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The demand for savings services among the urban poor – evidence from the Khayelitsha Panel Study (2000-2004)

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August 2006

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Introduction

In signing its charter in 2002, the South African financial sector voluntarily committed itself to providing first order retail financial service access to the un-banked by 2008. Although much of the media attention and academic literature has been focused towards the challenge of providing basic transaction services, the charter has also set out specific savings targets for the 2008 deadline. It specified that by 2008, 80% of the poorest half of the South African population (as judged by living standard measures (LSMs)) should have effective access to appropriate savings products and services (National Treasury, 2002:9).

Access to retail transaction banking services is the first key step to accessing more sophisticated financial products and services such as bank savings accounts, pension funds and unit trusts (Porteous, 2004: 21). By focusing on savings, this paper explores this element of the "financial services deepening" debate. If the savings services' net is to be extended through the design of more appropriate savings products for the poor, it is necessary to identify the factors that drive people to save in areas of high unemployment and poverty.

This paper explores three issues regarding poor savers in South Africa. Firstly, it tries to understand why poor people save. Microfinance has a wide body of literature on how the poor manage their finances. However no clear consensus has been reached on what the most applicable model is to understand savings in poor households. Whilst easier to work with, life-cycle theories and the associated permanent income hypothesis fail to deal with the issue of uncertainty over time. Unsurprisingly, poor households and individuals find it difficult to predict what their income flows will be over their life times. Precautionary savings motivations cause prudent consumers who cannot predict their future income flows, to save money now in *case* they need to spend their savings later. Savings is the focus here, not access to credit. Although credit is the dominant theme of the microfinance literature,

there is a growing consensus that the poor need safe, reliable and voluntary savings mechanisms irrespective of their need to access credit. Although the Financial Sector Charter (FSC) categorises savings and insurance differently, this distinction is not so clear cut for the poor. Accumulating savings is often a vital means with which to insure against risk.

Secondly, in exploring some of the supply-side issues surrounding the provision of basic transaction banking services, the paper looks at popular monthly savings vehicles in South Africa, specifically bank accounts, burial societies and stokvels. Savings, credit and insurance within the formal financial sector rely on access to basic transactional banking services. It is cheaper and easier for an individual to manage their finances electronically than it is for him or her to pay bills and save in cash.

Despite having a sophisticated, stable and highly profitable financial sector, the majority of South Africans, especially in the informal sector, remain un-banked. Regulatory priorities that are concerned with ensuring financial stability make it very difficult for new providers to join the financial sector (especially the national payment system network) and it seems almost impossible for a new institution to achieve the economies of scale necessary to supply financial services to the poor. If un-banked South Africans are to become banked then it is the responsibility of the formal financial sector to extend its service net to include the poor.

In the absence of appropriate formal financial services many South Africans use informal groups to save. The global popularity of Rotating Savings and Credit Associations (ROSCAs) amongst the poor is well documented. By exploiting the underlying social relationships in their communities, poor South Africans are able to pool money with other community members in burial societies and stokvels in order to save.

Finally, in an attempt to profile the socioeconomic characteristics of individuals who choose to save in an environment of poverty and unemployment, the paper uses the 2000 – 2004 Khayelitsha panel dataset to explore changes in savings behavior amongst a sample of poor urban African residents. Although the dataset has panel attrition and missing data problems, it is still able to provide some valuable insights into how the urban poor save.

The findings here complement those of the national cross-sectional "Finscope" surveys undertaken annually by the FinMark Trust. Studies using cross sectional surveys are restricted to a particular "snapshot" in time and this limits exploratory analysis of economic dynamics. Although two cross sectional surveys drawn from the same general population at two different points in time may (for example) indicate that there has been very little change in a particular variable over the two periods, the researcher is unable to determine whether this is because gains and losses by particular individuals in the sample have netted each other out or because there in fact has been no substantial change (Cichello et al, 2005:146). Comparing two cross-sectional surveys over time is thus necessarily an exercise in aggregation involving strong assumptions (May et al, 2000: 570).

Furthermore, the 'trend' that such comparative cross sectional studies may reveal cannot tell us anything about the behaviour of specific individual or households over time. Panel studies can be used for both static and dynamic analysis and can provide policy makers with the information needed to design strategies that address the needs of the specific characteristics of particular individuals or groups (Cichello et al, 2005: 146). Whereas cross-sectional analysis estimates of "changes" are based on variances between independent and dependent variables at one specific point in time, panel data provides the opportunity to model actual "changes" directly (Finkel, 1995:5).

The Khayelitsha Panel Study provides a unique opportunity for researchers to explore income, employment and savings dynamics among African residents of Khayelitsha and to profile the characteristics of Khayelitsha savers. It also allows us to attempt to identify the driving factors that enabled individuals to begin saving between 2000 and 2004. Given that the FSC was signed between the two waves of the panel, this study is well placed to explore whether changes in banking policies and the launch of new banking products after 2000 have had any observable effect on the savings behaviour of the Khayelitsha respondents (who fall within the LSM 1 -5 population targeted by the charter).

Chapter 1: Why do the poor save?

A common perception within the formal financial sector is that poor people do not need formal financial services (Robinson, 2001: 6). Rutherford (2000) disagrees, arguing that the poor desire the means to accumulate useful and substantial sums of money. This money is spent on emergencies, life cycle needs and the start-up costs required to take advantage of income earning opportunities. Armendariz de Aghion and Morduch (2005:160) argue that poor households are forward looking and want to protect themselves from unexpected adverse events, and thus see the value of building up a lump some of money even in a near subsistence environment

Risk, vulnerability and poverty are mutually reinforcing. Vulnerability is the inability of low income individuals and households to deal with unanticipated emergencies or the risk of emergencies occurring. The loss of assets or the death or sickness of a primary income earner may require the sale of productive assets or force children to quit schooling in order to find work and supplement the household income (Morduch and Sharma, 2002: 3).

Furthermore, to avoid being in a "poverty trap" the poor also need to access lump sums of money in order to take advantage of opportunities to accumulate productive assets or improve their income generating capacities (Rutherford, 2000: 4). Morduch and Sharma (2002: 11) argue that risk-averse households are willing to forego a level of potential earnings in order to protect their level of consumption over time. New income generating opportunities require some risk taking, be it the purchase of new technology or the creation of a new business partnership. Vulnerable individuals may shy away from these opportunities in favour of lower but more stable income streams so as to avoid risk. Accumulating a savings' insurance net can assist the poor in taking risks that could increase their capacity to generate increased income in the long term.

To lift themselves out of poverty the poor need to increase their income and diversify their assets (Cohen and Sebstad, 2003: v).Yet this process of asset accumulation is a long and difficult journey. Life cycle needs such as weddings, funerals, old age, education or purchasing or building a house often require the expenditure of lump sums that exceed usual average income (Matin et al, 1999: 7). In recovering from unanticipated emergencies such as death, fire or theft, the poor may be forced to take short-term measures (such as using up their available savings and/ or getting into debt) which have significant negative long term impacts. Given their limited means, the strategies that the poor use to reallocate resources in response to life-cycle events and emergencies may eliminate any previous gains and drag them swiftly back into poverty (Cohen and Sebstad, 2003: 1-7).

The ability of the poor to manage these risks is fundamental to their capacity to build assets (Ardington et al, 2004: 606; Churchill, 2002: 381-383). Matin et al (2002:275-276) argue that poorer households regard savings and credit services as being more important as a means of insuring themselves against risk than as a means of getting a return on their money. Mosley and Rock (2004: 487) argue that poorer individuals and households prefer savings to credit as there is a perceived lower risk to saving money than to borrowing. They cite Rutherford's 1998 study in Bangladesh where many poor borrowers felt that they were forced into taking loans because of the lack of voluntary saving mechanisms.

This is why savings are such an important risk management tool. Although an individual or household may be able to access a loan to pay for an emergency or life-cycle event, it comes at a price as they have to pay back (sometimes exorbitantly high) interest on their loan. As a result of their irregular income flows many choose not to take out loans as they cannot guarantee that they will be able to afford future repayments (Churchill, 2002: 382). By spending accumulated savings, the poor can smooth consumption, insure themselves against shocks, and can finance investments

and large expenditures (such as the purchase of durable goods) without having the added uncertainty of debt repayments.

Savings Theories

No consensus has been reached in the academic literature on which is the most appropriate model to describe household savings behaviour (Attanasio and Banks, 2001: 3). Essentially, private savings is about the way that households and individuals allocate resources over time (ibid, 1).The life-cycle savings model assumes that individuals and households smooth consumption over their lifetimes (Deaton, 1997: 337). As workers are promoted and earn progressively more money, they save more in preparation for their retirement when they expect to have no wage income. Once they retire, they may draw down their accumulated savings or may sell some or all of their assets in order to fund current consumption. The model predicts that individual savings rates will peak for individuals in their middle age.

This model has limited applicability in developing countries which typically have a higher proportion of multi-generational households, and household resources are often shared. Because the average age within the household remains relatively constant across time, average household income is not expected to vary and therefore there is less need to smooth consumption through savings and credit. The loss of wage incomes to the household pool when elderly members retire is replaced by new wage earnings as younger members enter the job market (Armendariz de Aghion and Morduch, 2005:152). In South Africa, it has been established that the old age pension provided to the elderly is used in poor households as the main source of household income (Bertrand et al, 2003:27-28). Thus rather than experiencing a decrease in income as would be expected by the life-cycle models, many pensioners and households experience an increase in income as elderly members gain access to South Africa's relatively generous old age pension (Seekings, 2006: 55).

The permanent income model suggests that consumption gets smoothed according to the extent of an individual or household's particular time horizon (Friedman 1957 as cited in Deaton 1997, . Some households may be dependent on seasonal employment and will save when they have employment in preparation for periods when no jobs are available. If the relevant time horizon is a lifetime then the life-cycle model becomes applicable (Deaton: 1997: 351).

These models of intertemporal choice assume that marginal utility of consumption is linear and diminishing. People save in times of excess because they realise that the payoff to added consumption in times of excess is less than what it is in times of scarcity. As long as the marginal utility of consumption is the same, rational agents are indifferent between consuming now and consuming in the future. They thus smooth consumption over their time horizon.

The precautionary savings model introduces uncertainty into the intertemporal choice models and suggests that the marginal utility of consumption in developing country' households are convex. At a point of subsistence, the marginal utility of an extra unit of consumption would tend to infinity. A convex marginal utility function means that the rate of increase of the marginal utility of consumption is higher when consumption is low than when consumption is high (Deaton, 1997: 361).

Unemployment and irregular incomes make it extremely difficult for poor households to predict their future incomes. Their future consumption could be high or low depending on their income flows at the time. Given that their marginal utility curve is convex, this uncertainty causes their expected future utility of consumption to be higher than the marginal utility they could expect if they were able to predict their consumption perfectly. This higher expected future marginal utility of consumption causes the individual or household to reduce current consumption (increase savings) so that the marginal utility of

current consumption matches that of future expected consumption. The poor thus use precautionary savings to buffer consumption from short term or seasonal fluctuations in income and to deal with emergencies (Kochar, 2000: 185; Cornell, 2003: 3). A reduction in uncertainty through the stabilisation of income through increased employment or extensions in the social safety nets could cause the precautionary savings motivations of households and individuals to be replaced by life-cycle concerns.

South Africa's formal banking sector

In developed countries, formal financial institutions are the dominant conduit for savings accumulation. The regulatory framework of the formal financial sector ensures that risks to deposits are minimized. Formal financial services not only assist the poor in accumulating lump sums but it also integrates them into the formal economy which assists national long term economic development (Genesis Analytics, 2005:1). Yet this system is not well suited to servicing the needs of the poor. Low income savers desire safe and accessible banking services as dealing in cash can be dangerous and expensive (Falkena et al, 2004: 81), However, the poor usually can save only small amounts of money. This raises the average cost of service provision for banks, making the extension of services to poor savers a less profitable activity (Robinson, 2001: 9). South African banks face an estimated annual cost of R1600 per bank account per annum. Accounts with less than R300 are generally found to be unprofitable for the banks to manage (Falkena et al: 2005:41).

South Africa is unique in that it has a highly sophisticated banking sector that is amongst the most concentrated and profitable in the world, yet a significant proportion of her population remains "un-banked". The 2004 Finscope Survey (FinMark Trust, 2004:12) estimated that almost 16 million adults in South Africa were un-banked, of whom 89% were African. A strong correlation exists between bank usage and employment status. Eighty-five percent of full time employees in South Africa were banked in 2003

(Porteous, 2004: 27). This can be attributed to the automation of payrolls as employers reduce administration costs and minimize their vulnerability to crime (Paulson and McAndrews, 1998:5). Porteous (2003: 2) estimates that 80% of formally employed South Africans save through pensions and provident funds.

Savings products, transaction services, credit and insurance are the main basic retail banking service categories (Porteous, 2004: 21). An individual is defined as being un-banked if he or she does not make use of any of the following banking products: an ATM, debit or credit card, a savings or transmission account, a cheque account or a current account, a garage card, a money market account or a mortgage (FinMark Trust, 2004: 12).

A distinction must be made between access and usage. The FSC regards effective access as being a supply-side measure that includes physical access, affordability and product choices (ibid: 3). A common methodology for measuring access is yet to be agreed upon and usage remains the most widely used proxy. Although the FSC has set specific geographic targets (consumers must be within 15km of the nearest access point to financial services) and has defined the user groups it wishes to target (LSM 1- 5) it has not defined specific affordability and product targets (Porteous, 2004: 48).

The transformation of the South African formal financial sector, as set out by the FSC, requires the provision of access yet it lacks a comprehensive definition of access. The lack of specific affordability and usage targets does seem to provide the financial sector with an escape clause from seriously committing to service provision. If user levels are still low by 2008, the banks could argue that they have done all they can to increase access and that usage levels are outside of their control. The FinMark trust argues that financial services provision can realistically only be provided to households in

LSM 3-5, as households in LSM 1-2 would not be able to afford even the cheapest financial services(Genesis Analytics, 2005: 23).

In order to reduce administrations costs the banks have moved from the paper-based savings-book systems to card based accounts using the ATM network (Paulson and McAndrews, 1998:3). Thus for the majority of South African consumers, the national payment system (NPS) is the primary point of access to banking services. Each bank has its own branches, staff and IT infrastructure. If two parties who are members of the same bank make a payment between each other, that payment is cleared through their individual accounts at the bank concerned. The NPS is used to settle payments between two parties who are members of different banks. The individual infrastructures of the banks that make up the financial sector are networked together to form the infrastructure of the Payments Association of South Africa (PASA). In 2005, there were approximately 2500 bank branches and 12,488 ATMs nationwide (Price Waterhouse Coopers, 2005: 9).The NPS network enables a customer of bank A to buy goods from merchant that banks at bank B, or to make a cashless payment to an individual that banks with Bank C. These inter-bank payment obligations are then settled and cleared in real time through the South African Multiple Option System (SAMOS) which is held at the South African Reserve Bank.

The NPS is made up of the participating banks, the privately controlled PASA, the state controlled SAMOS and the individual consumers needing to make payments (Falkena et al, 2005: 73). It is the operating system that allows the transfer of money through the economy and the exchange of goods and services and forms the very heart of the economic system. Its instruments include cheques, cash, electronic fund transfers (EFT) and credit and debit cards (FEASability 2006: 12-14). One problem with the move away from a paper based to an electronic payment system is that poorly educated people struggle to understand how to use the ATMs and are forced to pay higher fees for failed transactions or for using the teller. Thus although technical

advancements have reduced the banks costs for providing services to the poor, if used *incorrectly* this technology increases the cost burden to the consumer.

Standard Bank's E-Plan is regarded as one of the first successful attempts by the formal banking sector to provide basic transaction services to the urban poor (Paulson and McAndrews, 1998: 4). Started in 1993, the E-plan offers a portfolio of products including basic savings accounts, funeral insurance and small loans. Although the ATM transaction charges for most E-plan services are higher than the market norm, it offers a personalised service that caters specifically for the low income market. Security costs are reduced as all cash is held within the branches ATMs. Multi-lingual staff are trained to assist clients having problems using the ATMs. Paulson and McAndrews (1998: 10) argue that savings are rewarded as balances that are kept above R250 for more than six months are paid an additional interest rate premium on the normal deposit rate. However they failed to explore how much interest has to be earned on a R250 balance in order to offset the monthly management fee charged by Standard Bank[1]. By 2004 it was estimated that there were three million E-Plan customers (Dorsey and Jacob, 2005: 5).

Seemingly under pressure from the F.S.C.'s 2008 deadline, ABSA, First National Bank, Standard Bank, Nedbank and the Post Bank launched the Mzansi account under much public fanfare in October of 2004. The Mzansi account is targeted towards individuals who earn less than R2000 a month (Faure: 2004). Despite the Ministry of Finance ensured that the contributing banks priced their Mzansi products competitively, economies of scale in terms of pooling infrastructure has reduced the cost of the product's provision (Napier: 2005: 12).

[1] In 2006, the monthly management fee for the E-plan account was R6,50. Even if a customer kept the minimum R250 balance for a full year without incurring any other transaction fees, she would be required to earn an annually compounded interest rate of 31% in order to maintain this balance.

Although bank charges for the first few monthly transactions on the Mzansi account are estimated to be 35% -60% cheaper than other bank products, once the account holder transacts more than the monthly limit, charges increase substantially (Napier: 2005:14; Dorsey and Jacob, 2005: 6). Another complaint about the Mzansi initiative was that the account had limited functionality as it did not offer debit and stop orders (Business Day, 2004). This limited functionality was a deliberate design feature of the Mzansi product as banks were concerned that existing clients would downgrade their bank accounts so as to take advantage of the cheaper product offering. Within seven months of the Mzansi launch, the South African Banking Association announced that there were 1 million new account holders (Banking Association of South Africa, 2005). Ninety percent of new Mzansi account holders did not previously have accounts at their Mzansi bank. This seems to indicate that Mzansi's product design has been effective in attracting new previously un-banked clients whilst at the same time not cannibalising existing and more profitable accounts (Dorsey and Jacob, 2005: 6).

Despite this success in attracting new clients, questions have been raised about the sustainability of the account in its current format. Eighteen months after the launch of Mzansi, Peter Schleubusch, the director of Standard Bank's retail products division, acknowledged that although his bank had gained more than 300 000 new Mzansi customers, Standard Bank had lost more than R40 million on the initiative (Faure: 2005). The project can only become sustainable in the long term if Mzansi clients migrate upwards and start using accounts that are more profitable for the banks.

In 2004, 54% of the banking sectors income was derived from non-interest activities, R29 billion of which came from transaction fees that were derived from the NPS. (FEASability, 2006: 3) Little relationship was found between the fees that banks charged to their customers and the transaction, membership and regulatory costs that the banks incurred involved in the NPS

(ibid: 29). Fee pricing is a more stable revenue source for banks as interest rates are vulnerable to changes in the macro-economy (Price Waterhouse Coopers, 2005: 38). As illustrated by the E-Plan example earlier, it is possible that the high bank charges and low interest rates offered by South African banks disincentivise savers of small deposits as they face negative returns (Falkena et al, 2005: 87)

Hawkins (2004:200) attributes the lack of banking service provision partially on the inflexible regulatory environment. The capital requirements to become a bank in South Africa is R250 million. Only banks can have clearing accounts at the Reserve Bank and hence are able to settle payments in the NPS (FEASability, 2006: 70). The end goal of banking regulation is to ensure that there is stability in the banking system. Compliance requirements for recent legislation such as the Financial Intelligence Centre Act (FICA) and the Financial Advisors and Intermediary Services Act (FAISA) has made it more difficult and costly for banks to open new accounts for customers who were previously un-banked (Genesis Analytics, 2005: 58-59: 72-73)

In 2006, the South African competition commission announced that it was to hold a public enquiry into bank charges and access to the national payment system. Lack of access to the payments system was seen as an important barrier to competition in the banking sector as it stopped new entrants from providing services to the un-banked (FEASability, 2005: 2). Given that the Big Four Banks and Investec control 89.2% of the value of the payments in the NPS, concerns have been raised that this high degree of concentration has led to cartel-like behaviour and anti-competitive pricing (Falkena et al, 2005: 75). On average South Africa's banks fees are found to be higher than that of retail banks in other countries (FEASability, 2006: 36). Banking sector profits increased by 319% in real terms between 1993 and. 2001 (ibid:25) When compared to 100 international top performing banks, the report showed that the banking sector experienced a return on assets that was twice that of the average international benchmark (ibid:27).

Given that banks charge different fees for different services, it is very difficult to derive a precise figure for the cost of having a bank account. However, a recent *Genesis Analytics* (2005: 15) study estimated that the average monthly cost of holding a basic bank account was probably around R40. It argued that only households with a monthly income of above R2000 could afford basic transaction services at this price. An important element of the "banking the un-banked" debate that is often confused with the issue of financial service access is whether individuals who gain access to bank accounts are then able to use those accounts to save regularly. Seventy six percent of the *banked* respondents to the Finscope 2004 (FinMark Trust, 2004:12) survey indicated that they tried to save regularly. Sixty percent of the total population sample indicated that if the opportunity arose they would invest extra money in a bank account

Despite the launch of the Mzansi initiative, the fact remains that the majority of South Africans do not have access to the formal financial system. Porteous (2005: 9) defines the transactional banking services access frontier as the maximum number of eligible consumers who presently have access to transactional banking services. He estimates that although 95% of South Africans would like to have a bank account, because of income constraints the access frontier is limited to about 80% of the population (ibid: 22-23). Given that not all bank account holders save regularly, it seems that the F.S.C.'s savings targets will be unattainable.

Informal, group-based financial networks in the form of stokvels have long been a popular savings vehicle among the poor in South Africa. (Ardington et al, 2004: 606; Verhoef, 2002:11-12). Most of these member-based financial services are left unsupported by South Africa's regulatory framework yet still survive (Napier, 2005: 10). By improving their understanding of how these informal arrangements are tailored to the specific needs of the poor, the

formal financial sector has the opportunity to design more appropriate savings products thereby expanding the savings access frontier.

Informal savings vehicles in South Africa

Microfinance is the provision of informal and formal small-scale financial services to low income individuals and households (Robinson, 2001: 8). These services typically include credit provision, savings mobilization and insurance. Robinson estimates that 90% of developing countries' citizens do not have access to the credit and savings services provided by formal financial institutions. Despite the lack of formal financial services, the poor still need to fund life-cycle events, emergencies and opportunities. To do this they access funds from informal mechanisms. Matin et al (2002) define these informal mechanisms as money lenders, pawnbrokers, traders, rotating savings and credit associations (ROCSAs), accumulating savings and credit associations (ASCrAs) and deposit takers.

Stokvels are a form of rotating savings and credit association (ROSCA) and are thought to have originated in the nineteenth century amongst black farmers and laborers who attended stock fairs in the Eastern Cape. The resulting festivities associated with these events provided a platform for regular meetings and discussions which evolved into savings clubs (Verhoef, 2001: 266).It is estimated that more than R5 billion is saved in South African stokvels each year (Genesis Analytics, 2005:9).

In its most basic form, a stokvel is a group based savings organization. Members contribute a fixed amount to a common pool on a regular basis. In turn, each member is allocated the pool for their own use. More complex arrangements have evolved. In some stokvels, members contribute fixed amounts regularly but rather than allocating the accumulated pool to each member in turn, the money is saved up over a fixed period and then disbursed between the members. The money can be deposited in a bank account or investment account or can be lent out to earn interest (Irving, 2005:11). Stokvels among the urban elite may pool considerable amounts of

money which are then invested in equity or capital projects that provide a handsome return for its members (Verhoef, 2001:269 -271).

In the absence of a formal regulatory safety net, the strength and sustainability of stokvel networks are dependent on underlying social relationships. Chiteji (2002: 398) argues that these underlying relationships reduce the costs of ensuring that payment schedule contracts are obeyed. The stokvel arrangement depends on members who have already been paid out, continuing to pay their monthly contributions. Stokvel arrangements may seem irrational. In fact, individuals who participate in a basic stokvel would get exactly the same payout if they put a fixed sum of money under their mattress each month (Armendariz de Aghion and Morduch, 2005: 158-159). However, stokvels function as a way of "forcing" individuals to save. Peer pressure and peer regulation ensure that stokvel participants pay their dues. In Moyo et al (2002:11) one stokvel saver said *"it is always easier to save in a group, if on my own I would just blow the money or would sometimes not feel obliged to put aside something."* Those that default on payments are excluded from accessing the pool in the future (Verhoef, 2001: 264).

Haddad and Maluccio (2000: 9) found that relationships of trust had little effect on the returns experienced by stokvel members in Kwa-Zulu Natal. They argue that trust is less important to the sustainability of stokvel arrangements than explicit contracts for payment schedules and penalties for non-compliance. Other commentators (see Verhoef 2001, 2002; Irving 2004) see trust as an integral component of stokvels' success. In the absence of social sanction and reputation loss, stokvel participants would have more of an incentive to default once they had received the savings pool (Irving, 2005: 7; Chiteji, 2002: 398). Stokvel members know each other through kinship, ethnic or religious affiliations. As long as members value their reputation amongst their community they have an incentive to adhere to the payments schedule so as to avoid being socially ostracized.

Stokvels are dominated by women. Verhoef (2001: 260 -261) attributes this to the need of rural women who had moved to urban areas and were not employed to find a way of gaining some control of their households' resources. Given the loss of agricultural resources in the form of land and capital through urbanisation and their inability to access formal support through the financial system, stokvels provided an alternative means for women to supplement their households' income and ensure the household's survival. Stokvels not only provide economic support but form invaluable social networks that support individual members living in an environment of highly volatile income flows, poverty and unemployment. Access to the savings pool provide the opportunity for women to save in order to buy durable goods, pay for school fees or Christmas gifts or start their own business (Verhoef 2002: 9 - 11). Women may also prefer to commit themselves to a savings process that takes place outside of their household so that their husband or male partner has greater difficulty in accessing the saved pool and spending it on his own priorities (Armendariz de Aghion and Morduch, 2005: 159).

Burial societies are a particular form of stokvel that focus specifically on providing financial and emotional support to one of its members (or their family) in the event of a member's (or family member's) death (Thompson and Posel, 2002: 84). In most burial societies, members are charged a monthly fee. In the event of death, the society either pays out a pre-specified sum or pays for the cost of the funeral arrangements (ibid: 86). For many African groups there is a strong cultural importance attached to funerals (Roth, 2000:13).Lavish ceremonies are a way of paying respect to one's ancestors and a means of demonstrating a family's economic standing in the community. In Roth's (2000) Grahamstown study, funerals cost more than 15 times the average monthly household income.

Many households would not be able to bear the costs of the funeral by themselves and thus the burial society acts as a means for members to pay for funerals by pooling their money. However, even in the face of seemingly affordable formal financial insurance products, burial societies remain popular throughout South Africa[2]. Again, this can be attributed to the supportive role that these social networks provide. Not only do the bereaved gain financial support from their burial society but are also able to harness emotional and communal support from their societies' membership base. The recent *Financial Diaries* project which did a comprehensive study of the financial management strategies of poor South African households found that if these social benefits are taken into account, burial societies offer the same, if not better, value to members as formal funeral plans (Collins, 2006: 5).

When considering the need for service access, one thing must be made clear. Only those who participate in the cash economy can be assisted by appropriately designed formal financial services (Robinson, 2001: 20-22, 74; Rutherford, 2000: 2). Rather, poverty alleviation programmes that target the "extremely poor' directly through skills training, provision of housing and sanitation services and medical care (among others) are the only way that the needs of the extremely poor can be addressed.

Microfinance provides the opportunity for the economically active poor to save, to access credit and to insure themselves against risk and in so doing reduce their vulnerability to poverty. It must be seen as an additional and important tool in the poverty alleviation arsenal and not as a panaceaic cure-all (Morduch, 1999b:1607). At the same time, informal savings and insurance service must not be seen as substitutes for formal financial services but rather as being complementary to them (Ardington and Leibbrandt, 2004 : 2).

[2] ABSA, FNB, Nedbank and Standard Bank all offer funeral plans to their clients. Monthly premiums range from R17 to R80 depending on the payout at time of death. The payouts for these funeral policies range from R5000 to R20 000. These products typically cover the clients' nuclear family however extra family members can be covered by extra monthly premiums.

Risk management is merely one of numerous benefits that informal savings arrangements offer to its members. Financial institutions can bridge the informal and formal sectors of the South African economy by providing financial services to the poor. New understanding of the dynamics of informal savings groups may assist the formal financial sector in designing appropriate products for the poor to use (Roth, 2000, 1-2). Current product designs seem unlikely to attract new savers from the poorer half of the population. If government and the private sector are seriously committed to poverty alleviation and meeting the F.S.C.'s 2008 target deadline, then ensuring both the access to and the usage of formal financial savings services must become a priority.

Chapter 2: Using the Khayelitsha Panel - data and methodology

The sample used in this study is made up of the 570 Khayelitsha residents who participated in the Khayelitsha Mitchells Plain Survey (KMPS) in 2000 and the subsequent Khayelitsha Panel Study in 2004. Both surveys were undertaken by the University of Cape Town's Centre for Social Science Research .The original KMPS was not designed as a panel survey. Its aim was to investigate the labour market behaviour, socio-economic characteristics and social / political attitudes of Cape Town's working poor (Magruder and Nattrass, 2005:2). However in 2004 the decision was made to revisit the Khayelitsha portion of the sample. Khayelitsha's African residents account for 36% of Cape Town's African population and the income distribution and savings behaviour of Khayelitsha's residents can be regarded as representative of that of all Africans living in Cape Town (ibid).

One advantage of panel studies is that they reduce the effect of omitted variable bias that is inevitably present in cross-sectional survey analysis (ibid: 5-6). However panel data is not without limitations of its own. Missing data, measurement error and attrition create bias in the analysis and this undermines the ability of researchers to make accurate inferences from the data (Maluccio, 2000: 1–3; Alderman et al, 2000: 1). This is not to say that these issues should cause panel data to be dismissed out of hand, rather the researcher should be aware of the impact that these issues have on statistical inferences and, where possible, correct for them (ibid: 25).

The design of the Khayelitsha Panel

The 2000 Khayelitsha and Mitchell's Plain Survey (KMPS) took place in Cape Town , South Africa and covered the African townships of Khayelitsha, Gugulethu, Langa and Nyanga and the coloured (mixed race) suburb of Mitchell's Plain (Magruder and Nattrass, 2005: 1). The survey interviewed all adults in sampled households. A total of 2664 respondents were surveyed.

Nine-hundred and sixty six observations were Africans living in Khayelitsha and they formed the basis of the 2004 Khayelitsha Panel Survey.

The original 2000 survey was conducted at both an individual and household level and these datasets were merged to form the 2000 KMPS. The 2000 survey had a two stage sample design. Household clusters were identified using the residential enumerator areas (E.A.s) defined by the 1996 census. A random sample of E.A.s was then selected. Researchers sent to these E.A.s were expected to interview every adult in the household. Despite on occasion being visited three times, not every individual in every household was interviewed. Observations thus have to be adjusted for the probability of this non-response. The individual response rate for Khayelitsha's 41 E.A.s was 78% (ibid: 4).

In 2004 the individual Khayelitsha respondents were revisited and the 2004 Khayelitsha panel was created. When dealing with the Khayelitsha Panel, researchers should be aware of the following problems with the data:

1) **Attrition:**
Only 570 of the original 966 Khayelitsha respondents were able to be reinterviewed in 2004. Creating a panel proved to be problematic as little effort had been made since 2000 to track the movements of the 966 Khayelitsha residents. This meant that the household members of 176 of the original sample of 401 households were not resurveyed. If the attrition was non-random, estimates using the 2004 data would lead to inconsistent parameter estimates resulting in incorrect inferences from the data (Maluccio, 2000: 7).

2) **Inconsistency in income responses:**
In both waves of the survey, each respondent was asked whether or not they received income from a particular source. i.e.: E1: Are you currently in wage employment? They were then asked to disclose how much

money they earned from that income source. i.e. E9: What is your basic wage? A significant proportion of the respondents indicated that they did receive money from a particular source but did not disclose the amount. The observations that were unable to provide positive earnings estimates were regarded as missing values. Sixty-six respondents in 2000 and 40 respondents in 2004 were calibrated as having a missing value for their income variable. The use of an aggregate income variable accentuated this problem because individuals who were consistent in their disclosure of income in all but one of their income sources would end up with a missing value for the overall income variable.

3) **Discrepancies in key variables:**

There were clear inconsistencies in the measurement of key demographic variables such as education and age. Given that the two waves of the panel were four years apart, changes in these demographic variables would be expected to be capped at four years. The 2000 questionnaire asked respondents to declare their age whilst the 2004 survey asked respondents to declare their date of birth. There was evidence of error in the measurement of the age variable as more than forty percent of the sample indicated that their age did not change by four years between 2000 and 2004, as would be expected.

There was a similar problem with the education variable as more than 20% of the sample indicated that they had either "lost" years of education or had gained more than four years. Given that all the respondents were already adults in 2000, one would expect there to be little changes in education. Furthermore, the 2004 questionnaire education was capped at twelve years (i.e. primary and secondary schooling) whereas the 2000 survey asked respondents to declare tertiary education and on-the-job training.

4) **Differences in key questions in waves 1 and 2:**

In the 2000 questionnaire respondents were asked to disclose what their wages were after taxes were deducted. In addition, the 2000 survey asked respondents about wage deductions including tax, pensions, union fees etc. In contrast, the 2004 questionnaire did not have a separate question regarding wage income net of tax. After disclosing their wage income respondents were asked to list all wage deductions including tax.

Of the 207 respondents who said that they had some form of wage employment in 2000, less than 8% were unable to say what their salary was after tax. In contrast, in 2004, just over 20% of the 244 wage employed respondents did not disclose how much tax was deducted from their basic wage. In their analysis of the 2000 survey, Skordis and Welch (2004:465) chose not to use the net earnings figure after deductions because of the high incidence of non response. However, in order to make comparisons between the 2000 and 2004 waves it was necessary to use the tax deductions from the 2004 questionnaire in order to construct a wage income variable net of taxes. Given that the median tax deduction in 2004 was zero, the assumption was made that for those individuals who did not know or did not disclose their tax deductions, their answers to question F20, "What is your basic wage before deductions but excluding overtime payments" was regarded as being net of tax.

In addition to the questions regarding wage employment income, self employment income and income from government grants, the 2000 questionnaire asked detailed questions regarding income from casual employment and income that came from other people and investments. In 2004, casual employment income was included under wage employment. Income from other people and investments were included under one umbrella question (a32)" Does anyone outside of your household give you money regularly?" It is assumed that this question

included all other income sources and can therefore be compared to the aggregated income variable from the 2000 survey.

Missing Data:

Missing data problems are an inevitable consequence of survey analysis (Allison, 2001:1). Attrition is just one form of the missing data issue. The most common means of dealing with missing data is to assume that the sample without missing data is a random subset of the original sample (Schafer and Graham, 2002: 150; Allison, 2001: 6). However, if present, missing data can create problems for statistical inferences. Consider an observation with a missing value for variable Y. The data is regarded as being *missing completely at random* (MCAR) if the probability of missing data is independent of the value of the Y and the other characteristics (X_i) of the observation and the values of the Xs and Ys of the rest of the sample (Schafer and Graham,2002: 151; Allison, 2001: 3).

A more likely result is that the missing data is missing at random (MAR). This weaker assumption is satisfied when the probability of Y being missing is independent of the value of Y itself (Schafer and Graham, 2002: 151). Obviously, MAR is far more difficult to test as it is impossible to know the value of Y given that it is missing (Allison 2001: 4).

Maluccio (2000: 7) describes the problem of attrition bias (which can equally be applied to all missing data issues) as follows:

1) $y_i = x_i\beta_i + \varepsilon_i$ y_i observed only if $O_i^* < 0$

2) $O_i^* = x_i\beta_2 + z_i\gamma + \upsilon_i$

Assume that y_i is the variable of interest and can only be defined for variables that are observable in the second wave of the panel (i.e. non-attritors and non-missing values) and that O_i^* is a function of attrition (or missing data). O_i^* is only observed for non-attritors or respondents with complete data. If

there is correlation between ε_i and υ_i and it is not accounted for in the estimation of y_i then the estimate of β_i will be inconsistent.

In the Khayelitsha panel the problem of missing data was dealt with in two stages. The first step was to test whether attrition introduced biases into the analysis. The main reasons for attrition in the Khayelitsha panel were caused by fieldworkers being unable to find the designated household from the 2000 survey or because a particular respondent had died or moved away from Khayelitsha. This is consistent with Mallucio's findings in the Kwa-Zulu Natal Income Dynamics Study (KIDS) in which he argues that the three driving factors of attrition are population mobility, the success in which those that move away are tracked down and reinterviewed and the number of people who, when tracked down, refused to be reinterviewed. Magruder and Nattrass (2005: 10) argue that this sample attrition was not substantially more significant than that experienced by other long-term developing county panel studies such as the India Additional Rural Incomes survey (33 % attrition), the Bolivia Integrated Child Development Program panel survey (35% attrition) and the Kenyan Ideational Change Survey (32% attrition).

In order to test for the possibility of attrition bias, Magruder and Nattrass (2005: 11) compared the means and standard deviations of selected characteristics of attritors and not attritors. Their study showed that although household size, gender and housing types were significant determinants of attrition, their predicted influence on the probability that a respondent attrited was relatively small (ibid: 15). Both the Magruder / Nattrass study and the Maluccio study indicate that attrition bias is model specific and should be tested on a case by case basis.

As this study focuses on the characteristics of savers, it is appropriate to test whether attrition bias exists with regard to savers. A simple analysis using a logistic regression with a binary variable "saver" (saver = 1 if savings >0; saver = 0 if savings =0) as the dependent variable and a list of independent

variables and interaction terms with attrition is shown in Table 1 below. The variable 'stay' captures attrition. It has a value of 1 if the respondent appeared in both waves of the panel study, and 0 if the respondent was interviewed in 2000 but not in 2004.

Table 1:Logisitic regression for individual savers in 2000 - testing for attrition biases						
Saver in 2000	Odds ratio	Std. err	z	P>|z|	95% Con. Int.	
Log income 2000	1.0767	0.0383	2.0800	0.0380	1.0042	1.1545
Stay * log income 2000	0.9414	0.0436	-1.3100	0.1920	0.8598	1.0308
Wage employment 2000	4.9781	1.9747	4.0500	0.0000	2.2878	10.8323
Stay* wage-employment	0.9967	0.5222	-0.0100	0.9950	0.3569	2.7832
Self employment 2000	3.3520	2.6570	1.5300	0.1270	0.7089	15.8493
Stay*self-employment	0.7963	0.7786	-0.2300	0.8160	0.1172	5.4117
Age in 2000	1.1978	0.0823	2.6300	0.0090	1.0468	1.3705
Stay * age in 2000	0.9869	0.0849	-0.1500	0.8780	0.8337	1.1682
Age squared in 2000	0.9982	0.0009	-2.0400	0.0410	0.9965	0.9999
Stay* age-squared in 2000	1.0006	0.0011	0.5300	0.5960	0.9985	1.0027
Education 2000	0.9742	0.0529	-0.4800	0.6300	0.8759	1.0835
Stay* education in 2000	1.0535	0.0761	0.7200	0.4700	0.9144	1.2138
Female	1.3783	0.3935	1.1200	0.2610	0.7877	2.4117
Stay*female	1.0048	0.3742	0.0100	0.9900	0.4843	2.0847
Stay	0.6451	1.1720	-0.2400	0.8090	0.0183	22.7033
Obs	781					
Prob>chi2	0					
Pseudo R2	0.2446					
Hosmer-Lemeshow chi2(8)	12.4800					
Prob > chi2 (Hosmer- Lemeshow)	0.1310					
Prob > chi2 (Wald Test)	0.4935					

None of the interaction terms with the "stay" variables are significant. The results of the Wald /Chi test which can be seen at the bottom of the table prove that the co-efficients of the respondents who were re-interviewed in 2004 are not individually or jointly significantly different from the original 2000 Khayelitsha sample. Thus it seems that although there is a non-random attrition bias in the 2004 panel, it is not particularly problematic when dealing with savings and income specific issues.

Even after accounting for the 373 Khayelitsha respondents who did not answer the 2004 survey, the problem of missing data remained an issue in

the Khayelitsha Panel. One hundred and fifty-four of the 570 (27.19%) non-attritors had at least one missing value in their responses to the survey. The proportion of missing data for each variable in the model is ranked from highest to lowest and is shown in appendix 1.

A listwise deletion approach deletes any observation with missing data from the sample. This approach obviously limits the sample, as many observations may still have valuable information about some variables even though they have missing data for others. One option to address the problem of missing data is to impute values. But before using multiple imputation methods, it is necessary to test whether the missing data is MCAR or MAR (Schafer and Graham, 2002: 150). A considerable challenge in using a multiple imputation approach is designing appropriate regression relationships in order to predict the missing values. Deaton (1997: 28) discusses the problems researchers face in accurately measuring self-employment income. For example, in an urban setting it is particularly difficult to gauge the expenditures and incomes of family businesses. A self employed individual may report that his or her profits are zero but may still have sufficient money to purchase the following day's inventory. Thus the measurement of self employment provides sufficient challenges – let alone the additional difficulty of predicting missing values! The actual values for government child grants, disability grants and state pensions sourced from Statistics South Africa could substitute for missing data. Given these concerns, a list-wise deletion approach proved to be the simplest and most effective means of dealing with the missing data.

Measurement error:

The next step after dealing with the issue of missing data and zero income earners was to explore the effects of possible measurement error in the sample. The inconsistencies with the education and age variables mentioned earlier gave some warning that measurement error in the independent variables might possibly be a problem. Measurement error in the

independent variables is particularly problematic as it leads to biased and inconsistent co-efficient estimates of all the independent variables (Wooldridge, 2003: 321). Given that there are only two waves in the Khayelitsha sample, there were limited options in dealing with this measurement error issue (Finkel, 1995: 49).

Consider the following simple regression equation from Wooldridge (2003: 321-323):

1) $y = \beta_0 + \beta_1 x_1 * + \mu$

In the event that there is measurement error, x_1* is not observed. Rather

2) $x_1 = x_1 * + \upsilon_1$

Where:

i) $E(\upsilon) = 0$

ii) $Cov(x_1*, \upsilon_1) = 0$

iii) $Cov(x_1, \mu) = 0$

iv) $Cov(x_1*, \mu) = 0$

Therefore

3) $y = \beta_0 + \beta_1 x_1 + (u - \beta_1 \upsilon_1)$

The classical error in variable model assumes that the measurement error term is uncorrelated with the unobservable explanatory variable x_1*. If this is so, then the measurement error term and the observed variable x_1 must necessarily be correlated.

4) $Cov(x_1, \upsilon_1) = E(x_1 \upsilon_1) = E(x_1 * \upsilon_1) + E(\upsilon_1^2) = 0 + \sigma^2 = \sigma^2$

Therefore the covariance between the measurement error term and the observable variable x_1 is equal to the variance of υ. Given condition iii, the covariance between x_1 and the composite measurement error term $(u - \beta_1 \upsilon_1)$

is going to give a biased and inconsistent estimator in any OLS regression of y on x_1 because:

$Cov(x_1, \mu - \beta_1 \upsilon_1) = -\beta_1 Cov(x_1, \upsilon_1) = -\beta\sigma^2$ (i.e.: in contrast to the standard OLS requirement shown in iii)

If the extent of the measurement error is known then an errors-in-variable model can be used to create unbiased and efficient estimators. However estimating the reliability of variables can often be an ad-hoc process. The decision was made to rather use the 2000 education and age variables. Although the 2000 questionnaire asked questions about post secondary qualification, the education variable in this study was limited to matriculation and was thus capped at twelve years. This decision limited the impact of measurement error as the measurement of the education variable is likely to be mean reverting. Poorly educated respondents cannot report having less than zero years of education but can over-report their education. Similarly because of the twelve year cap, highly schooled respondents cannot over-report their education by very much but can under-report it (Hertz, 2002:5).

Survey improvements

The 2000 questionnaire failed to account for individuals who had bank accounts but spent all their banked money each month as it only asked respondents to disclose monthly bank savings. The 2004 questionnaire asked respondents whether or not they had a bank account and if so, whether or not they used their bank account to save each month. Furthermore the 2004 questionnaire asked the respondents qualitative questions about their monthly savings behaviour. These included why they did not save in a bank account, stokvel (gooi-gooi) or burial society, why they chose to save in an informal savings vehicle as opposed to saving in a bank or having a formal insurance plan, why they did not have a bank account and what they were using their bank account to save for. These qualitative questions gave some

insights into the savings behavior of the sample that the quantitative questions from the 2000 survey could not account for.

Unit of analysis: Households or individuals?

The decision whether to use individual or household level variables as the unit of analysis is also a key determinant of how savings and savers are evaluated. An important question that is relevant in all survey analysis is the extent to which individuals use and save resources for themselves, and to what extent do they do so in the interest or on the behalf of other household members? Haddad and Kanbur (1990: 866- 868) discuss the effect that ignoring intra-household allocation of resources has on underestimating income inequality and poverty. Most of the literature assumes that all household resources are shared equally. Adult equivalent income measures can be used to account for the size and demographic composition of households and are commonly used within the South African poverty and development literature (Leibbrandt and Woolard, 2001: 679)[3].

In 2000, the field workers conducting the research interviewed every adult in the households that were surveyed. In addition to being asked to answer a lengthy individual questionnaire these adult respondents were also asked to answer a household roster questionnaire. This household roster included questions about other members in the respondent's household. The questions asked about the other members' names, age, gender, their relationship to the respondent and the household's total income.

Unfortunately, because of 'reflection effects' (Manski, 1993: 531-537) household level data (i.e. the income and / or the savings of other household members) cannot be used at an individual level. The problem arises because similarities in variable values between members of the same household inflate the goodness of fit in any multinomial analysis. The problem can be

[3] Adult equivalents are defined as $(\text{Adults} + 0.6\ \text{children})^{0.9}$

stated as follows. Assume that the relationship between savings and the independent variables could be represented by:

$$y = \alpha + \varphi_0 i_1 + \beta_1(y \mid h_1) + \beta_2(y \mid h_2) + \beta_3(y \mid h_3) + \varpi_1(y \mid d_1) + \varpi_2(y \mid d_2) + \varpi_3(y \mid d_3) + \varpi_4(y \mid d_4) + \delta_1(y \mid e_1) + \delta_2(y \mid e_2) + \delta_3(y \mid e_3) + \mu$$

Where *i* is individual income, *h* represents the household variables (household income, other household savings and household size), *d* represents the demographic variables (age, gender, education and race), *e* represents the formal employment categories and *u* represents the error term.

The regression of *y* on *i, h, d and e* is:

$$E(y \mid i,h,d,e) = \alpha + \varphi_0(y \mid i_k) + \beta_i(y \mid h_k) + \varpi_i(y \mid d_k) + \delta(y \mid e_k) + E(u \mid i,h,d,e)$$

If $\beta i \neq 0$ the regression has correlated effects. If the probability that an individual saves (y) is predicted to vary with the aggregated income and savings of other household members, and the household size, $E(y|h)$, the predicted personal savings of an individual will be correlated with the savings, income and size of their particular household.

Consider individuals *a and b* of household *x*. If these individuals save, their savings will be reflected in the variable "other household savings". Therefore *h* is not linearly independent from y. One cannot distinguish whether the increase in *a's* savings is caused by a change in the savings of the other members of household *x,* i.e. which would include contributions from individual *b*, or whether the changes in *b's* savings caused *a's savings* to increase.

The only way to counter this problem is to undertake the analysis at a household level. Given that every respondent has answered the household questionnaire it made sense to nominate one individual respondent per a

household to act as its "spokesperson". In doing so, household level variables could be included in the multinomial analysis – but without inflating the estimators of other individuals who share the same household.

May et al (2000: 573) identified "core" household members who they regarded as being key decision makers within the households that were surveyed for the Kwa-Zulu Natal Income Dynamics Study (KIDS). Self-declared household heads and their spouses were considered "core" individuals. In multi-generational households, further criteria applied. If an individual was at least thirty years old, had at least one child living in the house and was the child, child-in-law, niece or nephew of the self-declared household head, then they and their spouses were also considered as "core" individuals. The problem was that "core" individuals in the Khayelitsha sample did not necessarily agree with each other on the composition of their households.

As each adult in every household was interviewed in 2000, it was possible to derive household level variables by merging the individual responses. The 2000 questionnaire also asked ""How much money comes to this household in a typical month? Skordis and Welch (2004) explore whether it is better to use this latter question (using a single household representative) or to derive a household income variable by summing the individual incomes of all household members. They showed that the derived household income variable was probably a more accurate estimator of true household income.

In both 2000 and 2004, there were clear inconsistencies in how households were reported. Members of the same household reported having different household members, different household heads and different disclosed household incomes. This confusion required the selection of one individual per a household who could act as its spokesman. The challenge was to select an individual respondent who would be able to provide the most accurate representation of the true dynamics of their particular household.

Rather than having to unravel which of the core household members provided the most accurate representation of a household's true status, the primary income earner of each household was selected as its spokesman. A primary income earner was defined as the household member who earned the highest amount of money in 2000 (Ardington and Leibbrandt, 2004:6). Income was an aggregated variable that included wage earnings, profits from self employment ventures, casual employment income, income from government grants, income as gifts from other people including remittances, investment income and rental income.

Although respondents were asked about extra income gained through bonuses, overtime, piece-rate pay, 13th cheques and profit shares in both waves of the panel, these income sources were regarded as being too unreliable to be included in a monthly income variable (See Skordis and Welch, 2004: 467-469). Nevertheless extra pay takes up a significant proportion of wage income and remains an interesting area for future research. Individuals with missing income variables were not selected as primary income earners. The person with the highest observable income was selected as a primary income earner even though fellow household members that had missing income data could have had a higher monthly income.

In the event that two or members of the same household indicated that they earned the same amount, the person with the lowest person code was selected as being the primary income earner. In each household, individual respondents were labelled with a person code. The first individual interviewed was given a person code of 1; the second was person code 2 and so on. Poor data capturing led to some households not having an individual with a person code of 1. In this case, the next person code was used to select the primary income earner.

The selection of primary income earners allowed the use of household level data in the analysis without it being negatively affected by reflection effects. Nevertheless, the possibility remains that other household members may still have had a more accurate understanding of the structure and income dynamics of their particular households. Unfortunately there was no formulaic approach with which to identify primary role players in each household. Given these restraints, selecting primary income earners as household spokespeople seems to be the most efficient means with which to incorporate household level influences in to the analysis of savings dynamics.

Most unfortunately, the 2004 Khayelitsha panel only surveyed those adults who had previously answered the individual-level questionnaires in 2000. The survey was not designed as a household panel. Thus, household members who were children in 2000 but were older than eighteen in 2004 and were earning an income were not included in the individual panel dataset. Adults that were not household members in 2000 but had subsequently moved into the household were similarly ignored by the 2004 panel individual-level questionnaires. There was also no way of knowing whether respondents who had been tracked down by the fieldworkers to be reinterviewed in 2004, had remained in the same household that they were in in 2000 or had moved into a different household all together. Given these constraints, one could not derive household level variables by aggregating the responses of a household's members to the individual level questionnaires.

Even if one were to ignore the issue of reflection effects and use responses to the household roster as a means of incorporating household level variables into the analysis of individual savers, the 2004 household roster still presented a host of irreconcilable problems. Firstly, it was more limited in its scope than the individual level questionnaires and only asked questions relating to the age, gender and incomes of the household's members.

Secondly, the 2004 household roster presented a potential double-counting problem. When answering the household roster, respondents were asked "who lives in this household". Deciphering whether the individual respondents who were answering the household roster had included themselves on the roster proved to a great challenge. The household roster had a simple coding system that was used to identify the relationship that each household member had with the respondent who was answering the household roster questionnaire. Forty-seven of the primary income earners did not identify themselves on their household rosters. In these cases, their details could be derived from the individual level questionnaires and added to the household roster. [4]

There were also clear inconsistencies in how the primary income earners reported their own incomes on the 2004 household roster. The individual incomes (as derived from the individual questionnaires) of forty-four percent of the primary income earners did not match the incomes that they disclosed for themselves on the household roster. Given these problems, there was no feasible way of looking at savings dynamics at a household level for 2004 and analysis of changes in the savings behaviour of the Khayelitsha respondents was restricted to an individual level.

[4] The double counting problem arose where in some cases the respondent had not identified himself, yet one of the incomes of a particular household member matched the personal income (as disclosed by the individual level questionnaire) of the respondent concerned. In these cases the double-counting problem was avoided by assuming that the respondent has included themselves on the household roster and thus there was no need to add their details from their responses to the individual questionnaires.

Chapter 3 -Savings in Khayelitsha

The Khayelitsha Panel asked respondents to disclose whether or not they saved in a bank, a stokvel or gooi-gooi or a burial society. "Gooi-gooi" is the term used for stokvels in the Western Cape. These savings vehicles provide the means through which lump sums of money can be accumulated and dispensed with in order to buy assets or smooth consumption in the event of emergencies or life-cycle shocks. The Khayelitsha panel provided a platform to explore the profiles of individual savers. Furthermore it also provided a rare opportunity to track the changes in savings behavior of specific individuals over the two waves of the panel. Unfortunately, although a comprehensive picture of the savings behaviour of households could be created for 2000, given the design of the 2004 survey panel it was not possible to model savings at a household level for 2004. Thus the changes in savings behaviour between 2000 and 2004 could not be traced at a household level.

Poverty, income inequality and income mobility in Khayelitsha, 2000 – 2004

There is an obvious relationship between savings and income. High levels of savings require high levels of income. What is of interest here is why some individuals in a high unemployment and low income environment choose to save whilst others do not. Both the life-cycle model and the precautionary savings model would expect that an overall average increase in income would be associated with an increase in the proportion of savers within the population. For this reason, it made sense to understand how incomes in Khayelitsha had changed between the two waves of the panel.

When exploring income dynamics it is important to analyse both income mobility and income inequality. Income inequality measures only reflect the distribution of income at particular points in time. High degrees of income volatility amongst the Khayelitsha respondents would result in income

inequality measures such as Gini coefficients painting a distorted picture as they do not readily identify the movement of particular households or individuals through the income distribution. Although inequality amongst high and middle earners may be decreasing over time, and this will be represented by a decrease in the Gini-coefficients, some of the poorest individuals may be falling behind the rest of sample population (Leibbrandt and Woolard, 2001: 676-678). Income mobility analysis allows us to focus on particular individuals and households and to see what their position in the income distribution is from one point in time to another.

Gini coefficients, the Shorrocks mobility index and quintile mobility matrices were used to illustrate income mobility and income inequality in the Khayelitsha panel. Gini co-efficients range between one and zero. One indicates a state in which one individual owns all the wealth in the community and zero indicates a state of perfect equality (Skordis and Welch, 2004: 480). The Shorrocks mobility index is a single stage income mobility index. A value of one indicates that there is no income mobility in the population and a value of zero indicates perfect mobility.

The 2004 Cape Town metropole consumer price index measure of 1.238 was used to convert the 2000 income variable into 2004 Rands (Statistics South Africa, 2005). The individual poverty line is the Statistics South Africa measure used in Leibbrandt et al (2005:44) and the poor are defined as those individuals who earn less than R400 a month in real terms.

Woolard and Klasen's (2005) adult equivalent income poverty measure of R212 in 1996 Rands was used to draw the poverty line for the adult equivalent income data for the 2000 households. This poverty measure was converted into R431 (2004 Rands) using the CPI inflator. Mean incomes, Gini co-efficients and Shorrocks rigidity indices can be seen for the individual and adult equivalent income variables in table 2.

Table 2: Poverty, income inequality and income mobility in Khayelitsha, 2000-2004		
	Individuals	Households
Mean income 2000	R819.49	R582.44
Mean income 2004	R940.09	
Gini 2000	67.95	57.04
Gini 2004	61.77	
Poverty 2000	56.52	55.95
Poverty 2004	45.41	
Shorrock's rigidity index	88.50	

Personal income increased by 14.72% in real terms between 2000 and 2004. One driver of the real increase in income was the increase number of grant recipients. Average grant income for the whole sample increased from R22.69 in 2000 to R106.69 in 2004. Ninety-three percent of the 124 new grant recipients were individuals who were able to claim a child support grant. The mean value of child support grants in 2004 was R207, 82.

As expected, adult equivalent income in 2000 was lower than adult individual income as it accounted for household size. This meant that every rand earned in 2000 was split between 1.4 adult equivalents. Unsurprisingly inequality at a household level was lower than that at an individual level as the household Gini coefficient ignored intra-household inequality. The Gini coefficient for 2000 (0.68) compares favourably with the 2001 national Gini co-efficient amongst Africans of 0.66 found by Leibbrandt et al (2005: 10). Both poverty and inequality decreased at an individual level between the two waves of the panel.

There was a substantial decrease in the poverty ratio between 2000 and 2004. The proportion of the adult population that earned less that R400 a month dropped from 56.5% to 45.4%.The Shorrock's rigidity index value of 88.5 was similar to that found by Woolard And Klasen (2001:874) in their analysis of the KIDS (89.85) between 1993 and 1998. They argue that

industrialised countries such as the USA, the UK and Germany usually have a rigidity index value of 0.95. Thus the respondents to the Khayelitsha survey show evidence of a relatively high degree of income mobility.
Mobility matrices (Woolard and Klasen, 2005: 867; Leibbrandt and Woolard, 2001: 679) are used to map transitions between pre-specified income groups. In this study, the income of the sample population is divided into endogenously determined quintiles for each wave of the panel.

Table 3- Individual income quintiles					
	Ratio	Mean Income 2000	Ratio 2004	Mean Income 2004	% change
1		R0	0	R0	0%
2	1	R49.74	1	R158.64	219%
3	6.54	R325.20	3.68	R583.31	79%
4	22.73	R1130.59	7.31	R1159.79	3%
5	**59.12**	R2940.81	**18.11**	R2873.20	-2%
Full sample	**16.47**	R819.42	**5.93**	R940.09	15%

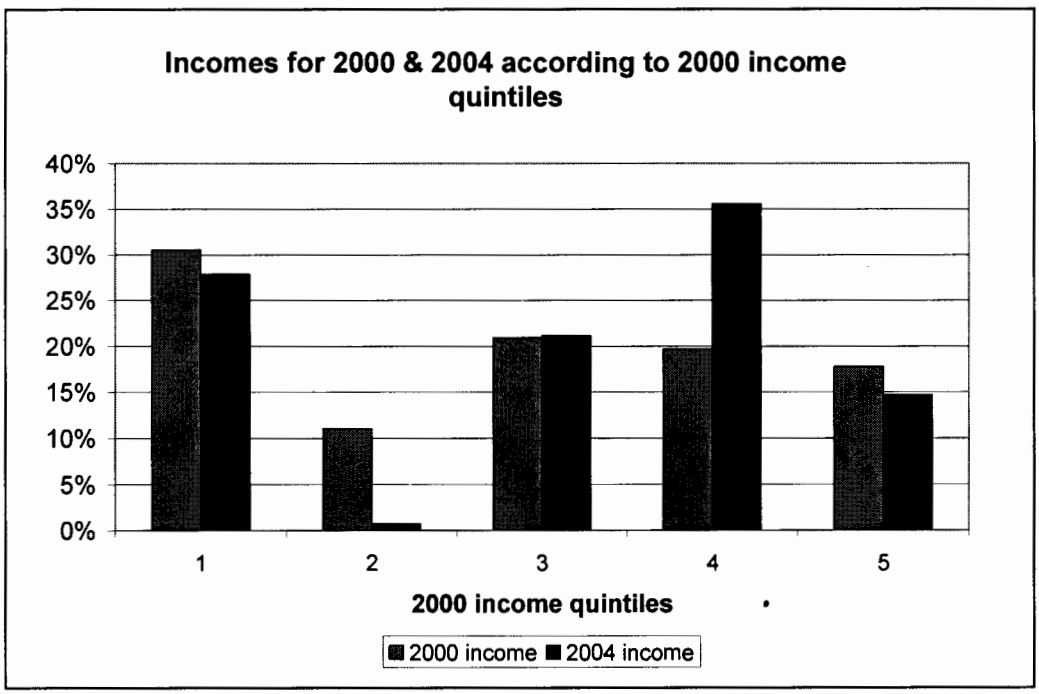
Table 3 shows the ratio between the mean incomes of each quintile with that of the second lowest quintile. Because the mean income of the lowest income quintile at an individual level was zero, each individual income quintile is compared to the second income quintile.

The second individual income quintile experienced a 219% increase in real income between 2000 and 2004. The ratio between the mean individual income of the whole sample and that of the second quintile fell from 16.47 to 5.93. This change was greatest at the top of the income distribution. For example, the ratio between the richest 20% of the population and the second income quintile decreased from 59.12 in 2000 to 18.11 in 2004. Although there was a slight decrease in the mean income of the richest quintile of the panel, there is clear evidence to show that the poorer respondents experienced both a real and relative increase between 2000 and 2004.

Panel data allows researchers the opportunity to evaluate behaviour in both absolute and relative terms. The individual incomes of the respondents could

be compared between the two waves as the incomes for 2000 had been transformed into 2004 Rands using the CPI inflator. When viewing the income quintiles for 2004 one must keep in mind that the ranges for each income quintile had changed considerably between the two years of the panel. Figure 1 shows the distribution of incomes in 2000 and 2004 according to the 2000 income quintiles. The number of respondents who earned between R0 and R49 each month and thus would have been positioned in the second income quintile in 2000, decreased considerably between the two waves of the panel. Similarly the number of people earning between R665 and 1605 (the range for the fourth income quintile in 2000) had increased significantly by 2004.

Figure 1 – Individual income quintiles for 2000 and 2004



Let K be a matrix of 5x5 transitions, with K_{pq} being the pq element indicating the percentage of the income quintile that is in income quintile p in 2000 and income quintile q in 2004. Quintiles are ranked between 1 and 5. 1 indicates the poorest 20% of the population and 5 indicates the richest. Those observations that moved from one income quintile to another ($p \neq q$) are regarded as "mobiles". Those that stay in the same income quintile in both

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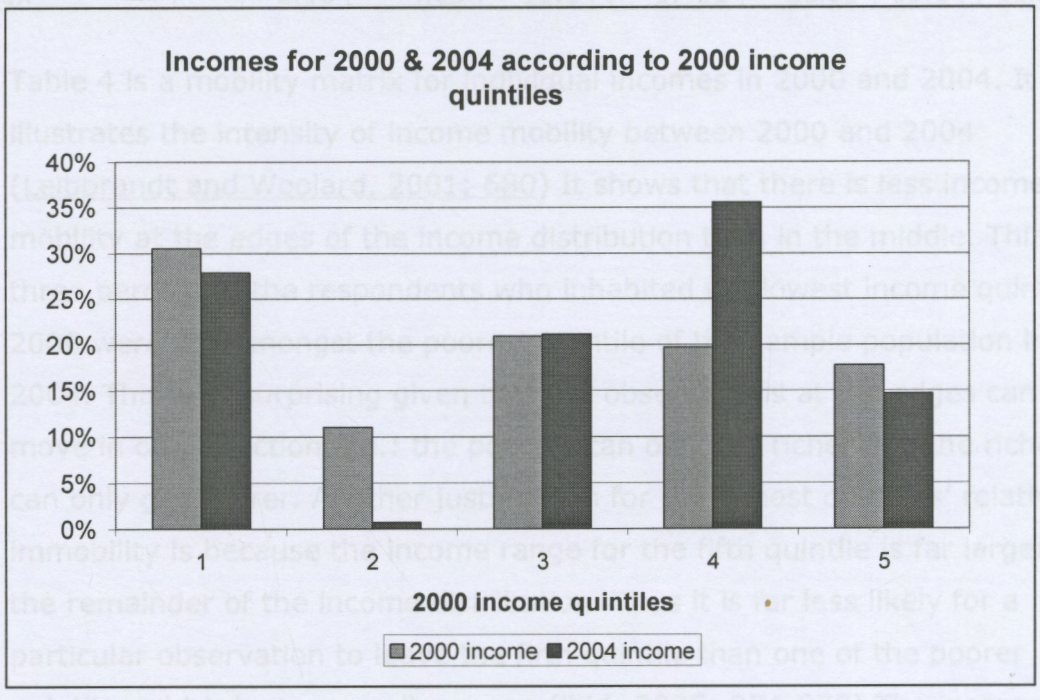

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2000 and 2004 are regarded as "immobiles". Observations that move up the income distribution (*q>p)* are regarded as "winners" whilst those that move down the distribution are regarded as "losers" (*p>q)* (ibid: 679).

Table 4 - income mobility and income change intensity									
	1	2	3	4	5	Total			
1	33.86%	11.81%	25.98%	14.96%	13.39%	100%			
2	4.35%	43.48%	19.57%	15.22%	4.35%	100%			
3	3.45%	37.93%	17.24%	13.79%	9.20%	100%			
4	4.88%	13.41%	21.95%	29.27%	32.93%	100%			
5	6.76%	12.16%	17.57%	21.62%	40.54%	100%			
Quintile change	-4	-3	-2	-1	0	1	2	3	4
Percentage of population	2.16	4.09	11.54	17.55	28.85	15.14	11.54	5.05	4.09

Table 4 is a mobility matrix for individual incomes in 2000 and 2004. It also illustrates the intensity of income mobility between 2000 and 2004 (Leibbrandt and Woolard, 2001: 680) It shows that there is less income mobility at the edges of the income distribution than in the middle. Thirty-three percent of the respondents who inhabited the lowest income quintile in 2000 were still amongst the poorest quintile of the sample population in 2004. This is unsurprising given that the observations at the edges can only move in one direction, i.e.: the poorest can only get richer and the richest can only get poorer. Another justification for the richest quintiles' relative immobility is because the income range for the fifth quintile is far larger than the remainder of the income distribution. Thus it is far less likely for a particular observation to leave the fifth quintile than one of the poorer quintiles which have a smaller range (ibid: 2005: 874-875) The income transition matrix shows that just over 40% of the individuals who were in the fifth income quintile in 2000 remained there in 2004.

The mobility matrix is a clear illustration of the degree of income volatility experienced by the residents of Khayelitsha between 2000 and 2004. Just less than 29 % of individuals were immobile between 2000 and 2004. 35.4%

of the individuals were "losers", whilst 35.9% were "winners". Around 34% of individuals moved up (or down) by only one quintile.

Although there is no easily measured absolute income threshold that determines whether an individual or household begins to save (i.e. anything beyond subsistence), it could be expected that savings at both an individual and household level would have increased between 2000 & 2004, given the absolute and relative increases in income experienced by the Khayelitsha respondents, and specifically the poorer respondents.

Descriptive statistics of Khayelitsha savers, 2000 – 2004

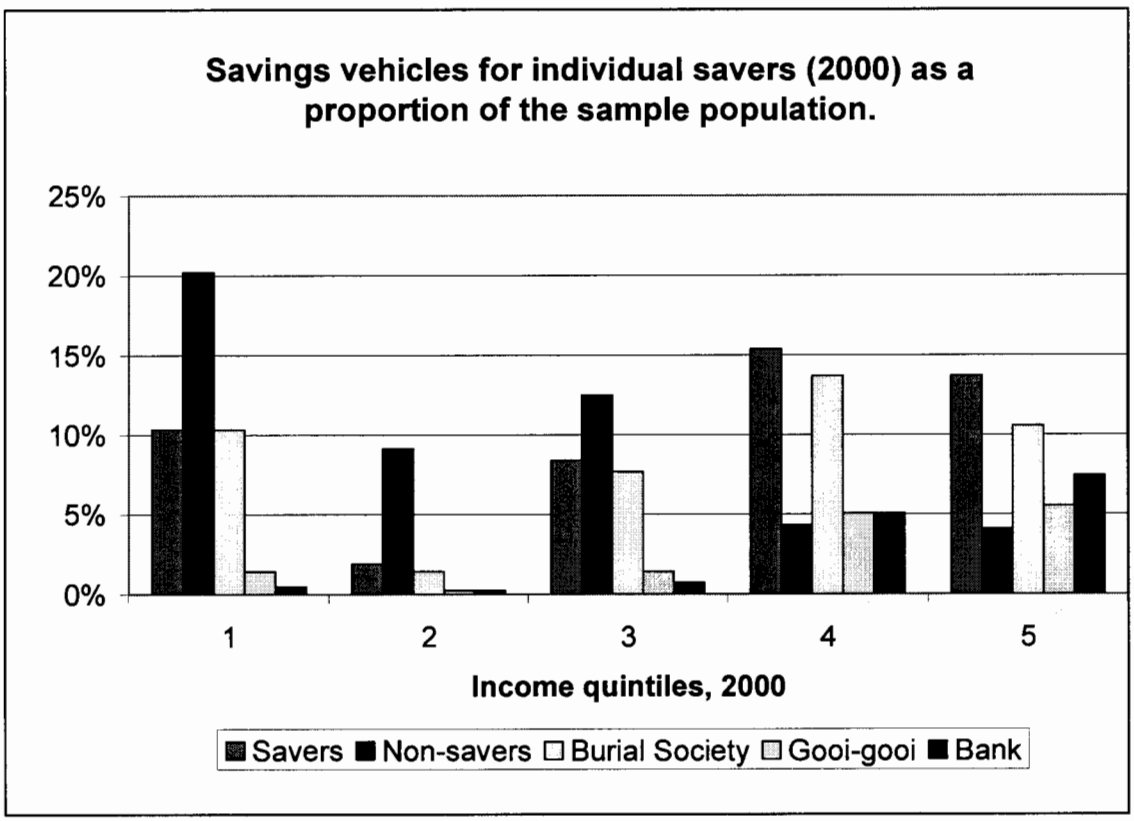
An individual's savings portfolio could consist of one or more of the following savings vehicles: a bank savings account or membership of a gooi-gooi or burial society. Table 5 shows the proportion of individuals in 2000 and 2004 that made use of at least one savings vehicle. Although 50.24 % of the individual respondents indicated that they saved in 2000, more than 69% indicated that they lived in a household with at least one member who made monthly savings. If savings are to be regarded as a risk management tool, then this result shows that although adult respondents may not be saving themselves many of them are covered by the savings of other household members.

Table 5- Individual Savers

	Non Saver, 2004	Saver, 2004	Total, 2000
Non Saver, 2000	29.81%	20.43%	50.24%
Saver, 2000	10.82%	38.94%	49.76%
Total, 2004	40.63%	59.38%	100.00%

The number of savers in the sample population increased from 49.8% in 2000 to 59.4% in 2004. Just less than 20.5% of the individuals indicated that they were new savers i.e.: they did not have monthly savings in 2000, but had monthly savings in 2004. Less than 11% of the sample stopped saving between 2000 and 2004.

Figure 2a: Proportion of sample population in each income quintile with savings in a gooi-gooi, burial society or bank account in 2000.



Cleary, there is a strong relationship between savings and income. In 2000, two thirds of the individual respondents in the lower three income quintiles did not utilise a savings vehicle, whilst just less than 59% of those in the richest two quintiles saved. The relationship between income and bank savings was even more pronounced. Less than three percent of the poorest 60% of the population saved in a bank whilst more than 40% of the respondents in the richest quintile had monthly bank savings. Burial society savings were the most popular savings form at all income levels, whilst gooi-gooi membership increased with levels of income.

Figure 2a: Proportion of sample population in each income quintile with savings in a gooi-gooi, burial society or bank account in 2000.

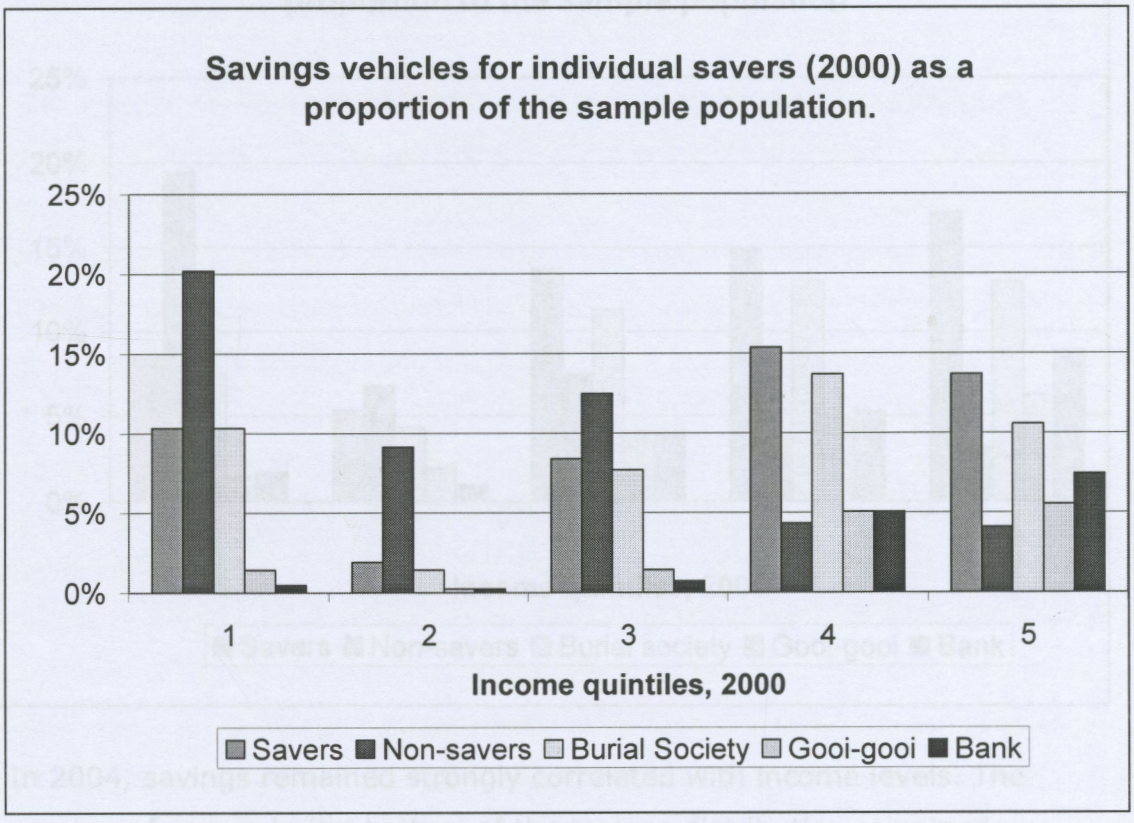


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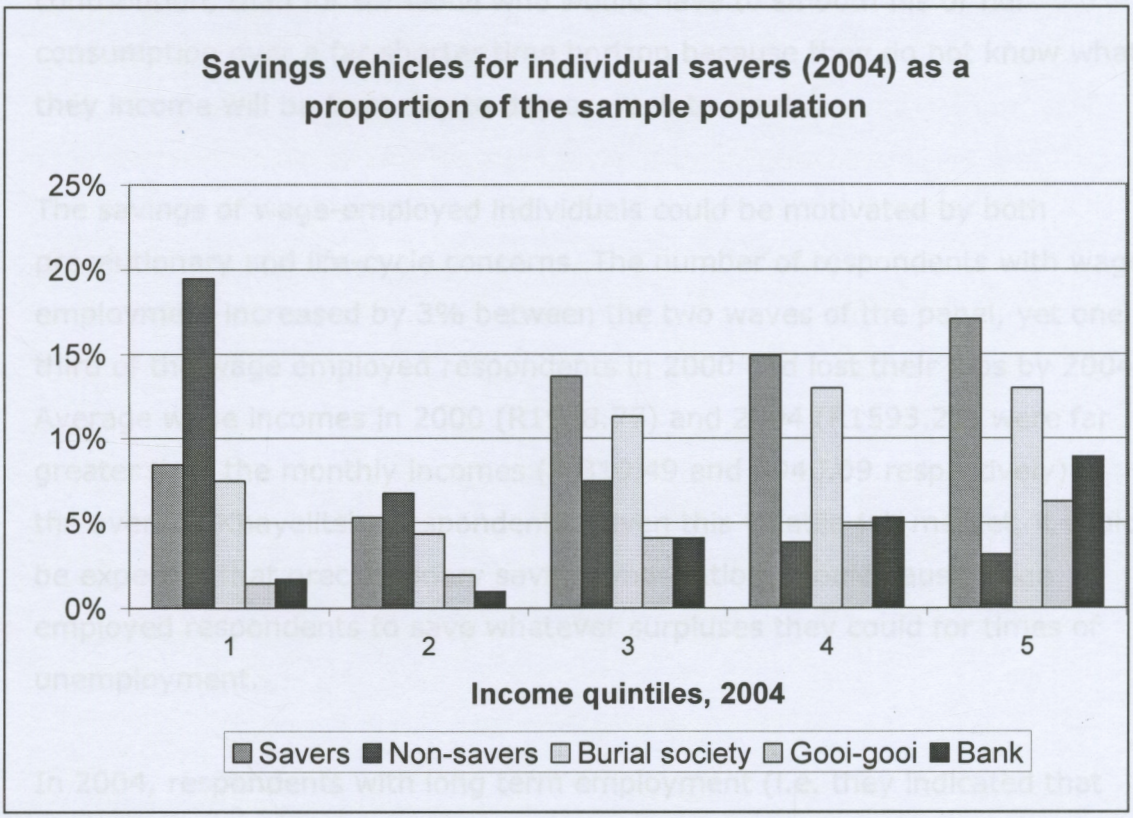
Figure 2b: Proportion of individuals in each income quintile with savings in a gooi-gooi, burial society or bank account in 2004.



In 2004, savings remained strongly correlated with income levels. The number of savers in the bottom of the income distribution remained extremely low. There was an increase in the proportion of savers in income quintiles 2 and 3, but it must be remembered that these income quintiles experienced a substantial increase in real income between the two waves of the panel. Bank savings remained the preserve of the richest 40% of the population. Again, burial society savings were the most popular savings vehicle at all income levels. As incomes increased, bank savings gained in popularity.

The permanent income hypothesis would expect respondents with a monthly income from either a grant or wage to be more likely to save than those with

a more erratic cash flow. As savings is about the way resources are allocated over time, it would be far easier for someone with a regular income to plan his or her finances over the month so as to afford their monthly savings contribution, than for someone who would have to smooth his or her consumption over a far shorter time horizon because they do not know what they income will be from day to day or week to week.[5].

The savings of wage-employed individuals could be motivated by both precautionary and life-cycle concerns. The number of respondents with wage employment increased by 3% between the two waves of the panel, yet one third of the wage employed respondents in 2000 had lost their jobs by 2004. Average wage incomes in 2000 (R1928.77) and 2004 (R1593.23) were far greater than the monthly incomes (R 819.49 and R940.09 respectively) of the average Khayelitsha respondents. Given this volatile job market, it could be expected that precautionary savings motivations would cause wage employed respondents to save whatever surpluses they could for times of unemployment.

In 2004, respondents with long term employment (i.e. they indicated that they had a job in both 2000 and 2004) had higher average monthly incomes (R1802.41) and a far higher proportion of bank savers (35.6%) than the rest of the population (20.91%). When asked "What are you saving in a bank

[5] Consider a construction worker who has the opportunity to join a gooi-gooi that meets on the second weekend of every month. Our construction worker has guaranteed work for the first half of the month and relies on casual employment for the remainder. He may have sufficient surplus income at the time that the gooi-gooi meets to afford the monthly contribution. However he remains unsure of what his income flows will be for the remainder of the month, especially if he cannot find work. In such a case, the worker could be fully justified in being wary of joining the savings club as he would not know if he would need his contribution on hand in the event that he could not find employment. Although a bank balance would be more accessible than a gooi-gooi contribution, the worker would incur travel costs and bank charges if he needed to withdraw his money and this would act as a disincentive for him to save.

for?", some bank savers (43%) indicated that they were saving to pay for their family members' education and 17.8% said that they were saving for when they were old. This seems to indicate that the Khayelitsha respondents are aware of life-cycle needs and are making provision for them when they can. The remaining bank savers had more immediate concerns: 14.4% said that that they were saving to buy things they couldn't usually afford, 20% said that they were saving in case they lost their job whilst 4.4% said that they were savings in case they got sick. The low income levels of the Khayelitsha respondents made it very difficult to distinguish between the life-cycle and precautionary savings motivations of any particular Khayelitsha saver and this topic remains an interesting area for future research.

Modeling the determinants of savings behaviour in Khayelitsha, 2000 -2004

The following relationships are proposed for modeling savings behaviour among the Khayelitsha residents in 2000 and 2004:

Individual Savers:

$Saver_i^z = f(Y_i^z, E_i^z, D_i^z)$

Where:

$Saver_i$ = 1 if Individual *i* saves in a bank account, gooi-gooi or burial society each month.

$Saver_i$ = 0 if Individual *i* doesn't save in a bank account, gooi-gooi or burial society each month.

Y = Log of real monthly income of individual *i*

E = Employment status of individual *i*

D = A set of demographic characteristics of individual *i*.

Z = 2000 or 2004

Table 6 shows the means and standard deviations of the explanatory variables. Observations were only included in the model if they had no missing data for both 2000 and 2004. There was a 12% increase in wage employment between the two waves of the panel. Self employment remained relatively constant.

Since 2000, there has been a massive expansion of the state's social grant's programme. The number of South Africans claiming a child support grant increased from 352 617 in 2000, to 4 309 772 in 2004 – an annual average increase of more than 87%! Between 2000 and 2004, the number of grant recipients in the Western Cape increased from 277 191 to 584 241. This extension of the social safety net is reflected in the Khayelitsha data. Less than 6% of the sample were grant recipients in 2000. By 2004, one third of the sample population was receiving grants.

Table 6 - Means and Standard Deviations of savers and non-savers

	Savers, 2000		Non-savers,2000		Whole sample, 2000	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std. Dev.
Saver	1.0000	0.0000	0.0000	0.0000	0.4976	0.5006
Log income	4.4819	4.7829	1.4074	5.1117	2.9373	5.1788
Poverty	0.3575	0.4804	0.7703	0.4216	0.5649	0.4964
Grant	0.0725	0.2599	0.0431	0.2035	0.0577	0.2334
Wage employment	0.5749	0.4956	0.1531	0.3610	0.3630	0.4814
Self-employment	0.0483	0.2149	0.0287	0.1674	0.0385	0.1925
Age in 2000	39.3044	12.0178	28.9426	10.4143	34.0986	12.3676
Female	0.6184	0.4870	0.5837	0.4941	0.6010	0.4903
Education	8.1739	2.7989	9.0144	2.7183	8.5962	2.7873
	Savers, 2004		Non-savers,2004		Whole sample, 2004	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std. Dev.
Saver	1.0000	0.0000	9.6909	169.0000	0.5938	0.4917
Log income	5.2601	4.1280	1.0071	5.4625	3.5323	5.1531
Poverty	0.2996	0.4590	0.7041	0.4578	0.4639	0.4993
Grant	0.3603	0.4811	0.2959	0.4578	0.3341	0.4723
Wage employment	0.6032	0.4902	0.2249	0.4187	0.4495	0.4980
Self-employment	0.0567	0.2317	0.0000	0.0000	0.0337	0.1806
Age in 2000	41.2915	11.6170	33.4320	11.9721	38.0986	12.3676
Female	0.6275	0.4844	0.5621	0.4976	0.6010	0.4903
Education	8.4130	2.8341	8.8639	2.7035	8.5962	2.7873

In 2000, savers had a substantially higher income than the population average. Fifty-seven and a half percent of savers in 2000 were wage-employed as opposed to only 15% of non-savers. Non-savers in 2000 were significantly younger (28,9 years old) than the average adult (34.1) and

were (8.9) slightly better educated than the average adult (8.6) in the sample. In 2004, the income gap between savers and non-savers had increased further. Savers had an average income of R1236.84 whereas non savers had an average monthly income of R396.90. Wage employment increased by 9% between the two waves of the panel. This overall increase in wage employment was not distributed equally between savers and non-savers. More than 60% of savers in 2004 were wage-employed as opposed to only 22.5 % of non-savers.

The model was run for both the 2000 and 2004 data. The results of the regressions can be seen in Table 7. In both years, wage earnings were the most significant predictor of whether or not an individual saved. In 2000, the odds of a wage earner saving were 4.15 times that of an adult who did not have a monthly income from wage or casual employment. By 2004, wage earners were predicted to be 6.6 times more likely to save than non wage earners.

Although the proportion of female savers was similar to the proportion of females in the whole sample, gender was predicted to be a key determinant of savings behaviour. Females were predicted to be 63% and 81% more likely to save than males in 2000 and 2004 respectively. This result shows that once income had been controlled for, females were more likely to save than men. Age was also a significant determinant of savings behaviour. A one year increase in age was predicted to increase the odds of a person saving by 15% (2000) and 22% (2004). Most interestingly, increases in individual income were not expected to influence a person's odds of saving.

Table 7 – Logistic regressions for savers in 2000 and 2004				
	2000 Savers		2004 Savers	
Variable	Odd ratio	P>|z|	Odd ratio	P>|z|
Income	1.00094	0.979	1.01982	0.684
Poverty	0.60353	0.221	1.13041	0.808
Grant	1.00066	0.999	1.29642	0.505
Wage - employment	4.14983	**0**	6.63613	**0.001**
Self-employment	1.94869	0.27	*dropped*	
Age	1.1531	**0.01**	1.22166	**0**
Age squared	0.999	0.154	0.99841	**0.01**
Education	1.00251	0.961	1.06003	0.246
Female	1.636	**0.055**	1.81157	**0.025**
Obs	402			402
Prob>chi2	0			0
Pseudo R2	0.2494			0.2352
Hosmer-Lemeshow	23.61			12.27
Prob>chi2 (HL)	0.0027			0.1397

The self employment variable from the 2004 regression was dropped as every self employed adult in the 2004 sample had savings of one form or another. The Hosmer-Lemeshow statistic shows that the 2000 model fits the data well, whereas the 2004 model can be accepted at a 14% significance level. When using primary income earners to test these relationships at a household level in 2000, the only significant determinant of whether a household saved was the percentage of adult members with wage-employment. The results for the household level regression can be seen in appendix A5.

Surprisingly, grant income was deemed to be an insignificant predictor of whether an individual would save. A large proportion of grant recipients also had income from other sources, which could dominate the effects of the monthly grants in the regression. Forty-three respondents admitted to receiving grants as well as having wage- employment. Their average monthly income was R1394.01.

An additional variable that accounted for the 79 individuals whose grant was their only source of monthly income was predicted to be insignificant when included in the models. This result was unsurprising given that the level of monthly grant income for these respondents (R366. 75) was below the R400 poverty line.
However new grant income also crowded out income from other sources (Morduch, 1999a:192). Although new grant recipients received an average grant income of R319.30 in 2004, their average monthly increase in income was only R 179.19 – an average crowding out of 43%! Thus it seems that by themselves the grants were too small to influence savings behaviour.

It is very difficult to determine with absolute certainty what influence wage employment has on savings behaviour. It is obvious that the respondents with wage employment had a higher average income than those without jobs and thus could be expected to be more likely to have a surplus of income with which they could save each month. However, wage employment remained a substantially significant predictor of a person saving, even when controlling for various income levels.[6] This seems to indicate that there are factors to wage employment, other than the level of income, which cannot be identified that influence a person's decision to save.

The next step in the analysis was to attempt to determine what factors caused an individual who did not save in 2000, to begin saving by 2004. The simple model above was extended to include change variables which were calculated by subtracting the 2000 values from the 2004 values.

[6] Dummy variables were created for four income levels (R200, R400, R800 & R1200). Separate regressions were run with each income level replacing the poverty variable shown in table 7. In every case, the income level was predicted to be insignificant.

$$New\ Saver_i = f(Y_i^{2000}\ \Delta Y_i\ ;\ E_i^{2000}\ \Delta E_i;\ D_i^{2000})$$

Where:

New Saver$_i$ = 1 if Individual *i* had no savings in 2000 but saved in 2004.

New Saver$_i$ = 0 if Individual *i* had no savings in both 2000 and 2004

Y = Log of real monthly income of individual *i*

E = Employment status of individual *i*

D = A set of demographic characteristics of individual *i*.

Table 8 shows the means and standard deviations of the variables used in the "new saver" model. New savers, on average, experienced a real increase in income whilst non-savers (i.e. those that had no savings in both 2000 and 2004) experienced a real decrease in income between 2000 and 2004. More than 41% of the new savers found wage –employment between the two waves of the panel as opposed to just 12% of the consistent non-savers. Again, new savers were on average six years older than the constant non-savers. The effects of the expanded state grant programme can be seen by the fact that 42% of the new-savers and 27% of the non-savers received more grant income in 2004 than in 2000. The share of male non-savers was 15% higher than that found in the total sample population.

Table 8 Means and standard deviations of new savers and consistent non savers

	New Saver		Consistent non-saver	
Variables	Mean	Std. Dev	Mean	Std. Dev
New Saver	1	0	0	0
Log income 2000	1.575021	5.299465	1.292473	4.997449
Change in log income	3.802939	6.13214	-0.828562	7.119523
Grant recipient 2000	0.047059	0.213022	0.040323	0.197513
Change in grant receipts	0.423529	0.49705	0.274194	0.447917
Wage employment 2000	0.223529	0.419083	0.104839	0.307588
Wage employment change	0.411765	0.495074	0.120968	0.327413
Self employment	0.035294	0.185617	0.024194	0.154273
Self employment change	0.023529	0.152477	0	0
Age in 2000	32.09412	9.456194	26.78226	10.52489
Age squared in 2000	1118.4	669.9639	827.1694	778.1728
Education in 2000	8.694118	2.939969	9.233871	2.544271
Females	0.623529	0.487376	0.556452	0.498818

Table 9 illustrates the results of the non-saver regression. Respondents who received an increase in grant income between 2000 and 2004, were not predicted to be more likely to save. Unlike the earlier cross-sectional logistic models presented for 2000 and 2004, the log of individual income in the new saver model was found to be significant. The model predicted that a 10% increase in individual income would increase the odds of an individual becoming a new saver by just 1.13%[7]. This is a very interesting result. Although changes in income were found to have a significant relationship with the odds ratio of the new savers, the model predicted that the effect that income changes had on the odds that an individual would start to save was small. In contrast the odds to begin saving of respondents who had found jobs between 2000 and 2004 were 5 times that of those who had not found jobs.

Table 9 – logistic regression for new savers		
New Saver	Odd ratio	P>|z|
Log income 2000	1.1279	0.0740
Log income change	**1.1197**	**0.0350**
Grant 2000	2.7664	0.3130
Grant change	1.2062	0.7140
Wage employment 2000	2.7598	0.1370
Wage employment change	**5.5433**	**0.0030**
Self employment 2000	0.5849	0.6040
Age in 2000	**1.4846**	**0.0000**
Age squared in 2000	**0.9949**	**0.0010**
Education in 2000	0.9496	0.4860
Female	**2.3304**	**0.0680**
Obs	207	
Prob>chi2	0	
Pseudo R2	0.2796	
Hosmer- Lemeshow	18.6400	
Prob>chi2	0.0169	

[7] The interpretation of this the co-efficient for the log income variable can be confusing. Because income is in log form the co-efficient is a measure of elasticity. For every percentage increase in income the odds of an individual saving was ln (1.119671) = 0.113% (Ardington and Leibbrandt,2004: 18)

Even when controlling for changes in income and wage employment, the odds of females beginning to save between 2000 and 2004 were more than twice that of males. The Hosmer-Lemeshow statistic shows that the model has a good fit.

The next step of the analysis was to test whether there were any differences between people who started saving in a bank account between 2000 and 2004 as opposed to those respondents who started saving via an informal savings vehicle such as a gooi-gooi or burial society.

Table 10 illustrates the means and standard deviations of the variables used in the model. More than 87% of the respondents who started saving in a bank account by 2004, also started saving in the informal sector. This confirms Ardington and Leibbrandt's (2004:2) argument that informal financial services should be seen as complementary to those found in the formal sector.

Table10: Means and standard deviations of new bank savers, new informal savers and constant non-savers

	New bank savers		New informal sector saver		Constant non-saver	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
New Saver	1.0000	0.0000	1.0000	0.0000	0.0000	0.0000
Log income 2000	2.1340	5.7063	3.2067	5.2881	1.2925	4.9974
Change in log income	4.3615	6.5523	1.9602	6.2307	-0.8286	7.1195
Grant recipient 2000	0.0333	0.1810	0.0664	0.2495	0.0403	0.1975
Change in grant receipt	0.3333	0.4754	0.3584	0.4806	0.2742	0.4479
Wage employment 2000	0.4000	0.4940	0.4558	0.4991	0.1048	0.3076
Wage employment change	0.4333	0.4997	0.2035	0.4035	0.1210	0.3274
Self employment 2000	0.0333	0.1810	0.0398	0.1960	0.0242	0.1543
Self employment change	0.0167	0.1291	0.0531	0.2247	0.0000	0.0000
Age in 2000	36.1333	11.0107	37.7212	11.5515	26.7823	10.5249
Age squared in 2000	1424.8330	855.2721	1555.7390	987.1930	827.1694	778.1728
Education in 2000	9.1667	2.7257	8.2035	2.8289	9.2339	2.5443
Females	0.6500	0.4810	0.6239	0.4855	0.5565	0.4988

On average, new bank savers experienced a higher increase in income than new informal sector savers between 2000 and 2004. Forty three percent of new bank savers had found new wage-employment by 2004 as opposed to 20.3% of new informal sector savers.

The responses to the 2004 questionnaire's qualitative questions about why Khayelitsha respondents chose to save in the informal sector can be seen in the appendix. Some of their responses are explored here. The vast majority of all respondents who did not save monthly in 2004 said that they did not have the money to save. Thirty-eight percent of gooi-gooi savers that they preferred to save in a gooi-gooi rather than in a bank because they enjoyed the meetings. Thirty-eight percent of gooi-gooi savers said saving in a group helped them to save. When asked why they preferred to save in a burial society rather than paying for a formal funeral plan, only 7.5% of the burial society savers said that the funeral plan cost too much. Fifty-percent said that the burial society covered more members, whilst 40% justified their membership by saying that the burial society assisted in organizing the funeral.

Figure 3 below shows the market share of the different South African banks. Fifty-three percent of the sample population had a bank account in 2004, but only 21% used it to save monthly. Standard Bank was the most popular bank with a market share of 24%, followed by ABSA (11.8%) and First National Bank (11.1%). Although Nedbank (the other Big Four bank) did not feature, 5.5% of the Khayelitsha respondents had bank accounts through Nedbank's joint venture with Pep - a popular clothing retailer. Standard Bank also had a higher proportion of account holders who used their account to save each month than any of the other Big Four Banks. The 2004 wave was undertaken within 6 months of the launch of Capitec's transactional banking service and thus it was unsurprising that Capitec had the smallest number of account holders. However, there were twice as many Capitec clients who indicated that they used their account to save each month than those who used it for

transactional purposes only. More than two-thirds of those who had a bank account in 2004 were also wage-employed. Less than 12% of the respondents who were banked but did not save, cited bank charges as the reason why they did not use their bank account to save. The majority of banked non-savers said that they did not have the money to save.

Figure 3: Bank Market share

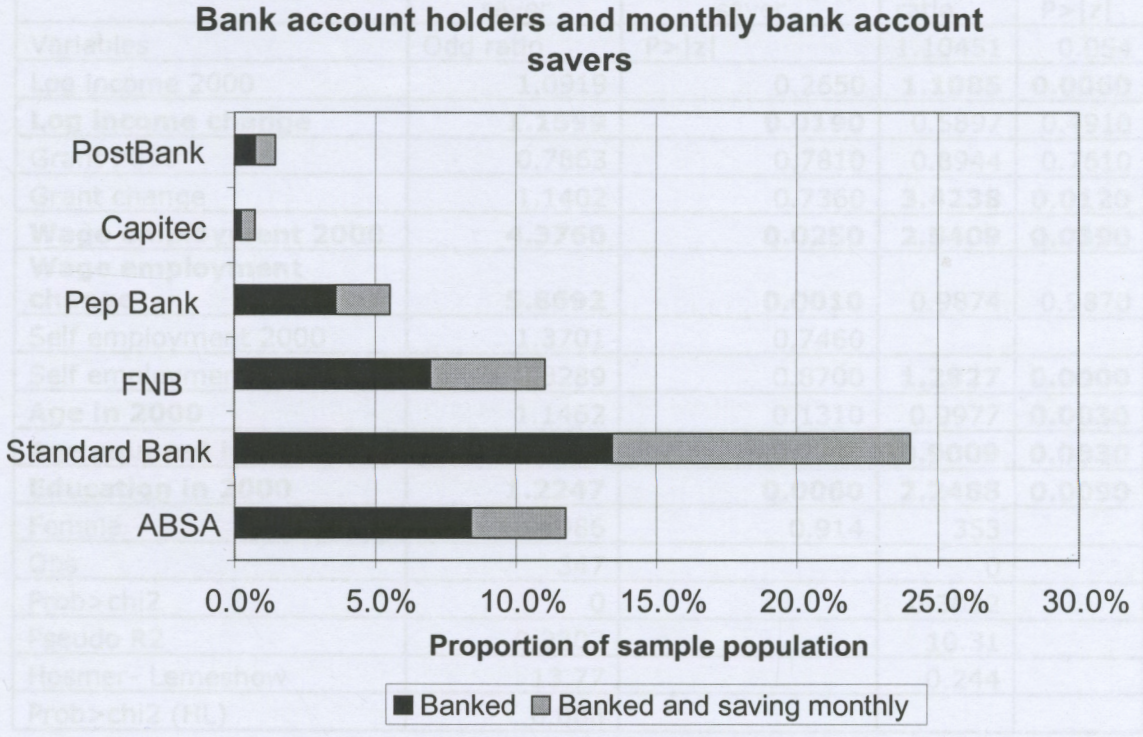


Table 11 shows the results of the logistic regressions on new bank savers and new informal sector savers. Again, increases in real income were predicted to have a small yet significant effect on the odds that an individual would begin to save between 2000 and 2004. A 10% rise in income was expected to increase the odds of a person beginning to save in a bank by 1.5%, whilst it was expected to increase the odds of a person beginning to save in a gooi-gooi or burial society by just 1%. The odds of an individual being a new bank saver increased substantially with new wage-employment. The odds of a person, who was not working in 2000 but had found some form of wage employment by 2004, beginning to save in a bank were 587%

higher than those who had not found work. Although education was not predicted to have any significant impact on new bank savers, higher education levels were predicted to increase the odds of a person beginning to save informally.

Table 11 – Logistic regressions for new bank savers and new informal savers				
	New bank saver	New informal saver	Odd ratio	P>|z|
Variables	Odd ratio	P>|z|	1.10451	0.054
Log income 2000	1.0919	0.2650	**1.1085**	**0.0060**
Log income change	**1.1599**	**0.0190**	0.5897	0.4910
Grant 2000	0.7863	0.7810	0.8944	0.7610
Grant change	1.1402	0.7360	**3.4238**	**0.0120**
Wage employment 2000	**4.3760**	**0.0250**	**2.5409**	**0.0390**
Wage employment change	**5.8692**	**0.0010**	0.9874	0.9870
Self employment 2000	1.3701	0.7460		
Self employment change	0.8289	0.8700	**1.2827**	**0.0000**
Age in 2000	1.1462	0.1310	0.9977	**0.0030**
Age squared in 2000	0.9988	0.2700	**0.9009**	**0.0830**
Education in 2000	**1.2247**	**0.0060**	**2.2488**	**0.0090**
Female	1.03986	0.914	353	
Obs	347		0	
Prob>chi2	0		0.3032	
Pseudo R2	0.2202		10.31	
Hosmer- Lemeshow	13.77		0.244	
Prob>chi2 (HL)	0.088			

Conclusion

The Financial Sector Charter placed similar emphasis on the need for both savings and transactional banking services. The Mzansi initiative has gone some way in showing that South African banks are committed to reaching the FSC targets with regards to extending the transactional services access frontier to include the previously un-banked. However, as this paper shows, not every bank account holder saves; access to transactional banking services is a sufficient but not a necessary determinant of savings behaviour.

Ultimately the provision of appropriately priced savings products and services must be taken within the context of an economy with high levels of unemployment. Savings products require users to plan their finances and commit to putting money away for times of need. Wage employment was by far the most significant predictor of individuals saving, both formally and informally. Membership of a stokvel or burial society or committing oneself to save in a bank account each month seems to require a regular monthly income that provides some surplus. Although the substantial expansion of the state's grant programme does provide recipients with a regular income stream, it seems not to supply a sufficient surplus to drive savings behaviour.

Access to formal financial savings products will improve the lives of the poor if they use banking products to accumulate savings and to insure themselves against risk. In this light, the South Africans banks should be encouraged to continue in their attempts to expand the provision of appropriate and affordable transaction banking products to the poor. However, this may not be sufficient. Given the highly volatile incomes of the poor, many may simply be unable to commit themselves to saving regularly under the current pricing structure of bank savings products.

Although access to transactional banking services does bridge the informal and formal sectors and makes it easier for individuals to manage their financial affairs, poor urban South Africans are not going to save regularly without having some form of regular wage-employment. Emergencies and life-cycle shocks, especially funerals, have very real impacts on the financial health of poor South Africans. Unless they can prepare for these events by accumulating savings (or harnessing credit), they may be pushed further into poverty. Robinson's argument that microfinance can only assist the financially active poor seems particularly pertinent in South Africa. The low and volatile incomes of many of the respondents in this study has increased their vulnerability to risk and poverty and makes it extremely difficult for

them to improve their financial position in a sustainable manner. It is only once incomes have stabilized that the poor can take advantage of financial services in order to save. Given the 2008 deadline, the evidence here shows that the Financial Sector Charter signatories should focus predominantly on the need to extend the transactional banking services net. Providing service access in a way that is both profitable for the banks and effective in channeling savings from a population that is experiencing rampant unemployment may well prove to be a bridge too far.

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Appendix 1 – Missing data			
Variable	Percentage missing	Mean	Std Dev
Saver 2000	1.579	0.4938	0.5004
Saver 2004	5.79	0.5866	0.4929
Income 2000	11.58	870.03	1384.2
Income 2004	7.02	918.07	1460.4
Education 2004	6.32	9.16	2.89
Education 2000	5.96	8.53	2.8
Self-employment 2000	5.79	22.36	194.22
Grant income 2000	4.21	116.38	217.87
Wage employment 2004	2.81	670.38	1223.69
Grant income 2000	2.28	24.7	119.11
Wage employment 2000	2.11	677.97	1261.69
Gift income 2000	1.75	86.85	306.55
Age in 2004	1.05	38.49	12.26
Casual work 2000	0.18	53.1	298.44
Self employment 2004	0.18	78.24	845.95
Gift income 2004	0.18	18.56	117.57
Rent income 2000	0	0.14	3.35
Gender	0	1.6	0.49
Age in 2000	0	34.75	12.36
Percentage of sample with missing data		27.19	

Appendix 2 -Logistic regression models for individual savers in 2000 & 2004

Logistic regression model for individual savers in 2000

	Income effects		Employment status		Demographics		Broad model	
Variable	Odds ratio	P>|z|	Odds ratio	P>|z|	Odds ratio	P>|z|	Odds ratio	P>|z|
Income	0.9916	0.78					1.0009	0.979
Poverty	0.1568	0					0.6035	0.221
Grant	1.1847	0.72					1.0007	0.999
Wage-employment			7.6403	0			4.1498	0
Self-employment			3.7464	0.015			1.9487	0.27
Age					1.2688	0	1.1531	**0.01**
Age squared					0.9980	0.001	0.999	0.154
Education					1.0558	0.239	1.0025	0.961
Female					1.1388	0.569	1.636	**0.055**
obs	416		416		416		402	
Prob>chi2	0		0		0		0	
Pseudo R2	0.1295		0.1576		0.1612		0.2494	

Logistic regression model for individual savers in 2004

	Income effects		Employment status		Demographics		Broad model	
Variable	Odd ratio	P>|z|	Odd ratio	P>|z|	Odd ratio	P>|z|	Odd ratio	P>|z|
Income	1.1249	0					1.0198	0.684
Poverty	0.4354	0.02					1.1304	0.808
Grant	0.7722	0.35					1.2964	0.505
Wage-employment			6.115	0			6.6361	0.001
Self-employment*	*dropped*							
Age					1.3430	0	1.2217	0
Age squared					0.9973	0	0.9984	0.01
Education					1.0619	0.193	1.0600	0.246
Female					1.2823	0.269	1.8116	0.025
obs	416		402		416		402	
Prob>chi2	0		0		. 0		0	
Pseudo R2	0.1407		0.129		0.1308		0.2352	

Appendix 3 - Logistic regression for households that have savings in 2000		
Household saver 2000	Odds Ratio	P>z
Log (Adult equivalent income)	1.0069	0.873
Household poverty	0.9149	0.836
Average number of adult grant recipients in household	2.1398	0.424
Average number of adults employed in household	1.0171	0.019
Average number of self-employed adults in household	0.9970	0.795
Average age of adults in household	1.0899	0.315
Average age squared of adults in household	0.9992	0.507
Average number of females in household	1.0036	0.418
Obs	253	
Prob>chi2	0	
Pseudo R2	0.0897	
Hosmer-Lemeshow	15.43	
Prob > chi2 (HL)	0.0513	

ppendix 4 – Logistic regression for new savers

	Income effects		Employment status		Demographics		Broad model	
ew Saver	Odd ratio	P>|z|	Odd ratio	P>|z|	Odd ratio	P>|z|	Odd ratio	P>|z|
g income 2000	1.2322	0					1.1279	0.07
g income change	1.24	0					1.1196	0.03
ant 2000	1.0288	0.97					2.7664	0.31
ant change	0.8030	0.525					1.2062	0.71
age employment 2000			5.0688	0			2.7598	0.13
age employment change			7.9704	0			5.5433	0.00
lf employment 2000			2.602	0.28			0.5849	0.60
e in 2000					1.4813	0	1.4846	
e squared in 2000					0.9951	0	0.9949	0.00
ucation in 2000					0.9703	0.641	0.9496	0.48
male					1.3895	0.304	2.3304	0.06
s	209		209		209		207	
ob>chi2	0		0		0		0	
eudo R2	0.1661		0.1441		0.1177		0.2796	
smer Lemeshow	12.92		6.69		10.41		18.64	
ob>chi2	0.1146		0.0826		0.2372		0.0169	

Appendix 5 - logistic regressions for new bank savers and new informal savers								
	Income effects		Employment status		Demographics		Broad model	
New bank saver	Odds ratio	P>|z|	Odds ratio	P>|z|	Odds ratio	P>|z|	Odds ratio	P>|z|
Log income 2000	1.28219	0					1.09193	0.265
Log income change	1.31541	0					1.15988	0.019
Grant 2000	0.39943	0.238					0.78629	0.781
Grant change	0.63401	0.151					1.14021	0.736
Wage employment 2000			5.8792	0			4.37603	0.025
Wage employment change			11.1716	0			5.86917	0.001
Self employment 2000			1.15724	0.866			1.37009	0.746
New selfemployment			1.28039	0.828			0.82888	0.87
Age in 2000					1.26575	0	1.14621	0.131
Age squared in 2000					0.99754	0.01	0.99876	0.27
Education in 2000					1.26212	0	1.22474	0.006
Female					0.89052	0.71	1.03986	0.914
Obs	347		347		347		347	
Prob>chi2	0		0				0	
Pseudo R2	0.1402		0.1392				0.2202	
Hosmer Lemeshow	9.41		5.03				13.77	
Prob>chi2 (HL)	0.2245		0.1699				0.088	
New Informal saver	Odds ratio	P>|z|	Odds ratio	P>|z|	Odds ratio	P>|z|	Odds ratio	P>|z|
Log income 2000	1.23239	0					1.10451	0.054
Log income change	1.18801	0					1.10849	0.006
Grant 2000	1.23203	0.695					0.58969	0.491
Grant change	0.67888	0.16					0.89444	0.761
Wage employment 2000			7.07535	0			3.42376	0.012
Wage employment change			3.3859	0			2.54091	0.039
Self employment 2000			3.90939	0.049			0.98736	0.987
New selfemployment			*dropped*					
Age in 2000					1.40302	0	1.28274	0
Age squared in 2000					0.99666	0	0.99773	0.003
Education in 2000					0.94112	0.27	0.90088	0.083
Female					1.60147	0.07	2.24881	0.009
Obs	365		353		365		353	
Prob>chi2	0		0		0		0	
Pseudo R2	0.1291		0.1219		0.2159		0.3032	
Hosmer Lemeshow	9.97		3.52		13.02		10.31	
Prob>chi2 (HL)	0.2669		0.1722		0.111		0.244	