.0241 (0.0163)	**0.0137 ***** (0.0047)	0.0081 (0.0189)
(∧)Household size	*-0.0015 +* (0.0016)	-0.0008 (0.0008)	-0.0017 (0.0026)	**-0.0071***** (0.0024)	**0.0110 ***** (0.0042)
(∧)Share children	0.0001 (0.0001)	*-0.0001 +* (0.0001)	-0.0002 (0.0003)	**0.0004 **** (0.0002)	-0.0001 (0.0004)
(∧)Share unempl (xx)	-0.0001 (0.0007)	0.0007 (0.0005)	0.0016 (0.0015)	0.0004 (0.0008)	-0.0026 (0.0022)
(∧)Share inact (xx)	0.0001 (0.0006)	*-0.0005 +* (0.0003)	-0.0010 (0.0012)	0.0001 (0.0006)	0.0012 (0.0017)

Significance levels are based on standard errors that take the clustered nature of the sample into account.

Symbols:
(d)   Marginal effect for dummy variable represented by discrete change 0 ·> 1

***/**/* Marginal effect significant at 1%/5%/10% level and coefficient estimate significant at 10% or higher

+ + +/ + + / + Coefficient estimate significant at 1%/5%/10% level

(x)/(xx) Wald test H(0): Variable's all coefficients = 0, not rejected at 5 / 10%

(∧)   Endogenous, observed variable replaced by prediction.

Source: OHS/IES95, own computations, weighted data.

The general trend of the marginal effects of education on the probabilities for having non-core income sources are positive, but diminishing with higher levels of education, and significant for tertiary education only in the non-urban transfer categories where the effect is negative. The marginal effects of earners in age categories is strongest in the public transfers category, where its effect is consistent with most public transfers being received by elderly earners. In non-urban areas, the elderly are however less likely to receive private transfer income, a source with which the only other significant effects are positive and associated with the youngest age category in both samples. There are also positive significant marginal effects for young age categories in the probability for non-urban primary sector main income.

In both sub-samples, the results indicate that main income sources are subject to substantial geographical variations. Starting with the non-urban sub-sample, positive and significant marginal effects on the probabilities for having either transfer income are found from residence in a former "tribal area", the impact from which is significant and negative on the probabilities for having primary or core sector main income. The only significant effect found for residence in an "agricultural or amenities area" is negative and relates to the core sector category.

The strongest of all significant geographical effects is the negative impact on the probability for having core sector main income from residence in the Eastern Cape. The sign of the marginal effect from residence in Limpopo is also negative albeit at only one-third of the strength of the former. Positive impacts on the same probability are found from residence in Mpumalanga and non-urban Gauteng. Residence in the latter province also shows a strong negative marginal effect on the probability for having private transfers as a main income source. While it is highly questionable whether the urbanised metropolitan province, encompassing Johannesburg, the capital Pretoria and Witwatersrand, actually hosts non-urban household, the latter two results are consistent with the province being an industrialised sending area for remittances.

Further, the marginal effects from residence in Limpopo and the Eastern Cape are strong, significant and reversed for private transfers main income, as compared to the core sectors category. Another noteworthy significant provincial effects in the non-urban sub-sample is the positive association between public transfers dependence in the Eastern Cape. In addition to the positive marginal effect on the probability for having core sector main income, the significant, marginal effect from residence in Mpumalanga on the probability for the primary sector category is also positive, and is coupled to significant negative effects for either transfer income.

In the urban areas, the Northern Cape displays a significant and relatively strong negative impact on the probability for having core sector income and has positive significant effects on the probabilities for all non-core main incomes. The province' marginal impact on the probability for private transfers reliance is the strongest significant impact in the category, among which are found significant, positive albeit relatively weak impacts also from residence in the Eastern Cape and the Free State. The same three provinces also display positive marginal effects on the probability of relying on the other transfer category for a main income, the sign of which is negative for Gauteng.

The lowest sections of the regression tables contain the endogeneity suspected household size and composition variables. Test results show that exogeneity was

not supported in any sub-sample for any of these variables (see Tables A3 and A4 for some detail). Consequently the variables were replaced with predictions through a non-simultaneous two-step procedure.[26] The relevant cells in Tables 11 and 12 are therefore shaded in grey to caution the reader as to the invalid significance levels of the slope parameters. While a little more than half of the parameter estimates for these variables were significant in the non-urban areas, less than half (five) of these, in turn, are associated with significant marginal effect. In the urban sample, six of the twenty parameter estimates were positive and three display positive marginal effects.

In both sub-samples, the marginal effect of household size was positive on the probability for having core sector income and negative for private transfers. Similarly, the marginal effect of the share of children is positive and significant on the probability for having private transfers main income. With respect to labour market statuses, significant marginal effects were found only with respect to the probability for having primary sector main income, where the fraction of unemployed household members display a slight negative impact and the share of inactive has the opposite effect.

Finally, the only outcome where the African population dummy variable appears with a significant marginal effect (and parameter estimate) is the urban private transfers category, which is quite surprising for the South African context where ethnical impacts are so often found in living standards related research. While the direction of causality from the household characteristics may be open to discussion, the high and relatively prevalent significance of parameter estimates are consistent with some interaction between household member composition and income sources, which will be illustrated at the end of the next section.

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[26] The variables were tested for endogeneity by the method suggested by Rivers and Voung (1988). Additional exogenous variables in the first-stage regressions were; the number of adults in the household, fraction of adult males out of total household size, fraction of adult females out of total household size, and the fraction of adult earners out of household size. Under the assumption of normally distributed errors in the first stage regression, a two-step estimator can be used to correct for endogenous variables (Wooldridge 2002). However, the second-stage standard errors and test-statistics derived by the non-simultaneous method applied here are not valid (Wooldridge 1999). Comparing Tables A1 and A2 in the statistical appendix to Tables A3 and A4 respectively, reveals that the magnitudes of coefficients for these variables do not differ significantly between the two regressions. Thus, different estimates are not generated when the first-step residuals "clear up" the endogeneity as compared to when the predictors are used (Wooldridge 1999).

8.2 Simulations of predicted probabilities[27]

The first simulation in Table 13 illustrates the impact on the predicted probabilities of a single main income earner's gender and location in households corresponding to those for which the marginal effects in Tables 11 and 12 were computed. The household is thus assumed to reside in KwaZulu-Natal, in a "tribal area" for the non-urban household, contain six members; two of which are children, one unemployed and two inactive adults, with a male earner aged 35-59 who has primary education. With a male earner, the urban household probability of having a core sector main income is close to 90% while it is just below 70% for a non-urban household. If the earner were female, the probability of earning a core sector main income is reduced to one-third for a non-urban household and one-half for an urban.

Table 13 Simulation of impact from location and main income earner's gender[28]

Location and earner gender	*Predicted probabilities for having main income from categories*				
	Primary sector	*Domestic services*	*Public transfers*	*Private Transfers*	*Core Sectors*
Urban male	0.2	2.7	6.5	0.7	89.9
Non-urban male	1.5	0.7	16.1	12.0	69.7
Non-urban female	0.8	10.6	25.4	30.2	33.0
Urban female	0.1	32.2	13.7	2.4	51.5

The non-urban household with a female earner has a 55.6% joint probability of having either transfer income, with private transfers five points higher than public. In the male case, the corresponding joint probability is 28.1%. For the urban household with a female earner household, the probability for transfer incomes (16.1%) is much lower than in the non-urban case (55.6%), but the predicted probability that the household derives its main income from domestic services is almost one-third. The same probability is just one-tenth in the female non-urban case. Clearly, having a female earner reduces the probability of having a core sector main income source, as does rural location, which also drastically affects the probabilities of having the other main income sources.

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[27] The reader show be advised that not all parameter estimates upon which probabilities were calculated were significant at the 10% level or higher.

[28] Table A5 in the Statistical appendix illustrates the corresponding predicted probabilities for otherwise identical households in Mpumalanga.

The second simulation, starting in the upper section of Table 14, illustrates the impact of sub-regional location and the earner's education. The default household is identical to the above non-urban household but located in the Eastern Cape, under the assumption that the main income earner is a female in the age category 35-59. The lower half of the table illustrates identical simulations for a household with younger female earner aged 24-35. In the first three cases of each section, the household resides in a "Tribal area", whereas the household is assumed to reside in an "Agricultural/-amenities area" in the preceding three rows. The simulations illustrate the impact of three different earner education levels for each area.

Table 14 Simulation of impact from location and main income earner's education and non-urban sub-regional location[29]

Education	Location	Predicted probabilities for having Main income from categories				
		Primary Sector	*Domestic Services*	*Public Transfers*	*Private transfers*	*Core Sector*
Earner aged 35 – 59						
None	Tribal area	0.5	2.4	34.4	55.6	7.1
Some 2:ndry	Tribal area	0.3	2.0	18.1	60.8	18.8
Matriculated	Tribal area	0.2	0.8	8.1	49.1	41.8
None	Agr/amenities area	18.9	11.2	44.6	17.4	8.0
Some 2:ndry	Agr/amenities area	11.4	11.5	28.5	23.1	25.5
Matriculated	Agr/amenities area	6.8	4.8	12.8	18.7	56.8
Earner aged 25 – 34						
None	Tribal area	1.7	4.8	11.0	70.3	12.2
Some 2:ndry	Tribal area	0.7	3.4	4.8	64.2	26.9
Matriculated	Tribal area	0.4	1.2	1.9	44.9	51.7
None	Agr/amenities area	46.2	16.6	10.7	16.4	10.2
Some 2:ndry	Agr/amenities area	26.3	16.1	6.4	20.5	30.7
Matriculated	Agr/amenities area	14.3	6.0	2.6	15.1	62.0

If the female earner aged 35-59 has no education in a household residing in a tribal area, the probability that the household depends on private transfers is almost 56%, while that for having core sector main income it is just over 7%. If her education included some secondary schooling the corresponding probabilities rise to around three-fifths and one-fifth respectively. With a complete matriculation, the probability that the household has a core sector main income is over two-fifths, but the estimated probability for private transfers remains high at almost one-half. Predicted probabilities for having public

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[29] Table A6 in the Statistical appendix illustrates the corresponding predicted probabilities for otherwise identical households with male earners.

transfers are reduced from just below 35% for an earner with no education to 8.1% with a matric. The corresponding joint probability for having either transfer main income is almost halved from 90% to 47.2%.

In the agricultural/amenities area, the trends for probabilities of having core sector or public transfers main income are similar, but start and end at higher levels, with a probability for having core sector main income with a matriculated earner now above 55%. The probability of having private transfers main income are much lower however, starting at roughly three-fifths and decreasing to just below one-third from the lowest to highest education levels. In this settlement type, the probabilities of having primary or domestic service sectors main income start at almost one-fifth and one-tenth and decrease with education, while in "Tribal" areas, these probabilities remain miniscule. Thus, in this settlement type, probabilities for all labour main income sources are higher, while in the tribal areas probabilities for having transfer main incomes are considerably higher in magnitude.

The lower section of Table 14 display very similar trends to the upper section, but the probabilities of the household with a younger earner of having core sector main income starts out higher and increases at a much higher rate. However, while ending at a somewhat lower level, the predicted probability that the household relies on private transfers starts at 70% and is reduced to 64.2% with some secondary education. Also, the probabilities for relying on marginal sector incomes in the agricultural/amenities area are higher.

With the younger earner, the probabilities for primary sector and public transfer main incomes in the agricultural/amenities area are almost reversed, as compared to the case with the older earner. The impact on predicted probabilities of having marginal sector main incomes from a younger earner's matriculation is dramatic, reducing the joint probability from three-quarters to one-fifth. Thus, increased levels of education - and matriculation in particular - seem to vastly improve chances of households having core sector main income regardless of location. The same probability and its compliment are however also strongly affected by sub-regional location.

Table 15 Simulated impact from household composition

Earner gender	House-hold size	Children	Adults	Predicted probabilities for having Main income from categories				
				Primary Sector	Domestic Services	Public Transfers	Private transfers	Core sector
F	4	2	1 inactive	4.9	21.3	10.2	17.6	46.1
F	5	3	1 inactive	4.0	16.8	11.9	22.2	45.0
F	5	2	1 inactive 1 unempl	0.2	5.5	27.7	52.0	14.6
M	4	2	1 inactive	8.8	23.9	2.3	11.5	53.4
M	5	3	1 inactive	7.8	20.0	2.7	14.4	55.1
M	5	2	1 inactive 1 unempl	1.0	12.3	8.4	45.1	33.3

A final simulation in Table 15 illustrates the impacts from household size and composition with respect to children, unemployed and inactive adults. The initial household again resides in a non-urban, "tribal area" in KwaZulu-Natal and has a female earner aged 35-59 with primary education. In the first row, the household of four members contain two children and an inactive member. Thus, in the first three rows, the female earner may be either the inactive working aged member or an employed or retired member.

As can be seen, for a female earner in this age category, the combination of two children and an inactive member is more likely to be supported by an employee than by a receiver of a private or public transfer. Increasing the number of children raises the probability of the earner being a transfer recipient, in line with the findings of Posel (2001), who shows that transfers behaviour is partially driven by the number of children in the receiving household. However, the probability of the earner accessing core sector income is still the largest and virtually unaffected by the increased number of children.

As noted earlier, both unemployed and inactive members are over-represented in households with private transfers as the main source of income. In the third row, the results from the addition to the original household of an unemployed member rather than a child, more than doubles probabilities of having either transfer main income. The joint probability for having a transfer income is almost four-fifths. Hence a *joint presence* of members in such labour force statuses increases the probability that the earner is one of those members, in which case the income must be a transfer and most likely a private one. Such a

result would also be consistent with a high prevalence of females among the rural unemployed and working-age inactive.

The increased probability for public transfers dependence with the additional unemployed member, despite the non-eligible age of the earner, may partially be driven by the suggested high prevalence of these constellations in conjunction with female earners in OAP households, as discussed earlier in the section on endogenous household formation. Such an explanation is consistent with the much lower probabilities for having a public transfers main income if the earner were male, as shown in the table's last three rows. Thus, the impacts from the presence of children and non-employed adults on having the various main income sources illustrate considerable effects also from household composition.

9. Conclusions

This study has shown that among the majority of coloured and African households captured by Statistics South Africa's 1995 *October Household Survey*, income generation largely revolves around one main income source, which is very often earned by one or two members. The study is based on a classification of a household's main income sources according to core economy integration. Low levels of integration are shown to be associated with the lower end of the household income distribution and often with very high non-participation and unemployment rates. While inference to the total South African population is prohibited by the intentional selection of households with a main income source, the study proceeds to identify statistical regularities that account for large fractions of the variation in the sample's main income sources.

The analyses show that integration is to a large extent driven by the characteristics of the household's earner or earners, and much affected by the households location. Differing household compositions also appear to be associated with differing main income sources. Most prominently *the spread across main income source categories is much greater in non-urban areas than in the urban* where core economy sources account for over three-quarters of the households. Within the urban and the non-urban areas, variations in main income sources depend largely on differing characteristics of main income earners. Results imply that the *gender, education and age of main income earners* all have considerable impact on integration by main income sources. With small variation across non-core main income sources, the likelihood for low integration increases if the main income is earned by *individuals with low levels of education, often by women, by elderly and by earners of young working age*.

Within the urban and non-urban sub-samples, main income sources are also subject to *inter-provincial variation* and in the non-urban case also by the households' *sub-regional location*. Of particular concern with low core-sector integration is the higher probabilities for transfers dependence in both urban and non-urban areas of the Eastern Cape, non-urban areas of Mpumalanga and Limpopo, as well as in the urban Northern Cape. Furthermore, non-urban household's residence in the former "tribal areas" is associated with higher probabilities for transfer dependence and lower probabilities for accessing core sector income directly. Residence in agricultural or otherwise commercialised non-urban areas raise probabilities for primary sector or domestic services main income sources.

Indications are that different household structures are associated with the various main income sources. After controlling for endogeneity and in line with previous findings, high fractions of unemployed persons are strongly and positively associated with public transfers (Klasen and Woolard 2001; Edmonds *et al* 2003; Betrand *et al* 2000). Having large fractions of economically non-active members is positively associated with reliance on either type of transfer income sources, but stronger for private transfers.

In non-urban areas, high fractions of children are positively associated with probabilities of transfers dependence. It has been noted by Keller (2003) that poor households differ from the non-poor in terms of generation structure. An explanation for that phenomenon which is consistent with the results here would be based on public transfer incomes largely being age-driven and strongly associated with low-income households, unemployed and inactive members, as well as with young children. Elderly individuals receive pensions, while younger women often have young children. Multi-generation households would arise when receivers of public pensions support their children and grandchildren (Edmonds *et al* 2003; Klasen and Woolard 2001). Some results in this study are consistent with these phenomena, since they show a positive impact on the predicted probabilities of households relying on both public and private transfers, from the presence of unemployed household members with female earners and children.

It may be questionable whether the patterns of living arrangements and income sources that are depicted through this 1995 data still prevail and whether derived policy implications apply. However, like many other studies, results from this investigation strongly endorse the need to stimulate employment creation. Such polices would be especially useful if they could be spatially targeted and if they could be assimilated to the very different patterns of non-integration that exist between both urban and non-urban areas as well as across sub-regions.

The considerable impact of education on core sector access suggests that adult literacy programmes may promote integration of marginalised or peripheral households. Finally, the empirical work in this paper highlights the importance of improving OAP and Child Support Grant take-up rates. For poverty alleviation purposes, transfers for children and young mothers would target the low-income, transfer dependent households and may also benefit the elderly. However, to the extent that household formation is endogenous to such transfers, household composition may reshape as collection of such transfers increases. The question of whether or not the high concentration of a single income source among households remains applicable can only be answered when more recent and reliable income data is made available.

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Statistical Appendix

Table A1 Multinomial logit estimates for main income categories in non-urban sample

Number of obs/ Weighted	7548 / 10000416			
Wald chi2(108)	21075.75			
Prob > chi2	0.0000			
Pseudo R2	0.4581			
Log pseudo-likelihood	-7443486.4			
Explanatory variables	*Primary Sectors*	*Domestic services*	*Public Transfers*	*Private Transfers*
Geography				
W Cape (x)	0.351 (0.529)	-0.944 (0.633)	-0.448 (0.501)	-1.118 (0.825)
E Cape	**0.883***\(0.325)	-0.056 (0.280)	**1.090***\(0.176)	**1.520***\(0.200)
N Cape (x)	0.432 (0.416)	-0.726 (0.638)	-0.748 (0.484)	-0.344 (0.703)
Free State (xx)	-0.348 (0.373)	-0.255 (0.409)	**-0.638*** (0.348)	0.098 (0.409)
NW Province	0.260 (0.414)	**-1.267***\(0.453)	**-0.934***\(0.258)	0.234 (0.248)
Gauteng	**-1.017*** (0.418)	0.034 (0.581)	-0.779 (0.513)	**-36.143***\(0.436)
Mpumalanga	**1.355***\(0.328)	0.331 (0.284)	**0.983***\(0.220)	**-0.784***\(0.257)
Limpopo (xx)	**1.102*** (0.440)	-0.378 (0.359)	0.280 (0.220)	**0.833***\(0.227)
Tribal area	**-1.187***\(0.382)	-0.091 (0.360)	**0.504*** (0.226)	**1.209***\(0.316)
Agric./Amenit. Area	**2.304***\(0.441)	**1.340***\(0.428)	**0.654*** (0.326)	-0.064 (0.445)
Earner characteristics				
Share female	0.001 (0.003)	**0.035***\(0.003)	**0.012***\(0.002)	**0.017***\(0.002)
Share w/ no eductn	**0.030***\(0.005)	**0.028***\(0.005)	**0.032***\(0.004)	**0.019***\(0.003)
Share w/ prim eductn	**0.027***\(0.005)	**0.027***\(0.005)	**0.025***\(0.004)	**0.013***\(0.003)
Share w/ sec eductn	**0.013***\(0.004)	**0.017***\(0.005)	**0.016***\(0.004)	**0.010***\(0.002)
Share w/ tertiary eductn	**-0.022***\(0.008)	**-0.016*** (0.009)	**-0.009*** (0.005)	**-0.020***\(0.004)
Share ≤ 24 years	0.006 (0.004)	0.005 (0.005)	**-0.019***\(0.003)	**0.012***\(0.003)
Share 25-34 years	0.002 (0.005)	-0.003 0.005)	**0.046***\(0.003)	**-0.010***\(0.004)
Share 35-59 years	**-0.005*** (0.003)	-0.005 (0.004)	**0.029***\(0.002)	**-0.007***\(0.002)
Share ≥ 65 years	-0.010 (0.006)	-0.008 (0.008)	**0.014***\(0.004)	**-0.011*** (0.006)
Household characteristics				
African (xx)	-0.377 (0.367)	-0.635 (0.533)	-0.369 (0.384)	0.593 (0.635)
(∧) Household size	**-0.091*** (0.049)	**-0.190***\(0.067)	-0.057 (0.037)	**-0.212***\(0.044)
(∧) Share children	0.001 (0.005)	-0.002 (0.007)	**0.007*** (0.004)	**0.026***\(0.005)
(∧) Share unempl (x)	-0.090 (0.084)	-0.001 (0.065)	**0.105*** (0.047)	**0.125*** (0.057)
(∧) Share inact (xx)	0.022 (0.031)	0.001 (0.027)	**-0.034*** (0.019)	**-0.042*** (0.023)
Intercept	**-3.278** (0.680)	**-4.957***\(0.870)	**-1.711** (0.608)	**-4.474** (0.756)
χ-2- value Hausman test of IIA when category omitted	0.000 Supported	0.000 Supported	0.000 Supported	-5.7490 Supported
Significance levels are based on standard errors that take the clustered nature of the sample into account.				
Symbols: (x) / (xx) Wald test H(0): Variable's all coefficients = 0, not rejected at 5 / 10%				
(∧) Endogenous, observed variable replaced by prediction.				

Source: OHS/IES95, own computations, weighted data.

Table A2 Multinomial logit estimates for main income categories in urban sample

Number of obs/ Weighted	7893/9999347			
Wald chi2(108)	5695.23			
Prob > chi2	0.0000			
Pseudo R2	0.3962			
Log pseudo-likelihood	-4849848.9			
Explanatory variables	*Primary sectors*	*Domestic services*	*Public Transfers*	*Private Transfers*
Geography				
W Cape (x)	**1.994***(0.730)	-0.210 (0.427)	-0.064 (0.251)	-0.410 (0.385)
E Cape	0.817 (0.662)	0.276 (0.374)	**0.831***(0.200)	**0.922***(0.263)
N Cape	**2.001***(0.723)	**1.000** (0.406)	**1.113***(0.262)	**1.322***(0.339)
Free State (xx)	0.139 (0.792)	**0.639* (0.365)	**0.693***(0.213)	**1.037***(0.268)
NW Province	1.271 (0.864)	-0.318 (0.484)	0.060 (0.283)	-0.018 (0.428)
Gauteng	-1.091 (1.026)	-0.211 (0.431)	**-1.026***(0.280)	**-1.178***(0.385)
Mpumalanga (xx)	**1.798** (0.893)	-0.020 (0.555)	-0.381 (0.324)	-0.614 (0.478)
Limpopo	**3.432***(1.060)	-0.766 (0.614)	-0.027 (0.408)	0.164 (0.437)
Earner characteristics				
Share female	0.001 (0.003)	**0.030***(0.003)	**0.013***(0.001)	**0.018***(0.002)
Share w/ no eductn	**0.027***(0.006)	**0.031***(0.005)	**0.035***(0.003)	**0.016***(0.003)
Share w/ prim eductn	**0.022***(0.006)	**0.023***(0.005)	**0.024***(0.003)	**0.013***(0.002)
Share w/ sec eductn	**0.014** (0.006)	**0.013***(0.004)	**0.016***(0.003)	**0.008***(0.003)
Share w/ tertiary eductn	**-1.012***(0.025)	-0.014 (0.013)	0.004 (0.005)	**-0.018***(0.006)
Share $\leq$ 24 years	**0.007* (0.004)	**0.013** (0.007)	**-0.015***(0.004)	**0.016***(0.004)
Share 25-34 years	-0.001 (0.009)	0.005 (0.005)	**-0.031***(0.003)	-0.002 (0.004)
Share 35-59 years	-0.009 (0.006)	**0.011** (0.005)	**-0.020***(0.002)	-0.002 (0.003)
Share $\geq$ 65 years	-0.007 (0.013)	-0.001 (0.009)	**0.026***(0.003)	0.006 (0.007)
Household characteristics				
African	0.313 (0.971)	0.084 (0.337)	-0.400 (0.258)	**0.983***(0.291)
(^) Household size	**-0.273* (0.153)	-0.097 (0.080)	-0.046 (0.052)	**-0.338***(0.072)
(^) Share children	0.014 (0.020)	**-0.014* 0.008)	-0.005 (0.006)	**0.018***(0.006)
(^) Share unemp (xx)	-0.012 (0.124)	0.077 (0.047)	0.034 (0.034)	0.022 (0.039)
(^) Share inacti (xx)	0.023 (0.096)	**-0.058* (0.034)	-0.021 (0.027)	0.004 (0.028)
Intercept	**-6.098** (1.747)	**-6.409** (0.803)	**-2.312** (0.506)	**-4.942** (0.634)
χ-2- value Hausman test of IIA when category omitted	-0.381 Supported	0.000 Supported	-0.508 Supported	-0.000 Supported

Significance levels are based on standard errors that take the clustered nature of the sample into account.

Symbols: (x) / (xx) Wald test H(0): Variable's all coefficients = 0, not rejected at 5 / 10%

    ($\wedge$) Endogenous, observed variable replaced by prediction.

Source: OHS/IES95, own computations, weighted data.

Table A3 Selected results from tests of endogeneity in non-urban sample

Number of obs/ Weighted	7548 / 10000416			
Wald chi2(108)	5679.29			
Prob > chi2	0.0000			
Pseudo R2	0.5967			
Log pseudo-likelihood	-7443486.4			

Explanatory variables	Primary sectors	Domestic services	Public Transfers	Private Transfers
W Cape	0.655 (0.592)	-0.531 (0.691)	-1.373 (0.629)	-2.008 (0.706)
E Cape	0.520 (0.437)	-0.531 (0.384)	1.693 (0.204)	2.035 (0.238)
N Cape	0.495 (0.422)	-0.428 (0.634)	-0.975 (0.876)	-0.151 (1.086)
Free State	-0.381 (0.381)	-0.136 (0.415)	-0.890 (0.361)	-0.019 (0.584)
NW Province	0.275 (0.417)	-1.264 (0.462)	-0.906 (0.276)	0.260 (0.315)
Gauteng	-0.924 (0.439)	0.179 (0.599)	-1.467 (0.619)	-31.256 (0.969)
Mpumalanga	1.373 (0.326)	0.290 (0.296)	-1.397 (0.263)	-0.997 (0.290)
Limpopo	0.964 (0.465)	-0.758 (0.381)	0.645 (0.247)	1.242 (0.269)
"Tribal area"	-1.202 (0.389)	-0.126 (0.385)	1.107 (0.255)	1.880 (0.321)
"Agric./Amenities area"	2.412 (0.459)	1.440 (0.469)	0.320 (0.392)	0.041 (0.522)
Sh. MIE female	0.000 (0.003)	0.034 (0.004)	0.016 (0.002)	0.023 (0.002)
Sh. MIE No educ	0.052 (0.023)	0.051 (0.021)	0.035 (0.005)	0.022 (0.005)
Sh. MIE Pr educ	0.049 (0.022)	0.049 (0.021)	0.025 (0.005)	0.013 (0.004)
Sh. MIE Sec educ	0.036 (0.023)	0.039 (0.021)	0.018 (0.005)	0.014 (0.004)
Sh. MIE Matric educ	-0.002 (0.022)	0.004 (0.021)	-0.020 (0.007)	-0.020 (0.006)
Sh. MIE $\leq$ 24 yrs	0.010 (0.006)	0.012 (0.007)	-0.013 (0.004)	0.012 (0.004)
Sh. MIE 25-34 yrs	0.021 (0.018)	0.022 (0.017)	-0.058 (0.004)	-0.028 (0.004)
Sh. MIE 35-59 yrs	0.011 (0.015)	0.018 (0.014)	-0.036 (0.002)	-0.020 (0.003)
Sh. MIE $\geq$ 65 yrs	0.008 (0.017)	0.020 (0.016)	0.007 (0.005)	-0.007 (0.007)
African	-0.336 (0.373)	-0.389 (0.545)	-0.204 (0.506)	0.494 (0.898)
Household size	-0.157 (0.064)	-0.254 (0.081)	-0.151 (0.050)	-0.247 (0.061)
Sh. Children	-0.010 (0.013)	-0.009 (0.013)	0.010 (0.005)	0.093 (0.014)
Sh. Unemployed	-0.080 (0.085)	-0.002 (0.071)	0.191 (0.057)	0.271 (0.066)
Sh. Inactive	0.043 (0.037)	0.028 (0.032)	-0.075 (0.024)	-0.012 (0.029)
Resid. Househ size	-0.178 (0.120)	0.173 (0.151)	0.414***(0.099)	0.501***(0.120)
Resid. sh. Children	5.066 (4.921)	5.314 (4.640)	-0.321***(0.095)	-0.340***(0.083)
Resid. sh. unemployed	0.083 (0.085)	0.008 (0.071)	-0.021 (0.057)	-0.017 (0.065)
Resid. sh. Inactive	-0.041 (0.037)	-0.040 (0.033)	0.238***(0.028)	0.242***(0.030)
Intercept	-6.904 (3.717)	-9.555 (3.452)	-1.058 (0.788)	-10.019 (1.524)

χ – test of H_0 : residuals' parameters are all zero = 175.9   p-value = 0.0000
Significance levels are based on standard errors that take the clustered nature of the sample into account.

Source: OHS/IES95, own computations, weighted data.

Table A4 Selected results from tests of endogeneity in urban sample

Number of obs/ Weighted	7893/9999347						
Wald chi2(108)	7870.3						
Prob > chi2	0.0000						
Pseudo R2	0.5768						
Log pseudo-likelihood	-3398956.4						
Explanatory Variables	*Primary Sectors*		*Domestic services*		*Public Transfers*		*Private Transfers*	
W Cape	2.000	(0.723)	-0.133	(0.432)	-0.151	(0.281)	-0.549	(0.445)
E Cape	0.804	(0.660)	0.409	(0.380)	1.227	(0.239)	1.191	(0.358)
N Cape	1.982	(0.724)	1.051	(0.423)	1.685	(0.318)	1.813	(0.452)
Free State	0.120	(0.791)	0.778	(0.370)	1.059	(0.264)	1.347	(0.369)
NW Province	1.262	(0.865)	-0.248	(0.491)	0.113	(0.331)	0.107	(0.557)
Gauteng	-1.088	(1.028)	-0.097	(0.434)	-1.142	(0.331)	-1.098	(0.446)
Mpumalanga	1.787	(0.884)	0.018	(0.551)	-0.363	(0.431)	-0.728	(0.567)
Limpopo	3.449	(1.046)	-0.723	(0.627)	-0.085	(0.417)	0.126	(0.517)
Sh. MIE female	0.001	(0.003)	0.031	(0.003)	0.017	(0.002)	0.023	(0.002)
Sh. MIE No educ	0.026	(0.005)	0.032	(0.005)	0.040	(0.004)	0.019	(0.005)
Sh. MIE Pr educ	0.022	(0.006)	0.024	(0.005)	0.025	(0.004)	0.013	(0.004)
Sh. MIE Sec educ	0.014	(0.006)	0.013	(0.004)	0.016	(0.004)	0.006	(0.004)
Sh. MIE Matric educ	-1.262	(0.026)	-0.015	(0.013)	0.002	(0.007)	-0.013	(0.008)
Sh. MIE ≤ 24 yrs	0.006	(0.005)	0.017	(0.007)	-0.018	(0.005)	0.007	(0.005)
Sh. MIE 25-34 yrs	-0.001	(0.009)	0.010	(0.006)	-0.043	(0.004)	-0.022	(0.005)
Sh. MIE 35-59 yrs	-0.008	(0.005)	0.015	(0.005)	-0.029	(0.002)	-0.017	(0.003)
Sh. MIE ≥ 65 yrs	-0.010	(0.012)	0.001	(0.009)	0.032	(0.005)	0.018	(0.009)
African	0.302	(0.945)	0.069	(0.331)	-0.312	(0.291)	1.016	(0.375)
Household size	-0.270	(0.152)	-0.102	(0.079)	-0.199	(0.071)	-0.379	(0.093)
Sh. Children	0.014	(0.019)	-0.011	(0.008)	0.013	(0.008)	0.078	(0.019)
Sh. Unemployed	-0.009	(0.120)	0.069	(0.047)	0.042	(0.039)	0.054	(0.053)
Sh. Inactive	0.023	(0.092)	-0.052	(0.034)	-0.008	(0.032)	0.070	(0.043)
Resid. househ size	0.554***(0.210)		0.296*	(0.161)	0.513***(0.139)		0.697***(0.185)	
Resid. sh. children	0.015	(0.039)	0.051	(0.038)	0.043	(0.033)	0.006	(0.038)
Resid. sh. unemployed	0.003	(0.124)	-0.068	(0.048)	0.100**(0.041)		0.142***(0.054)	
Resid. sh. inactive	-0.025	(0.091)	0.048	(0.034)	0.150***0.034)		0.110***(0.041)	
Intercept	-6.208	(1.688)	-7.097	(0.836)	-2.670	(0.616)	-9.060	(1.596)
χ – test of H_0: residuals' parameters are all zero = 24.17 p-value = 0.0198 Significance levels are based on standard errors that take the clustered nature of the sample into account.								

Source: OHS/IES95, own computations, weighted data.

Table A5 Simulation of impact from location and main income earner's gender; Mpumalanga

Location and earner gender	Estimated probabilities for holding main income categories; Mpumalanga				
	Primary sector	*Domestic services*	*Public transfers*	*Private transfers*	*Core sector*
Urban Male	1.3	**2.7**	**4.5**	**0.4**	91.2
Rural Male	6.7	**1.1**	**6.8**	**6.2**	79.2
Rural Female	4.1	**20.0**	**12.8**	**18.6**	44.5
Urban Female	0.8	**33.4**	**9.9**	**1.4**	54.5

Table A6 Simulation of impact from location and main income earner's education and non-urban subregional location; Male earners

Education	Location	Estimated probabilities for holding main income categories				
		Primary Sector	*Domestic Services*	*Public Transfers*	*Private transfers*	*Core sector*
Rural male earner aged 35 – 59 in the E Cape						
None	Tribal area	1,7	0,3	36,3	36,7	25,1
Some 2:ndry	Tribal area	0,7	0,2	15,1	31,7	52,4
Matriculated	Tribal area	0,3	0,0	4,5	17,2	78,0
None	Agr/amenities are	41,1	0,8	31,6	7,7	18,8
Some 2:ndry	Agr/amenities area	21,4	0,7	17,3	8,8	51,8
Matriculated	Agr/amenities area	8,9	0,2	5,4	5,0	80,5
Rural male earner aged 25 – 34 in the E Cape						
None	Tribal area	5,1	0,5	10,9	43,3	40,2
Some 2:ndry	Tribal area	1,6	0,3	3,5	29,2	65,4
Matriculated	Tribal area	0,5	0,1	0,9	13,8	84,7
None	Agr/amenities area	21,8	0,7	8,5	16,8	52,2
Some 2:ndry	Agr/amenities area	6,3	0,3	2,6	10,7	80,1
Matriculated	Agr/amenities area	2,0	0,1	0,6	4,5	92,8

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The Centre for Social Science Research

The CSSR is an umbrella organisation comprising five units:

The Aids and Society Research Unit (ASRU) supports quantitative and qualitative research into the social and economic impact of the HIV pandemic in Southern Africa. Focus areas include: the economics of reducing mother to child transmission of HIV, the impact of HIV on firms and households; and psychological aspects of HIV infection and prevention. ASRU operates an outreach programme in Khayelitsha (the Memory Box Project) which provides training and counselling for HIV positive people

The Data First Resource Unit ('Data First') provides training and resources for research. Its main functions are: 1) to provide access to digital data resources and specialised published material; 2) to facilitate the collection, exchange and use of data sets on a collaborative basis; 3) to provide basic and advanced training in data analysis; 4) the ongoing development of a web site to disseminate data and research output.

The Democracy in Africa Research Unit (DARU) supports students and scholars who conduct systematic research in the following three areas: 1) public opinion and political culture in Africa and its role in democratisation and consolidation; 2) elections and voting in Africa; and 3) the impact of the HIV/AIDS pandemic on democratisation in Southern Africa. DARU has developed close working relationships with projects such as the Afrobarometer (a cross national survey of public opinion in fifteen African countries), the Comparative National Elections Project, and the Health Economics and AIDS Research Unit at the University of Natal.

The Social Surveys Unit (SSU) promotes critical analysis of the methodology, ethics and results of South African social science research. One core activity is the Cape Area Panel Study of young adults in Cape Town. This study follows 4800 young people as they move from school into the labour market and adulthood. The SSU is also planning a survey for 2004 on aspects of social capital, crime, and attitudes toward inequality.

The Southern Africa Labour and Development Research Unit (SALDRU) was established in 1975 as part of the School of Economics and joined the CSSR in 2002. SALDRU conducted the first national household survey in 1993 (the Project for Statistics on Living Standards and Development). More recently, SALDRU ran the Langeberg Integrated Family survey (1999) and the Khayelitsha/Mitchell's Plain Survey (2000). Current projects include research on public works programmes, poverty and inequality.