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Abstract

In this paper, we re-examine private transfer behaviour in light of recent public and media discourse on black tax. In particular, we aim to better understand whether graduates of post-secondary education face disproportionate responsibilities to meet family needs through increased ability to offer financial support. Firstly, we reject a unitary model of household decision making for remittances, suggesting that a collective model of household behaviour is likely to govern remittance-sending behaviour. This means an individuals' characteristics, preferences and responsibilities are likely to underpin remittance decisions. Indeed, we find that graduates are more likely to be remitters than other individuals, and that part of this responsibility arises from graduate status alone – that is, over and above labour market characteristics and living arrangements. We additionally observe a weaker relationship between remittance value and graduate remitters' income, suggesting the amount sent by graduates is not as strongly determined by the income they earn – consistent with graduates facing a responsibility regardless of their income. Lastly, we consider a measure of intra-household sharing, and find that a sizeable share of children receive transfers towards their education expenses from co-resident family members who are not their parents. Thus intra-household transfers may form an integral part of the black tax narrative, although they are not typically observed in survey data.

1. Introduction

Owing largely to the persisting ramifications of Apartheid, a large portion of South Africa's African¹ population remains restricted by intergenerational education and economic disadvantages. Only 10% of African individuals have a high value qualification,² and poverty is a daily threat for 76% of South Africans. This risk is greatest for the African population (The World Bank, 2018). In the face of adversity, literature suggests that support offered by family networks is important in the provision of economic and social security (Cox & Fafchamps, 2008). Indeed, recent media discourse on what is colloquially termed black tax (Daya & Mpete, 2017; Magubane, 2016; Mhlongo, 2019) highlights the responsibilities that African individuals face to financially support their family networks.

Black tax broadly refers to financial contributions that African professionals make to less fortunate family members.³ While young white South Africans typically enter the labour market with generational wealth and additional support from their parents, African youth face an additional 'tax' on their income in the form of support offered to their families.

Labour market returns to tertiary qualifications in South Africa are high (Branson et al., 2013; Keswell & Poswell, 2004), but a low share of the population has access to these returns. Black tax is thus relevant to South African graduates in particular, since the completion of post-secondary education may come with responsibilities to meet family and household needs through an increased ability to offer financial support. Where graduate status further induces responsibilities to offer support over and above income or employment status, graduates may experience a particular manifestation of black tax.

While we acknowledge that black tax is not unique to graduates, we are particularly interested in how it manifests for this group of individuals for two core reasons. Firstly, interrogating graduate responsibilities⁴ is relevant to policy on the funding of post-secondary education. If post-secondary education were to be financed through a graduate tax, for example, African graduates' incomes could be seen to be taxed twice – privately by transfers sent to support family members and publicly via the graduate tax. Understanding graduate responsibilities is thus key to understanding how sustainable funding mechanisms can be created and implemented in the future.

¹ Black African.

² See Siyaphambili website [here](#). High value qualifications include diplomas, bachelor's degrees and post-graduate degrees awarded at universities, colleges or other post-school institutions. These contrast to all qualifications which additionally include short-course qualifications or certificates.

³ See Mhlongo (2019) for a more in-depth description.

⁴ We use the term **graduate responsibilities** to refer to expectations on graduates to make financial contributions to their families. Responsibilities may arise from feelings of obligation, reciprocity, altruism or indebtedness, among others. Given that *tax* typically has a negative association, we prefer the term 'graduate responsibility' to 'black tax' as it encompasses the various motivations for sharing.

Secondly, although we know that returns to tertiary education in South Africa are large and positive, without adequately understanding behaviour with respect to private financial support, and particularly how this manifests among higher income earners, we may inadvertently reach inaccurate conclusions about income inequality and wealth generating capacity. Thus despite the fact that private transfers can work to lower the persistence of poverty among receiving households (Posel, 2016), where they hamper individuals' own wealth accumulation, they can manifest as an intergenerational transmission of social inequality.

This study, to the best of our knowledge, is the first of its kind to quantitatively analyse private transfers within the frameworks of black tax and the responsibilities associated with the completion of post-secondary education in South Africa. Using the latest available evidence from a nationally representative household survey, we re-examine inter-household transfer (remittance hereafter) behaviour in South Africa. Demographic information on remitters collected at the individual level allows us to interrogate who within a household unit is sending remittances, and particularly whether their individual characteristics and associated income, matter in addition to the pool of resources available to the household. In particular, individuals with varying interests or preferences may respond differently to the needs of certain family members compared to others, or may face differing responsibilities to offer financial support.

Our first step is to understand whether remittance expenditure is allocated from a pool of household income by a benevolent or dictatorial head, or whether it is allocated from the resources under the control of the remitter – and according to their preferences or responsibilities. For example, if households pool income, then the presence of a graduate in the household may have an effect on the value of remittances sent (whether the graduate is the remitter or not). This is because their labour market returns are likely to be higher, which would increase the pool of household income from which remittance expenditure is drawn. However, if income pooling is rejected, the effect of a graduate's income on remittances may only matter if they are the remitter.⁵ We thus ask:

1. Does an individual's income, and whether the individual is a graduate, play a role in determining who sends a remittance, and the value of the remittance they send, over and above the collective resources available in the household? That is, are remittances sent from a common pool of household income, or does selection into remitting and the amount of the transfer depend on a remitter's individual income?

⁵ As noted by Burns & Keswell (2006), the welfare of household members is affected not only by the resources at the disposal of the household, but by the way in which these resources are allocated within the household.

If the income-pooling hypothesis is rejected, this would suggest that an individual's characteristics and preferences would likely influence their decision – or responsibility – to remit. We then ask:

2. Who sends transfers and to whom? How does this relate to the structure of a remitter's household of residence, and does it differ by the remitter's graduate status?⁶

To complement our understanding of inter-household transfer patterns, we look at patterns of support within the household. The survey allows us to directly observe a form of intra-household financial transfer through questions posed about respondents enrolled in education. Specifically, these questions ask who contributed to their education expenses in the year prior to the survey. We ask:

3. Who contributes to education expenditure in households with children of school-going age, and are patterns of support different for children residing with a graduate? What are the implications of these findings for how we understand networks of private family support in South Africa?

The remainder of the paper is set out as follows: in Section 2 we provide background on black tax, private transfers, and remittances in South Africa. This is followed by a brief review of literature on the responsibilities that graduates may face to extend financial support to members of their family. In Section 3, we discuss models of household decision making, present the empirical specification used to test the income-pooling hypothesis, and introduce the selection and determinants of remittance value models used in the multivariate analyses. In Section 4 we present our data, the results of income-pooling hypothesis tests, and descriptive statistics. In Section 5 results of the multivariate analyses are discussed. We offer concluding remarks in Section 6.

⁶ A graduate of post-secondary education, or not.

2. Private transfers, remittances and graduate responsibilities

In South Africa, public and media discourse has colloquially termed financial contributions to family 'black tax'. A recently published book of essays on the topic queries whether black tax is a 'burden or *ubuntu*'⁷ by delving into the complexities of the everyday lived experiences of the book's contributors and their kin. The stories are testament to the existence of private networks of financial support, and while contributors' opinions vary about whether black tax is a burden or *ubuntu*, none dispute its prevalence. Mzobe (2019) deftly captures the notion that black tax was borne of Apartheid, but is perpetuated by the less obvious, but equally damaging, ramifications of that era that persist in our society today. While the migrant labour system established during Apartheid was a central driver of remittance sending in the past,⁸ various authors have suggested that prevailing conditions of unemployment and poverty are key drivers of current private transfers and remittances (Jensen, 2003; Magubane, 2016; Sagner & Mtati, 1999).

Additionally, despite a variety of state transfers for social support,⁹ access to formal structures of private financial support (e.g. bank loans) are not available to those without asset surety. Wealth accumulation for the African population was curtailed by Apartheid policies, meaning that (generational) wealth inequality in South Africa is stark (Mbewe & Woolard, 2016; StatsSA, 2018). This is aggravated by the high correlation between tertiary education and wealth generation (StatsSA, 2018). Within race wealth inequality is particularly high among the African population, with a greater concentration of African individuals at the bottom end of the distribution (Mbewe & Woolard, 2016). Given this, networks offering informal, private financial support are additionally important.

Chiteji & Hamilton (2002) study wealth accumulation among black and white individuals in the United States, and find that differing levels of relative economic status within a family (e.g. having parents or siblings that are poor) explain a non-trivial portion of the wealth accumulation gap that exists between black and white families. This likely owes to private transfers from relatively better off to relatively worse off family members.

⁷ The word *ubuntu*, common to many indigenous languages and cultures in South Africa, literally translates as 'humanity', but encompasses the idea that 'I am because you are'. It largely speaks to concern for others and/or community wellbeing, which can in turn govern solidarity, mutual exchange and reciprocity. It is against this culture of humanity that opponents of the term 'black tax' advocate for terms such as 'collective family responsibility' instead (e.g. Maqetuka, 2019).

⁸ Initially, African migrants were prevented from settling permanently in urban areas. Thus remittances were not only an important means of economic support for households of origin, but also a means for the migrant to retain ties with the household. See Wilson (2011) for background on South Africa's migrant labour system and how it generated and entrenched poverty and racial inequality.

⁹ Often, state transfers are a source of private transfers. Klasen & Woolard (2008) state that access to state transfers (especially the old age pension) plays an important role in ensuring private safety nets for the unemployed.

There are a variety of factors that may affect selection into remitting, as well as the level of transfers sent. The decision to remit may be influenced by altruism, bargaining (e.g. Cox & Fafchamps, 2008), as well as obligations or responsibilities to fulfil implicit contracts (potentially simultaneously). The black tax narrative particularly speaks to the responsibility shouldered by graduates and working professionals in African communities (Magubane, 2016; Mhlongo, 2019). Additionally, transfers may be induced by specific ties at the household of origin, or by receipt of government grants such as the child support grant received for non-co-resident children (for example).

On the other hand, public transfers may crowd out private transfers. For example, Jensen (2003) provides evidence that public pensions crowd out private transfers, but Maitra & Ray (2003) find this is the case only for poor households, not non-poor households. Where migrants establish ties in their new households, these may also crowd out remittances. Children especially are likely to compete for household or remitter resources.

Self-interested motives would likely also impact sharing. In this case, migrants with more precarious forms of employment may remit more in order to secure their slice of 'the pie' in their household of origin, and indeed Posel (2001) finds evidence of this. On the other hand, where those in more formal forms of employment (which are often better paid and offer better job security) face greater responsibilities or obligations to remit, the opposite result to that observed by Posel may be observed. Age, or life-cycle considerations, may impact remittances, especially where older migrants may expect to return permanently to their households of origin in the near future. Posel (2001a) also suggests that expectations of reciprocity drove remittance sending in South Africa in the 1990s.

In this vein, du Toit & Neves (2006) suggest that a common imperative for educating children is part of a larger survival strategy for rural households in South Africa. The authors argue that education provides access to urban economic opportunity, but with this comes the expectation that employed adult children will later support the household. Complementing this, qualitative findings from a study in Cameroon highlight parents' feelings that once educated, graduates should provide for the needs of their families (Mbah, 2014). Similarly, evidence from South East Asia, provided by Frankenberg et al. (2002), is consistent with the idea that parents pay for their children's education in the form of a loan, that is later repaid through support during old age (see also Nyathi, 2019).

Du Toit and Neves (2006) further evidence scenarios in which individuals and households continually invest in children's education, even when it seems to be an irrational strategy (e.g. the student is failing, or qualifications have not led to jobs in the past), because the expected payoff is anticipated to be so large. Such notions could fuel feelings of indebtedness (see also Chauke, 2019) on behalf of students to support their families once their studies are complete. This sentiment is reflected by Ghanaian university graduates in Caldwell's (1965) early work.

Nonetheless, there may be unobservable household or family characteristics which are correlated with both the presence of a graduate in the household and expectations to offer support. For example, households/families that place greater value on education attainment, may also place greater value on offering support to family in need. Or, since fertility typically falls as education attainment increases (Mlatsheni & Leibbrandt, 2001), households with graduates may have fewer children, and thus be better positioned to offer financial support.

3. Theoretical and empirical framework

Becker's (1974) unitary model commonly provides a starting point for theoretical work in the field of household decision making. The model assumes a benevolent head, who allocates pooled household income among all members. It is assumed that the household's utility function is identical to that of the head, since the head, through their concern for the welfare of other members,¹⁰ fully incorporates all members' utility functions. In other words, all members share the head's preferences to maximise family income and consumption. In this way, the household operates (and is analysed) as if it were a single decision-making unit. If remittance-sending households behaved as a unit, then an individual remittance sender's preferences and characteristics (e.g. income) should have no additional effect on remittances sent once the total resources available to the household are accounted for.

Since Becker's (1974) pioneering work, however, scholarship on household decision making has grown extensively, featuring arguably more realistic 'collective' models of decision making. The general framework for collective models differs from the unitary model framework in that intra-household allocations can be influenced by differing preferences¹¹ of household members. Members jointly determine how resources are accessed and redistributed via cooperative 'sharing rules'¹² (e.g. Bourguignon et al., 1993; Bourguignon & Chiappori, 1992; Chiappori, 1992) or bargaining processes (e.g. Lundberg & Pollak, 1993; Manser & Brown, 1980). Regarding the latter, individuals' characteristics matter in so far as they influence bargaining power.

Bargaining power may be affected by education attainment or graduate status, especially where this is linked to favourable labour market outcomes and asset or wealth accumulation. In this vein, Browning et al. (1994) find that among Canadian couples with no children, increasing an individual's relative share of household income affects final allocations. Similarly, Ambler (2016) shows

¹⁰ I.e. the head is not dictatorial (Becker, 1974).

¹¹ Which are potentially altruistic (Chiappori, 1992).

¹² The authors do not provide details on how this comes to be, but assume the resulting allocations are efficient (i.e. each individual's utility function is maximised to the effective budget of each – Deaton (2018) provides a summary).

that altering household income shares can shift bargaining power: African women who experience an increase in income when they become pension eligible are more likely to be primary decision makers in their households, compared to non-eligible women.

Evidence against unitary decision-making models in South African households and extended families can be found in Ambler (2016), Bertrand et al. (2003), Duflo (2003) and Posel (2001), suggesting a collective model of decision making may be more appropriate for South African households. Thomas (1996), however, shows that there may be variation in strategies employed across race groups in South Africa. Investigating the effect of parental income on children’s education levels, he provides evidence in support of income pooling in African and white households, but rejects the income-pooling hypothesis, and hence the unitary model, for Coloured and Asian households.

It is important to note here, that although evidence of income pooling is typically understood as evidence in favour of the unitary model, Thomas’s findings do not preclude a collective model of household decision making in African and white households. Although income is typically not pooled in collective models (e.g. Bourguignon & Chiappori, 1992), Manser & Brown (1980) present a bargaining model in which individuals do pool their resources. Final allocations, though, are determined via a bargaining rule which accounts for differences in individuals’ utility functions.

In her earlier work, Posel (2001) rejects the income-pooling hypothesis for remittance expenditure. However, her analysis is restricted to a sample of households from KwaZulu-Natal province surveyed relatively soon after the end of Apartheid. Authors have suggested that in recent years there has been shrinkage in the extent of kinship ties in South Africa (Harper & Seekings, 2010), as well as changing patterns of mobility and migration (Hall, 2016). While remittances were traditionally sent from men in urban areas to their rural households of origin, Posel et al. (2006) find that the expansion of the state old age pension promoted women’s migration, for example. Where remitters and their households have differing characteristics and formations respectively to that of the past, static patterns of decision making or allocation should not be presumed. Through re-visiting remittance-sending behaviour, we hope to shed new light on drivers of remittances in a contemporary South Africa, especially where we may expect transfers to be governed less by altruism or self-interest but by feelings of reciprocity or responsibility. This, especially with the expansion of post-school qualifications among African youth in recent years.¹³

To test the income-pooling hypothesis for remittance expenditure, we estimate the following equations:

$$R_{ih} = \beta_1 Y_h + \beta_2 Y_i^L + \beta_3 Y_i^O + \theta X_h + \delta X_i + \varepsilon_{ih} \quad (1)$$

$$V_{ih} = \beta_1 Y_h + \beta_2 Y_i^L + \beta_3 Y_i^O + \theta X_h + \delta X_i + \varepsilon_{ih} \quad (2)$$

¹³ See Siyaphambili website [here](#).

where R_{ih} in equation 1 is an indicator for whether an individual i in household h reports sending a remittance or not, and V_{ih} in equation 2 is the value of cash and in-kind remittances sent by a remitter in the last month. Y_i^L is an individual's monthly income from the labour market; Y_i^O is their monthly income from other, non-labour market sources (other income hereafter); and Y_h is other household monthly income excluding individual i 's income. We separate income to account for the fact that it may be used differently according to its source. For example, if remittances in the data are typically intended as child support payments, income from non-labour market sources (e.g. the child support grant) may have a differential effect on remittances sent.

X_h is a vector of household-level controls including the number of children and location; X_i is a vector of individual-level regressors including gender, a quadratic in age, education, employment status, the number of people an individual remits to, and how frequently they remit (the latter two controls apply to equation 2 only). ε_{ih} is the individual specific error and therefore includes all unobserved factors that affect the amount of remittance sent, assumed to be uncorrelated with all included regressors. Under the income-pooling hypothesis $\beta_1 = \beta_2 + \beta_3$. Income pooling is rejected if $\beta_1 \neq \beta_2 + \beta_3$.

A limitation of the specification in equations 1 and 2 is that if income is measured with error, coefficients will be biased towards zero. Measurement error arises when respondents may be reluctant to disclose income, may understate or overstate their income, or may have trouble accurately recalling income (especially before-tax income). Individuals in the survey are administered an individual questionnaire and therefore report their income directly. Of particular concern in our analysis is therefore that total household income, reported by the household head, will be reported with more error than individual income. If this is the case, the coefficient on other household income would be biased towards 0, and any relative significance of individual income may owe to measurement error in household income. In households with more than one remitter, we can control for measurement error in household income by estimating a household fixed-effect model that replaces Y_h with a fixed effect μ_h :

$$R_{ih} = \mu_h + \beta_1 Y_i^L + \beta_2 Y_i^O + \theta X_h + \delta X_i + \varepsilon_{ih} \quad (3)$$

$$V_{ih} = \mu_h + \beta_1 Y_i^L + \beta_2 Y_i^O + \theta X_h + \delta X_i + \varepsilon_{ih} \quad (4)$$

If households behave as a unit, an individual's income should have no additional impact on the amount sent. That is, β_1 and/or β_2 should not be statistically different from 0.

If the income-pooling hypothesis is rejected, we have motivation to further consider how an individual's personal characteristics may affect their decision to remit, as well as their choice of how much to remit. Participation in remittance sending is unlikely to be randomly determined, and individuals will likely self-select into remitting. We thus begin by estimating the following linear

probability model [LPM], which estimates the probability of an individual being a remitter, conditional on demographic and other characteristics:

$$R_{ih} = \gamma_1 Y_i^L + \gamma_2 Y_i^O + \theta X_h + \delta X_i + \varepsilon_{ih} \quad (5)$$

$$R_{ih} = \gamma_1 Y_i^L + \gamma_2 Y_i^O + \gamma_3 Y_i^L g_i + \gamma_4 Y_i^O g_i + \theta X_h + \delta X_i + \varepsilon_{ih} \quad (6)$$

Again, X_h is a vector of household-level controls including the number of children and location; X_i is a vector of individual-level regressors including gender, a quadratic in age, education, and employment status. In equation 6 we introduce an interaction between the income variables and graduate status (g_i) to test whether there are differential effects for income received by graduates versus individuals without a post-secondary education (other individuals hereafter). For example, if the majority of non-labour market income for other individuals comes from child support grants received for non-coresident children, this may more readily induce remitting than graduates' income from non-labour market sources (which may be more likely to be returns from financial assets).

Where household-level unobservables are relevant for remittance value and are correlated with the other covariates, coefficients from an ordinary least squares [OLS] regression will be biased. To account for this, in equation 7 below we further estimate a household fixed-effects version of equation 5. μ_h represents time-invariant, unobservable household-level characteristics that may affect selection into remitting (e.g. attitudes towards remitting, or the importance of family relationships).

$$R_{ih} = \gamma_1 Y_i^L + \gamma_2 Y_i^O + \theta X_h + \delta X_i + \mu_h + \varepsilon_{ih} \quad (7)$$

Following the LPM, we explore the determinants of remittance value, conditional on remittances being sent. We again include an interaction between graduate status (g_i) and income to test for a differential effect of graduate income on the amount remitted:

$$V_{ih} = \gamma_1 Y_i^L + \gamma_2 Y_i^O + \gamma_3 Y_i^L g_i + \gamma_4 Y_i^O g_i + \theta X_h + \delta X_i + \varepsilon_{ih} \quad (8)$$

To test whether there are non-linearities in the relationship between remittance value and income, in our second specification for remittance value we include the square of individual income:

$$V_{ih} = \gamma_1 Y_i^L + \gamma_2 Y_i^O + \gamma_3 (Y_i^L)^2 + \gamma_4 (Y_i^O)^2 + \theta X_h + \delta X_i + \varepsilon_{ih} \quad (9)$$

Lastly, we run a fixed-effects model for the determinants of remittance value, where μ_h again captures unobserved, time-invariant household-specific effects which affect remittance value and may be correlated with the other covariates:

$$V_{ih} = \gamma_1 Y_i^L + \gamma_2 Y_i^O + \gamma_3 Y_i^L g_i + \gamma_4 Y_i^O g_i + \theta X_h + \delta X_i + \mu_h + \varepsilon_{ih} \quad (10)$$

4. Data and descriptive statistics

To estimate our models we use data from Wave 5 of the National Income Dynamics Study [NIDS] (Southern Africa Labour and Development Research Unit [SALDRU], 2018). NIDS is the first nationally representative panel study in South Africa. The first wave of data was collected in 2008 on a sample of over 28 000 individuals in about 7 300 households across the country. Individuals from the baseline survey were then recontacted every two years and interviewed along with their current household residents. In addition, in Wave 5 the sample was topped up to account for high attrition in high-income areas (Branson & Wittenberg, 2019). The Wave 5 sample therefore includes 37 368 successfully interviewed respondents.

An important contribution of the NIDS data is that it facilitates research of intra-family allocations and remittance behaviours, particularly by offering a wealth of information on cash and in-kind transfers made and received. Furthermore, the survey asks detailed questions on individual annual education expenses and identifies who within a household makes contributions to education expenditure. These latter variables are yet to be explored in-depth. In answering our third research question, we provide a preliminary contribution towards unpacking the wealth of information contained therein.

We define a graduate as an individual who has successfully completed a post-**secondary** education qualification. Students who complete their final three years of secondary school in the general education stream¹⁴ are eligible to obtain a school leaving qualification called the National Senior Certificate [NSC] or ‘matric’.¹⁵ Students who complete an NSC with the appropriate pass level – a bachelor’s pass – can go on to complete a post-secondary qualification at a university. Those completing matric with an NSC or diploma pass can enrol for post-secondary education at a TVET college, and universities of technology also accept students with a diploma pass into certain courses. Students who do not complete the NSC still have the option to complete a post-**school**¹⁶ certificate or diploma that does not require an NSC qualification, but these qualifications do not fall under post-secondary education by our classification.

Our sample of interest is African remitters and their households. Questions about cash and in-kind contributions sent to non-residents¹⁷ are asked of all household residents aged 15 and above as

¹⁴ This refers to an academic stream which prepares students for further studies in a university or college. It contrasts with a technical or vocational stream.

¹⁵ The NSC is commonly termed ‘matric’ in South Africa. We use the terms interchangeably.

¹⁶ Post-school education refers to any education that takes place after this compulsory schooling, outside the general education stream. Compulsory schooling in South Africa occurs from the year in which a child turns seven until Grade 9 or the age of fifteen, whichever occurs first (South African Schools Act, 1996).

¹⁷ I.e. remittances can be sent to non-resident household members, or to individuals who are not part of the household at all. A non-resident member is an individual who lived under the household’s roof for at least 15 days

part of the individually-administered adult questionnaire. A remitter is thus defined as an individual who reports having sent a contribution in the last year. A household is classified as a remittance-sending household if at least one resident reports making a cash and/or in-kind contribution in the last 12 months. A household is considered African if the household head is African. Where no head is reported, the modal race of household residents is used.

African households comprise 76% of households successfully surveyed in Wave 5. Remittance-sending African households represent 20.5% of all African households.¹⁸ This is in line with national estimates for African households in Posel (2001), but is lower than rates reported in surveys from other developing countries such as Indonesia, where 88% of households report sending a transfer (LaFave & Thomas, 2017).¹⁹ The low share of remittance sending in South Africa is perhaps unsurprising, though, given extensive social support programmes.

Table 1 presents characteristics of African households that report sending remittances compared to those that do not. All characteristics presented differ significantly between these two household types. The majority of households reporting remitters (80%) report only one resident remitter, however, this is partly a result of 54% of remittance-sending households being single-person households (i.e. the remitter is the sole resident).²⁰ While the majority (64%) of African households are situated in urban localities, the share is predictably higher for remittance-sending households (73%).

Remittance-sending households report fewer resident children on average, and the share of households with at least one child in each of the age groups is significantly lower in remittance-sending households than in other households. As suggested by Posel (2001), other household residents – and especially children – may crowd-out remittance sending. This is one of the potential reasons that we observe fewer residents, and specifically fewer children, residing in households that do not send remittances. Another reason may owe to the endogeneity of household formation. Where remittances are sent to support non-co-resident biological children, one would observe a higher frequency of remittances sent from households in which remitters do not live with their children. There is thus a selection mechanism, which is related to household formation, affecting observed transfers.

Remitter households further differ on a number of dimensions. They are smaller, have older members, are more likely to be male headed and more likely to have a graduate resident. They also have significantly higher household income and expenditure. Having a graduate in the household who

in the last year. A resident member, on the other hand, is an individual who usually sleeps in the household for at least 4 nights a week.

¹⁸ The overlap between remittance-sending and remittance-receiving households is low: just 19% of remittance-sending households also report receiving transfers from a non-resident or non-member (not shown here).

¹⁹ Similarly in Malaysia, 31% of households report receiving a remittance (Vogel & Korinek, 2012) compared to around 20% of households receiving remittances in our data.

²⁰ There may, however, be non-resident members.

is accessing labour market returns to a university or college degree will contribute to the significantly higher income levels observed in remittance-sending households. If income is pooled, then the presence of a graduate in the household may have an effect on remittances sent irrespective of whether the graduate is the remitter or not. However, if a collective model of household decision-making is more appropriate for remittance behaviour, then the presence of graduates who do not remit would not necessarily affect the amount remitted. Thirty-four percent of remittance-sending households have a resident graduate, compared to only 23% of other households. This is partly driven by the higher prevalence of remitting among graduates. Although African graduates constitute a much smaller share of the population – just 12% of African adults (15+) report a post-secondary qualification – a greater share of graduates remit²¹ (30%) compared to other individuals (13%).

Table 1: Characteristics of all African households compared to remittance-sending African households

	All households	Remittance-sending household?	
		No	Yes
Household monthly expenditure (Rands)	5 690.91	5 121.38	6 664.32***
Household monthly income (Rands)	8 489.11	7 125.92	11 278.59***
Household has a resident graduate (yes=1) ^a	0.26	0.23	0.34***
Household head is male (yes=1)	0.52	0.46	0.67***
Average age of residents	30.49	29.8	32.28***
Household has at least 1 child aged 7 to 17 (yes=1)	0.37	0.43	0.22***
Household has at least 1 child under age 7 (yes=1)	0.31	0.36	0.19***
Number of children 7 to 17	0.64	0.75	0.36***
Number of children under 7	0.45	0.53	0.27***
Number of residents	3.03	3.29	2.38***
Household is a single person household	0.39	0.33	0.54***
Household has only 1 remitter (1=yes) ^b	0.22	0.00	0.80***
Urban location (yes=1)	0.64	0.61	0.73***
Household has at least one pensioner (yes=1)	0.16	0.19	0.09***
Household receives at least one state grant (yes=1)	0.42	0.49	0.25***
Observations	8 490	6 705	1 723

Notes: Data are weighted using post-stratification weights. There are 8 428 households that have valid responses to remittances sent. Statistically significant differences in the characteristics of households that send remittances and households that do not are indicated by *** p<0.01, ** p<0.05, * p<0.1.

^a This figure is conditional on residents in the households having non-missing education status. There are 1 718 remittance-sending households with non-missing graduate status, and 6 699 households that do not send remittances which have non-missing graduate status. Thus N=8 479.

^b Conditional on residents in the household having valid responses to the question on contributions given. N=8 428.

Source: Authors' own calculations using NIDS Wave 5.

²¹ Conditional on them answering this question.

Our first step in understanding how best to measure whether there could be potential differences in expectations of support placed on individuals of differing characteristics (e.g. graduates versus other individuals), is to check whether the income-pooling hypothesis holds. If it holds, we would expect household characteristics rather than individual characteristics to determine whether a household is a remittance-sending household. To this extent, we are interested in whether remittance expenditure is drawn from a common pool of household income, or whether a remitter's income matters more in this regard. In the former case, the coefficients on other total household income and individual income should be similar. In the latter case, the coefficient on individual income should be different. A rejection of the income-pooling hypothesis would suggest that a collective model of household behaviour is likely to underpin remittance-sending behaviour, and that the resources a remitter potentially brings into the household may be allocated differently from other resources – that is, according to the remitters preferences or responsibilities.

Table 2 presents the results of regressions to test the income-pooling hypothesis. Columns 1 and 2 show results for selection into remitting, and Columns 3 and 4 show results for remittance value, conditional on remitting. Our sample in the selection specification comprises 18 929 African individuals who responded to whether they made a cash or in-kind contribution to someone not co-resident in their household in the last 12 months (this includes maintenance and child support payments). Fifty-nine individuals who have missing education information are excluded, along with 81 individuals missing information across the other covariates. Our sample in the remittance value specification (Columns 3 and 4) consists of 1 866 remitters who responded to the question on how much was sent in the last month – both cash and in-kind. Some remitters report zero incomes (6% of the estimation sample), and others report zero values for amount sent in the last month (11%). We thus enter both income and the value of remittances sent as levels rather than logarithms. Columns 1 and 3 show the resulting coefficients on income from an ordinary least squares regression [OLS] and Columns 2 and 4 show the results of a fixed-effects [FE] specification, which verifies whether results are robust to measurement error in the household income variable.

The results in Table 2 reject the income-pooling hypothesis for both selection into remitting and the amount remitted. F-tests in Columns 1 and 3 show that equality of individual income and household income is rejected at the 1% and 5% levels respectively.²² Results in Column 2 confirm that our rejection of the income-pooling hypothesis for selection into remitting is robust to measurement error in the household income variable. Results in Column 4 show that the coefficient on labour market income increases in size and remains significant, indicating that the income-pooling hypothesis is also rejected for the value of remittances sent. These results suggest that households do not operate as a

²² Income is as reported. When income is deflated, coefficients do not change.

unit with respect to remittance decisions. As such, we now turn consider which personal characteristics of individuals may affect selection into remitting.

Table 2: Regressions testing the income-pooling hypothesis

	Selection into remitting		Amount remitted	
	(1) LPM	(2) FE	(3) OLS	(4) FE
Other household income	-0.00 (0.00)	- -	-0.00 (0.00)	- -
Individual labour market income	^a 0.00*** (0.00)	^b 0.00** (0.00)	0.04*** (0.01)	0.06*** (0.02)
Individual income from non-labour market sources	0.00 (0.00)	0.00 (0.00)	0.03 (0.04)	-0.01 (0.06)
Controls	Yes	Yes	Yes	Yes
Observations	18 929	18 929	1 866	1 866
R-squared	0.19	0.07	0.21	0.44
Number of households	-	8 446	-	1 740
F-test: individual labour market income + non-labour market income = other household income (p-value)	0.00	-	0.05	-

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. Standard errors are robust to clustering at the household level. Data are weighted using post-stratification weights. The dependent variable in Columns 1 and 2 is a binary variable = 1 if an individual is a remitter, and in Columns 3 and 4 it is value of cash and in-kind remittances sent in the last month. Additional controls include gender, a quadratic in age, categories of education (no schooling, primary, incomplete secondary, matric, qualification not requiring matric, and post-secondary), dummy variables for whether the individual is in wage employment and/or casual/self-employment respectively, the number of children under 7, the number of children aged 7 to 17, and indicator variables for whether each of the mother and father are co-resident or not. The remittance value specifications in Columns 3 and 4 additionally control for the number of individuals remitted to, and the frequency of remittances sent.

^a A R1 000 increase in labour market income increases the probability of remitting by 0.44 percentage points.

^b A R1 000 increase in labour market income increases the probability of remitting by 0.43 percentage points.

Source: Authors' own calculations using NIDS Wave 5.

Table 3 contrasts the characteristics of individuals who remit compared to those who do not remit. On average, remitters fair better in the labour market than those who do not. Remitters are more likely to be in wage employment, less likely to receive a social grant and are more likely to be graduates compared to those who do not remit (12% of individuals who do not remit are graduates compared to 28% of remitters). In other words, those who remit are distinct on observable characteristics. We further explore the determinants of who selects into remitting in a multivariate setting in the following section, but the higher prevalence of graduates among remitters provides suggestive evidence that graduates may be disproportionately affected by black tax.

Graduates who do not remit earn more than other remitters (remitters without a post-secondary qualification) on average, suggesting that higher income alone is not a sole determinant of remittance sending. However, both graduate remitters and other remitters' income comprises a greater share of total household income than does the income of individuals who do not remit.

Additionally, the share of other remitters in wage employment and casual/self-employment²³ is higher than among graduates who do not remit, suggesting that employment is likely a key driver of remittance sending too. Although employment and income are a rough approximation of bargaining power – as they may be the result of time-allocation bargaining processes – a greater share of household income, or having greater job security, may enhance remitters’ bargaining power in their households.

Table 3: Characteristics of those who remit and those who do not by their graduate status

	Remitter?		Remitter=no		Remitter=yes	
			Graduate?		Graduate?	
	No	Yes	No	Yes	No	Yes
Age	35.92	36.52	36.08	34.82***	36.60	36.38
Gender (Male=1)	0.44	0.66	0.44	0.39**	0.70	0.54***
No schooling	0.06	0.02	0.06	0.00***	0.03	0.00***
Primary schooling	0.14	0.08	0.16	0.00***	0.12	0.00***
Incomplete secondary	0.44	0.31	0.50	0.00***	0.43	0.00***
Matric	0.17	0.19	0.20	0.00***	0.27	0.00***
Qualification not requiring matric	0.06	0.12	0.07	0.00***	0.16	0.00***
Post-secondary (graduate)	0.12	0.28	0.00	1.00	0.00	1.00
Mother’s education – years ^a	5.34 (1 037)	5.33 (93)	5.02 (976)	7.50 (56)***	4.49 (74)	7.43 (17)***
Father’s education – years ^a	4.72 (2 979)	4.74 (303)	4.40 (2 717)	6.95 (253)***	3.97 (241)	6.59 (59)***
Graduate mother (yes=1) ^a	0.06	0.06	0.04	0.14***	0.03	0.14***
Graduate father (yes=1) ^a	0.05	0.05	0.03	0.12***	0.02	0.14***
Individual labour market income (Rands)	1 968.41	6 804.11	1 109.60	8 079.16***	4 816.47	11 918.59***
Individual income from non-labour market sources (Rands)	758.54	503.04	643.58	1 571.98	530.79	450.86
Individual income as a share of household income	0.35	0.73	0.33	0.54***	0.73	0.74
Individual is in wage employment	0.28	0.75	0.24	0.61***	0.71	0.84***
Individual is in casual/self-employment ^b	0.10	0.14	0.10	0.09	0.15	0.13
Individual receives a social grant	0.36	0.16	0.38	0.20***	0.19	0.10***
Individual receives a child support grant	0.26	0.13	0.27	0.18***	0.15	0.09***
Observations	17 168 ^c	1 901 ^c	15 505	1 617	1 387	501

²³ We separate wage (or salaried) employment and casual/self-employment since job security and income stability is likely to differ between these two employment types, with the latter being a more precarious form of employment than the former. Casual employment is defined in the NIDS questionnaire as irregular and short-term employment.

Notes: Data are weighted using post-stratification weights. Statistically significant differences in the characteristics of graduates and other individuals are indicated by *** p<0.01, ** p<0.05 and * p<0.1.

^a Parental education contains high rates of missingness, especially for father’s education. The number of missing observations is shown in brackets following the mean. The graduate parent indicator is similarly conditional on non-missing information.

^b Four remitters did not respond to this question. Two are graduates. Forty-three individuals who do not remit are missing information on casual/self-employment (three are graduates) and 21 are missing information on wage employment (two are graduates).

^c Forty-six individuals who do not remit are missing information on their graduate status. Three remitters are missing this information. Thus the observations in the columns that split individuals by graduate status do not sum to the observations in the first two columns.

Source: Authors’ own calculations using NIDS Wave 5.

Table 4 additionally shows that remitters live in very differently structured households than those that do not remit. These household living arrangements will be endogenous to the decision to remit. Table 4 broadly shows an increased autonomy and reduced reliance on the traditional household and its associated support structures as we move from those who do not remit, to those who do. Graduates within the group that do not remit are marginally less reliant than the other individuals, and then graduate remitters are even less reliant than other remitters.

Table 4: Mean co-residency and other household characteristics of those of remit and those who do not by their graduate status

	Remitter?		Remitter=no		Remitter=yes	
	No	Yes	Graduate		Graduate	
	No	Yes	No	Yes	No	Yes
Father is co-resident	0.10	0.02	0.10	0.09	0.02	0.02
Mother is co-resident	0.26	0.06	0.27	0.21***	0.07	0.04*
Have at least 1 biological child with whom they are co-resident [†]	0.45	0.25	0.44	0.49**	0.23	0.31**
Co-resident grandfather ^a	0.01	0.00	0.01	0.01	0.00	0.00*
Co-resident grandmother ^a	0.03	0.00	0.03	0.01***	0.00	0.00
At least 1 child aged 7 to 17 in household (yes=1)	0.60	0.22	0.62	0.49***	0.21	0.25
At least 1 child under 7 in household (yes=1)	0.48	0.21	0.49	0.39***	0.21	0.19
Number of children aged 7 to 17 in household	1.17	0.37	1.22	0.78***	0.35	0.40
Number of children under 7 in household	0.80	0.28	0.83	0.58***	0.30	0.23*
Urban location (yes=1)	0.57	0.73	0.54	0.73***	0.72	0.75
Household size (number of residents)	4.86	2.49	5.01	3.82***	2.49	2.38
Individual lives alone (yes=1)	0.15	0.50	0.13	0.26***	0.51	0.49
Observations	17 168	1 901	15 505	1 617	1 387	510

Notes: Data are weighted using post-stratification weights. Statistically significant differences in the characteristics of graduates and other individuals are indicated by *** p<0.01, ** p<0.05 and * p<0.1.

+ respondents without children are assigned the value zero on this indicator. Note, male respondents are not asked whether they have any biological children in the survey. We can therefore only identify biological children with whom they reside.

^a It should be noted we can only link a grandchild to the grandparent via a personal identifier when a child's parent has been co-resident with the grandparent at least once during the course of the panel. In the case where a child has always lived with the grandparent but not their parent, this share may be underrepresented.

Source: Authors' own calculations using NIDS Wave 5.

The biggest difference in household structure, however, is between those who remit and those who do not – that is, selection into remitting. Compared to those who do not remit, remitters are less likely to co-reside with a biological child, are more likely to live alone, or are more likely to reside in households with fewer children and other individuals in general. That is, the household structure of graduate remitters and other remitters is closer in similarity than the household structure of graduates and others who do not remit: remitter households are of a similar size and equally likely to have children, whereas among those who do not remit, graduates' households are significantly smaller than other households, and significantly less likely to have children, on average. Note that since men are not asked whether they have any biological children in the survey, the 'live with a biological child' indicator reflects the combined differences in the incidence of having a biological child and differences in co-residency patterns.

These findings suggest that household structure likely also affects selection into remitting, in addition to the labour market and education characteristics of individuals. Being a graduate may be correlated with an individual's level of autonomy – due in part to labour market factors – to start their own household. So rather than an increased responsibility (conditional on income) alone, remitting may also be a function of being in a different place (i.e. other individuals could be equally called upon to remit, but are more likely to reside in their original household). This is explored further in the multivariate analysis. Suffice to say, while improved labour market outcomes appear to be a channel through which graduates select into remitting (by choice, responsibility or otherwise), those who live with fewer children, who do not reside with their parents, and who earn a greater share of household income are also more likely to remit.

Focusing now on differences between graduate remitters and other remitters, Table 3 shows that other remitters earn on average less than half the labour market income compared to graduates, are more likely to receive a social grant – the majority of which are child support grants – and are significantly less likely to be in wage employment. Eight percent of remitters report no income from any source. However, an intra-household transfer may occur between the remitter and another resident, which would enable the individual to send a remittance.²⁴

²⁴ Of those who report no income (N=116), 21% report zero for the value of remittances sent in the last month. Another 5% have a missing value for remittance sent in the last month.

Table 3 shows that remitters are, in general, more likely to be male. However, 46% of graduate remitters are women compared to only 30% of other remitters. This could be suggestive of a couple of different things. First, post-secondary education may increase the likelihood that women live and work away from their household of origin. Second, increased education could increase a women's economic freedom and hence ability to offer financial support or, perhaps, the expectation to offer financial support to those outside her home. As Posel (2001a) notes, historically, most migrants were men as they faced better urban economic opportunities and household decision-making hierarchies restricted women's mobility. Graduating with a post-secondary qualification could play an important part in shifting gender norms in this regard.

Graduate remitters are more likely to reside with a biological child compared to other remitters (Table 4), but again it is unclear whether this is a result of graduate remitters being more likely to have a biological child, more likely to reside with a biological child, or a combination of both. More individuals who do not remit live with their biological children than do remitters, a fact that is likely driving the high share of remittances sent to children (36%)²⁵ observed in Table 5 below. Unfortunately, though, unless all of a male respondent's children have been co-resident with them at some point in the panel, we do not know how many children a male in NIDS has. Thus despite the fact that together Tables 3 and 5 indicate that a substantial number of remittances are likely sent from non-coresident fathers to their children, we do not have a complete birth register to explore this in more detail.

²⁵ This includes foster, step and adopted children.

Table 5: Characteristics of remitters by identity of recipient and remitter graduate status

	All remitters	Other remitters	Graduate remitters
Remittance(s) sent to [...] (yes=1)			
A non-resident household member	0.19	0.19	0.19
A non-household member	0.82	0.81	0.83
Children	0.36	0.36	0.36
Parents	0.32	0.28	0.40***
Grandparents	0.02	0.03	0.01**
Siblings	0.10	0.09	0.11
Other family	0.16	0.16	0.14
Other non-family ²⁶	0.10	0.12	0.06***
Number of remittances sent	1.10	1.08	1.15**
Frequency of cash and in-kind remittances sent in the last year ^a	12.46	12.22	13.12
Value of cash and in-kind remittances sent in the last year (Rands) ^b	13 814.61	12 785.97	16 530.40***
Value of cash and in-kind remittances sent in the last month (Rands) ^c	1 424.84	1 279.60	1 813.91***
Value of cash and in-kind remittances sent in the last month as a share of total individual income ^d	0.48	0.57	0.28
Observations	1 901	1387	501

Notes: Data are weighted using post-stratification weights. Statistically significant differences in the characteristics of graduate and other remitters are indicated by *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

^a Four remitters did not respond to the frequency question for either cash or in-kind remittances. $N = 1\ 897$. No graduates were non-responders.

^b One hundred and forty-five remitters did not respond or responded 'don't know' to the question on the value of remittances sent in the last year. $N = 1\ 756$. Five non-responders were graduates and the remainder were other individuals.

^c Seven remitters did not respond or responded 'don't know' to the question on the value of remittances sent in the last month. $N = 1\ 844$. One non-responder was a graduate and the remaining six were other remitters.

^d $N = 1\ 774$. Of the 1 844 who report a cash and/or in-kind contribution in the last month, 110 report zero income from any source (27 graduates and 83 other individuals). Thus this figure is conditional on positive income.

Source: Authors' own calculations using NIDS Wave 5.

While Table 5 shows that a similar share of graduate and other remitters also send contributions to their children (36%), graduates are more likely to send contributions to their parents (40%) than others (28%). This is consistent with lower parental co-residency rates for graduates shown in Table 4. Since other remitters are less likely to have wage employment (Table 3), this may contribute to a delay in the formation of their own household (see Klasen & Woolard, 2008). It is also consistent with the idea that parents may support their children's education in the form of a loan that is later repaid. Although, since we are not able to observe the purpose of cash remittances sent, it may be that

²⁶ This category includes boyfriends and girlfriends, lodgers or relatives of lodgers, and household help.

remittances sent to parents are *intended* to be spent on children (where children co-reside with their grandparents, for example).

Table 5 further shows that the majority of remitters send to individuals who are not (non-resident) household members. Only 19% of remittances go to non-resident members of a remitter's household.²⁷ It is often assumed that remittances are sent by a labour migrant to their household of origin. It may also be the case, however, that the household of origin may be transferring money to a labour migrant who has left the household to look for work. This is particularly likely to be the case for the 19% of recipients who are non-resident members.

Not shown in the table is that cash remittances are sent more frequently than in-kind remittances, and both the monthly and yearly values of cash remittances are higher than of in-kind remittances. Together, an average of R1 425 was remitted in the month prior to the survey, with remittances occurring roughly every month of the last year on average. It is important to note that remittances may fluctuate over the course of the year, and thus some variability in the value is likely to owe to this fact. Additionally, where individuals remit over the course of their lifecycle, cross-sectional estimates will underestimate the extent of transfers.

Graduate remitters do not remit more frequently than other remitters, but they do remit significantly more on average (except in the case of in-kind transfers where there is no statistical difference in amount sent by remitter type). This is likely enabled by their higher average incomes observed in Table 3. The number of individuals whom a remitter supports is also slightly higher for graduates than for other remitters. This may be indicative that responsibilities to offer support affect graduates to a greater degree than others. A causal conclusion cannot be drawn from this data alone though. On average, remitters send roughly half their total monthly income. Although the share of income spent on remittances in the last month is almost double for graduates than other remitters, the difference is not statistically significant.

Table 6 presents the average frequency and value of cash and in-kind remittances sent in the last month²⁸ by the recipient's relationship to the sender. The majority of remittances (36%) were sent to children in the month prior to the survey.²⁹ Although roughly the same share of graduate and other remitters remit to children, graduate remitters remit significantly higher amounts to their children than other remitters. While Table 5 shows that a significantly lower share of graduate remitters support non-family members, Table 6 shows that among those that do, the amount sent is higher. The group that

²⁷ Not the proportions in these categories do not sum to 100% as some remitters send to more than one person.

²⁸ This measure has a higher response rate than the annual measure, and is less likely affected by recall bias.

²⁹ Note that each remittance does not equal one remitter. A remitter may send to multiple children, or to a child and a parent, for example.

both graduates and other remitters send the highest remittances to, is other family. This is perhaps unsurprising, since this category includes spouses.³⁰

Table 6: Average frequency and value of remittances by recipient's relationship to the remitter

	All	% of remittances	Remittances sent to [...] by other remitters	Remittances sent to [...] by graduates
Frequency of cash and in-kind contributions sent to children in the last year	13.28	-	12.79	14.58
Value of cash and in-kind contributions sent to children in the last month (Rands)	1 287.17	-	986.08	2 066.97***
Observations	708	36%	519	187
Frequency of cash and in-kind contributions sent to parents in the last year	11.61	-	11.82	11.19
Value of cash and in-kind contributions sent to parents in the last month (Rands)	1 197.18	-	1 102.57	1 374.61
Observations	540	27%	363	171
Frequency of cash and in-kind contributions sent to siblings in the last year	8.73	-	8.80	8.64
Value of cash and in-kind contributions sent to siblings in the last month (Rands)	850.25	-	828.27	888.95
Observations	199	10%	136	62
Frequency of cash and in-kind contributions sent to grandparents in the last year	9.38	-	9.28	10.09
Value of cash and in-kind contributions sent to grandparents in the last month (Rands)	708.22	-	672.14	968.18
Observations	45	2%	36	9
Frequency of cash and in-kind contributions sent to other family in the last year	12.60	-	12.74	12.25
Value of cash and in-kind contributions sent to other family in the last month (Rands)	2 437.36	-	2 491.72	2 339.83
Observations	276	14%	209	65
Frequency of cash and in-kind contributions sent to other non-family in the last year	10.11	-	10.07	10.52
Value of cash and in-kind contributions sent to other non-family in the last month (Rands)	1 011.95	-	924.02	1 486.50**
Observations	218	11%	178	38

Notes: Data are weighted using post-stratification weights. Statistically significant differences in the remittances sent by graduate and other remitters are indicated by *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Source: Authors own calculations using NIDS Wave 5.

Very few transfers are directed towards grandparents, possibly reflecting the good coverage of the old age pension. As alluded to previously, the patterns of remittances observed in Tables 5 and 6, will be affected by household formation and with whom the remitter resides, but the low share of grandparent co-residency (Table 3) suggests that we are not simply missing transfers to the elderly because of co-residency arrangements.

³⁰ Posel (2001) finds evidence that spouses induce higher transfers.

Together, Tables 3 to 6 are suggestive of largely differing patterns of remittances sent by graduates and other individuals. Graduate remitters are, on average, more likely to support their parents, and support more individuals more generally. Graduate remitters also send more on average, although it is not clear whether this can be attributed to higher levels of income, greater responsibilities, remitting to more people, or an interplay of these factors. The regression analysis in the following section will allow us to explore this further. Before this, though, we briefly turn to consider patterns of intra-household transfers. Specifically, we explore whether any additional insights into private transfers can be observed in our data.

In Table 7, we unpack a measure of intra-family transfers, by considering who contributes to children's education expenses. Furthermore, we consider whether contributors differ depending on whether a graduate is resident in the child's household. This allows us to observe preliminary patterns of how education characteristics of household residents might be related to patterns of intra- or inter-households transfers. We consider the identity of individuals from inside and outside the household who are listed as contributing to a child's annual education expenditure in 2016 (from the perspective of the child). Our sample of children comprises those enrolled in 2016 who were between the age of 6 and 16 (7 to 17 in the survey year – 2017). Children can legally leave school at age 15. Our results are thus concentrated on those contributing to spending on compulsory education.

A low share of contributions to schooling expenditure come from outside the household, with the majority of contributions coming from individuals residing with the child (92%). Seventy-two percent of transfers come from resident parents, though, which suggests that there are other resident household members who allocate money to children's education spending.

Over half of the children residing with a graduate receive support from that graduate. Of those, 16% receive support from a graduate who is not their parent (not shown here). Children residing with a graduate are significantly more likely to receive support from a parent (whether they are co-resident or not), and significantly less likely to receive no support at all. A greater share of children not residing with a graduate receive support from grandparents, compared to children residing with a graduate. However, after parent contributors, grandparent contributors are the biggest contributing category for all children.

Table 5 shows that inter-household transfers sent to children constitute a large share of all remittances observed. Table 7 presents an alternative lens through which we observe transfers to children, that is, transfers made specifically towards education expenditure. As might be expected, most children's education is paid for by people within a child's household. However, while the majority of these transfers come from resident household members, these individuals are not always a child's parents. Thus interrogating intra-households transfers is an important part of understanding private

networks of support among (extended) family, and interrogating how these households operate with regard to their sharing and decision making will be important for understanding the welfare of individuals within households.

Table 7: Average share of children in African households whose education is supported by [...]

	All	Children not residing with a graduate	Children residing with a graduate
Receives private support	0.81	0.78	0.89***
Observations	8 054	6 300	1 754
Receives support from [...]*			
A household member (resident or non-resident)	0.95	0.94	0.97***
Someone who is not a household member	0.12	0.12	0.12
A resident in the household	0.92	0.92	0.94***
A parent	0.83	0.81	0.86***
A co-resident parent	0.72	0.70	0.78***
A graduate	0.16	0.00	0.58***
A grandparent	0.20	0.22	0.16***
A sibling	0.02	0.03	0.02
An aunt or uncle	0.06	0.06	0.06
Other family	0.01	0.01	0.01
Other non-family	0.00	0.00	0.00*
Observations	6 300	4 801	1 499

Notes: Data are weighted using post-stratification weights. Statistically significant differences in mean characteristics of children residing with at least one graduate and children not residing with any graduates are indicated by *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The categories are not mutually exclusive, i.e. more than one individual can contribute to a child's education expenses. All variables are dummy variables where yes=1.

* Conditional on receiving support

Source: Authors' own calculations using NIDS Wave 5.

To conclude this section we note that survey data can only tell us part of the story, and whilst the data shows that only a small portion of the population send remittances, it should in no way be read as discrediting the existence or importance of private support networks and the intricacies of household allocation. Indeed, looking at the example of education expenditure, we see that most financial contributions to education spending come from within the household and are not limited to children's parents. But intra-household networks of private transfers will be unobserved in survey data, since questionnaires typically do not ask about transfers between co-resident individuals.

We thus acknowledge that remittances are only one of the lenses through which we may observe graduate responsibilities. We do not attempt to comment on graduate responsibilities to share within households, although literature suggests this is common. For example, contributing authors to Mhlongo's (2019) book attest to opening their doors to non-biological children and other relations who need somewhere to stay while looking for work, or attending school or university. Klasen & Woolard

(2008) similarly find that household formation is a critical way in which unemployed individuals access resources. Particularly, the authors note that co-residence is a preferred way to meet obligations to help less fortunate relatives. In this vein, if black tax is confined within household boundaries, a question about remittances will not elicit the pervasiveness of the matter.

We turn now to explore selection into remitting and determinants of remittance value further in a multivariate setting.

5. Regression results

The results of multivariate analyses of selection into remitting and the determinants of remittance value are presented in a sequence of OLS and FE regressions in Tables 8 and 9 below.

In Table 8, the regression in Column 1 estimates the relationship between remitting and education, controlling only for an individual's age and gender. As suggested by the descriptive statistics in the previous section, graduates of post-secondary education are more likely to be remitters. In this simple specification, the coefficients on all the education categories are significant, reflecting that those with more education are more likely to remit. The coefficient for qualifications not requiring matric and post-secondary qualifications show a 10 and 16 percentage point increased probability of remitting relative to those with incomplete secondary education. The second regression, which introduces income and employment variables, suggests that the relationship between education and remittance sending is partly a function of improved labour market outcomes. Only the coefficients on the post-school qualification indicators remain significant, and the size of the coefficients for qualifications not requiring matric and post-secondary qualifications have reduced to 0.07 and 0.05 respectively. Both wage employment and casual/self-employment have a practically large and statistically significant relationship with the probability of remitting, as does labour market income. Although the coefficient appears small, a R1 000 increase in labour market income increases the probability of remitting by a statistically significant 0.45 percentage points.

The third regression introduces controls for living arrangements. These results reinforce the descriptors discussed in the previous section, namely: labour market characteristics *and* household structure are important determinants of who remits, and education levels result in differences in these characteristics across individuals. In this specification, the coefficient on qualifications not requiring matric is further reduced in size and significance. However, the coefficient on post-secondary qualifications increases in size and significance; individuals with post-secondary qualifications are 9 percentage points more likely to remit than those with incomplete secondary education once household structure, labour market outcomes and demographic characteristics are controlled for. The

statistically significant coefficients on number of children in the household suggest a decrease in the probability of remitting of around 2 percentage points for each additional co-resident child. Similarly, having a co-resident parent also decreases the probability of remitting, with coefficients being -0.06 for mothers and -0.04 for fathers.

Table 8: Regressions for the probability of selecting into remitting

	(1) LPM	(2) LPM	(3) LPM	(4) FE
Education (omitted: incomplete secondary)				
No schooling	-0.03* (0.02)	-0.01 (0.01)	-0.00 (0.01)	-0.02 (0.01)
Primary schooling	-0.03** (0.01)	-0.02 (0.01)	-0.01 (0.01)	0.00 (0.01)
Matric	0.04*** (0.02)	0.02 (0.01)	-0.01 (0.01)	-0.00 (0.01)
Qualification not requiring matric	0.10*** (0.02)	0.07*** (0.02)	0.05** (0.02)	0.05* (0.03)
Post-secondary (graduate)	0.16*** (0.02)	0.05** (0.02)	0.09*** (0.02)	0.09*** (0.02)
Age	0.02*** (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00 (0.00)
Age-squared	-0.00*** (0.00)	-0.00*** (0.00)	-0.00 (0.00)	-0.00 (0.00)
Gender (male=1)	0.12*** (0.01)	0.08*** (0.01)	0.06*** (0.01)	0.01 (0.01)
Individual labour market income	-	0.00*** ^a (0.00)	0.00*** ^b (0.00)	0.00** ^c (0.00)
Individual income from non-labour sources	-	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Labour market income & graduate interaction	-	-	-0.00*** (0.00)	-0.00 (0.00)
Other income & graduate interaction	-	-	-0.00 (0.00)	-0.00 (0.00)
Wage employment (yes=1)	-	0.21*** (0.02)	0.17*** (0.01)	0.06*** (0.02)
Casual/self-employment (yes=1)	-	0.10*** (0.02)	0.07*** (0.02)	0.05** (0.03)
Number of children aged 7 to 17 in household	-	-	-0.02*** (0.00)	-
Number of children under 7 in household	-	-	-0.02*** (0.00)	-
Mother is co-resident	-	-	-0.06*** (0.01)	-0.01 (0.01)
Father is co-resident	-	-	-0.04*** (0.01)	-0.00 (0.01)
Constant	-0.24*** (0.02)	-0.08*** (0.02)	0.09*** (0.02)	0.07*** (0.02)
Observations	18,995	18,929	18,929	18,929
R-squared	0.09	0.16	0.19	0.07
Number of households				8,446

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. Standard errors are robust to clustering at the household level. Data are weighted using post-stratification weights. The dependent variable is binary taking the value 1 if an individual remits and 0 otherwise.

^a A R1 000 increase in labour market income increases the probability of remitting by 0.45 percentage points.

^b A R1 000 increase in labour market income increases the probability of remitting by 0.13 percentage points.

^c A R1 000 increase in labour market income increases the probability of remitting by 0.89 percentage points

Source: Authors' own calculations using NIDS Wave 5.

The regression in Column 3 additionally introduces an interaction between income and graduate status. The results suggest no differential relationship between non-labour market income earned by graduates and the probability of remitting, but there is a statistically significant negative coefficient on the labour market income and graduate interaction. This suggests a weaker relationship between labour market income and the probability of remitting for graduates compared to other individuals. Where graduates face responsibilities to remit owing to their graduate status over and above their earnings capacity, this observation is not unexpected.

The fourth regression controls for time-invariant, unobserved household-level factors affecting individuals' decision to remit. Positively, the coefficient on post-secondary education remains consistent with that in the third regression. Post-secondary graduates are 9 percentage points³¹ more likely to remit than those with incomplete secondary education, even once household and individual demographic and labour market factors are controlled for. A R1 000 increase in labour market income increases the probability of remitting by 0.9 percentage points. This is roughly double the coefficient in the first two regressions, but 0.04 percentage points lower than the coefficient on labour market income in the third regression. Again, other income has no statistically significant effect, but the effect of graduate labour market income on remitter status is no longer weaker than other individuals' labour market income.

Lastly, it should be noted that in all regressions, the coefficient on post-secondary education is not statistically different to the coefficient on 'qualification not requiring matric' when compared against incomplete secondary as a base category. However, post-secondary education has a statistically significant positive probability on remitting in all specifications when compared to all other education as base category (not shown here).

Table 9 presents regression results for the determinants of remittance value, conditional on remitting. The first regression considers the relationship between education and the value of the remittance sent, controlling only for a quadratic in age, and gender. These results suggest that graduates of post-secondary education remit significantly more than those with incomplete secondary. However, once controls for labour market outcomes are introduced from Column 2 onwards, this relationship is no longer statistically significant (when compared to incomplete secondary as a base category, or no post-secondary qualification as a base category). Thus controlling for other

³¹ The proportion remitting in the base education category (incomplete secondary education) is 11.5%, therefore a 9 percentage point increase is relatively large.

determinants of remittance value, and conditional on remitting, a remitter's graduate status alone is not related to higher remittances values.

Table 9: Regressions for the determinants of remittance value, conditional on remitting

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) FE
Education (omitted: incomplete secondary)					
No schooling	-304.95 (242.32)	-241.68 (235.07)	-360.16 (220.75)	-291.46 (212.83)	617.31 (390.48)
Primary schooling	86.52 (273.29)	210.77 (263.32)	194.55 (247.44)	253.98 (239.06)	292.30 (254.65)
Matric	71.33 (154.20)	-104.27 (153.41)	-161.77 (148.95)	-252.27** (128.30)	-251.89 (260.93)
Qualification not requiring matric	-216.67 (135.74)	-227.07* (125.13)	-248.02* (129.57)	-276.23** (123.29)	-304.83 (408.60)
Post-secondary (graduate)	556.47*** (175.80)	153.73 (179.81)	190.19 (209.03)	-101.22 (168.09)	-119.68 (362.58)
Age	122.17*** (21.64)	77.30*** (22.29)	65.93*** (21.78)	61.16*** (19.66)	56.41 (50.67)
Age-squared	-1.14*** (0.26)	-0.65** (0.27)	-0.54** (0.26)	-0.53** (0.23)	-0.65 (0.60)
Gender (male=1)	462.15*** (114.74)	272.90** (121.27)	183.19 (122.34)	154.43 (120.01)	-388.44* (207.39)
Individual labour market income	-	0.05*** (0.01)	0.05** (0.02)	0.12*** (0.02)	0.14*** (0.04)
Individual income from non-labour sources	-	0.03 (0.03)	0.04 (0.04)	0.13** (0.06)	-0.03 (0.07)
Labour market income & graduate interaction	-	-	-0.01 (0.02)	-	-0.10** (0.04)
Other income & graduate interaction	-	-	-0.03 (0.06)	-	0.04 (0.09)
Labour market income squared	-	-	-	-0.00*** (0.00)	-
Other income squared	-	-	-	-0.00** (0.00)	-
Number of children aged 7 to 17 in household	-	-	-130.22*** (41.57)	-136.14*** (42.21)	-
Number of children under 7 in household	-	-	-183.96*** (51.15)	-199.59*** (51.57)	-
Constant	- 1,836.95*** (405.49)	- 1,191.74*** (405.66)	- 1,382.39*** (424.02)	- 1,284.43*** (393.52)	-1,061.98 (1,016.16)
Observations	1 870	1 866	1 866	1 866	1 866
R-squared	0.09	0.15	0.21	0.24	0.49
Number of households	-	-	-	-	1 700

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. Standard errors are robust to clustering at the household level. Data are weighted using post-stratification weights. The dependent variable is value of cash and in-kind remittances sent in the last month. Columns 3-5 additionally include controls for employment (both wage employment and casual/self-employment), parents' co-residency, the frequency of remittances sent and the number of individuals remitted to. All coefficients on these controls are not statistically significant from 0, with the exception of maternal co-residency and number of individuals remitted to in the FE specification.

Source: Authors' own calculations using NIDS Wave

Individual labour market income, however, is associated with higher remittance values sent. The fact that the relationship between income and remittance value does not differ significantly by remitter's graduate status, after controlling for other remittance determinants (Column 3), would suggest that graduate remitters are not sending more relative to their 'earnings' capacity than other remitters. However, results in the fifth column, which control for time-invariant, unobserved household fixed effects, suggest that the relationship between labour market income and amount remitted may be weaker for graduates (0.14-0.10) than for others (0.14). Identification in this FE regression comes from households that report more than one remitter, though, so the interaction coefficients should be understood in light of the fact that identification comes only from roughly 48 of fewer households. Nonetheless, results in this column are broadly consistent with those from the OLS regressions, showing no particular relationship between graduate status and the value of remittances sent once labour market income (and other household characteristics) is controlled for, but a significant coefficient on labour market income itself for both graduates and others.

Some of the other coefficients in the models, although not directly related to our research questions, are interesting for our understanding of the determinants of remittance values. Column 4 introduces a quadratic in the individual income variables to test for non-linearities in the relationship between income and remittance value. These coefficients suggest that the strength of the relationship between income and the amount of remittance sent is non-linear and diminishes with increasing amounts of both types of income, from a certain point.

Posel (2001) finds that remitters in regular (wage) employment send less on average given other characteristics, and attributes this to self-interested motives of remitting – those with more job security in their place of work are less likely to need to ensure they access the resources of the household of origin in the future. Our results, however, suggest the opposite is the case. Wage employment is associated with an increase in the amount sent, although not statistically significant so (not shown in Table 9). This may stem from the fact that 73% of remitters are in wage employment, and of those in any employment, 87% have wage employment.

The regressions in Columns 3 and 4 added controls for some measures of household structure, and suggest that not only do the number of children work to lower the probability of selection into remitting, but children of *all ages* also crowd out the value of remittances sent for those who do remit. This contrasts Posel (2001), who found that it was only children of school going age (6-18) specifically that reduced the value of remittances sent.

The statistical significance of age suggests that as remitters age, they may remit more, possibly in anticipation of returning to their household of origin. This could be motivated by ensuring they secure

a piece of 'the pie' or as a direct contribution for their consumption in the future. This is consistent with the life cycle and associated self-interested motives.

6. Concluding remarks

The discussion on black tax and informal, private networks of support is becoming more prominent as an increasing share of young African individuals access a post-secondary education and its labour market returns. A key component of this study was thus to re-visit remittance behaviour in light of the potentially increased responsibilities graduates may face to offer financial assistance to family in need. This study, to the best of our knowledge, is also the first of its kind to use a nationally representative data set to quantitatively analyse private transfers within the frameworks of black tax and the responsibilities associated with the completion of post-secondary education in South Africa.

In rejecting that households pool income for remittance decisions and expenditures, we find evidence in favour of a collective model of household decision making. Remittance-sending households do not behave in a way that is consistent with a benevolent household head who redistributes resources according to a combined budget constraint. The fact that remitters, whether graduates or not, are more likely to be employed and earn incomes that comprise a greater share of household income, compared to those who do not remit, may be indicative of increased bargaining power to select into remitting, or simply that, unsurprisingly, selecting into remitting is strongly determined by the availability of income to remit.

Of those who do remit, graduates comprise just over one quarter of these individuals – roughly double the share of graduates in the population. Finding that the probability of remitting is higher for graduates, even once individual income is controlled for, is our first indication that graduates face a differential responsibility to remit. Secondly, the fact that graduates' labour market income has a weaker effect on the probability of remitting, compared to other individuals, further suggests that there is an element of responsibility that arises from graduate status alone.

Graduate remitters' income is significantly higher than that of other remitters. However, after controlling for determinants of remittance value including individual income, and conditional on remitting, graduate status is not statistically related to the amount sent. On the other hand, the relationship between income and amount sent is weaker for graduates versus other remitters. This could suggest that the amount sent by graduates is not as strongly determined by the income they earn, once again consistent with the literature that graduates face a responsibility regardless of their

income. Our results further suggest that graduates are more likely to remit to their parents and support more people, versus other remitters in general.

Compared to other developing nations, South Africa has relatively low level of remittances sending. This is perhaps unsurprising given the extensive social support programmes. The discussion on black tax, however, does not distinguish support extended between households from support offered between individuals residing in a common household of residence. In this regard, observing that a relatively low share of households report sending remittances should not be read as empirical evidence against the prevalence of black tax or private networks of support.

Exploratory results on intra-household transfers suggest that informal, private support networks are prevalent within households, and there are potential differences within the household depending on whether or not a graduate is resident. For example, we find that over half of the children residing with a graduate receive support from that graduate and that of those, 16% receive support from a graduate who is not their parent. Children residing with a graduate are significantly more likely to receive support from a parent (whether they are co-resident or not), and significantly less likely to receive no support at all. Although we cannot explicitly comment on graduate responsibilities within household boundaries, this preliminary evidence suggests that sharing responsibilities within households may manifest differently for graduates too. Additionally, where intra-household transfers are more prominent than inter-household transfers, survey data may be unable to directly elicit the true extent of private networks of support. Where this is the case, understanding how allocation decisions in the household are made will be of fundamental importance to understanding individual welfare.

Our results provide a descriptive overview of graduate responsibilities evidenced in remitting behaviour, and we do not attempt to identify causal effects of being a graduate on family and extended family responsibilities. Nonetheless, our results still have some relevance for policy, including policies aiming to disrupt intergenerational social inequality, policies aimed at altering saving behaviours, as well as policy on the funding of post-secondary education. In this latter regard, our results suggest that post-secondary education financed through a graduate tax, for example, would essentially tax African graduates twice. Future research looking at the effect of private transfers on intergenerational saving and consumption patterns would be a valuable addition to scholarship in this field.

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The Southern Africa Labour and Development Research Unit (SALDRU) conducts research directed at improving the well-being of South Africa's poor. It was established in 1975. Over the next two decades the unit's research played a central role in documenting the human costs of apartheid. Key projects from this period included the Farm Labour Conference (1976), the Economics of Health Care Conference (1978), and the Second Carnegie Enquiry into Poverty and Development in South Africa (1983-86). At the urging of the African National Congress, from 1992-1994 SALDRU and the World Bank coordinated the Project for Statistics on Living Standards and Development (PSLSD). This project provide baseline data for the implementation of post-apartheid socio-economic policies through South Africa's first non-racial national sample survey.

In the post-apartheid period, SALDRU has continued to gather data and conduct research directed at informing and assessing anti-poverty policy. In line with its historical contribution, SALDRU's researchers continue to conduct research detailing changing patterns of well-being in South Africa and assessing the impact of government policy on the poor. Current research work falls into the following research themes: post-apartheid poverty; employment and migration dynamics; family support structures in an era of rapid social change; public works and public infrastructure programmes, financial strategies of the poor; common property resources and the poor. Key survey projects include the Langeberg Integrated Family Survey (1999), the Khayelitsha/Mitchell's Plain Survey (2000), the ongoing Cape Area Panel Study (2001-) and the Financial Diaries Project.

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