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Moving Across Boundaries: Migration in South Africa, 1950-2000

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The ending of the apartheid system of brutal oppression and racial segregation and the ushering in of a representative democracy during the late 1980s and early 1990s brought dramatic social changes to the nation of South Africa. The impact of these social changes has been particularly pronounced for black South Africans[1], as they were the most disadvantaged group during the apartheid era. Although blacks remain the most disadvantaged today, the potential benefits of democracy and freedom are considerable for them. One of the key social changes that may benefit black South Africans is freedom of movement. Geographical mobility, which was previously restricted by various racial segregation and migration control laws, is now formally and legally free for everyone. Of course, social, economic, and political barriers to movement and residential choice remain, but blacks are no longer in danger of being arrested or fined for moving to particular places within South Africa and they are no longer banned from living in certain areas.

Historically, migration played a key role in social and political change in South Africa. Yet because of the paucity of good life course studies and the apartheid government's suppression and censoring of data about the black population, existing knowledge about the actual historical patterns of black migration within South Africa is incomplete at best. There were pioneering efforts by some scholars to document the migration situation for black South Africans during the apartheid era and a new generation of scholars has recognized the need for understanding past and current patterns. Nevertheless, existing studies of internal migration in South Africa have not been able to take a true longitudinal approach because of the lack of good historical data.

There are two major motivations behind my research. First, there is a need for better empirical evidence about historical patterns of black migration in South Africa (White, Mberu and Collinson 2008). Much of the existing research on internal migration in South Africa (and also elsewhere in sub-Saharan Africa) has taken one of three approaches. The first approach focuses on particular periods of time, generally using cross-sectional survey data to get a snapshot of migration patterns for a specific geographic area or sub-population in a given year or small set of years. The second approach employs census data to examine changes in migration patterns for the entire population over a decade or more, but only macro-level changes across and within provinces can be examined, not individual characteristics and determinants of migration patterns. The third approach comes closest to a life course approach, following the

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[1] Note: I use the terms blacks and black South Africans here as they are still the most common terms used in South Africa for the racial and social grouping that is, in fact, a highly diverse population.

population living in a small geographic area annually with a prospective census and survey. However, this approach cannot represent the experiences of black South Africans over the entire nation. None of these approaches offers both a longitudinal life course perspective and a nationally representative sample (Kok and Collinson 2006; Kok et al. 2003; Posel and Casale 2003).

This paper offers a fourth approach: a historical analysis of individual retrospective migration life history data from a nationally representative sample of the black population of South Africa. To my knowledge it is the first research to use event history analysis to study internal migration in South Africa. Thus it captures not only the migration experiences of blacks living in South Africa during the last half of the twentieth century, but also gives insights into the micro- and macro-level characteristics and changes that produced these migration patterns.

I begin with a brief introduction to the current social and demographic context of South Africa, focusing particularly on recent migration patterns, according to what is currently known from the existing research literature. Then I describe the key research questions and hypotheses to be tested, followed by a description of the data and methods used to investigate these research questions. Next, I present the results, focusing on historical patterns of change that I found using multivariate event history models. Finally, I describe the implications of these results in the conclusion.

Current South Africa: The Social, Demographic, and Migration Contexts

In terms of land area, South Africa is the 25th largest country in the world, comparable in the size to Colombia. It has the largest economy in Africa and the 24th largest economy in the world. It is the most socially and economically developed country in Africa (National Foreign Assessment Center 2008). There are nine provinces in South Africa: Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo (or Northern), Mpumalanga, Northern Cape, North-West, and Western Cape. The population of South Africa was approximately 47.9 million as of mid-2007 (up over 3 million from the 2001 census estimate of 44.8 million). The largest share of the population lives in KwaZulu-Natal—approximately 21 percent or about 10 million people—followed by Gauteng, with 20 percent, or about 9.6 million people. Eastern Cape has about 14.5 percent of the population, while Limpopo has a little over 11 percent and Western Cape has about 10 percent (7 million, 5.4 million, and 4.8 million people, respectively). Mpumalanga, Free State and North-West each have over 5 percent of the total population (around 3 million people each), while the remaining province—Northern Cape—has only 2.3 percent or about 1 million people, despite having the largest land area (it is a very dry climate) (Statistics South Africa 2007).

Although there are few major urban centers and a lot of open space, slightly more than half of South Africa's population lives in urban areas. Limpopo province is the most rural, while Gauteng, which contains the cities of Johannesburg and Pretoria, is almost entirely urban. Johannesburg is the most cosmopolitan metropolis in South Africa, and it is a huge magnet for migrants from within and outside of South Africa. The 2001 census

found that nearly 7% of Johannesburg's population was born outside of South Africa, and more than 35% were born outside of Gauteng, the Province in which Johannesburg is situated (Peberdy, Crush and Msibi 2004). Other areas that have high urban concentrations are Cape Town in the Western Cape, Durban in KwaZulu-Natal, Port Elizabeth and East London in the Eastern Cape, and Bloemfontein in the Free State.

Black Africans comprise 80 percent of the population (almost 38.1 million), followed by just over 9 percent whites (about 4.4 million), just under 9 percent coloured (those of mixed racial or ethnic descent; approximately 4.3 million), and 2.5 percent Indian or Asian (about 1.2 million). Fifty-one percent of the population is female (approximately 24.3 million) and about one-third of the population is under the age of 15 (Statistics South Africa 2007).

Recent evidence has shown that South Africa was on the forefront of the demographic transition in sub-Saharan Africa (Cohen 1998). Fertility decline among black South Africans began several years before the South African government extended its family planning program to blacks in 1974. The gradual fertility decline continued throughout the 1970s. As apartheid's constraints on blacks' opportunities slowly crumbled in the later 1980s and early 1990s, the pace of fertility decline quickened (Moultrie and Timaeus 2003). The country is now well advanced in the fertility transition and birth cohorts have already peaked in size, so like many countries around the world, South Africa's annual population growth rate has been steadily declining. The estimated overall growth rate was approximately 1.3 percent in 2001-2, but only 1 percent in 2007-8 (Statistics South Africa 2007). South Africa's declining growth is not only due to declining fertility rates, as is the case in most countries, but also because of increasing mortality rates due to HIV/AIDS, which according to some recent estimates, accounts for about 40 percent of all mortality in South Africa (Bradshaw et al. 2003). While the total fertility rate (TFR) has declined from almost 5.0 in 1980 to 2.7 in 2007, life expectancy has declined from almost 62 years in 1990 to only 49 years in 2005 (United Nations Population Division 2006).

The estimated overall HIV prevalence rate is current around 11 percent and the HIV positive population is approximately 5.3 million (Statistics South Africa 2007). The AIDS crisis has hit South Africa very hard, in part because of labor migration and the accompanying separation of families. Migration has the potential, often realized, to spread contagious disease by putting those who are infected in contact with those who are not. Packard (1989) described this relationship between mining labor migration and the spread of tuberculosis in South Africa in his seminal book on the topic. More recently, researchers have shown that a similar process is occurring with the HIV epidemic. Originally, many researchers believed that migrant male laborers, who worked away from their homes and families for long periods of time, were likely to become infected with HIV while they are away and then to infect their partners or wives when they returned to their rural homes (Mabey and Mayaud 1997; Mbizvo et al. 1996; Pison et al. 1993). Yet more recent research has uncovered a more complex process in which men may infect their rural partners when they return home, but rural female partners also take on outside relationships in the rural areas and become infected with HIV through those

relationships (Lurie 2006). Moreover, men who have lived in four or more places are more likely to be HIV-positive, which points to the importance of the social disruption and extended family separation associated with multiple relocations (possibly dislocations forced as a result of government resettlements and political violence) as a risk factor for HIV in South Africa (Lurie et al. 2003).

Migration and Urbanization

In terms of migration within the country, now there is theoretically free movement, yet the legacies of apartheid remain in the spatial and economic distribution of the population and in migration patterns. Although historical trends are difficult to ascertain given the poor quality of data, it is possible to take a look at shorter-term trends, particularly since 1980, using census and national survey data. Comparing census data, some authors found that overall migration rates remained relatively constant between 1975 and 2001, with about 12 percent of the population moving in any given five-year period. Yet they argue that most of this migration is temporary or circulating (Kok and Collinson 2006; Collinson and Wittenberg 2001). Another researcher found that between 1993 and 1999, internal labor migration increased slightly and that rural households with a migrant worker outside the house were increasingly likely to receive remittances over this time period (Posel 2003). Yet another study did not find that permanent migration was replacing circular migration as an economic strategy (which is what one might have expected once families were free to move together) (Posel and Casale 2003).

This evidence suggests that despite black South Africans' new freedom to move permanently and as a family unit, temporary and circular migration is not abating as a household economic strategy. Commuter migrants have become more common; these workers live in the compounds while at work, but commute on a regular monthly or weekly basis from family homes in rural areas or townships (Crush, Jeeves and Yudelman 1991). Other authors have come to similar conclusions (Collinson et al. 2006a; Posel 2006; Kok and Collinson 2006; Kok et al. 2003). Yet there is some evidence from KwaZulu-Natal that fewer migrants are sending remittances to rural areas and maintaining their rural ties (Mosoetsa 2004; Cross, Mngadi and Mbhele 1998). This may point to some decline in circular migration in certain areas of the country.

Urbanward migration seems to be dominant in terms of overall national trends in migration patterns. Although some of this migration is rural to urban migration, migration between cities, particularly step migration from smaller cities to the larger metropolises, is also a large flow, which is evident from national-level analyses (Collinson, Tollman and Kahn 2007). One study found that although black migration to the cities from the rural former homeland areas has increased, that this increase has been relatively modest (Cox, Hemson and Todes 2004). Although there are many urban areas that are destinations for migrants, including Durban, Cape Town, and a number of former (or continuing) mining centers, a large proportion are drawn to the largest city in the country. Johannesburg and the Pretoria/Gauteng metropolitan region overall were a key destination for, by some estimates, almost 40 percent of migrant workers during the late 1990s (Cox, Hemson and Todes 2004).

There is still substantial migration between rural areas, as some migrants begin their step migration by first moving from rural areas or villages to small towns (Collinson, Tollman and Kahn 2007). According to some researchers, circular and temporary migration still seems to be a major part of the flow to large cities, which have developed networks of migrants over time (Collinson et al. 2006a). One study in Soweto, however, found that many urban residents are natives of the city and have settled there permanently, albeit often in informal shack housing areas (Gilbert and Crankshaw 1999).

Researchers have also found evidence of return migration to rural areas (which reinforces the notion that many migrants maintain ties with these areas and that some may ultimately move back there to retire or to be cared for when they become sick, particularly in light of the AIDS crisis) (Collinson, Tollman and Kahn 2007). Some research suggests that more permanent migration to rural areas may be driven not by employment, but rather by the need for improved infrastructure and services, which some advantaged rural areas now have. Some rural areas—particularly small towns—actually now have higher average incomes than some urban squatter settlements (Collinson et al. 2006b; Cox, Hemson and Todes 2004; Cross, Mngadi and Mbhele 1998; Mbhele 1998). One argument put forth is that the high population densities of some rural former homeland areas may also be a factor causing people to want to move from those areas (Kok et al. 2003); however, they would presumably be moving to equally densely populated areas, so this argument seems to be flawed. There is also evidence of migrants moving from the large metropoles to secondary cities, perhaps to escape the difficulties of life in squatter settlements in the cities like Johannesburg and Durban (Collinson, Tollman and Kahn 2007). This suggests migration driven not only by the typical labor market forces, but more by a "push" force of poverty causing migrants to move from certain rural areas. On the other hand there are "pull" forces of infrastructure, services, and safety, lower costs of living, and simply ease of life drawing migrants to smaller towns and cities.

Thus, although there is some existing research on migration processes in South Africa, a complete understanding of both historical and current migration patterns and their determinants for the country as a whole remains elusive. Debates continue about the nature of migration in the post-apartheid era and how it may or may not change in the twenty-first century. My study aims to address some of the many lingering questions about how migration has or has not changed over time in South Africa.

Research Questions and Hypotheses: Patterns and Determinants of Migration

The research questions addressed in this paper have to do with migration patterns and determinants. In light of the historical context and the theoretical issues discussed in the literature review, I ask:

- How have patterns of internal migration changed in South Africa?;
- How have the determinants of internal migration changed in South Africa?; and

- Assuming that there have been changes in migration patterns and determinants, when did these changes occur in relation to the end of apartheid? Did these changes begin before the 1994 election brought the final end of apartheid and the end of the Afrikaner minority rule?

As the research questions make clear, a major focus of this paper is to try to understand how the gradual disintegration and ultimate demise of the apartheid system relate to changing migration patterns. It is difficult to set an exact date for the ending of apartheid, as democratization was a long process. For analytical purposes, three historical periods are included in the models. Each of these periods represents an important turning point in South Africa's path towards full freedom. In 1976, the famous student uprising in Soweto reinvigorated the somewhat dormant anti-apartheid black resistance movement. While crackdowns by the government against black South Africans continued (and even intensified) after this date, the events of 1976 also signaled a new determination on the part of apartheid resisters to bring the Afrikaner government's rule to an end (Thompson 2001) and potentially a new resistance towards apartheid laws. The first historical period that will be measured in the analysis is 1976-1985.

The second period included in the models is 1986-1993, the years after the infamous Pass Laws were repealed. Although the Afrikaner government remained in power and other apartheid laws remained on the books until 1991, the Pass Laws, which required blacks to carry identity passes and to be arrested if they did not produce them for the police, were repealed in 1986. Thus, blacks could move more freely and one of the most important formal legal barriers to free migration was lifted. The second historical period that will be measured in the analysis is 1986-1993. The final period, 1994-2000, follows the year of the first free election. The ANC party, which was the party of many black anti-apartheid activists, won this election and Nelson Mandela became the first majority-elected black president of South Africa. Even though the apartheid system had been crumbling for many years and formal apartheid laws had been revoked three years earlier, it was only once the Afrikaner government was voted out of power that some blacks felt safe and free to move. So the final historical period in the analysis is 1994-2000, the year of the survey.

Freedom of movement will be measured in the statistical analysis in terms of the probability of various types of migration. Note that almost all types of migration are expected to have increased over time after 1976, as apartheid was gradually dismantled and new possibilities for mobility opened up. Although migration restrictions for black South Africans remained on the books until 1991, and the apartheid government was not out of office until 1994, I expect that black migration increased in each of the three historical periods as black resistance to apartheid strengthened and mobility opportunities opened up.

Although the political changes and changes to the laws in South Africa are key predictors in the models of increasing migration, there could be other explanations for migration changes. Labor market and economic shifts may also play a role; as the South

African economy, which was traditionally heavily dependent on the mining industry, shifted to an economy more reliant on the informal sector particularly in the 1990s, these changes likely contributed to changes in migration as well. For example, as fewer men were recruited into mining labor pools, more of them may have begun moving to the cities in search of work in construction, transportation, trading or other informal work. As fewer men were able to get steady work in the mining sector, perhaps more women turned to looking for work outside of the home to support their families. Demographic shifts, like decreased fertility and the increased mortality rates due to HIV/AIDS may also have had an impact on changing migration patterns. Although I cannot directly test these alternative explanations because of a lack of data, it is important to keep in mind that some changes in migratory behavior might be due to economic or socio-demographic changes as well as broader political changes. In future work, I will examine whether the pattern of migration changes seems to map more closely to political, economic, or demographic shifts.

To summarize, the hypotheses relating to the historical changes in migration due to the demise of apartheid are that, for black South Africans, all other things being equal:

- The probability of moving has increased over each the four time periods;
- This increased probability of migration began well before the 1994 election, and even before the official end of apartheid laws in 1991;
- The probability of moving across provincial borders increased over each of the four time periods.

As apartheid began to crumble, the labor control system also ended and blacks were finally free to move into cities with reduced, and then no legal restrictions. I expect that rural-urban migration would have increased as the restrictions of apartheid declined. In addition, South Africa is in an advancing stage of urbanization, which would also lead to an expected increase in rural to urban migration, in line with Zelinsky's mobility transition hypothesis (Zelinsky 1971). Note, however, that there is some empirical evidence in the post-1994 literature to contradict this (Cox, Hemson and Todes 2004), but there is no good historical evidence, so I will use event history analysis to elucidate the actual pattern.

Urbanization tends to increase mobility within countries, and there is also some evidence in the literature that those who previously moved (to any type of destination) are more likely to move again—repeat movers (White and Lindstrom 2005; Reed, Andrzejewski and White 2008). It may be that there is a selection process at work, in which some people are "movers" and others are "stayers", or it may be that moving once makes it easier for a person to move again.

The traditional urban poles of Johannesburg, Cape Town, and Durban are probably still significant draws for migrants (Cox, Hemson and Todes 2004). Yet as countries increase their overall levels of urbanization, there is also often increasing migration between urban centers, and out-migration from the largest metropolises to

smaller secondary cities and towns. Therefore, I hypothesize that, for black South Africans, all other things being equal:

- Urban dwellers will be more likely to move than rural dwellers;
- Previous movers will be more likely to move again;
- The probability of moving to urban areas, either from rural or urban areas, increased over the four time periods; and
- This increased probability of urbanward migration began before 1994.

Data Source and Methods

The data source for this paper is the South African Migration and Health Survey (SAMHS), collected between November 1999 and March 2000. This survey was conducted by the Population Studies and Training Center (PSTC) at Brown University, the Centre for Population Studies (CENPOPS) at the University of Pretoria, and the Human Sciences Research Council (HSRC) of South Africa. The SAMHS data are particularly useful for examining changes over time because they include lifetime residence histories for all individuals surveyed. They are also unique because they are nationally representative for the adult black South African population (age 18 and older) in the year 2000. Finally, the data contain detailed information about migrants' social networks and social support (in both origin and destination communities), and remittances associated with their last residential move (Population Studies and Training Center et al. 2002).

A national sample of 2,552 black South Africans over the age of 18 years old was drawn using a stratified sampling procedure. South Africa was divided into three primary strata: a) metropolitan areas, b) other urban areas, and c) rural areas; samples in each strata were drawn independently from each other. Then, a sample of 800 respondents was selected from each of the three locality strata. Twenty primary sampling units (PSUs)—based on the 1996 South African Census assignments of either transitional local councils (TLCs) or transitional rural councils (TRCs)—were randomly selected, four enumerator areas (EAs) were randomly selected in each PSU, and 11 households were randomly selected from each EA. Finally, one adult respondent per household was randomly selected to be interviewed. Although 240 EAs (3 strata x 20 PSUs x 4 EAs) were anticipated, in the end, only 232 EAs were employed. Ultimately a sample of 2,552 households and individuals (232 EAs x 11 households) was drawn (Roux 2000).

Four EAs were drawn from each PSU, but they were also first grouped into categories containing high, medium, and low proportions of migrants. To increase the chances of the sample containing migrants, two EAs per PSU were allocated to the high proportion category and one each to the medium and low proportion categories. Again, EAs were drawn using systematic random sampling with selection probability proportional to the size of the population (according the 1996 Census). A total of 232 EAs, representing 2,552 households, were eventually drawn on a randomly stratified sample for the entire nation. Eleven households were selected using systematic random sampling in each EA. For the purposes of the survey, a household was defined loosely as

all the people who live together for at least four nights a week (not necessarily under the same roof, but on the same premises), who eat together, and who share resources. Usual household residents were determined by the respondent for the household questionnaire (often, but not always, the household head). For group quarters or hostels, each unrelated person was considered a single-person household, even if they shared meals or lived in the same room (Roux 2000). After each household questionnaire was complete, the household roster was used as a sampling frame from which a systematic random sample of one eligible individual (a usual resident 18 years or older) in the household was drawn; this selected individual was interviewed for the individual questionnaire (Roux 2000). Unequal sampling weights are used in the descriptive and analytical results to account for the stratification introduced by the sampling design. Because of the complex clustered sample design, robust standard errors are also calculated for all analyses.

The total number of households intended to be interviewed was 2,552 (drawn from the 232 EAs). Ultimately, 2,371 household questionnaires were completed, a total of 92.94 percent of the original sample goal. In these households, 2,331 individuals were interviewed, or 98.31 percent of the total realized household sample (but only 91.34 percent of the anticipated sample). By strata, 89.57 percent of the anticipated sample was realized in metropolitan areas, 94.67 percent in other urban areas, and 93.67 percent in rural areas (Roux 2000).

Questionnaires

Three questionnaires were fielded for the survey: household, individual, and community questionnaires.[2] For the household questionnaire, the head of household or his or her spouse was asked approximately 150 questions about persons living in the household and the characteristics of the housing unit. The household roster includes information about the usual residents' socio-demographic characteristics (e.g., age, sex, relation to the head, educational attainment, labor force status, occupation, place of birth, date moved to current residence, children ever born, and temporary absences from the household). This information was also collected for any visitors to the household who slept there the night before the interview (Population Studies and Training Center et al. 2002).[3]

The individual questionnaire, administered to a randomly selected adult in each household, focuses on the migration experience of the respondent. This includes a detailed lifetime migration history, with the origin and destination of each move, reasons for the move, and work experience before and after the move. Respondents were also

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[2] The community questionnaire had poor response and completion rates and the full results are not available.

[3] The household questionnaire also includes information about the characteristics of the housing structure and facilities, a list of major household possessions, and sources of income. Finally, the household questionnaire has a section on out-migration. This section lists persons who had moved out of the household since 1980 (or since the household was established, if it was after 1980). It also includes out-migrants' characteristics at the time of their move, as well as their reasons for leaving, their destination and current residence, and any contacts they had with the household since their move (Population Studies and Training Center et al. 2002). The data from the household questionnaire are not used in this paper.

asked about social networks used in connection with each move and resources used for moving and finding a job and housing. The questionnaire also includes related information regarding remittances and visits to the home place following the last residential move (Details about any moves of a month or more made in the year prior to the survey were collected.) (Population Studies and Training Center et al. 2002).[4] Data from the individual questionnaire, including the residential migration history, are the data I use for the analysis.

Data Quality and Limitations

The overall quality of the data is very high because of the careful training of field workers and supervisors, and the detailed editing and checking of the data that occurred both in the field and during data entry and coding (Roux 2000). The data compare favorably to results obtained from the 2000 Census, which further underlines the high quality of the data (Population Studies and Training Center et al. 2002). Although there are a number of missing values for some of the household roster questions, I do not use the household roster data in this paper, so it does not affect the quality of my analyses.

One limitation to the data is imposed by the definition of usual resident employed by the survey, i.e., that a usual resident is a person who usually sleeps in the household for at least four nights a week. This definition makes it difficult to distinguish between temporary and permanent migrants, since some potentially temporary migrants might satisfy this condition and be classified as usual residents. Although some information on temporary migration is found in a separate module of the individual questionnaire, it is outside of the scope of this study and the data are not yet cleaned and coded. Thus, at the household roster level, from which the selection of lifetime or ever migrants for the residential history was made, it is difficult to distinguish between temporary and permanent migrants. In the historical context of South Africa, where so many blacks were part of sometimes temporary and sometimes more permanent labor migration streams, it is especially difficult to separate temporary and permanent migration (either conceptually or formally) anyway. For the purposes of these analyses, however, I will assume that all residential moves that respondents report (e.g., a move of at least one month or more) are more permanent than temporary. This assumption means that some temporary moves may be analyzed as more permanent, and perhaps some overestimation of permanent moves will occur. However, due to the fact that I examine moves over such a long historical trajectory (almost 50 years), an event history analysis of the temporality of migration or of short-term moves would be a massive and nearly impossible undertaking. Although the information is available (moves are coded by both year and month), these data as well as the module on short-term migration will have to be the subject of a future analysis.

Another potential limitation is that, because the data were collected in 2000, they can capture moves that occurred during the apartheid era, but they only represent up to six years of mobility during the democratic era (post-1994). Thus, if mobility patterns

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[4] The individual questionnaire also includes information about fertility and health, and future migration intentions, which I do not examine in this study

have changed and continue to change (which is likely) in the subsequent years (2000 to 2008 and beyond) in ways that are quite different from the period immediately following the first democratic election in 1994, this survey cannot capture those changes. Nevertheless, one of my key goals was to explore how migration patterns began to change prior to the official end of the apartheid laws in 1991 and prior to 1994. So this limitation does not affect the analysis very much. One might expect a slow ramping up of mobility among blacks in the immediate post-apartheid era, or alternatively, one might expect a rapid increase in migration, followed by a leveling off of movement. Either way, I investigate migration patterns during the 1990s, and future survey and census data can indicate whether the 1990s patterns were a historical anomaly or not.

Recall bias is a possible limitation for any survey that asks for detailed retrospective information; respondents may sometimes have difficulty recalling details of their lives and it is likely to be more difficult to recall events that happened many years ago than it is to remember more recent events. When events are placed within the framework of a life history, however, the quality of recall is generally improved (Smith and Thomas 2003; Moreno and White 1989). Detailed questions about each place of residence and the circumstances surrounding the move (including province, rural or urban location, month and year of the move, the reason for moving, co-residents in the month after moving, and occupations before and after the move) were asked of respondents. This approach helps to reduce the potential issue of recall bias. If recall bias is a major issue, one might expect to find clustering of moves reported around the years of particularly salient historical events (e.g., the 1976 Soweto uprising or the 1994 election), or around the years of important personal events. The moves are fairly evenly distributed across the years of the study, so recall bias does not seem to be a major problem with this data set.

Finally, there is a potential limitation to the variables used in the statistical analyses. Although residence histories and some individual socio-demographic characteristics are available, some key characteristics and variables were only measured in the year 2000, and therefore cannot be included as predetermined covariates in the models. Only residence histories were collected, not marital histories or educational histories. Birth histories are available, but only for women, and this section of the questionnaire is not yet cleaned and coded. Since fertility is not a major focus of my research, I do not include it here, but in future work, I plan to code the fertility histories and analyze them in conjunction with the migration histories. Marital status, the number of children ever born, and completed education are all measured in the year 2000, and therefore represent the completed marital, fertility, and educational attainment of migrants (and non-migrants), rather than characteristics measured before a potential move (or non-move) that could be considered predictors of that move. For example, someone might report being married in the year 2000, but he may have been married previously (in 1990) and divorced (in 1993), which could have occurred immediately prior to a move (in 1994). Thus, while his marital status as a determinant of that move will be "currently married" (as of 2000), if I had perfect life history information, his status should actually have been "divorced". Thus, these variables can only serve as proxies of prior human capital attainment and demographic behavior and may either

over- or underestimate the effects of education, marital status, and fertility on migration. Although one might argue that someone who is married in the year 2000 is qualitatively different from someone who is not married in the year 2000, it is still not reflecting the fact that the two people could have quite different marital histories over time. I attempt to deal with this endogeneity by running the models in several different ways, which I discuss below.

Definitions of Migration

The lifetime retrospective histories include detailed locational information (e.g., province, rural or urban location, district) for all of the places where an individual has lived for one month or more. Thus, for the purposes of my analysis, the temporal definition of any residential move is when a person moved to a new place of residence for a period of at least one month. Defining migration requires a geographical definition as well as a temporal definition; in this study there are several geographical definitions for a move, because there are several types of moves that are analyzed. The first type of move is any residential move, which is defined as any change in residence, even if it is a move within the same village, town, or city. Recall that South Africa has ten provinces. A second type of move is a change in residence within the same province (intra-provincial), while a third type of move is a change in residence in which a migrant crosses a provincial border (inter-provincial). These moves are compared in the same multinomial logit model described later in the paper and serve as proxies for more local moves and longer-distance moves. The third type of move is a move from a rural area to another rural area (rural-rural), while the fourth type of move is a move from a rural area to an urban area (rural-urban). These moves are also compared in the same multinomial logit model. Rural and urban locations were as reported by the respondent. The fifth type of move is a move from an urban area to a rural area (urban-rural) and the sixth type of move is a move from one urban area to another urban area (urban-urban). Again, these moves are compared in the same multinomial logit model. I am particularly interested in moves to urban areas, but it is important to compare these moves against moves to rural areas.

Methods

I conducted all of the descriptive and multivariate analyses using either Excel or STATA 10/SE statistical software. All descriptive statistics are presented weighted, to account for differential sampling probabilities. All multivariate analyses are conducted using unweighted data, but Huber-White or "sandwich" estimators are used to estimate robust standard errors to adjust for the sampling design and possible correlation within cases in the event history models.

In addition to basic descriptive analyses, I use a discrete-time event history logit model – an extension of logistic regression – to estimate the probability of a migration event occurring in the current year as a result of the previous year's characteristics (as available) as well as some current characteristics and non-changing characteristics (e.g.,

sex). This estimation procedure divides time to migration into discrete intervals (calendar years) and estimates the probability of observing a move event within each interval. This model not only accommodates repeated observations from the same individual, but also time-varying covariates, because for each discrete interval a new value of the covariate can be included (Yamaguchi 1991; Box-Steffensmeier and Jones 2004). The time-varying independent variables are lagged by one year on the assumption that changes in covariates in the previous year may affect the probability of migrating in the current year. I begin the analysis at age 12 (the age when the residence history begins) and continue up to the current age (at the time of the survey, in the year 2000) for all adults (age 18 and older in 2000) in the sample.

Although calendar intervals of one year may be subject to some potential misreporting due to misremembering of sequences or timing by respondents, it is likely that a key life event such as a move of one month or more will be fairly well reported. The event history analysis begins with a simple logit model containing basic demographic and socio-economic characteristics and then moves to a more complex model incorporating historical periods and other covariates as described below. The model for the analysis is:

$$\log \ [p_{it} /(1-p_{it})] = \alpha + \beta_x X_i + \beta_x X_{i(t-1)}$$

where X_i represents covariates that are constant over time; $X_{i(t-1)}$ represents time-varying covariates; and the β_xs are the respective coefficients. This equation estimates: the probability of any residential move (the first set of models), the probability of moving within a province or across provinces (the second set of models), and the probability of moving between rural and urban areas (the third set of models); compared with not moving in a given year, as a function of the previous year's characteristics, some current characteristics (as of the year 2000), and constant characteristics such as sex. The second and third sets of models, focusing on intra-provincial and inter-provincial and rural-urban moves, rely on multinomial logistic (MNL) regression to capture multiple discrete outcomes, here alternative destinations. These MNL models estimate: a) the probability of moving intra-provincially, or inter-provincially, compared with not moving at all, for all individuals; b) the probability of moving to a rural area or to an urban area, compared with not moving at all, for a subset of the sample: rural residents at any time t-1; and c) the probability of moving to a rural area or to an urban area, compared with not moving at all, for a subset of the sample: urban residents at any time t-1.

To account for various types of mobility, there are a number of dependent variables related to migration used in the event history models. All moves come from the lifetime migration histories collected in the individual questionnaire and are coded by year of the move. The moves are included in the person-year data set, so the place of residence for each year of each person's life is recorded and any change in that residence indicates a move. Thus, individuals contribute multiple person-years (equal to the span from age 12 to their age in the year 2000) to the analysis. For example, if an individual is 28, he contributes 16 person-years to the models. Individuals who have moved more than once also contribute multiple move events to the analysis.

The first type of model predicts the probability of any residential move; the simplest definition of migration. The dependent variable is any move, coded 0 if there is no move, or 1 if there is a change in residence. The second type of model predicts the probability of changing residence or moving within one of the nine provinces of South Africa or between provinces, compared with not moving. The dependent variable is coded 0 if there is no move, 1 if there is an intra-provincial move, and 2 if there is an inter-provincial move.

The next set of dependent variables relates to moves between rural and urban locations. The third type of model predicts the probability of moving from a rural area to another rural area, from a rural area to an urban area, or not moving, for rural residents at time t-1. The dependent variable in these models is coded 0 if there is no move, 1 if there is a rural-rural move, and 2 if there is a rural-urban move.[5] Similar models are estimated for urban-origin populations at time t-1. The next model predicts the probability of moving from an urban area to a rural area, from an urban area to another urban area, or not moving. The dependent variable is coded 0 if there is no move, 1 if there is an urban-rural move, and 2 if there is an urban-urban move.[6]

Finally, a number of models were run for different sub-populations, but due to space constraints cannot be explored in this paper. There are also results from models estimating any move, intra- versus inter-provincial moves, and rural-urban moves for male and female sub-populations separately to test for differential gender effects. The model for any move was run for different age sub-groups—age 12-64 and age 65 and older in 2000—to test for recall bias. It was also run for age 25 and older to test the educational attainment variables as proxies for previous human capital accumulation (see discussion below). The models estimating any move, intra- and inter-provincial moves, and rural-urban moves were also run separately for the person-years before 1976, between 1976 and 1985, between 1986 and 1993, and between 1994 and 2000 (see below for discussion of historical time periods). For some of the pre-1976 models there were sample size problems (because there were so few moves during that period), so they were omitted. Additional dependent migration variables were also tested in models not shown here, based on reasons for moving and circumstances surrounding the move, such as forced migration, family migration, and network migration.

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[5] Sub-types of rural-origin models (estimated only for the full sample with a limited set of covariates, because of sample size limitations) were also estimated, but are not shown here. These predict the probability of: a) intra-provincial rural-rural moves (coded 1) versus intra-provincial rural-urban moves (coded 2) versus no move (coded 0) for rural-origin residents; and b) inter-provincial rural-rural moves (coded 1) versus inter-provincial rural-urban moves (coded 2) versus no move (coded 0), again for rural-origin residents at time t-1.

[6] As with the rural models, sub-types of urban-origin models were estimated for the full sample with a limited set of covariates (results not shown). These predict the probability of: a) intra-provincial urban-rural moves (coded 1) versus intra-provincial urban-urban moves (coded 2) versus no move (coded 0); and b) inter-provincial urban-rural moves (coded 1) versus inter-provincial urban-urban moves (coded 2) versus no move (coded 0).

The key independent variables for the migration models are the historical time periods and provinces. There are four key time periods: pre-1976, post-Soweto (1976-1985), post-pass laws (1986-1993), and post-election (1994-2000). Pre-1976 is the omitted category and the other three time periods are included in the models as dummy variables.

Understanding migration patterns within different regions of South Africa is also important, so the other key independent variables are provincial dummy variables. Three variables are included in the models: residence (in the previous year) in one of the Cape provinces (Northern, Eastern or Western Cape); residence in KwaZulu-Natal province; and residence in Gauteng or Free State provinces. The Cape provinces are grouped together because migration patterns in that region of the country are somewhat isolated from patterns in the rest of the country and there were very few cases in the Northern Cape. Gauteng and Free State are grouped together because of their proximity and interrelated labor markets, and because there are a relatively small number of cases in Gauteng. Residence in the other provinces (Northern/Limpopo, North-West, and Mpumalanga) is the reference category; these provinces are grouped together because of their relatively rural nature, their proximity to one another, and their locations on the northern border of South Africa. The three major cities (Cape Town, Durban, and Johannesburg, respectively) and much of the population resides in these three areas measured by the dummy variables: the Cape provinces, KwaZulu-Natal, and Gauteng/Free State.

Both age and sex are usually key predictors of migration patterns. Age is included as a lagged term, so that age in the previous year predicts mobility in the current year. A lagged quadratic term is included (age squared in the previous year) to account for the usual curvilinear pattern of mobility by age. The probability of having ever migrated starts at age 12 at about 30 percent, and increases gradually to a probability of almost 70 percent by age 50, then levels off and even declines slightly to about 65 percent by about age 60. The other simple covariate is sex, which is a fixed covariate and is coded 0 for male, 1 for female.

The next set of covariates is those variables dealing with marital status, childbearing, and human capital. Recall that these variables must be considered as proxies for previous behavior, because they are measured in the year 2000, and are neither time-varying nor true prior predictors of mobility. Marital status in the year 2000 is a simple dichotomous variable, coded 0 if one is not married (never married, widowed or divorced) and coded 1 if one is currently married in 2000. The variable measuring the number of children ever born is a continuous variable, again measured in the year 2000.

Two dummy variables—no education and primary education—measure educational attainment. The reference category is secondary or higher education. Measured in terms of years of schooling completed, the black population of South Africa (and this sample) is actually relatively well-educated compared to many other developing country populations. Again, because this variable measures only completed education in the year 2000, it is a proxy for human capital attainment and not a true predictor. To test

the utility of the education variables as proxies, I ran the basic event history migration models (any move, intra-provincial versus inter-provincial moves, and rural-urban moves) on a sub-sample of those who were age 25 and older in the year 2000. These are adults I expect would have completed their education by that age. The results were very similar to the results with the full sample, so it is likely that the education variables are decent proxies for prior human capital attainment.

Urban residence in the previous year is included in any model which does not predict moves between rural and urban areas (any move, inter-provincial and intra-provincial moves). Lagged urban residence is a dummy variable coded 0 for rural residence in the prior year, 1 for urban residence in the prior year. Persons in the sample can contribute observations (person-years) across different risk sets as they change provinces, urban and rural residences, etc. The sum of total moves in the previous year is also included in all of the migration models to explore whether those who previously moved are more likely to move again.

Several additional covariates were tested but are not presented here. First, a series of language variables, indicating the native language of the individual (essentially a proxy for ethnicity, which was not collected in the survey) were originally included. Most of them were highly significant, but they were also highly collinear with the provincial dummy variables described above, so they were ultimately omitted from the models. Those who speak IsiXhosa, for example, are very likely to live in the Cape provinces, and those who speak IsiZulu are likely to live in KwaZulu-Natal province. Therefore, I determined that the language variables were essentially capturing a geographic effect that could be more precisely measured by the province dummy variables.

Two sets of interaction terms were also included to explore whether the effects of certain independent variables changed over the four historical time periods. Sex and educational attainment were both interacted with the four time period dummies. No significant effects were found in any models, so the interaction terms were dropped from the final analyses.

Results

Characteristics of the Sample: Lifetime Migrants versus Non-Migrants

Before moving into the descriptive analyses of migration, it is helpful to have a picture of the sample of individuals who answered the survey questions, and it is particularly useful to compare those who ever moved during their lifetimes to those who never moved from their birthplace. Table 1 shows descriptive characteristics of the sample of individuals from the SAMHS survey, for both migrants (persons who have *ever* moved from their birthplace) and non-migrants (persons who have *never* moved from their birthplace). Note that these values are weighted and that numbers in the table are rounded to the first digit (N) and the first decimal place (percentages and means).

It is immediately clear that migration is a common experience among black South Africans. The majority of the total sample of 2,331 individuals—1,413 people or 63 percent—have moved at least once during their lives. There are more women (1,235) than men in the overall sample (998), but men are only slightly more likely to have moved than women (about 66 percent versus 61 percent, respectively). This suggests that perhaps men's and women's migration frequencies in South Africa are not as different as the literature might predict; potential sex differences in migration patterns are explored further in other analyses (not shown here). The mean age of migrants (37 years) is only about three years older than non-migrants (34 years). Age will be a key control variable in later analyses, because the age pattern of migration is usually quite prominent in many settings. Note that only about one percent of the sample was born outside of South Africa (all of these persons are migrants, of course); because of the very small number of foreign-born persons, further analyses of international migration are outside of the scope of this study. It is possible that there was some under-reporting of foreign birthplaces or some under-sampling of this population, because it was not a focus of the SAMHS survey.

In terms of geography, more persons were born in rural areas (56 percent) than urban areas (44 percent), and rural-born persons were more likely to have moved during their lifetimes than urban-born persons (77 percent versus 46 percent, respectively). Although this seems somewhat counter-intuitive, because much of the literature about migration suggests that urban residents are more likely to move than rural residents (Montgomery et al. 2003; Reed, Andrzejewski and White 2008; White and Lindstrom 2005), the particular situation in South Africa negates some of this urban mobility, particularly during the apartheid era. Many black South Africans were forced to live in rural "homelands" and therefore, rural to urban migration increased greatly as the apartheid system crumbled. Although fairly high percentages of those living in every province have moved at least once in their lives (at least 49 percent), residents of Western Cape, Gauteng, KwaZulu-Natal, Eastern Cape, and northern provinces have particularly high levels of mobility (at least 70 percent of current residents are lifetime migrants in each of these provinces). These provinces contain the largest metropolitan areas in South Africa and have strong links to industrial, mining, and transportation hubs (Cape Town—Western Cape; Johannesburg—Gauteng; Durban—KwaZulu-Natal; Port Elizabeth—Eastern Cape; Polokwane (Pietersburg)—northern).

Looking more closely at household demographics in the sample, Table 1 also shows that people who are currently married or living with a partner are the most likely to have moved, followed by those who are separated, divorced, or widowed, but this is likely to be an age effect, and will be explored in the multivariate models. Age may also be the explanation for why people with more children are more likely to have moved than those with only one or no child. Note that those with two children are the most likely to have moved, which may indicate that mobility declines with the birth of additional children after the second child.

In terms of human capital, over 64 percent of literate persons are migrants, and the majority of people in each category of educational attainment are movers, although those with higher degrees are less likely to have moved than those with other levels of schooling. This is a first indication that education may not significantly affect mobility in South Africa (or may not affect it in the anticipated way); this will be analyzed further in the multivariate models. Work plays an important role in migration as well, since at least 70 percent of those employed in either the formal or informal sector have moved during their lifetimes, compared to less than 60 percent of those who are unpaid family workers, homemakers, retired, or disabled. Current students are very unlikely to have moved, probably because they are still quite young. Those who are currently unemployed are almost as likely to have moved as those who are employed, probably because they are looking for work. Some of these relationships will be tested further in the multivariate models.

Changing Migration Patterns through Historical Time

Figure 1 shows overall, inter-provincial, and intra-provincial migration rates in South Africa from 1955 to 1999, calculated from the moves reported by the SAMHS sample (moves per person-year x 1,000). It is readily apparent that there has been an overall increase in migration over the period. The top line shows the overall migration rate, the middle line shows the inter-provincial migration rate, and the lower line shows the intra-provincial migration rate. Note that the overall migration rate is equal to the sum of the other two rates. Particularly since 1968, there has been a clear increase in overall mobility among this population.

Although intra-provincial mobility has not increased as much or as dramatically as inter-provincial mobility, it still showed a steady increase from close to zero during the 1950s to a peak of almost 25 moves per person-year x 1,000 in 1991, to a leveling off around 15 in the late 1990s. The inter-provincial migration rate, increased quite rapidly beginning in the late 1960s to a peak of almost 122 in 1991, with some periods of slight decline or adjustment in the mid-1970s and mid-1980s. Although this migration rate declined in 1992, it began to increase again and by 1999 was back up to over 90 moves per person-year x 1,000. The strong increase in inter-provincial mobility is likely the product of two trends. First, as apartheid laws began to crumble, blacks who were previously forced to either remain in the homelands or to move only as a part of highly regulated labor streams to specific places (e.g., mines), became more able to move across provincial boundaries and into other areas that had previously been off-limits. Second, because of increasing urbanization and economic development, migrants are particularly drawn to labor markets in major urban areas, including Johannesburg, Durban, Port Elizabeth, and Cape Town.

It is interesting to note that migration within South Africa by blacks began to increase even before all of the apartheid laws were repealed in 1991. Although some of the moves in the 1970s and 1980s may have been circular migration between rural areas and mines or factories, or forced removals of blacks from their homes, these two types of moves cannot account for all of the mobility increase. Further analyses of migration

types and the multivariate models will help to tease out some of the reasons behind the increased migration. The sharp peak of the migration rate in 1992 followed the 1991 repeal of all official apartheid laws. Black South Africans could then move freely without any further fear of prosecution. However, the increases in migration clearly began in the late 1980s, before the laws officially ended. Some of the peak in 1992 might also be misreporting, with people remembering that the laws ended in 1991, so they reported that they moved in the following year, when in fact they could have moved either slightly before or after 1992. Clearly there were some adjustments following the sharp increase in the late 1980s and early 1990s. However, another sharp increase is apparent following the 1994 election, with a second peak at about 100 moves per person-year x 1,000 in 1995, followed again by some adjustment in the late 1990s.

Figure 2 shows migration rates for four types of moves (and the overall migration rate, for comparison) for the four key time periods. Rates for moves between rural areas, rural to urban moves, moves between urban areas, and urban to rural moves are graphed before 1976, between 1976 and 1985, between 1986 and 1993, and between 1994 and 2000. What is most evident here is that although rural-urban migration, urban-rural migration, and urban-urban migration followed the same relative trajectory as overall migration, rural-rural migration increased only slightly through the post-Pass Laws period and then almost leveled off after 1994. Mobility between rural areas appears to be less common now and comprises a smaller proportion of overall mobility. This is not surprising, as urbanization continues apace in South Africa and as the changing economy concentrates more jobs in urban areas. It is worth noting, however, that this pattern is quite different from much of sub-Saharan Africa, where movement between rural areas still makes up a large percentage of overall mobility.

Multivariate Event History Results

Now I turn to the results from the multivariate discrete-time logit event history models. Recall that these models all estimate the probability of migrating in a given year based on a number of predictor variables from the previous year, as well as some human capital and family status variables (which serve as proxies) measured in the year 2000. First I present results from the binomial logit model for any residential move, then I proceed to discuss results from multinomial logit models, including intra- versus inter-provincial moves, rural-rural versus rural-urban moves, and urban-rural versus urban-urban moves. I also present models that were run separately for sub-samples of person-years during each of the four different historical periods to determine whether or not factors that affected migration changed over time. Finally, I summarize the key overall findings from the multivariate results.

Any Residential Move

The most basic version of the discrete-time event history model examines the probability of any residential move in a given year as a function of some characteristics from the prior year, as well as some human capital and family status characteristics that were measured in 2000. Table 2 shows results for three versions of this model, each of

which builds on the previous version with additional covariates. The first column of coefficients gives the results from Model 1, which only includes age, age squared, sex, marital status, children ever born, and highest educational attainment (the last three covariates are proxies, as they were measured in 2000). These are some of the most common predictors of migration and they do significantly affect the probability of any residential move in this basic model. The probability of moving significantly increases with age (β= 0.37, p<0.001). Note that although the quadratic age term is not quite significant here, the probability of migrating is likely to level off around age 50, as described earlier. Interestingly, women are significantly more likely to move than men, which is contrary to many of the findings in the migration literature. However, this model does include all moves across all time periods, so it may include significant amounts of marriage migration or short distance moves, as well as forced removals, which often affected women and children (because men were away at the mines).

Being married and having children significantly reduces the probability of moving (β= -0.36 for marriage and β= -0.18 for each child, respectively, both p<0.001), even though these are proxies for previous marital and childbearing behavior since they are measured in the year 2000. Thus, people who eventually married and had children by the year 2000 were less likely to move in any year of their lives compared to those who were unmarried and without children. Finally, those with no education or only primary schooling are significantly less likely to move than those who at least attended secondary school (β= -0.80, p<0.001 and β= -0.18, p<.05, respectively). Recall that educational attainment was also measured in the year 2000, so those who had not yet attended secondary school as of that year were less likely to move in any year of their lives than those who had.

Model 2 in Table 2 adds two additional covariates to the discrete-time binomial logit model: a dummy variable for urban residence in the prior year and a continuous variable measuring the total number of lifetime moves as of the prior year. Both of these covariates are positive and significant at p<0.001. Urban residents have 0.58 higher log odds of moving than rural residents do and each additional prior move by a person in the sample increases the log odds of moving by 0.39. These results are not surprising; urban residents are generally much more mobile than rural residents and that it is often true that those who move once are more likely to move again. These results, however, confirm those hypotheses for the South African context and are found in nearly all of the models estimated, strengthening the argument that these relationships hold true for different types of moves and across different time periods. Note that the age effect is no longer present in this model; it is probably captured in the number of total moves (which would increase with age). The strength and significance of some of the basic covariates is slightly reduced, but the overall effects are essentially the same as in Model 1, except that primary education is no longer statistically significant. This effect is likely captured by urban residence, as urban dwellers are likely to have more education than rural dwellers.

The final results shown in Table 2 are from Model 3, which includes all of the previously listed covariates, as well as two sets of dummy variables to indicate historical periods and provincial residences. With the pre-1976 period as the reference category, it

is clear that the probability of moving increased substantially and significantly ($p<0.001$) in each of the subsequent historical periods: after the Soweto uprising (1976-85; $\beta = 0.77$), after the Pass Laws were repealed (1986-93; $\beta = 1.38$), and after the first free election (1994-2000; $\beta = 1.52$). This is strong evidence that mobility among blacks increased over the four time periods and also that mobility began to increase before the official end of apartheid and before democracy was instituted in South Africa in 1994. Significant period effects are found in the majority of the models that I estimate.

The final set of variables in Model 3 indicates the provincial region of residence in the prior year. The reference category includes northern (Limpopo), Mpumalanga, and north-West provinces, as well as countries outside of South Africa. For brevity, I refer to these areas as the north. Those who resided in the Cape provinces (northern, Eastern or Western Cape) had a 0.3 higher log odds of moving ($p<0.001$) than those living in the north. Those living in KwaZulu-Natal province had a 0.19 higher log odds of moving ($p<0.05$) than those living in the north. Finally, residents of Gauteng of Free State provinces had a 0.29 higher log odds of moving ($p<0.01$) than those living in the north. Mobility in these southern and central areas of the country is probably higher than in the north, because these are coastal regions, very urbanized regions, and the center of agriculture, commerce, industry, and mining. In addition, transportation and communication infrastructure is much better developed in these provinces, which facilitates mobility between areas.

The effects for the other covariates in Model 3, particularly the basic demographic and human capital variables are significantly changed. Age is now significantly negative ($\beta = -0.03$, $p<0.01$) and age squared becomes significant and positive ($\beta = 0.0003$, $p<0.05$). The inclusion of the historical period variables in the model likely accounts for this effect, because older persons are more likely to have migrated in the earlier time periods, so there is some collinearity between these two sets of variables. Female is still slightly positive, but no longer significant, suggesting that the positive effect of sex on migration is related to changes over historical periods or provinces (or both). (I explore this more fully in sex-differentiated models estimated, which are not presented here.) The negative effects of marriage and children on the probability of migration are reduced in magnitude and significance, and education no longer has any significant effect on the probability of moving. Yet, the effects of urban residence and total number of moves are still strongly positive and highly significant.

Because I suspected that there was a differing effect of education for men and women and by time period, I ran some additional models with interaction terms to try to better assess whether these variables in combination with educational level had any effect on migration. These models (not shown here) were run for the population age 25 and older (one would assume that most people would have completed their education by that age, so the problem with the education variables being proxies because they were measured in the year 2000 would be ameliorated). In addition to the covariates included in the models, I included interaction terms for both no education and primary education with female, and for the two educational categories with each of the three time period dummy variables. I found no significant effects for any of the interaction terms in any of

the models (I ran models for any move, as well as intra- vs. inter-provincial moves, rural-origin moves, and urban-origin moves). Thus, the measures of educational attainment in the year 2000, as a proxy for previous human capital experience, seem to capture relatively well the actual effects of educational attainment on blacks' migration patterns in South Africa. Both men and women with less education were less likely to move at any given time.

To further examine how gender and education might affect the probability of migrating over time, I did a simple simulation inserting the coefficients from Model 3 into the logistic regression equation. I calculated the odds of migrating for men and women by educational level for each of the four time periods and predicted the probability of a hypothetical person moving (the rest of the sample characteristics are held constant at their means or normative values) at each time period. The results give the predicted proportion of each of six subgroups (women and men with no education, primary education, or secondary/higher education) that would move during each of the four time periods according to Model 3 from Table 2. The probability of moving increases over each time period for all six subgroups. Yet there is remarkably little variation between the subgroups in a given time period. Men are slightly less likely than women to move at each time period, but as discussed earlier, this difference is not a significant one. Both men and women without any education are less likely to move than their more educated counterparts are in each of the four time periods, but there is no appreciable difference between those with primary education and those with secondary or higher education in the predicted proportion moving in any of the periods. The difference in mobility between the uneducated and those with education increases somewhat over the four time periods, suggesting that there is an increasing disadvantage for those who do not have any schooling over time.

The proxy variables for marital status, children ever born and educational attainment did have some results, which are difficult to interpret given that these variables were measured in the year 2000, after a move. In order to deal with the educational attainment variables, I did run this for a restricted sample, only age 25 and older, as discussed above. But the marital status and fertility variables are more difficult, particularly as South Africa has a relatively high incidence of non-marital union formation and relatively late age of childbearing. I did run all of the models both with and without the education, marital status, and children ever born variables (results not shown here). I found that the major effects—the period effects and the geographic or provincial effects—remained robust and strong even in the absence of these variables, across all of the models. In the end, I decided that it was best to include these variables, despite the difficulty in interpretation. I do think that they tell us something about the context of migration (e.g., education seems to be less important in the South African case as a predictor of migration than it is in other cases). Yet it is possible that I may revisit that decision in the future. Note also that I do plan to eventually clean and code the fertility history, which would allow at least the children ever born variable to be included as a time-varying and accurate predictor variable.

Finally, note that the pseudo R^2 increases from Model 1 to Model 2 from about 0.02 to 0.07, which indicates that there is some improvement in model fit with the inclusion of the covariates for number of prior moves and urban residence. The pseudo R^2 for Model 3 is only 0.09, however, so including all of the independent variables improves the model fit (compared to the mean) only about 9 percent. There are many other factors, unavailable in this data set, which affect the probability of migration. However, there are strong and significant effects for some of the covariates that are included in the model, which suggests some interesting factors that help to explain migration patterns in South Africa. Now I will proceed to examine the explanatory factors for different types of moves.

Inter-Provincial and Intra-Provincial Moves

In Table 3, I present the results of the first discrete-time multinomial logit model. This model estimates the probability of moving within a province (intra-provincial) or between provinces (inter-provincial) compared with not moving in given year, again based on the same covariates as in Model 3 for any residential move. Although models with a smaller set of covariates were estimated, as in the previous section, only the full model is shown here.

Intra- and inter-provincial moves are (admittedly poor) proxies for local and long-distance moves; because there is no information available about the distance between places of residence, one might assume that intra-provincial moves are shorter distance than inter-provincial moves. Yet clearly, one can move a long distance within a province, however, or a short distance across a provincial border. It is important to examine these types of moves, even though they are proxies, because despite recent innovations and improvements in transportation and communication, the distance of a move can matter (and did matter much more during previous decades in South Africa). For example, the farther one moves from one's family, the more difficult it is to maintain close contact with them. Longer distance moves also can be more costly. Those who move longer distances might differ from those who move shorter distances; they may be greater risk takers, less connected to their families or home places, or they may be better off and more able to move a longer distance.

Comparing the results across the two columns, we see that age has a curvilinear effect on the probability of both types of moves, although age squared is not significant for inter-provincial moves. There is no statistically significant effect of sex on either type of move. Being married in the year 2000 reduces the probability of either intra- or inter-provincial moves, but is only significant for intra-provincial moves (β= -0.34, $p<0.01$), which seems somewhat counterintuitive, as one might expect marriage to be more likely to reduce the probability of longer distance moves. Remember, however, that this is not a true predictor but a post-hoc proxy measure. Children ever born also has a negative effect on both types of moves, but only a significant effect on inter-provincial moves (β= -0.06, $p<0.05$). Those with no education are significantly less likely to move within a province than those with secondary education (β= -0.91, $p<0.001$), but there are no other significant effects for educational attainment.

Urban residents have a significantly higher probability of moving between provinces compared to rural residents (β= 0.62, p<0.001). They are not significantly more likely to move within a province, probably because there are only a few major urban centers in South Africa, so if one is already living in an urban area in a province, one is unlikely to move within that province to a more rural area. As found in the binomial logit model, previous movers also are significantly more likely to move again, either within a province or across provincial borders, than those who have not moved before (β= 0.17, p<0.001 and β= 0.36, p<0.001, respectively). This suggests that there are inherent differences between movers and stayers, or some process of selection underlying mobility.

Turning to the historical period covariates, the probability of intra-provincial moves was significantly higher during the post-Pass Law era and the post-election era than it was before 1976 (β= 0.51, p<0.01 and β= 0.41, p<0.05, respectively). The coefficients for inter-provincial moves, however, are highly significant (at p<0.001) and strongly positive for all three post-1976 periods, and the coefficients are much larger than those for the same variables in the model predicting the probability of any residential move. The log odds of moving increase from 1.12 in the post-Soweto era, to 1.74 in the post-Pass Law era, to 1.93 in the post-election era. Clearly, the opportunities for blacks to move increased significantly in the years after 1976. Some of this movement in the 1976-85 period may have been forced removals by the government. Yet forced migration cannot account for all of the increase, particularly for inter-provincial moves, as most blacks who were forced to move from their homes were relocated within the same province. Clearly there was an increase in voluntary movement between provinces by black South Africans over the period, and again, an opening up of migration before the official end of apartheid.

The results for the provincial covariates differ between intra- and inter-provincial mobility. While Cape residents are significantly more likely to move within their own province compared to residents of the north (β= 1.17, p<0.001), residents of Gauteng or Free State are significantly less likely to move within their province, but significantly more likely to move across provinces (β= -0.51, p<0.05 and β= 0.35, p<0.001, respectively).   The Cape migration streams may be a bit more isolated from the rest of the country because of the draw of Cape Town as a migrant destination and the distance between the Cape and the other major cities like Johannesburg and Durban. On the other hand, those who are living in Gauteng or Free State, which are relatively small provinces with high concentrations of mining and industry and the large urban pole of Johannesburg, might be much less likely to move within the province if they are going to move, but more likely to make a longer distance move to another province. KwaZulu-Natal residents are also significantly more likely to move across provinces than residents of the north (β= 0.35, p<0.001).

In sum, the major findings from this model are that the probability of both intra- and inter-provincial mobility increased after 1986, although inter-provincial mobility actually increased after 1976 and more strongly in every period than intra-provincial

mobility. While provincial residence has varying effects on the different types of moves, previous movers are more likely to move again either within or across provinces. Urban residents were more likely to move inter-provincially. Now I turn to the results of models estimating the probability of migration between rural and urban areas.

Moves between Rural and Urban Areas

There are two sets of discrete-time multinomial logit models to look at mobility between rural and urban areas. The first model, results of which are shown in Table 4, estimates the probability of moving to a rural area or an urban area, compared with not moving in a given year, for the rural-origin population at time t-1.   The second model's results, displayed in Table 5, show the probability of moving to a rural area or an urban area, compared with not moving in a given year, for the urban-origin population at time t-1.

Results for the rural-origin population are shown in Table 4. Few of the basic demographic and human capital variables appear to affect the probability of moving for rural residents. Being married in the year of the survey does significantly reduce the probability of either type of move—rural to rural and rural to urban (β= -0.32, $p<0.05$ and β= –0.18, $p<0.05$, respectively). Having children also significantly reduces the probability that one moved from a rural to an urban area (β= -0.06, $p<0.05$). Finally, those with no education have –0.51 lower log odds of moving between rural areas than those with secondary or higher education ($p<0.05$). This is a somewhat puzzling result, as one might expect that those with no education would be the ones who did make rural-rural moves, but remember that this is education as measured in the year of the survey, so it is not a truly accurate predictor variable. Urban residence is not included in these models, as they are run separately for rural-origin and urban-origin populations.

Results regarding prior moves and the historical time periods are similar to those discussed in the previous two models. People who have moved before are significantly likely to move again, both between rural areas (β= 0.34, $p<0.001$) and from rural to urban areas (β= 0.11, $p<0.01$). The probability of both types of moves increased significantly in each subsequent time period compared to the period before 1976. For rural-rural movers, the log odds of moving are 0.78 higher in the post-Soweto period ($p<0.01$), 1.29 in the post-Pass Laws period ($p<0.001$), and 1.2 higher in the post-election period ($p<0.001$) than in the earliest period. For rural-urban movers, the log odds are even higher and all are significant at $p<0.001$: 1.09 in the post-Soweto period, 1.65 in the post-Pass Laws period, and 1.83 in the post-election period.

Finally, there are some interesting results for the provincial variables. Rural residents of the Cape provinces, KwaZulu-Natal, and Gauteng or Free State are all significantly less likely to move to another rural area compared to residents of the north (β= -0.29, $p<0.05$, β= -0.29, $p<0.05$, and β= –1.37, $p<0.001$). However, rural residents of these same three areas are more likely to move to urban areas, and significantly more likely in the case of Cape residents and KwaZulu-Natal residents (β= 1.38 and β= 1.25, $p<0.001$, respectively). Rural-rural migration streams are probably much more common

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in the northern areas of South Africa where agriculture (and now some safari tourism) dominates the economy, and urban areas are smaller and fewer. In the more industrialized and urbanized south, however, rural-urban moves are more likely.

The results for urban-origin residents, shown in Table 5, are similar. This discrete-time multinomial logit model estimates the probability of moving from an urban to a rural area, and the probability of moving between urban areas, compared to not moving in a given year. Although the curvilinear age pattern is present for both urban-rural moves and urban-urban moves, the coefficient is only significant for the age covariate for urban-rural moves. There are few other significant results for the demographic and human capital characteristics. One exception is that urban dwellers with a primary education are significantly more likely to move to a rural area compared with those who have secondary education or higher ($\beta = 0.34$, $p<0.05$). Urbanites who are more highly educated will have more employment opportunities in urban areas, so they will be less likely to move rural areas.

Again, in this model, previous movers who live in urban areas are significantly likely to move again, either to rural areas ($\beta = 0.51$, $p<0.001$) or to other urban areas ($\beta = 0.36$, $p<0.001$). There are significant and strongly positive increases in the probability of both types of moves over the three later historical periods compared to the period before 1976. These effects are stronger for urban-urban moves than they are for urban-rural moves, but both types of moves increase over time and all of these effects are significant at least at the level of $p<0.01$. The log odds of an urban-rural move are 0.96 higher ($p<0.001$) in the post-Soweto period than in the years before that. Between 1986 and 1993, the log odds of moving to a rural area are 1.59 higher and after the 1994 election they are 1.8 higher ($p<0.001$ for both). For urban-urban moves, the log odds are 1.01 higher in the post-Soweto period ($p<0.01$) and 1.85 higher and 2.07 higher in the post-Pass Laws and post-election periods, respectively ($p<0.001$ for both estimates). So both urban-rural and urban-urban mobility increased over time, which is likely because the gradual increase in freedom of movement with the ending of apartheid laws allowed people who were living in urban areas (many of them illegally or on limited labor contracts) to move to new urban destinations, or to return home to rural areas.

Finally, we also find strong provincial effects on migration probabilities for urban residents at time t-1. Those who live in the Cape provinces and KwaZulu-Natal are significantly less likely to move to a rural area, but more likely to move to another urban area. There is no significant effect of living in Gauteng or Free State provinces on urban-rural mobility, but there is a strongly positive and significant effect on urban-urban migration. The highly urbanized nature of these provinces make it more likely that urban dwellers will move from one urban area to another (possibly to a larger urban area, in what is often termed step migration), rather than moving to a rural area.

Migration over Time

To explore how factors affecting the probability of migration changed over time, I ran models separately for each of the four historical time periods. Thus, the person-years

analyzed in each of the models are only those during that particular window of time (different years in a person's life are analyzed separately in the correct historical period). Table 6 shows the comparative results for the discrete-time binomial logit models of any residential move for the following four eras: pre-1976, post-Soweto (1976-85), post-Pass Laws (1986-93), and post-election (1994-2000).

The first two columns give the coefficients and robust standard errors for the probability of migrating before 1976. Although there are few significant results for the basic demographic and human capital factors, somewhat surprisingly, women are significantly more likely than men to move during this time period. However, it may be explained by men's increasing mobility over time (found in other models, not shown here) combined with the possibility that some female migration before 1976 was likely to be either marriage migration or forced removals and government dislocations. And even though the coefficients for female are not significant in the other three periods, they are negative after 1986.

Looking across the other three time periods, there are very few significant demographic or human capital effects. Although there is always a curvilinear relationship between age and migration, it is only significant during the post-Soweto era; the coefficient for age is -0.09 (p<0.001) and for age squared is 0.001 (p<0.01). Marriage has a negative effect on migration in the first three eras, but it only significantly decreases the probability of moving in the post-Pass Law era. Similarly, having children negatively affects the probability of migrating, but this relationship is only significant in the pre-1976 era (β= -0.16, p<0.05). There are no significant effects for educational attainment in any of the four eras. It is impossible to know the true effects of these covariates, however, as they are all measured in the year 2000, after the analyzed moves occurred, so I do not draw any conclusions about the changing effects of marriage, children, or education on migration over time.

On the other hand, turning to some covariates that are time-varying, there are strongly positive and significant effects for both urban residence and total number of moves across all four periods. The log odds of urban residents moving (compared with rural residents) increase in both magnitude and significance from 0.39 (p<0.05) in the pre-1976 period to 0.71 (p<0.001) in the post-election period. Thus urban residents become more likely to move over time (as both urbanization and the percentage of urban dwellers increase in South Africa). Previous movers on the other hand, have a highly significant probability of moving again (at p<0.001 in all periods), but the magnitude of this probability decreases over time from 1.21 before 1976 to only 0.25 after 1994. Whether this signifies decreased overall mobility over time or simply a saturation of those who have moved more than once is a question that remains to be answered. It is quite possible that repeat movers are circulating between employment sites and their homes, but with the information available in this dataset it is impossible for me to measure this precisely.

The provincial variables give few statistically significant results, other than during the post-Pass Laws era. During this period, between 1986 and 1993, those who lived in

the Cape provinces, KwaZulu-Natal, and Gauteng or Free State were significantly more likely to move (all at p<0.001) compared to those living in the northern provinces. After 1994, those living in Gauteng or Free State were also significantly more likely to move (β= 0.37, p<0.01). While there are positive effects for the Cape and KwaZulu-Natal in this era, they are not statistically significant. While part of these results may be explained by the increasingly more dynamic character of the labor markets due to increased urbanization and the presence of significant urban centers in these provinces, it is likely that stronger social and political networks and other factors are also at play.

Summary and Conclusions

Changing Migration over Time

This paper has presented the analysis of the patterns and determinants of migration for black South Africans and how these patterns changed over time. Although there are numerous models analyzed, there are some results that hold across the models as key findings. First and foremost is the result that almost all types of migration increased over the four historical periods, and that this increase—a substantial proportion of which was voluntary migration—began even in the period before the Pass Laws were repealed and thus, before apartheid started to end. This supports the hypothesis that overall migration has increased over time, and that migration began to increase prior to 1994. Across all the models with different move outcome variables, there is a striking and consistent pattern. The coefficients are nearly uniformly positive and significant (with one exception: intra-provincial moves in the post-Soweto era). Also, the magnitude of the coefficients tends to increase for each subsequent time period in comparison with the period before 1976. (This is a strong tendency with two exceptions: the coefficients for the post-election period are slightly smaller than those for the post-Pass Laws period for intra-provincial moves and rural-rural moves.) This strongly indicates that mobility overall—and almost all *types* of mobility—has increased over time, but also that it increased before the Pass Laws were repealed in 1986 and before the first democratic election in 1994. Although labor market shifts and demographic transitions likely also played a role, Black South Africans were probably defying the pass laws well before they were repealed, and their migratory response to poor conditions and political changes shows up in this life history data.

Locational Differences in Migration

I hypothesized that overall mobility would have increased over time, but I expected this to be primarily driven by urban ward migration and inter-provincial migration. Although there is evidence that moves between rural areas and intra-provincial moves did not increase as much or declined compared to moves to urban areas or moves across provinces, it still seems that almost all types of moves have seen an increase over time and before the ending of apartheid.

Nevertheless, there were robust and strongly positive indications across most of the models that urban residents are more likely to move than rural residents are. Also,

those who have previously moved at least once are significantly more likely to move again. The results in terms of provincial residence as a predictor of mobility were also mixed, but there were clear differences in many of the models. These suggest that the urban centers of the southern part of the country, such as Johannesburg, Durban, Port Elizabeth and Cape Town, have developed particular characteristics over time that drive much of the migration in their regions. These forces seemed particularly salient in the post-Pass Laws period and, in the case of Gauteng and Free State, after the election in 1994, when residents of these provinces were significantly more likely to move than residents in the northern part of the country. Further research is needed to better understand these provincial (and inter-provincial forces).

In the intra- versus inter-provincial models, I found that while both types of mobility increased after the Pass Laws were repealed, inter-provincial mobility began to increase after 1976. This is far earlier than one might expect, and although some of this might be labor mining recruitment, increases after 1986 are likely to reflect voluntary migration flows across provincial borders. Intra-provincial mobility also increased, but the increases for inter-provincial mobility were larger over every subsequent time period relative to their starting point. This suggests that migration across provincial borders became more important and more possible as an economic strategy as new freedom of movement opened up.

In models estimating the probability of migration from rural areas and urban areas, I found that each of the four types of moves (rural-rural, rural-urban, urban-rural, and urban-urban) increased over each of the historical time periods. However, these increases were not comparable in magnitude across the different types of moves. Nevertheless, rural-urban, urban-rural, and urban-urban migration all increased steadily in the time periods after the Soweto uprising.

Discussion

These findings indicate that almost all types of voluntary migration have significantly increased among black South Africans during the last half of the twentieth century, and that this increase began well before the official end of apartheid in 1991 or the first free election in 1994. Although there was some anecdotal evidence about this increase, this is the first comprehensive statistical analysis to confirm this significant increase in migration that occurred beginning after the Soweto uprising. In numerous event history logistic regression models, with different types of move outcomes (any residential move, moves from rural areas, moves from urban areas, moves across and within provinces) the coefficients for the three key time period dummy variables—post-Soweto (1976-85); post-Pass Laws (1986-93), and post-election (1994-2000)—were nearly uniformly positive and significant (as compared to the reference period of pre-1976). This confirms my hypothesis that black internal migration in South Africa increased and that this increase began well before the official end of apartheid.

The coefficients also increased in each subsequent time period across nearly all of the models, which indicates that there was an overall increase from the 1976-1985 period

to the 1994-2000 period. There were significant increases in each of the time periods. The increase in migration rates began even before the Pass Laws were repealed in 1986, when black South Africans could have moved without fearing arrest and punishment, which suggests that defiance of the Pass Laws (albeit a dangerous proposition) was a necessary way of life for many South Africans during apartheid. It suggests that the inequitable and inefficient apartheid labor control system was not only unjust, but also that the system did not work as an economic strategy. Although macro-level economic changes, such as the labor market shift away from formal sector mining jobs to more unstable informal sector trades, and demographic shifts like fertility decline and mortality increases probably also contributed to migration increases, the robustness of the period effects across so many of the models suggests that national political changes were important determinants of migration changes.

According to my results from event history models, the magnitude of these historical increases in migration is quite substantial. Overall migration approximately doubled from the 1976-85 period to the post-1994 period. Increases of similar magnitude were found for most types of moves, including inter-provincial moves, rural-urban moves, urban-rural moves, and urban-urban moves. Intra-provincial moves and rural-rural moves also more than doubled from the post-Soweto period to the post-Pass Laws period, but then leveled off slightly in the post-1994 period (more on this in the next section). But the main finding is that overall migration in South Africa increased quite significantly between 1976 and 2000. These substantial increases began in the 1970s and continued into the 1990s, are too large to be solely explained by forced removals and government resettlements during the post-Soweto period, and thus suggest that black South Africans were defying the pass laws in increasing numbers before the laws were repealed in 1986.

I also found compelling evidence that mobility of all types opened up as the apartheid gradually failed. As I hypothesized, moves from rural to urban areas, between urban areas, and across provincial boundaries all increased—approximately doubled in magnitude—over the most recent three time periods. However, there is also evidence that moves between rural areas and moves within the same province also increased up through 1994, but then declined slightly in the latest period.

Nevertheless, as South Africa also rapidly urbanized, urban dwellers have become about twice as likely to move compared to rural residents and those who had previously moved are more likely to move again. This confirms my hypotheses and the findings in much of the existing migration literature. It also suggests that, although the changing political economy of South Africa was an important driver of migration patterns, migration was also affected by economic development and the overall mobility transition.

Provincial differences are quite striking in many of the migration analyses, where residents in the southern provinces of the country are more likely to move than those in the northern part. It is likely that the major urban centers of Johannesburg, Durban and Cape Town are driving migration patterns for the country as a whole; it is possible that greater economic development and easier transportation and communication in the more

urbanized southern part of the country facilitate easier and more frequent migration compared to patterns in the northern provinces. Further exploration of these patterns is needed to better understand inter-provincial and intra-provincial dynamics.

A major contribution of this paper is that it furthers our empirical understanding of historical patterns of migration in South Africa. To my knowledge, this is the first study to use event history analysis to examine internal migration in South Africa. Its unique contribution is the ability to examine historical migration patterns from the apartheid era to the turn of the 21st century for a nationally representative sample of black South Africans. In this way I enhance knowledge gained from previous studies. Small area studies, demographic surveillance data, or sample surveys have small, geographically constrained samples, which are useful for capturing certain migration patterns (especially circular migration) among subpopulations in particular areas, but they miss the national and inter-provincial dynamics that this study can capture. Most small-area or sub-population studies also lack a historical political economic perspective, which is a strength of my research. Another type of study uses census data to capture broad national and inter-provincial migration patterns and how they have changed at regular intervals (e.g., every 10 years), but this type of study cannot use an event history approach to understand the timing and sequencing of migration in detail. Studies using census data to analyze migration also have a limited set of covariates and predictive factors to use in statistical analysis. While my study, like all studies, has its own limitations, it does have the distinct advantages of a nationally representative sample, retrospective life histories of migration, and the ability to include a large number of individual-level factors in the analyses while still maintaining a broad historical political perspective.

The results suggest a more complex and nuanced story of historical migration change in South Africa than most researchers have previously articulated.   Many researchers seem to assume that the ending of apartheid led to increasing migration, particularly in the 1990s, but that circulatory and temporary migration patterns remained the norm for most migrants. Yet, my research has indicated that voluntary migration was increasing throughout the period after the Soweto uprising, even as the government was cracking down on black resistance in the early 1980s. This migratory increase was already occurring, and only gained more momentum after the Pass Laws were repealed in 1986 and after the 1994 election. These findings point to the persistence of migratory agency in the face of the apartheid regime, yet in other analyses I found some evidence in the effects on social networks and the ability to remit that the legacy of apartheid remains difficult for black migrants to surmount. Future research should examine whether and how families in South Africa are adopting different types of migration as economic strategies and whether or not these strategies are working.

The historical political economy framework employed in this study indicates the continued agency of migrants even in the face of harsh government restrictions on mobility. South Africa is not the only country to ever employ internal migration restrictions, which means that there are other avenues for further comparison and contrast. One example that springs to mind is the Chinese case, in which a household

registration system was employed by the government, which attempted to restrict migration to cities and promote rural development. This system has also broken down, and there are many illegal migrants in Chinese cities. There is also a parallel to be drawn with international migration laws, which are frequently broken by migrants. The U.S./Mexico border is enforceable by the U.S. government, but only up to a point. There are indications that controls may be effective in all of these cases, but only for a period of time. An inefficient economy and migrant labor system will ultimately fail to keep free movement of labor migrants in check. This also suggests the importance of studying internal and international migration in tandem and drawing upon the same bodies of theory to explain both types of migration, which are frequently more similar than they are different.

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Table 1 Descriptive characteristics of the South Africa Migration and Health Survey, 2000 (All adults ages 18+ in the year 2000)

Characteristic	Migrants (ever moved)		Non-migrants (never moved)	
	N	Percentage or Mean	N	Percentage or Mean
Total	1,413	63.3	820	36.7
Sex				
Male	656	65.8	342	34.2
Female	757	61.3	478	38.7
Age	1,413	37.4	820	33.5
Foreign-born	18	1.3	N/A	N/A
Urban/rural birthplace				
Urban	453	46.0	531	54.0
Rural	960	76.9	288	23.1
Province of current residence				
Western Cape	14	84.0	3	16.0
Eastern Cape	300	69.9	129	30.1
KwaZulu-Natal	281	70.8	116	29.2
Mpumalanga	148	58.3	106	41.7
Northern	183	70.0	77	30.0
North West	62	59.0	43	41.0
Gauteng	119	81.4	27	18.6
Free State	306	49.0	318	51.0
Relationship to household head				
Head	828	71.6	329	28.4
Spouse/partner	261	69.5	115	30.5
Son/daughter	178	40.7	259	59.3
Brother/sister	51	62.8	30	37.2
Other relative or non-relative	95	52.5	86	47.5

Marital status				
Never married	585	55.5	469	44.5
Married or living with partner	629	71.3	253	28.7
Separated, divorced or widowed	200	67.2	98	32.8
Children ever born (only for women)				
None	99	46.2	115	53.8
One	128	50.0	130	50.0
Two	170	77.2	50	22.8
Three	126	67.5	61	32.5
Four	74	63.7	42	36.3
Five or more	109	67.8	52	32.2
Literate	1,248	64.1	700	35.9
Educational attainment				
No schooling	180	65.2	96	34.8
Primary school	413	60.8	266	39.2
Attended secondary school	725	63.1	424	36.9
Secondary school diploma	86	77.2	26	22.8
Higher degree	10	54.6	8	45.4
Labor force status				
Unemployed	511	69.3	227	30.7
Employed in informal sector	259	73.8	92	26.2
Employed in formal sector	325	70.0	140	30.0
Unpaid family worker, homemaker, retired, disabled	211	58.8	147	41.2
Student	107	33.4	214	66.6

Source: South Africa Migration and Health Survey, 2000.

Note: Values are weighted.

Table 2 Discrete-time binomial logit model of any residential move (compared to no move a given year)

	Model 1			Model 2			Model 3		
Covariate	Coefficient		Robust Standard Error	Coefficient		Robust Standard Error	Coefficient		Robust Standard Error
Age[a]	0.3744	***	0.0089	0.0005		0.0094	-0.0285	**	0.0097
Age squared[a]	-0.0002		0.0001	0.0001		0.0001	0.0003	*	0.0001
Female	0.2732	**	0.0808	0.1528	*	0.0660	0.0251		0.0615
Married[b]	-0.3558	***	0.0667	-0.2433	***	0.0521	-0.1064	*	0.0502
Children ever born[b]	-0.1795	***	0.0250	0.1232	***	0.0209	-0.0455	*	0.0205
No education[b]	-0.8042	***	0.1096	-0.5763	***	0.0913	-0.1405		0.0893
Primary education[b]	-0.1836	*	0.0793	-0.1075		0.0635	0.0209		0.0584
Secondary+ education[b] (ref.)	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000
Urban residence[a]				0.5764	***	0.0464	0.5383	***	0.0425
Total number of moves[a]				0.3916	***	0.0195	0.3332	***	0.0161
Pre-1976[a] (ref.)							0.0000		0.0000
Post-Soweto (1976-85)[a]							0.7737	***	0.1205
Post-Pass Laws (1986-93)[a]							1.3820	***	0.1176
Post-Election (1994-2000)[a]							1.5178	***	0.1199
Northern, Eastern, or Western Cape[a]							0.2980	***	0.0772
KwaZulu-Natal[a]							0.1898	*	0.0803
Gauteng or Free State[a]							0.2855	**	0.0898
Other provinces[a][c] (ref.)							0.0000		0.0000
Constant	-3.3494	***	0.1465	-3.2589	***	0.1499	-4.0806	***	0.1934
Person-years (N)	56,683			56,683			56,683		
Wald chi-square	197.93 (7)			865.07 (9)			1,040.13 (15)		
Pseudo R-squared	0.0217			0.0708			0.0925		
Log pseudolikelihood	-11,107.88			-10,550.53			-10,304.10		

(a) Lagged by one year; (b) Current status, measured in 2000; (c) Reference category includes: Northern (Limpopo), Mpumalanga, North West, provinces and countries other than South Africa.

*p<0.05; **p<0.01; ***p<0.001

Table 3 Discrete-time multinomial logit model of intra-provincial or inter-provincial moves (compared to no move in a given year)

Covariate	Intra-provincial move			Inter-provincial move		
	Coefficient		Robust Standard Error	Coefficient		Robust Standard Error
Age[a]	-0.0415	*	0.0162	-0.0249	*	0.0109
Age squared[a]	0.0005	**	0.0002	0.0002		0.0001
Female	0.0621		0.1412	0.0180		0.0709
Married[b]	-0.3394	**	0.1146	-0.0518		0.0582
Children ever born[b]	-0.0148		0.0424	-0.0557	*	0.0237
No education[b]	-0.9049	***	0.2156	0.0209		0.1002
Primary education[b]	-0.1523		0.1367	0.0674		0.0694
Secondary+ education[b] (ref.)	0.0000		0.0000	0.0000		0.0000
Urban residence[a]	0.1542		0.0991	0.6201	***	0.0475
Total number of moves[a]	0.1732	***	0.0387	0.3612	***	0.0175
Pre-1976[a] (ref.)	0.0000		0.0000	0.0000		0.0000
Post-Soweto (1976-85)[a]	-0.0627		0.1632	1.1174	***	0.1635
Post-Pass Laws (1986-93)[a]	0.5096	**	0.1527	1.7434	***	0.1618
Post-Election (1994-2000)[a]	0.4072	*	0.1741	1.9263	***	0.1630
Northern, Eastern, or Western Cape[a]	1.1721	***	0.1459	0.0485		0.0807
KwaZulu-Natal[a]	0.2130		0.1683	0.1760	*	0.0810
Gauteng or Free State[a]	-0.5065	*	0.2402	0.3527	***	0.0894
Other provinces[a][c] (ref.)	0.0000		0.0000	0.0000		0.0000
Constant	-4.6447	***	0.3459	-4.7175	***	0.2116
Person-years (N)	56,683					
Wald chi-square	1,335.21 (30)					
Pseudo R-squared	0.096					
Log pseudolikelihood	-11,460.47					

(a) Lagged by one year; (b) Current status, measured in 2000; (c) Reference category includes: Northern (Limpopo), Mpumalanga, North West, provinces and countries other than South Africa.

*p<0.05; **p<0.01; ***p<0.001

Table 4 Discrete-time multinomial logit model of rural-rural or rural-urban moves (compared to no move in a given year)

Covariate	Rural-rural move Coefficient	Rural-rural move Robust Standard Error	Rural-urban move Coefficient	Rural-urban move Robust Standard Error
Age[a]	0.0002		0.0230	-0.0156		0.0122
Age squared[a]	-0.0001		0.0003	0.0002		0.0002
Female	-0.3154		0.1683	0.0691		0.0974
Married[b]	-0.3181	*	0.1371	-0.1793	*	0.0744
Children ever born[b]	-0.0424		0.0547	-0.0609	*	0.0288
No education[b]	-0.5140	*	0.2074	-0.2137		0.1255
Primary education[b]	-0.2315		0.1485	-0.0887		0.0871
Secondary+ education[b] (ref.)	0.0000		0.0000	0.0000		0.0000
Total number of moves[a]	0.3404	***	0.0340	0.1110	**	0.0349
Pre-1976[a] (ref.)	0.0000		0.0000	0.0000		0.0000
Post-Soweto (1976-85)[a]	0.7761	**	0.2918	1.0918	***	0.1916
Post-Pass Laws (1986-93)[a]	1.2932	***	0.2940	1.6533	***	0.1877
Post-Election (1994-2000)[a]	1.1937	***	0.3025	1.8264	***	0.1945
Northern, Eastern, or Western Cape[a]	-0.2947	*	0.1500	1.3840	***	0.1693
KwaZulu-Natal[a]	-0.2924	*	0.1360	1.2488	***	0.1707
Gauteng or Free State[a]	-1.3654	***	0.2833	0.1253		0.2256
Other provinces[a][c] (ref.)	0.0000		0.0000	0.0000		0.0000
Constant	-4.4681	***	0.4820	-5.7490	***	0.3209

Person-years (N)	33,939
Wald chi-square	684.05 (28)
Pseudo R-squared	0.0767
Log pseudolikelihood	-6,049.98

(a) Lagged by one year; [b] Current status, measured in 2000; [c] Reference category includes: Northern (Limpopo), Mpumalanga, North West, provinces and countries other than South Africa.

*$p<0.05$; **$p<0.01$; ***$p<0.001$

Table 5 Discrete-time multinomial logit model of urban-rural or urban-urban moves (compared to no move in a given year)

Covariate	Urban-rural move			Urban-urban move		
	Coefficient		Robust Standard Error	Coefficient		Robust Standard Error
Age[a]	-0.0423	**	0.0154	-0.0216		0.0190
Age squared[a]	0.0004		0.0002	0.0002		0.0003
Female	-0.0612		0.1344	0.1780		0.1178
Married[b]	-0.0461		0.1111	0.1107		0.0981
Children ever born[b]	0.0391		0.0474	-0.0318		0.0405
No education[b]	0.2211		0.2110	0.0055		0.1796
Primary education[b]	0.3366	*	0.1415	0.1253		0.1223
Secondary+ education[b] (ref.)	0.0000		0.0000	0.0000		0.0000
Total number of moves[a]	0.5138	***	0.0456	0.3605	***	0.0347
Pre-1976[a] (ref.)	0.0000		0.0000	0.0000		0.0000
Post-Soweto (1976-85)[a]	0.9611	***	0.2235	1.0126	**	0.3118
Post-Pass Laws (1986-93)[a]	1.5917	***	0.2258	1.8482	***	0.3158
Post-Election (1994-2000)[a]	1.7991	***	0.2392	2.0652	***	0.3201
Northern, Eastern, or Western Cape[a]	-0.5348	**	0.1655	0.7139	***	0.1645
KwaZulu-Natal[a]	-0.5423	***	0.1528	0.5584	***	0.1588
Gauteng or Free State[a]	0.2729		0.1399	0.7596	***	0.1655
Other provinces[a][c] (ref.)	0.0000		0.0000	0.0000		0.0000
Constant	-4.1311	***	0.3114	-5.3136	***	0.3942
Person-years (N)	20,435					
Wald chi-square	438.83 (28)					
Pseudo R-squared	0.1002					
Log pseudolikelihood	-5,686.41					

(a) Lagged by one year; (b) Current status, measured in 2000; (c) Reference category includes: Northern (Limpopo), Mpumalanga, North West, provinces and countries other than South Africa.

*p<0.05; **p<0.01; ***p<0.001

Table 6 Discrete-time binomial logit model of any residential move (compared to no move in a given year) by historical time period

Covariate	Pre-1976 Coefficient	Pre-1976 Robust SE	Post-Soweto ('76-85) Coefficient	Post-Soweto Robust SE	Post-Pass Laws ('86-93) Coefficient	Post-Pass Laws Robust SE	Post-Election ('94-00) Coefficient	Post-Election Robust SE
Age[a]	-0.0412	0.0551	-0.0859 ***	0.0244	-0.0182	0.0150	-0.0286	0.0148
Age squared[a]	0.0002	0.0009	0.0010 **	0.0003	0.0002	0.0002	0.0002	0.0002
Female	0.6165 *	0.2872	0.3516	0.1902	-0.0033	0.1166	-0.1546	0.1115
Married[b]	-0.3087	0.2347	-0.2099	0.1417	-0.2621 **	0.0941	0.1515	0.0951
Children ever born[b]	-0.1586 *	0.0694	-0.0333	0.0549	-0.0728	0.0432	0.0135	0.0400
No education[b]	-0.2577	0.2410	-0.4898	0.2614	-0.0849	0.1813	0.0602	0.1696
Primary education[b]	0.0131	0.2680	-0.1207	0.1694	0.0295	0.1117	0.0932	0.1143
Secondary+ educ[b] (ref.)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Urban residence[a]	0.3907 *	0.1729	0.3585 **	0.1183	0.5042 ***	0.0697	0.7145 ***	0.0683
Total number of moves[a]	1.2099 ***	0.1180	0.6499 ***	0.0499	0.3122 ***	0.0333	0.2447 ***	0.0260
N., E., or W. Cape[a]	0.3145	0.2655	0.1975	0.1701	0.6537 ***	0.1331	0.2106	0.1277
KwaZulu-Natal[a]	-0.1403	0.2070	-0.0520	0.1566	0.4606 ***	0.1186	0.1947	0.1095
Gauteng or Free State[a]	0.0197	0.2820	-0.0313	0.1900	0.4894 ***	0.1377	0.3684 **	0.1182
Other provinces[a][c] (ref.)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Constant	-4.4719 ***	0.7786	-2.5209 ***	0.3769	-3.0156 ***	0.2595	-2.5384 ***	0.2831
Person-years (N)	13,197		12,553		15,720		13,854	
Wald chi-square	174.83 (12)		260.03 (12)		293.16 (12)		297.09 (12)	
Pseudo R-squared	0.1429		0.1003		0.05		0.0455	
Log pseudolikelihood	-748.95		-1,640.14		-3,629.96		-3,952.18	

(a) Lagged by one year; (b) Current status, measured in 2000; (c) Reference category includes: Northern (Limpopo), Mpumalanga, North West, provinces and countries other than South Africa.

*p<0.05; **p<0.01; ***p<0.001

Figure 1   Historical Migration Rates in South Africa

Moves per person year*1000

Legend:
- Migration rate (all moves)
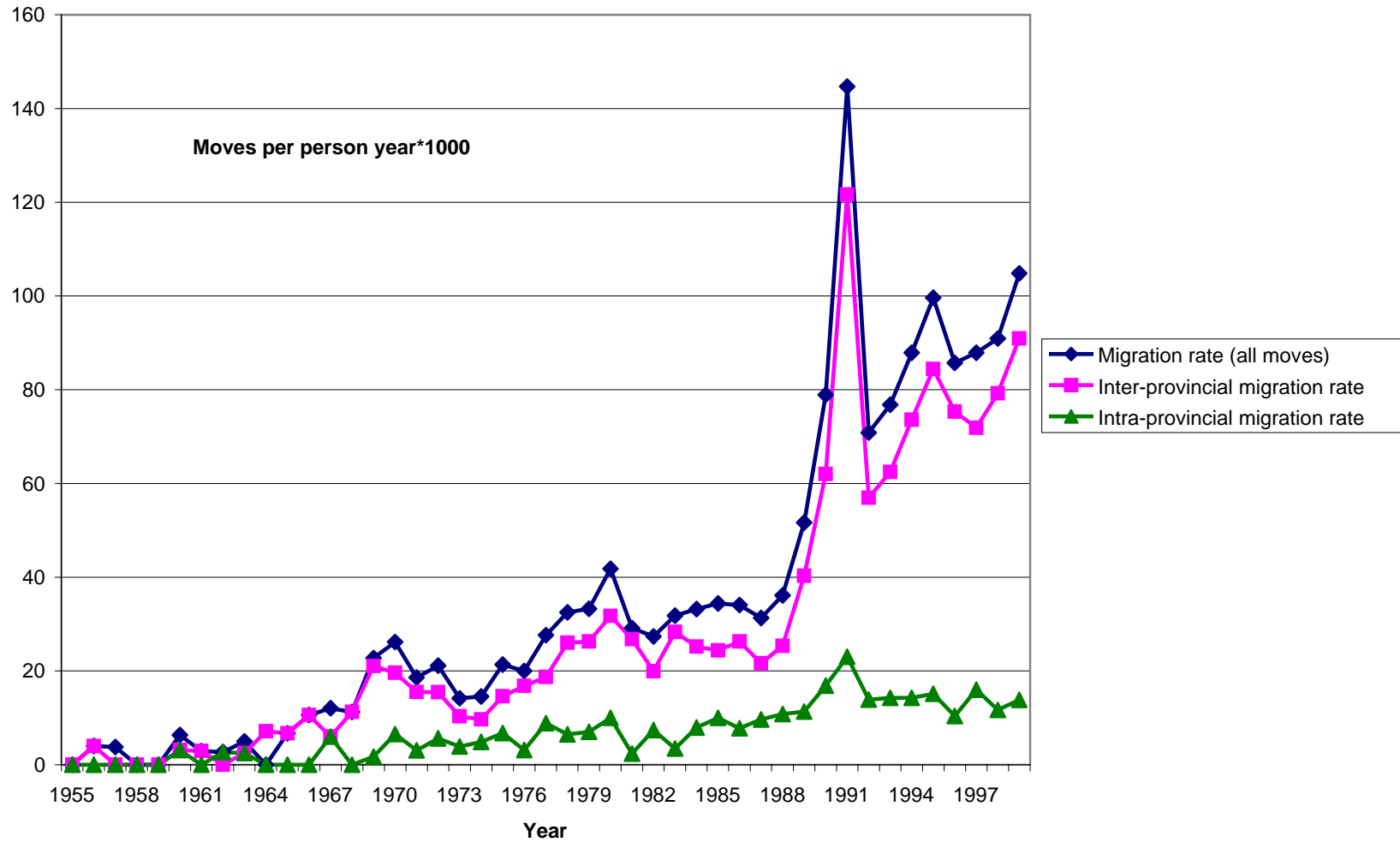- Inter-provincial migration rate
- Intra-provincial migration rate

X-axis: Year (1955–1997)
Y-axis: 0–160

Figure 2 Rural, urban migration rates

Moves per person-year x 1000

Legend:
- Overall migration rate
- Rural-rural migration rate
- Rural-urban migration rate
- Urban-rural migration rate
- Urban-urban migration rate

X-axis (Historical period): Before 1976, 1976 to 1985, 1986 to 1993, 1994 to 2000