

Structural Change and Democratization: Evidence from Rural Apartheid*

Laurence Wilse-Samson[†]

December 2014

Abstract

The relationship between economic development and democracy is key in political economy. Many commentators have suggested that economic growth increases support for democracy. One proposed mechanism is that modernization, by reducing the demand for low-skilled labor, increases the willingness of elites, particularly in agriculture, to extend the franchise. I use subnational variation in South Africa to test this mechanism. I employ national shocks to the mining sector's demand for native black workers and cross-sectional variation in labor market competition induced by apartheid to estimate the effect of black labor scarcity on wages, capital intensity, and changes in partisan voting preferences. I find that reductions in the supply of foreign mine labor following the sudden withdrawal of workers from Malawi and Mozambique (and the increased demand for native black workers) increased mechanization on the mines and on farms competing with mines for labor. I then show that these induced structural changes resulted in differential increases in pro-political reform vote shares in the open districts relative to closed districts, even as mining districts became more conservative and voted more to maintain the non-democratic regime.

The relationship between economic development and political institutions is a long-standing area of interest in political economy. In particular, scholars going back to Barrington Moore have stressed the interest of agricultural landowners in non-democratic political institutions, owing to their dependence on labor-repressive economic institutions that would not survive democratic decision making (Moore, 1966). As agriculture modernizes, agricultural elites have less need to maintain control over labor, and thus are more willing to extend the franchise.

*I thank Ethan Kaplan, Suresh Naidu, and Joseph Stiglitz for encouragement and advice. Chris Boone, Jonas Hjort, Navin Kartik, Supreet Kaur, Martine Mariotti, David Munroe, Nicoli Nattrass, Christian Pop-Eleches, Sébastien Turban, Miguel Urquiola, and Eric Verhoogen provided helpful comments. This research has also benefited from the input of participants at the Economic Research Southern Africa conference on the Economics of Apartheid held in Cape Town in March 2013, and the Columbia development seminar. Thanks to Kathy Brookes at the University of Johannesburg for assistance with the TEBA mine recruitment archive, and Celia Matsoma at the National Library in Pretoria for helping to locate various production censuses.

[†]Cornerstone Research, lwsamson@cornerstone.com

Apartheid South Africa provides a good setting in which to examine these issues. It was non-democratic. Its economy remained dependent on agriculture for a long time.¹ And two sectors of the economy — mining and farming — were dependent on low-skilled labor. In its economic content, Apartheid was primarily a large set of tools for black labor allocation and control. As I outline below, the Apartheid state was deeply committed to managing black labor supply. The constraints on the movement of blacks were strict and, importantly, varied by location. Jobs were reserved along racial lines, and the 1913 Natives Land Act denied blacks property rights. In South Africa, therefore, white political preferences were crucially related to preferences over the control of black labor. Changes over demand for labor may, thus, have changed political preferences.

In this paper I focus on one component of the apartheid coalition:² the allocation of black labor between white farmers and mining companies that was moderated by successive white governments.³ I describe a shock to this compact brought about by a sudden reduction in the supply of foreign mine labor. Using novel datasets I have collected and digitized, I am able to provide some of the first evidence on the economic determinants of the stability of apartheid.

The state was attempting to manage two strategic concerns. On the one hand, there was an ideological long-run worry about being overpowered by the native majority — and hence a pull for geographic separation.⁴ On the other, there were the politically powerful mining and farm sectors with their competing demands for black labor. Thus, one way of thinking about Apartheid politics is in terms of the difficulty of marrying the desire for long-run physical separation with the short-run sectoral needs for labor. The solution was a system of migrant labor to the mines, which helped to satisfy the mining demand for labor while accommodating the goal of separation. In addition, the acquisition of mine labor from beyond South Africa's borders helped alleviate some of stress caused by the competition for workers between the mining and agricultural sectors.

A shock to the supply of foreign labor may have contributed to the instability of

¹Agricultural employment was 40% all employment as late as 1958 (Atkinson, 2007).

²I do not take the view that the 1948 election, which ushered in the National Party's official policy of 'Apartheid', differed in kind from the system that prevailed before. For that reason I will sometimes use 'segregationist' and 'Apartheid' interchangeably. I do argue, though, that the National Party was relatively more sensitive to the demands of the (especially smaller) farmers when it came to power than the United Party had been.

³I put to one side the role of manufacturing — this is a political economy of *rural* apartheid.

⁴A charitable reading would be that there was an ideological belief that in the long-run, political logic required separate states for separate "nations".

the Apartheid regime. Specifically, the sudden withdrawal of workers from Malawi and Mozambique between 1974 and 1976 required an immediate increase of recruiting within South Africa. By comparing outcomes in South African districts where historically mine recruiting was permitted to areas where it was not, I show that the increase in mine recruiting generated spillovers onto the farming sector in the years following the shock, inducing higher agricultural wages and the greater adoption of combine harvesters. I then show that these shocks had indirect political consequences by looking at the results of elections — I present suggestive evidence that these changes raised support for parties favoring some reforms of the Apartheid system in the regions forced to modernize.

The shock may also have helped to speed up important changes in labor organization on the mines. By examining mine-level outcomes, I show that in the years around the shock, the mines most dependent on foreign labor experienced relatively more strike action. Narrative evidence drawn from the annual reports of the Chamber of Mines and their recruiting company arms suggests that it was in response to these developments that the mining companies decided to raise wages, lengthen contractual terms for mineworkers, and increase mine mechanization. The mining companies took strategic steps to become less reliant on migrant labor, and lobbied the state for a ‘stabilized’ black labor force that was more permanently at the mines. When black unions were legalized, the National Union of Mineworkers became instrumental in the broader labor movement, which itself became a primary internal vector for the political demands of black citizens.⁵ I show that in the elections following the shock that there was increased support for the right wing in the districts where mines were located.

This work informs the literature on democratic transitions. Acemoglu and Robinson (2012) characterize the institutions that prevailed in South Africa throughout most of the twentieth century as “extractive” and as creating a “dual economy” wherein white elites initiated policies designed to reduce competition from black Africans and create a “reservoir of cheap labor”. But white elites were not homogeneous,⁶ and the study of the effect of shocks to the Apartheid economy allows us to better understand the political equilibria which sustained the state. Democratization can be a way for elites to respond to protest through committing to future redistribution (and thus escape

⁵Their role was reinforced following the reforms of 1979 which allowed economic protest while still limiting political organization. Note that, while the Natal strikes of 1973 were very important, it was not until 1979 — and in some sectors later — that black employees were recognized within the framework of the Industrial Conciliation Act.

⁶The Anglo-Boer war ended in 1902. The four white settler colonies combined into the Union of South Africa in 1910. Afrikaans- and English-speaking whites — mostly descended from separate Dutch and British colonizations — were for some time largely divided socially and politically.

violent revolution). In other cases, insufficient voice might be met by repression or temporary transfers (Acemoglu and Robinson, 2006). From its apex at the start of the 1970s until the democratic transition in 1994, Apartheid was in retreat.⁷ During its decline, the government explored all these routes.

This research also speaks to an old question around the relationship between factor endowments and technological adoption and innovation: whether and under what circumstances does the scarcity of a particular factor induce the adoption of new technologies? Acemoglu (2010) shows that labor scarcity promotes technological advance when innovation reduces the marginal product of labor. Indeed, most of the analysis of this issue has arisen in the context of *labor* scarcity due to the number and variety of institutions directly affecting the availability of labor. These include numerous coercive labor systems: feudal institutions,⁸ Masters and Servants Laws (Steinfeld, 2001), and colonial systems such as the mine *mita* in Peru and Bolivia.⁹ Habakkuk (1962) argues that relative technological advance in the United States over Great Britain was due to greater relative scarcity of labor in the former country. Hornbeck and Naidu (2013) argue that having a large amount of low wage labor available limited development in the US South. And controls on labor remain important. There are within country restrictions such as the *hukou* system in China and internal passport regimes within Russia and Ukraine. Even more important are the vast and complex systems governing labor movement across national borders which must shape, in ways we do not understand, development and democratization today.

The paper is organized as follows: In Section I I present the instruments of labor control — first in general, then particularly as related to the geography of separation between mining and farming recruitment. Section II introduces the data on which the analysis relies, and outlines the empirical strategy used to identify the effects and mechanism of interest. Section III presents results related to economic outcomes and

⁷“Grand Apartheid” was the vision of a multi-state South Africa — solving the problem of accommodating black (or “tribal”) self-determination — as expressed most forcefully by Prime Minister H.F. Verwoerd. His plan was for a white South Africa, with 10 “bantustan homelands” formed on the basis of the Trust land. Economic opportunity would be provided through “border” industries, that is white firms located just outside the border of a bantustan in which blacks could work on a migrant labor basis. Policies to reach this ultimate goal were implemented with some vigor from the 1960s until the early 1980s when the absurdity became entirely unsustainable. Furthermore, the western part of the Cape Province was designated a “Coloured Labor Preference Area”, providing disincentives for firms hiring black labor in lieu of coloured labor. (This is apartheid era racial classification — the Apartheid government used 4 main racial classifications: black/African/Bantu; coloured; Indian/Asian; and white. The term “coloured” refers to South Africans of mixed racial descent).

⁸Domar (1970)’s hypothesis is that serfdom arose in Russia in the 16th century to mitigate the scarcity of labor relative to land abundance

⁹Dell (2010) shows that these institutions can have persistent effects on household consumption and child health.

section [IV](#) discusses political effects. Section [V](#) concludes.

I Apartheid labor controls

Apartheid's controls on labor were very strict. Unlike in some settings where borders are porous, the description in this section suggests that geographic and sectoral mobility was relatively difficult. Secondly, the extreme lengths to which the state went in order to secure black labor for various sectors indicates that this was a politically important policy dimension.

The South African economy, even as late as 1970, was dependent on low-skilled labor in agriculture and mining. As a share of the economically active black population in 1970, about 40% of blacks were employed in agriculture, forestry and fishing (2.26m people), while blacks employed in mining and quarrying comprised 11% (610k people).¹⁰

The state used a number of tools to maintain the supply of low wage labor. First, we can think of tools where the state operates on the extensive margin. These included restricting land ownership, movement, and alternative employment opportunities for blacks — that is, lowering the value of their outside option. Second, there are tools where it operates on the intensive margin (through putting state power behind onerous and unequal contractual relations such as Masters and Servants Laws). Both were used.¹¹ In addition, policies could be classified in terms of whether the aim was slowing urban to rural flows of labor, or rural to rural flows; and whether the controls were at the urban or rural end. The segregationist regime, again, played on all those levers. The underlying logic was increasing 'reserve labor'.¹²

I distinguish between legislation with the general aim of lowering labor costs, and legislation directly targeted at preventing competition between farming and mining. In order to avoid labor market competition and keep wages low, whites negotiated competing claims on black labor through lobbying the state, rather than through increasing wages and improving working conditions (Lacey, 1981). Below I first discuss the extensive and intensive margin before turning to the organization of mine labor recruitment and the specific geography of separation between the mining and farming

¹⁰There were fewer blacks in manufacturing at about 514k while about 1m blacks were employed in the service sector (Lombard and Stadler, 1980).

¹¹One might also characterize this as increasing the supply of labor and improving labor productivity. A framework here is lowering the value of unemployment to the worker to improve worker discipline in the Shapiro-Stiglitz sense.

¹²By "reserve labor" I mean workers that could be idled or used according to demand without shifting wages.

sectors.¹³

I.A The extensive margin of employment

I now sketch the main laws defining the labor framework. These consisted of laws restricting the lands blacks could own, and laws restricting the places to which, and conditions under which, blacks could move. Throughout this period, except for a few people in the Cape province, for a few years, blacks were entirely politically disenfranchised.

The *Natives Land Act of 1913* restricted the land that blacks could own to “scheduled areas”, comprising 7% of the country, whereas blacks were some 68% of the population at the time. The scheduled lands reflected the historical dispossession following wars of colonial conquest in the nineteenth century. These areas, also called “native reserves”, would be ruled by “traditional” chiefs on the basis of customary law.¹⁴

The Natives Land Act restricted blacks to owning land (in common) only in the reserves. It also prohibited whites from owning land in the reserves. Blacks were to have a nominal source of subsistence land outside of white-owned farms to create a ‘pool’ from which mining companies could recruit migrant labor.¹⁵ The mining companies pushed for the reserves to be extended while white farmers pushed back. Lacey (1981) for example argues that the expansion of the reserves was (p.4) “blocked by the farmers”, who were concerned about labor scarcity. Whereas under the *1936 Native Trust and Land Act* the area of the reserves was expanded — the new demarcated territories were called the “released areas” (the total land now allocated to blacks comprised about 13% of the country) — this reflected mainly recognizing places where blacks were already settled.

Blacks could not own land in “white South Africa”, but were required to work if living therein. In terms of the *Native Regulation Act of 1911*, black men and women aged 16 or over had to register with a labor bureau. Registered farm workers could not switch to industrial work (Atkinson, 2007, p.35).

The foundation of “influx control”, that is, the control of rural-urban migration by

¹³I do not focus here on the regulation of rural-urban flows, but the controls there were also strong.

¹⁴The law also foreshadowed the desire of the state to ensure that blacks either work as wage laborers on (white) farms or relocate to the reserves, through creating limits on renting land to black tenants and imposing stricter controls on black sharecropping (Atkinson, 2007). Before World War 2, however, these restrictions were most strongly implemented in the Orange Free State province — elsewhere, systems of black labor tenancy and sharecropping continued. Appendix C describes the timing of the end of the system of labor tenancy in South Africa.

¹⁵The system of migrant labor allowed a mining company to recruit a male worker for 6 or 9 months without having to pay a wage that would also support his family. Women remained subsistence farmers in the reserves.

blacks, was the *Native (Urban Areas) Act of 1923*. The chief effect of this law was to regulate migration into and residence in towns on the basis of the “pass”, a focal point of opposition to Apartheid. Blacks who were staying illegally in urban areas were punished.¹⁶ Savage (1986) reports that more than 9m Africans were prosecuted under the pass laws between 1960 and 1980.

I.B The intensive margin of employment

Employers were also aided by regulations on the conditions of employment. While *Masters and Servants (M&S) Laws* had been on the books since 1880, in 1926 the Pact Government passed an amendment which brought oral and written contracts between farmers and labor tenants under M&S laws.¹⁷ Farmers could now bring criminal charges against labor tenants in breach — a provision that was only repealed in the 1970s with the rest of the M&S laws.

The Pact government also passed the *Native Servant Contract Act of 1932*. Some of its provisions included for instance, (i) strengthening the power of black parents to enter into binding contracts on behalf of their children, and (ii) introducing whipping for contraventions of M&S laws.¹⁸

The *1936 Native Trust and Land Act*, aside from extending the reserves, also sought to end ‘squattling’. Laborers would qualify as ‘labor tenants’ and not ‘squatters’ only if they were employed by the white landlord on the farm for 180 days of the year. Blacks could not live on white rural areas, unless registered as ‘servant of the owner’, a ‘labour tenant’ or a ‘squatter’.

I turn now to the division of the rural (‘unskilled’) labor between competing white interests, in particular farmers and mine owners. Traditionally, the source for mining capital was English-speaking industrialists, historically in conflict with Afrikaans-

¹⁶In addition to this battery of laws controlling the land blacks could own and farm, and the places to which and conditions under which blacks could move, farmers were also able to use foreign migrant labor, particularly in the border districts. Bradford (1990) describes how the migration of black South Africans from rural areas into urban areas was partially offset by increased recruitment of foreign labor from neighboring countries. (Her paper is entitled “Getting away with slavery” which sheds some light on the labor conditions prevailing on those farms.) Farmers were also in some cases able to employ prison labor. For a time, the state provided subsidised credit to farmers to fund the construction of rural prisons, the labor from which would be used on participating farms.

¹⁷The ‘Pact’ government was a coalition between the farmer friendly National Party and the white worker-backed Labour Party. The law passed covered Transvaal and Natal provinces — 2 of the 4 provinces.

¹⁸Duncan (1995) argues that the egregiousness of the Act, the complexity of administration, and the obstruction by Native Affairs Department officials, made it fairly unenforceable. He describes the ambition of the act as one of “unsurpassed repressive qualities” (p.137). However, notes Atkinson (2007) (p.37) “child labour practices were integral to the farm economy until they were outlawed by the Basic Conditions of Employment Act of 1997. It is estimated that there were over 60 000 black child farm labourers in 1990, many between eight and 14 years of age.”

speaking farmers. The managed competition over black labor is sometimes referred to in South African historiography as the story of 'gold and maize'.¹⁹

I.C The organization of mine recruiting

South African economic history is intimately tied to the story of gold mining. In the 20th century, South Africa was the world's primary exporter of gold, a commodity central to global monetary policy. It is the interaction of its *geographic endowment* of minerals — primarily diamonds and gold — with the *institutions* inherited from colonization — Dutch and British — that shaped the country's path of economic and political development in the 20th century.

I.C.1 A monopsonist mine recruiter

Various supervisory roles on the mines were undertaken by white mine workers who were unionized (primarily within the Mine Workers Union) and were a powerful lobby. In contrast the far more numerous black workers — drawn from throughout Southern Africa — were non-unionized and a comparatively weak political force.

There were six major mining houses,²⁰ but they organized various joint actions within the industry association, the Chamber of Mines. Notably, nearly all recruiting of black labor by the mining industry was done by one of the Chamber's recruiting arms — the Witwatersrand Native Labour Recruiting Agency (Wenela) or the Native Recruiting Corporation (NRC). The former was tasked with recruiting north of the 22 degree south line of latitude (primarily in Malawi and Mozambique), the latter with recruiting south of it (primarily in South Africa, Lesotho, Botswana, and Swaziland). The location of their recruiting stations at 1948 is illustrated in Figure 3.²¹ Foreign black mine recruiting was important. It increased both in absolute and relative terms in the 1960s as mining companies substituted cheaper foreign labor for South Africans. There had been 175,000 black South African mine workers in 1960, but by 1971 that number had been halved. At 1974 foreign migrant mine labor as a share of mineworkers on the South African gold mines was 78%.²² At the end of 1977, after the shock to foreign

¹⁹See Morrell (1988) and Crush (1993). It is important, however, to keep in mind the contest *within* mining also. As described by Bonner and Shapiro (1987), the coal mining companies in Natal and the Transvaal had thinner margins than the gold miners and demanded cheaper labor still. They argue that the desire for lower wage rates resulted in an increased application of coercion — (p.2) "in Northern Natal [...] workers were encouraged to live on neighbouring farms and were deliberately enmeshed in a system of debt bondage."

²⁰Anglo American Corporation (AAC), GENCOR, Goldfields, Rand Mines, JCI, and Anglovaal.

²¹As Savage (1986) notes, this decade was also the period of the highest rate of arrests for pass law violations in South African cities. It is possible that former mine workers were trying to find work in the cities.

²²A total of 296,219 out of 382,448 of the total black labor force was from outside South Africa (Lombard

labor supply described below, that number was to 47%.²³

I.C.2 The geography of recruitment

The *Native Labour Regulation Act of 1911* allowed the state to exclude private (including mine) recruiting in magisterial districts in which there were white farms. Under this Act and the *Natives (Urban Areas) Act of 1923*, the Native Affairs Department could assign to local authorities the ability to establish local labor bureaus. As described by Jeeves (Crush and James, 1995), the purpose of the Act was to “shelter” the labor supply of important white farming areas from mine recruitment (and other industries). In his assessment this institutional structure “could not have survived [...without the] use of foreign mine labour.”

The calls from farmers for even stricter controls on labor movement had increased during and after the Second World War, a time during which black labor had been widely employed in manufacturing. The exigencies of war had required faster migration of blacks into cities. Promising more rigid application of the principles of influx control under their new policy of apartheid, the National Party secured important farming constituencies to come to power in 1948.²⁴ After 1948 the Native Affairs Department was transformed; a paternalistic ethos was supplanted by a more bureaucratic and more extensive labor bureau system.²⁵ This new system, part of the 1952 *Native Laws Amendment Act*, constituted a vast network of labor allocation and influx control.²⁶ Local labor bureaus had to approve each application of a black individual to leave a rural district — which would depend on whether local labor supply was deemed adequate. Blacks would only be able to leave the farm and work in the city if the white farmer agreed.²⁷ Atkinson (2007) points to the remarkable ‘success’ of this system in terms of its aim — maintaining a pool of black agricultural labor; including domestic workers, there were some 1.85m workers (black and white) on farms in 1958, accounting for 40% of total workers.

Thus by the start of the 1970s, large parts of the country (containing large numbers of

and Stadler, 1980).

²³In 1977, following the changes I describe below, the two recruiting companies were merged into The Employment Bureau of Africa — which still operates today in Southern Africa as TEBA Ltd. See <http://www.teba.co.za/>

²⁴They lost the popular vote to the United Party by a considerable margin.

²⁵The transformation of ‘native’ policy through the extension of the administrative powers of this department is a topic tackled at book length by Duncan (1995) and Evans (1997).

²⁶The law required also passing the “Natives (Abolition of Passes and Co-ordination of documents) Act of 1952” a wonderfully Orwellian name for a law establishing an expansive Pass system. Influx controls were only finally abandoned in 1986.

²⁷See also Giliomee and Schlemmer (1985) and Greenberg (1980).

potential mine workers) were closed to the mines (Crush, 1993). Restrictions added under the Bantu Labor regulations of 1965 meant that private recruiting was closed even in some districts containing bantustan land.²⁸

Crush (*ibid.*) maps the regions which were open and closed to mining recruitment in 1970, just before the shocks to mining I describe below (see figure 1). I will call the parts of South Africa open to mining recruitment “open districts” and the parts closed “closed districts.” Note that the open districts include both areas in the Native Reserves (later “homelands” or “bantustans”) and areas within “white South Africa”.²⁹ Since I will mainly be concerned with outcomes obtained by surveying white farmers — such as black farm wages and investment in combine harvesters — I will primarily be interested in the difference between the white agricultural land parts of open districts and the white agricultural land parts of closed districts. Figure 1 also indicates a set of closed districts marked as ‘high potential’ for recruiting by the mining industry association in internal documents. This set of districts will serve as ‘placebos’ against which I compare the effects of the shocks to mining on open districts.

II Data and Empirical Strategy

I first briefly outline the data on mining, agricultural and political outcomes on which my analysis will rely, before turning to a description of the natural experiment and the empirical strategy. It is worth spending some time on the data since in a number of places this is the first time these data have been digitized and/or used in the economics literature.

II.A Data

Mining production. For information about mine output I rely on the annual reports of the Chamber of Mines. These include at the mine level: annual tons produced, working costs, working profits, and (from 1973 onwards) capital expenditure.

Mine labor recruitment. Various sources provide annual data on sources of mine labour by country — I use average number of black workers employed (1920-1989) and black workers received by mines drawn from the appendix to Crush, Jeeves, and Yudelman (1991). The annual memoranda for the Board of Governors of the Native Recruiting Corporation (NRC) and the Witwatersrand Native Labor Association (WNLA)

²⁸This applied in particular to the provinces of Natal and Transvaal. By “bantustan” land I mean “scheduled” and “released” land as set out above.

²⁹The bantustans, or homelands, were generally open to recruiting. As we have noted, there were also some closed parts, but this was relatively rare.

(tasked respectively with recruiting south and north of the 22 degree latitude parallel) contain data on number of recruits by *recruiting station*. These are available in hardcopy format at the TEBA archive at the University of Johannesburg. The collection also contains some information on the country origins of recruits by mine as well as the value of voluntary deferred payments and remittances by station year. There is incomplete data on the recruits by contract type (i.e., recruits for 6 month tours, 9 month tours, etc.).

Agriculture. My primary source for information about agricultural holdings, production, employment, wages and mechanization is the Census of Agriculture prepared by the Central Statistical Services (CSS) of South Africa (later called Statistics South Africa).³⁰ The geographic unit I employ in the construction of the panel is the magisterial district of which there were about 300 (the number for which agricultural data was reported was around 250). The agricultural censuses group magisterial districts into 67 economic regions which are contained within (the 4) provinces. (This classification was done by CSS, and does not correspond to administrative units). I use the classification as at 1972, before the shock, throughout. The main variables of interest include: black wages per worker, total black regular employees, number of tractors, number of combine harvesters, and average farm size. The empirical analysis focuses on a panel of magisterial districts and the years between 1963 and 1983 for which data are available.³¹

Voting. I draw on Schoeman (1977) for electoral division (plurality election) results to 1974. Schoeman's detailed work contains returns for all elections from 1910-1976 as well as commentary on the results. There were between 121 (at Union) and 164 (at 1974) constituencies over this period.³² The remaining election results (1977, 1981 and 1987) I obtain directly from the relevant government gazettes.

There is considerable difficulty in measuring political consequences given the quality of available data, the chief challenge being mapping electoral divisions to magisterial districts.³³ Fortunately, the 1981 election results published in the government gazette include the home address of each of the constituency winners. I georeference these,

³⁰This publication was also known at various times as the *Report on Agricultural and Pastoral Production* and the *Agricultural Survey*.

³¹I do not account for district border changes.

³²Another useful source is Nohlen (1999) which explains for example how the military and state security council governance structure was formed in 1978, and how the Westminster system changed with the 1983 tricameral parliament.

³³Maps linking electoral divisions to magisterial districts exist but are extremely difficult to use. They are not complete, located in various national archives all around the country, and are so large that they are impossible to scan with nearly all scanners.

assign them to magisterial districts, and (i) drop the urban areas (politicians in cities don't necessarily live in their constituency) and (ii) drop the magisterial districts not containing a politician. Thus the analysis of voting outcomes is for those magisterial districts which we can match to an electoral division.

Strikes. I will discuss also how the shock described in the following section was associated with increased strike action. Following this shock, policy on the mines changed towards higher wages, longer stays at the mines, and more mechanization. For mine level outcomes on number of strikes, and number injured or killed, I use Horner and Kooy (1980) who report statistics between 1972 and 1979 and also provide details on changes in living and working conditions on the mines.³⁴ I summarize the data used in the main empirical specifications below in Appendix Table A.1.

II.B A shock to the native labor demand to mining

I focus here on the rapid and dramatic reduction in the foreign *supply of labor* starting in 1974. Foreign black mine workers declined from 336,000 in December 1973 to 208,000 at the end of 1977. Over this period, the number of South African black mine workers increased from 86,000 to 214,000.

The *heterogeneous geographic incidence of this shock* within South Africa provides the main source of identification in the analysis of the effects on South African agriculture that follows in section III. Additionally, the large increase in the price of gold over the 1970s generally increased the demand for labor. The constraints on geographic sourcing within South Africa — a result of the institutional structure given by the historical political agreement on labor allocation between gold and maize — meant that different parts of South Africa were affected differently by these shocks.

It is important that this change was exogenous to other conditions on the mines and unplanned by industry. There were two components of the shock. First, following the crash of a plane transporting Malawian miners, President Banda of Malawi decided to entirely stop Wenela's recruiting operations in Malawi. Second, the coup in Portugal in 1974 would lead to the dramatic scaling back of recruiting operations in Mozambique, a former Portuguese colony. (There was a slight lag — while the coup was in April 1974, the reduction would only occur from 1976).³⁵ Whereas 175,468 new recruits were

³⁴They also provide their own figures for total numbers of Malawians employed on the mines — 110 000 in 1973, but only 163 in April 1977 (this was also the period in which disturbances on the mines were most concentrated).

³⁵As Crush (1996, p. 167) describes, "neither of the major withdrawals of foreign labour in the 1970s were policy measures directed by the mining industry. When Malawi unilaterally withdrew its mineworkers in 1974 and the Chamber of Mines' conciliatory overtures were repudiated by President Banda, the industry

from Malawi or Mozambique in 1974, by 1977 that number was 40,417 — a change of 135,051.

After the US abandoned the gold standard in 1971, the price of gold increased from a level of \$36 at the start of the decade in 1970, to about \$300 in 1979 (it would rise still further to \$600 in 1980 before the dramatic collapse of commodity prices in the early 1980s). The price rise was not monotone. It increased from \$36 in 1970 to \$59 in 1972, and then \$98 in 1973, and \$159 in 1974. This increase was important, increasing the demand for mine labor throughout Southern Africa. Nonetheless, the increase in total number of recruits in the 1970s was only 28,811.³⁶ My focus is on the compositional shift, with more recruits from within South Africa (including the Bantustans), and far fewer from Mozambique and Malawi. There were also important increases in recruiting from some of the other neighboring countries (especially Lesotho, but also Zimbabwe and Swaziland), but these were from a far lower base.

The significance of these events was recognized by the industry's recruiting arm, TEBA. Its five-year plan, circulated to the Board of Directors in December 1977, begins by recognizing these events as turning points for the industry:

April, 1974, was a significant date for South Africa and for its primary industry, mining. The tragic Francistown accident and Spinola's action in Europe heralded a [...] re-adjustment for the mining industry as a major employer of foreign labour [...]

The immediate effect of these shocks was to increase emphasis on recruiting within South Africa rather than from foreign sources. Figure 2 shows annual recruiting figures by country. The sharp reductions in Malawian recruits from 1974 and Mozambican recruits from 1976 are clear as is the ramping up of recruits from South Africa. While the mines were located in the interior — around Johannesburg and in the Orange Free State province, the recruiting districts were considerable distances away. Figure 3 illustrates the location of the recruiting stations in reference to the mining areas (boxed). The Native Recruiting Corporation (NRC) was organized into recruiting stations in the recruiting districts, regional offices (each managing groups of 4 or 5 stations), and receiving depots near the mines at Johannesburg and Welkom. The data presented in Figure 4 illustrates the median number of recruits across regional recruiting offices

was forced to scramble for labour throughout the region [...].” Furthermore, “the dramatic fall-off in Mozambican labour in 1976 (after a jump of 27,000 between 1974 and 1975) coincided with FRELIMO's equivocal attitude to migrancy and its reorganization of the WNLA recruiting apparatus in that country.” For a discussion of the relationship between the South African labor recruiters and the Malawian government, see Chirwa (1996).

³⁶From 370,312 in 1970 to 399,123 in 1979.

within South Africa and was collected from the TEBA archive at the University of Johannesburg. The scaling up of domestic recruiting after the shocks is clear.

As detailed later, the mining industry did not just switch to greater domestic sourcing of labor. It also raised wages, changed contractual terms to incentivize workers to stay longer on a mine during a tour, and provided incentives to return to the same mine on future tours. There was also a push towards greater mine mechanization.

II.C Empirical Strategy

The discussion in the previous section suggests that the effect of increased mine recruitment within South Africa would be most felt in those districts in which, for historical reasons fixed primarily by the politics of the early Union, mine recruiting was permitted. While mining companies tried to widen the net for recruiting, their political overtures to government to expand geographic labor sourcing were ultimately unsuccessful in the wake of vigorous opposition from the farm lobby (Crush, 1993). This informs the basic empirical approach which is to compare outcomes in districts open to mine recruiting to those closed. In terms of *economic outcomes* this means comparing wages, employment and the adoption of combine harvesters. In terms of *political variables* this means comparing voting outcomes for parties favoring some loosening of the labor controls underpinning Apartheid with the outcomes of more conservative parties opposed to any loosening. I add controls and sample restrictions to test the robustness of this basic analysis, and repeat the analysis on a set of “placebo districts” that the mining companies identified as suitable for recruiting (and unsuccessfully lobbied to open). I supplement this analysis with a study of mine level outcomes on output and political activity (strikes), as a function of exposure to this shock to labor supply.

The logic of this paper is to examine how economic shocks are filtered through political institutions to produce structural changes in the economy, which then changes the institutions themselves.³⁷ This can be illustrated as

$$\begin{aligned} \text{shock} | \text{institutions}_0 &\Rightarrow \text{technology choice} \Rightarrow \text{institutions}_1 \\ (\text{labor supply} | \text{open}) &\Rightarrow (\text{combines}) \Rightarrow (\text{voting}) \end{aligned}$$

The Apartheid institutions of labor control shaped the response to the external shock which then fed back into differential support for institutions (proxied by voting out-

³⁷Note also that in important senses, structural change can be an endogenous response to the static political equilibrium — there is evidence that in some cases, innovation and mechanization within South African industry was a response to the strong controls on the labor market. This was self-undermining, in the sense of Greif and Laitin (2004).

comes).

II.C.1 Conceptual Framework

Consider a farmer in a district d in year t producing agricultural goods at a fixed price according to technology $A_d F(K_{dt}, L_{dt})$. Capital is mobile across districts and labor is supplied inelastically. In this setting capital (combine harvesters) and labor are taken to be substitutes.

In open districts blacks can earn an outside wage w_m from working on the mines so that $w_o = w_m$. For farm workers in closed districts there is an added cost of possible punishment, p , should they attempt to work on the mines outside their designated occupation and district, so that $w_c = w_m - p$.

The cost of punishment is determined as a function of the political equilibrium. Farmers lobby their representatives over many dimensions: the provision of credit for capital investment, agricultural extension services, as well as (in the closed districts) the strength of the punishment for labor mobility. Capital choice and labor input are fixed in the usual way but in closed districts there is also a parameter, p , for the level of punishment (exerted through the political system, for example via representations by the Agricultural Union). In the closed districts this means:

$$A_c F_K(K, L) = r \quad (1)$$

$$A_c F_L(K, L) = w_m - p \quad (2)$$

whereas in the open districts the p is dropped from the final equation given that the institutional structure inherited from 1911 does not permit them to exclude mine recruiting.

Following an increase in the mining wage w_m the equilibrium wage in both districts rises, but relatively less in closed districts since they optimally also substitute an increase in political pressure (which raises the equilibrium p) through threats to leave the National Party for the far right which will be realized variably across districts. Hence I expect the observed wage and optimal capital labor mix to rise relatively more in open districts. The increase in punishment p corresponds to an increase in vote share for the right-wing parties in closed districts. Hence I also expect to see relatively higher (lower) support for the right in closed (open) districts.

II.C.2 Comparing open and closed districts

Baseline differences. I first compare the baseline characteristics of districts ‘open’ and ‘closed’ to mining recruitment in 1972, before the shocks to the supply of labor from the changes in Malawi and Mozambique. While these types of districts were different on average, when comparing open and closed districts in the same economic regions they are not statistically distinguishable. The location of open and closed districts is illustrated in Figure 1. The figure shows the districts open to mine recruiting in 1970 with a dark shade. In the other districts recruiting was entirely prohibited.³⁸ The grey shaded regions are those districts closed to recruiting, but identified by the mining companies as having ‘high potential’ for recruiting in the future (provided government could be convinced to open those districts). I thus examine baseline differences by regressing district outcomes in 1972 on open status. I then repeat this regression but include economic region fixed effects. The estimated coefficients are the within-region differences for open districts.

$$y_d = \beta Open_d + \alpha_r + \epsilon_d \quad (3)$$

It is clear from Table 1 Panel A that our “treatment” districts (open) are different on average from the “control” districts (closed). Open districts have smaller average farm size, lower wages, more employees, fewer combine tractors and lower white incomes in 1970. However, conditional on economic region, the districts are indistinguishable — see Table 1 Panel B — aside from white agricultural incomes in 1970, which are 14 percent lower in the open districts.

Difference in differences. My baseline specification pools over the years 1976-79, of greatest exposure to the shock. I create a single dummy, *Post*, which takes on the value of 1 for those years and I estimate differences between open and closed districts, relative to the excluded base year of 1972. Outcome *y* in district *d* and year *t* is regressed on economic region cross year fixed effects, district fixed effects and open status. My identifying assumption is that open districts would have changed in a way similar to closed districts (in the same economic region), in the absence of the foreign mine labor supply shock which differentially exposed districts open to mine recruiting.

$$y_{dt} = \beta Post_t \times Open_d + \gamma_t X_d \alpha_t + \alpha_{rt} + \alpha_d + \epsilon_{dt} \quad (4)$$

³⁸There was some leakage. Crush (1993) reports that at 1970, 12% of the 90,322 black mineworkers recruited from white South Africa and the bantustans were recruited from ‘closed’ districts.

In practice I control for other characteristics (X_d) of the district that might explain different changes. In particular, I control for the percent of maize production in 1963 interacted with the outcome year. The specification allows the effect of maize suitability (proxied by 1963 output) to change over time (for example there might be particular price shocks or technology changes affecting maize). I also weight the regression by the share of the population that is black and rural in 1960.³⁹ Standard errors are clustered at the district level to account for district level heteroskedasticity and within-district time correlation.

To examine dynamics, I also estimate year-specific differences between open and closed districts, relative to the excluded base year of 1972.

$$y_{dt} = \beta_t Open_d + \alpha_{rt} + \alpha_d + \gamma_t X_d \alpha_t + \epsilon_{dt} \quad (5)$$

Coefficient β_t can vary by year, so its interpretation is the average difference between our open districts and closed districts in that year, relative to 1972.

In terms of agricultural outcomes I am interested both in the effects of the shock on factor prices (does the cost of farm labor increase on farms competing with mines for labor?), and also in whether higher wages induced the adoption of labor-substituting technology (in particular the combine-harvester). This I define as “agricultural modernization”.

For voting outcomes the basic specification I run is similar to the agricultural outcomes; I regress electoral division-year level outcomes (relative to the 1970 elections) on economic region by year fixed effects, year by maize production in 1963 interactions, and a dummy for the 1977 and 1981 elections interacted with open status. Similarly to our baseline specification above, I weight by the proportion of the black population in that district which is rural. Standard errors are clustered at the electoral division level to account for division level heteroskedasticity and within-division time correlation.

II.C.3 Comparing Mines

The basic specification for information about mine output and political activity is

$$y_{mt} = \beta Post_t \times MMShare_m + \alpha_m + \alpha_t + \epsilon_{mt} \quad (6)$$

where $MMShare_m$ is the share of Mozambican and Malawian miners of all miners at mine m in 1967, y_{mt} is the outcome (output or political action) on mine m in year t , α_m

³⁹This is the last year for which urbanization status is available.

is a mine fixed effect and α_t is a year fixed effect. *Post* takes on the value 1 after 1976 and is otherwise 0. Standard errors are clustered at the mine level to account for mine level heteroskedasticity and within-mine time correlation.

III Evidence on Economic Outcomes

I now illustrate how the changes in mine recruiting spilled over onto agriculture particularly in those areas directly competing with mining for labor. I show how in the open districts, agricultural wages increased significantly more between 1976 and 1979 relative to the closed districts. Furthermore, the adoption of combine harvesters similarly increased in the open districts relative to the closed, suggesting substitutability between workers and combines. These findings are robust to various controls, including the status of tenancy ‘reform’ in that district, the level of white agricultural incomes, and the inclusion or exclusion of the four ‘independent’ homelands (Transkei, Bophutatswana, Ciskei, and Venda). I also perform a placebo regression on the set of closed districts identified by the mining recruiter as ‘high potential’ for recruitment. There was no similar response in those districts to the mining sector shock.⁴⁰

III.A Effects on farms

III.A.1 Baseline results

Wages. My results show wages rise differentially in the open districts. When I collapse the year by open interactions into a single variable for open status for 1976 to 1979, consistent with the main identification assumption, the results in Panel A of Table 2 show that over this time period the wages in open districts were significantly higher by 0.152 log points relative to closed, conditional on economic region. Column (1) of Table 3 reports estimated differences in black wages for regular farm workers in open districts relative to closed in various years, following estimating equation 5. We see the largest difference by magnitude in 1976, where the difference (conditional on economic region by year fixed effects, and district fixed effects) is 0.217 log points. Though the difference is not statistically significant in 1976, it is significant at the 10% level in 1978. These dynamics are shown in Figure 5. Thus while agricultural wages

⁴⁰The effects of the shock to foreign labor supply on the South African countryside may have been somewhat attenuated by contemporaneous changes in agricultural organization in South Africa and by the ramping up of recruiting operations elsewhere in Southern Africa (in Lesotho, Swaziland, and Botswana). I detail the changes brought about by the ending of the system of labor tenancy in appendix C. These changes, including evictions of blacks from white farms to the Bantustans resulted in an increased number of unemployed blacks willing to work on the mines by the 1970s. Later I show that my findings are robust to these changes.

across the country rose over this time period, the increase was even greater in those areas exposed to competition from mining following the shock to the supply of Malawian and Mozambican labor.

Employees. The relative number of regular black employees falls in the open districts. In columns (2) and (3) of Panel A of Table 2 I report the coefficients from the regression with a single open status interaction over 1976–1979. Conditional on economic region the number of regular black employees on farms was 0.087 log points lower in open districts than closed, and this result is significant at the 10% level. The wage bill was also higher but this was not statistically significant. Columns (2) and (3) of Table 3 similarly report estimated differences in the number of black regular employees on farms, and the total black regular employee wage bill, in open districts relative to closed. As expected, the former decreases from 1976 (and is significantly lower by 0.100 log points in 1978) while the latter increases (0.190 log points in 1979).

Mechanization. Farmers in open districts add more combine harvesters. Columns (1), (2) and (3) of Panel B of Tables 2 and 4 report year by open status differences for combines, power combines and all tractors. While combines and power combines increased in open districts relative to closed, the differential impact is not visible when one aggregates over all tractor types. But the difference between tractor types is important — as has been outlined by historians using survey evidence of individual magisterial districts. De Klerk (1984) sets out the important distinction between ‘hand harvesting’ — by which is meant reaping by hand and threshing using a tractor — and ‘combine-harvesting’ which means doing both reaping and threshing with the same machine, a ‘combine’ harvester.⁴¹ De Klerk’s work is based on a survey of 6 (closed) districts in a particular economic region of South Africa. He finds for those districts an increase between 1968 and 1981 from 25% of combine-harvested maize to 95%, with a particular increase between 1973 and 1977. What Panel B of Tables 2 shows is that this increase was *relatively larger* in open districts. De Klerk argues that in the period between 1945 and 1970, the adoption of tractors permitted more land to be cultivated and hence increased farmer demands for labor for harvesting, but that in contrast combines and people were substitutes. Schirmer (2004) makes similar points, and suggests also the importance of the increase in agricultural wages (driven by mine wage increases),

⁴¹As De Klerk (1984) (p.87) describes, “harvesting maize involves both reaping - that is, picking the ‘head’ or blaarkop from the stalk - and threshing, or removing the grain from the cob. Both can be done by hand or mechanically but it is many years since maize was last threshed by hand in the Western Transvaal. The basic alternatives are therefore: reaping by hand and threshing mechanically - called ‘hand-harvesting’ - or reaping and threshing with the same machine, i.e. ‘combine-harvesting’. In both cases a number of variations are possible.”

relative to the increase in the cost of combines. This is consistent with the results for employees and combines just outlined.

De Klerk (1984) also finds (p.91) important changes in the sizes of farms over the time period covered by his sample of 6 districts with the average gross surface area increasing to 1155 ha. in 1981 from 664 ha. in 1968 (with 2/3rds of this increase concentrated between 1973 and 1977). I have insufficient data to analyze average farm sizes over the country as a whole, but it would be surprising if increases in mechanization were not associated with increases in average acreage.

III.A.2 Threats to validity

An important concern is that it may be that inherent differences between open and closed districts resulted in differences between 1976 and 1979, unrelated to the shock from mining. While it is clearly not possible to control for all other potential channels, I can reject a few competing stories.

The open and closed districts were fixed by historical political negotiation and differ on some dimensions which may begin to be important from 1976. I perform a number of robustness checks to explore the importance of inherent differences between open and closed districts. I add controls for whether or not tenancy ‘reform’ has been completed in that district, the level of white agricultural incomes in 1970 (and year interactions) and the inclusion or exclusion of the “independent” Bantustans — Transkei, Bophutatswana, Venda and Ciskei (TBVC).

Column (1) of Table 5 Panel A presents the baseline results for the log differences in black regular wages between open and closed districts as a basis for comparison. Column (2) controls for whether or not the district has undergone tenancy ‘reform’ (that is, whether or not the institution of tenancy has been restricted in that district) and year interactions. If tenancy reform happened disproportionately in open districts in this time period that might translate into wage increases, but I find that the results are robust to the inclusion of these interactions also.⁴² Column (3) includes white farmer incomes in the 1970 census and year interactions. This crudely proxies for political power — we might think that farmers might influence recruiting behavior differentially across districts over this time period. I also run the baseline specification excluding all of the districts intersecting the “independent” TBVC homelands.⁴³ During this time period these regions gained nominal independence from South Africa, a process which involved some adjustments of borders. In fact Column (4) indicates that doing this

⁴²For a discussion of the changes brought about under the label ‘tenancy reform’ see Appendix C.

⁴³I use the shapefile of the TBVC homelands from the Municipal Demarcation Boards.

does not change our estimates — simply reflecting that there was very limited white agriculture in these districts.

Panels B and C of Table 5 report similar robustness checks for my results on employees and combines. Again, the results are in line with the baseline specification.

III.A.3 Placebo districts

In September 1974, the Research Department of the Native Recruiting Corporation released a memo in which they identified closed districts from which more labor might be recruited — they labeled these ‘high potential’ districts and noted that “[r]epresentations are being made to Government to relax regulations wherever possible to enable us to recruit from all areas, including urban areas and farming areas.”⁴⁴ I repeat the baseline specifications where I replace the open districts with these high potential districts. The results are reported in Table 6, Panels A and B. It is clear that there was no significant response in similar districts which were closed to mine recruiting. There was very limited “opening” of closed districts in response to the shock. As reported in Crush (1993), 4 farming districts were opened to mine recruiting on an “experimental” basis in late 1976. The total number recruited from those districts in 1976 and 1977, however, was only 1,053 people.⁴⁵

III.B Effects on the mines

I first confirm that there were mines that in the short term were forced to reduce output as a function of the shock. Output drops from 1976 differentially in the mines dependent on these workers after the shock. This confirms the impression conveyed by Figures 2 and 4 that 1976 was the year in which the effects of the labor supply shock began to be felt acutely. In Table 7 Column (1), I present a mine-level regression of mining output on mine fixed effects, and an interaction between the share of Mozambican and Malawian workers at that mine in 1967 and a dummy for the years 1976 to 1979.⁴⁶ Output was 1.3% lower in those most exposed mines.

There were a number of changes in policy on the mines, and in terms of mine recruit-

⁴⁴The memo is titled “Recruitment in South Africa”.

⁴⁵Crush (1993) also indicates that there may have been a few thousand recruits from closed districts in those years also. While it is likely that there were leakages across districts, it is also apparent that the recruiting intensity within open districts was far greater.

⁴⁶WNLA referred to mine workers from Mozambique and Malawi as ‘East Coast’ and ‘Tropical’ respectively. The latest year for country \times mine recruiting data I was able to locate in the TEBA archive at the University of Johannesburg was 1967. This is problematic because the share of East Coast and Tropical workers rose further between 1967 and 1974. There is thus likely some attenuation bias.

ing, resulting from this shock: Most directly, and as discussed above, the sourcing of black mine labor shifted towards South Africa. But also, wages were increased and working conditions improved. Less directly, there was the implementation of a policy of labor force “stabilization” (keeping mine workers at mines longer, with more returning workers), and greater mine mechanization.

III.B.1 Changes in labor policy

TEBA’s five year plan set out the broad pillars of a new recruiting strategy: greater domestic sourcing, wage increases, and improved incentives for longer duration stays on the mines.

Higher Wages. The average annual pay rate for blacks in mining and quarrying increased in real terms from R235 in 1972 to R606 in 1976 (a real increase of 158%. It would rise to R651 by 1979. The nominal increase over the same time was 604%) (Lombard and Stadler, 1980). Over the same time period, the increase in real wages for blacks in manufacturing was from R643 in 1972 to R859 in 1976 (a real increase of 34%, and R897 by 1979). As reported by (*ibid.*), this sharp increase in black mine wages meant that the ratio of white to black pay on mines fell from 19.8 times in 1970, to 6.7 times by 1979. Nominal wages *per ton milled* increased from R3.77 in 1971 to R9.79 in 1976, in real terms an increase of 53%. The 1977 five year-plan recommended that wages be increased further still, though from then, “in the order of 10% per annum should be sufficient”. Furthermore, it recommended improved financial services for remittances and savings.

Stabilization. The effect of the compositional change of labor was important with respect to *turnover*, since the preference of South African workers was for shorter contracts in comparison to workers recruited from Malawi and Mozambique. The five year plan notes that “clearly this situation is unsatisfactory and we should plan for greater stability through both incentives to stay and disincentives to go [...]”. It also expresses a desire for more selectivity, and recommends building systems which would reward ‘good service’ and create incentives for workers to return to particular mines. The mining companies and TEBA introduced various contractual changes towards these ends, including *Voluntary Re-engagement Certificates* which rewarded workers through bonuses for renewing employment at the same mine. In addition, there were other developments such as improved retirement benefits for ‘long service’.⁴⁷ Cobbe (1986)

⁴⁷The 1976 Annual report of the Chamber describes (p.29), ‘The formulation of an improved retirement benefit scheme for Asiatic, Black and Coloured employees referred to in the 1974 and 1975 annual reports was completed during the year with the introduction [...] of a new long service award scheme.’

compiles data for mine workers from Lesotho showing average contract length increasing from 11 months (the average between 1967 and 1977) to 16 in 1979.

There is evidence that these measures were to a some extent successful in stabilizing the labor supply. As described in Giliomee and Schlemmer (1985), by the early 1980s TEBA was no longer employing its network of labour agents and runners to source workers from remote areas. They argue that while in the past poor conditions for agricultural production in the homelands increased labor supply, seasonal fluctuations by then were less relevant.⁴⁸

III.B.2 Mine Mechanization

A further response of the industry to the combination of increased price of gold and reduced foreign labour supply was to emphasize the importance of capital investment. It is notable that Capital Expenditure only began to be reported in the annual report of the Chamber from 1973. Capex rose rapidly in the years following.⁴⁹

IV Evidence on Political Outcomes

I now look at political consequences from the changes in economic structure identified in the preceding sections. I first consider differences in voting outcomes across open and closed districts. The voting outcomes are more infrequent than the agricultural surveys, and the assignment of electoral divisions to magisterial districts is with some error, so results presented here should be handled with care.

I then present some suggestive evidence that the labor supply shock was associated with greater political activity by black workers on the mines. I discuss how this may have influenced and been reflected in structural changes in labor organization on the mines.

Giliomee (1995) classifies the different potential interpretations of the halting apartheid reforms started in the late 1970s and early 1980s into 'elite initiative', motivated by the skills shortage which had developed; and 'elite response' to black labor protest. Each of these stories likely has some merit. It is clear that this period saw the start of the appearance of opposition to NP rule, noticeably from within the party. During the 1980s, there were important shifts to the (new) rightwing parties, increasing their share from

⁴⁸They write (Giliomee and Schlemmer, 1985, p.72) "in the past [...] bad rains brought increased interest in wage work on the mines. But in 1982, the widespread drought brought almost no increase in the labour available to the mines [...] a TEBA official observes 'the question of seasonal rains and droughts has much less effect than it did 10 years ago.' "

⁴⁹Appendix E traces out the history of changes in strategy of the Chamber of Mines through the lens of its annual reports.

14% in 1981 to 30% in 1987 (a pickup of 22 electoral seats) (Rooyen, 1994). In the election in 1987 the Conservative Party (CP) became official opposition in parliament, in addition to displacing the HNP as the primary far right party. Rooyen (*ibid.*) notes that their support was mainly in the Transvaal and Free State, and in particular in *agricultural and mining towns*. The NP shed further seats to the right in the general election of 1989, but in addition lost votes on the left. I will provide evidence in this section that it was precisely in agricultural and mining towns in closed districts which abandoned the NP to the right.

IV.A Comparing open and closed districts

Column (1) of Table 8 (Panel A) reports estimated differences in the cumulative vote share for parties to the right of the National Party, while Column (2) of Panel A reports the differences in the sum of the vote share for the ruling National Party and parties to its left. The results suggest that following the shock to mining, and the structural changes in agriculture, the 1977 and 1981 may have seen increased support for some of the reforms the National Party was introducing. Charney (1984) gives an essentially class-based, analysis for the loss of some agricultural seats in this period, arguing that the government became perceived as too much in favor of big farmers, “its relaxation of labour and racial policies is regarded as threatening black labour supplies and the whole labour-repressive system on which small farmers, particularly, depend. There has been a big swing to the right, mostly to the CP, among [...] the maize men, who depend heavily on government decisions on the price of inputs and produce.”

Charney (*ibid.*) also argues that the increase in far right support during the 1980s emanated from white working class opposition to National Party policies. In addition to small farmers, he also notes the strong opposition to any reforms (and an increase in the militant right) among white mine workers for example, who opposed the ending of job reservation, while government sided with mine management. We have seen that important changes had occurred in mining recruitment, capital intensity, and labor organization by the start of the 1980s.

IV.B Developments on the mines

Throughout the 20th century white mineworkers jealously guarded their relatively privileged positions, primarily through the Mine Workers’ Union (MWU). Their political strength was first felt during the strikes in 1922 (the “Rand Revolt”) against the threat of mine owners using more black labor and in more skilled positions. It required the use of the army by Prime Minister Smuts to suppress the rebellion. There was no

serious challenge to the white mineworkers (or the fixed 8:1 black:white labor input ratio) until the 1960s.⁵⁰ And, in fact, it would only be with the structural changes of the 1970s that the old institutional arrangements would begin to change.

Table 7 (Columns (2) and (3)) investigates whether the shock to the supply of foreign labor was associated with an increase of strikes and other workplace interruptions (Lemon, 1984). Indeed, there is suggestive evidence that the mines most exposed to the shock also had an increase in strikers injured or killed. Horner and Kooy (1980) (p.10) classify the majority of “disturbances” as relating to ethnic differences. In particular, they argue that (p.23) “the sources of conflict are to be found in such factors as differential treatment of workers, different lengths of contract, and differential access to jobs [...] it is in the interests of management to suppress forms of class consciousness in the work force and rather to encourage forms of national or tribal consciousness”.⁵¹ The analysis here suggests that the compositional changes in the work force helped to make the strike activity so acute.

The series of strikes is important for helping to understand some of the changes in strategy on the mines. Following the shock there were renewed demands by the mining industry leaders first for a “stabilized” black labor force around the mines, and second, for deregulation of the racial controls on semi-skilled and skilled work. The moment of the entirely transitory, low wage, migrant laborer had passed.⁵²

Two commissions. In 1977, A.C. Peterson, member of the council of the Chamber of Mines would argue, “the industry’s long-term aim must [...] be to eliminate work restrictions and job reservation and convince our White employees that this, by raising of the whole South African economy, can only be to their advantage as well as the advan-

⁵⁰But, even then, the changes that were instituted under the new agreement in 1967 were (Wilson, 1972) “a triumph for the trade unions ... the lion’s share of any increases in productivity due to the elimination of some restrictive practices [i.e. restricting blacks from certain occupations] would go to white worker”. Whites would work less, for more pay (the total white wage bill rose by 11%). (White) management and (white) labor could only agree to Pareto-improving bargains over the extra surplus generated by the greater application of black labor.

⁵¹In his 1975 address, the President of the Chamber of Mines would state, “the strikes and disturbances on the mines resulted in a number of deaths during the year [...] the great majority arose from inter-tribal clashes”.

⁵²Chairman of Anglo American Corporation and De Beers Consolidated Mines, Harry Oppenheimer, argued at a meeting of the Chamber of Mines in 1975, “[t]he time has clearly gone by, never to return, when we sought to control the level of costs in the industry by keeping wages down. We have got to control costs in future, not by low wages, but by high productivity [...] We are not going to be able to count [...] on solving our problems by a great influx of totally unskilled workers, a great many of them foreign [...we should] increase the percentage of Black workers who are South Africans, and we should increase the time they spend in the industry, so that the skills they acquire when working with us are not allowed to go to waste [...] you have got to house them with their families, and there we need the co-operation of the Government[...].” Chamber of Mines South Africa, *85th Annual Report*.

tage of the Blacks.” In the same year the government launched two major reviews of aspects of labor legislation in South Africa, the Wiehahn and Riekert Commissions.⁵³ Part 6 of the final Wiehahn Commission report concerning Labour Legislation and the mining industry was published 30 September 1981. The changes emanating from the Wiehahn Commission were to open up a number of new semi-skilled jobs to blacks on the mines. Black mine workers were now working in a more capital intensive setting, and for longer stays. Various other important regulatory changes happened around this time the effect of which was to improve the bargaining position of black employees. Importantly, the establishment of black trade unions was made possible in 1981.⁵⁴ Resistance to these changes by the unionised white artisans on the mines was fierce. Positions such as “blaster” in mining were some of the last to be removed from the “colour bar”. The series of labor reforms following the Wiehahn commission reached mining last (indeed government withheld the mining report until the end). In Table 8 Panel B I report results from the regression of electoral division outcomes (right share and NP or left) on year by mining district interactions and year by National Party vote share in 1970 interactions. *minedistrict* is simply a dummy for whether the electoral division contained a mine. As is clear from Column (1), the share of the conservative white right increases dramatically in mining districts during the 1980s.

Black Labor is organized. Ultimately, the employers’ association (the Chamber of Mines) and the largest black trade union (the National Union of Mineworkers — NUM) found themselves arguing on the same side for the end of the color bar. NUM was formed in 1982 and quickly became the most important union on the mines.⁵⁵ Its membership was 40 percent of the black workforce on the gold mines and collieries, and in the Chamber’s words it came to “[dominate] the industrial relations scene, both nationally, through its influence in COSATU, and in the industry.”

V Conclusion

This paper reveals some of the fault lines of the Apartheid South African state. The links between extractive political and economic institutions in the stark South African context sheds light on fundamental features of the interplay between economic and

⁵³The Chamber expressed support for reduced discrimination against blacks on the mines. The Chamber’s President, in his annual address of 1978 would report, “[t]he Chamber submitted detailed evidence [...the Chamber] welcomes these urgent enquiries aimed at the removal of discrimination in the workplace [...] non-White workers must be absorbed into the skilled labour pool.”

⁵⁴This was an outcome of the Labour Relations Amendment Act (No 57 of 1981. We discuss in more detail in appendix D the history of white labor protection and the slow liberalization of these controls.

⁵⁵After being recognised by the Chamber of Mines in June 1983 it had 6000 employees. This grew to 40,000 by December 1984, and 187,000 by mid-1987. See Appendix E for more detail.

political development and, in particular, the role of labor controls. I have collected and digitized important novel datasets and provided some of the first evidence on the economic determinants of the stability of the apartheid regime.

Specifically, the paper has shown how the geography of recruitment between mining capital and white farmers — managed by the use of external unskilled labor in mining — was changed by the shocks to foreign labor supply in the first half of the 1970s. Using the variation in geographic incidence of the shock I show how it changed economic structures and interests, and perhaps influenced political preferences.

Future work will explore the long-run effects emanating from these changes — in terms of persistent economic outcomes and political consequences. In ongoing work, I and collaborators examine in more depth the important role of labor conflict and labor unions during the late 1970s and 1980s. In particular, Naidu, Turban, and Wilse-Samson (2014) study the economic incidence of politically and economically motivated strikes in this period. The powerful National Union of Mineworkers would have an important role in the transition to democracy. As described in the 1987 Annual Report of the Chamber of Mines, “NUM initiated a costly three-week strike [...] the industry sought to view and handle the strike as an industrial dispute, but the evident underlying aim with the strike was to demonstrate wide worker support for an agenda ranging from sanctions to seizure of control of the national economy.”⁵⁶ What is clear from the analysis in this paper is that the strength of the labor movement in general was aided by the changes on the mines in the mid- to late 1970s.

Much more historical data remains untapped, and many important questions about South Africa’s economic and political development remain understudied. South Africa is an important case study for the relatively peaceful transition out of non-democracy. This analysis has suggested that one potential mechanism was the reduced reliance on labor controls resulting from technology substituting for labor. But, the country’s unemployment rate has remained trapped at extraordinarily high levels for decades following transition, perhaps reflecting in part a historically “too” capital intensive growth path.⁵⁷ Mechanized mining and agricultural jobs have never been replaced. Understanding why and where development went wrong is the *sine qua non* for effective growth strategies today. This paper suggests that part of the answer might lie in the important changes of the 1970s.

⁵⁶NUM was headed by Cyril Ramaphosa —who would later become the chief negotiator for the ANC during the constitutional negotiations around the end of Apartheid. Today Ramaphosa is ANC deputy president.

⁵⁷As noted in Spandau (1980), the Minister of Economic Affairs reported to Parliament in February 1977 concerns about the economy’s increasing capital-intensity.

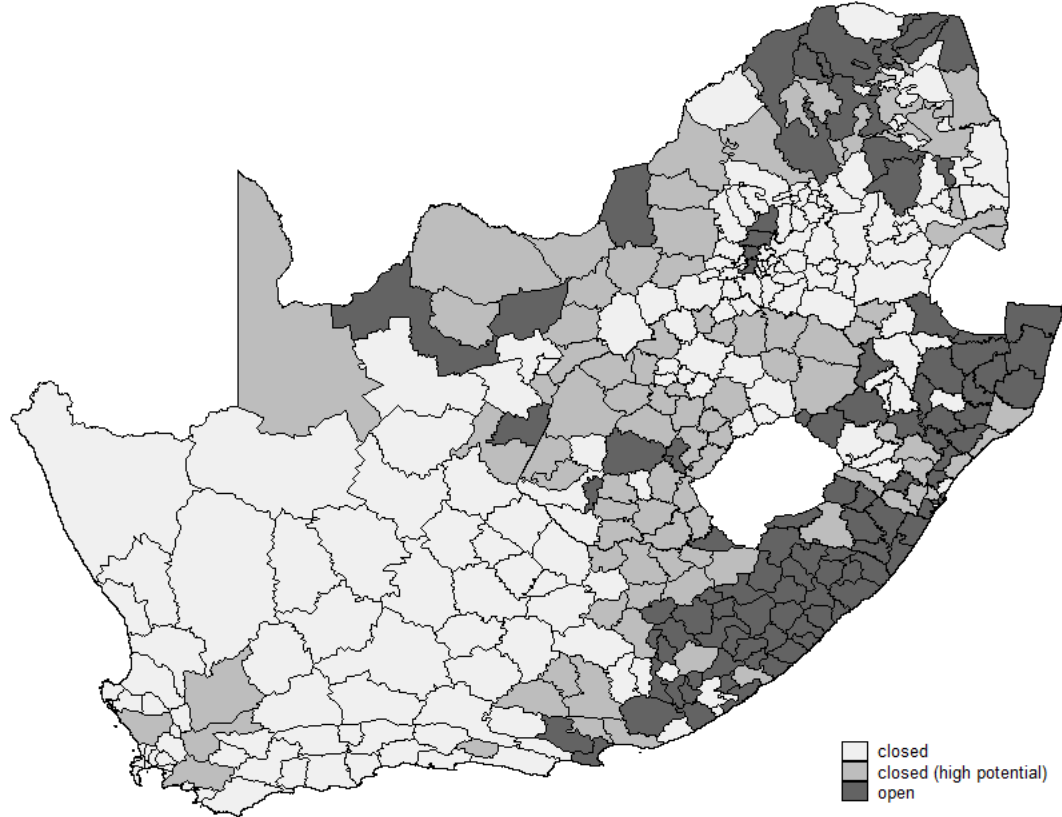
References

- Acemoglu, D. (2010). "When does labor scarcity encourage innovation?" In: *Journal of Political Economy* 118.6, pp. 1037–1078.
- Acemoglu, D. and J. Robinson (2006). *Economic Origins of Dictatorship and Democracy*. New York: Cambridge University Press.
- (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Crown Publishers.
- Alston, LJ and KD Kauffman (1997). "Agricultural chutes and ladders: new estimates of sharecroppers and 'true tenants' in the South, 1900—1920." In: *The Journal of Economic History* 57.2, pp. 464–475.
- Atkinson, Doreen (2007). *Going for broke: The fate of farm workers in arid South Africa*. Human Sciences Research Council.
- Bonner, P. and K. Shapiro (1987). "Company estate, company town: Pilgrim's Rest 1910-1932." In: *University of Witwatersrand. African Studies Seminar Paper* 223.
- Botha, S. (1996). "South Africa's Party System." In: *Journal of Theoretical Politics* 8.2, pp. 209–225. ISSN: 0951-6298.
- Bradford, Helen (1990). "Getting Away with Slavery: Capitalist Farmers, Foreigners and Forced Labour in the Transvaal, c. 1920 - 1950." In: *University of Witwatersrand. History Workshop*.
- Case, A. and A. Deaton (1999). "School Inputs and Educational Outcomes in South Africa." In: *Quarterly Journal of Economics* 114.3, pp. 1047–1084.
- Charney, C (1984). "Class conflict and the National Party split." In: *Journal of Southern African Studies* 10.2, pp. 269–282.
- Chirwa, WC (1996). "The Malawi Government and South African Labour Recruiters, 1974-92." In: *The Journal of Modern African Studies* 34.4, pp. 623–642.
- Christopher, AJ (1983). "Parliamentary delimitation in South Africa, 1910-1980." In: *Political Geography Quarterly* 2.3, pp. 205–217. ISSN: 02609827.
- Cobbe, James (1986). "Consequences for Lesotho of changing South African labour demand." In: *African Affairs* 85.338, pp. 23–48.
- Crankshaw, Owen (1997). *Race, Class and the Changing Division of Labour under Apartheid*. London: Routledge.
- Crush, J. (1993). "'The Long-Averted Clash': Farm Labour Competition in the South African Countryside." In: *Canadian Journal Of African Studies* 27.3, pp. 404–423.
- Crush, J. and W. James (1995). *Crossing Boundaries: Mine Migrancy in a Democratic South Africa*. Ed. by Jonathan Crush and W James. IDASA and IDRC. ISBN: 1874864128.
- Crush, J., A. Jeeves, and D. Yudelman (1991). *South Africa's Labor Empire: A History of Black Migrancy to the Gold Mines*. Boulder: Westview Press.
- Davies, Robert et al. (1976). "Class struggle and the periodisation of the state in South Africa." In: *Review of African Political Economy* 3.7, pp. 4–30. ISSN: 0305-6244.
- De Klerk, M (1984). "Seasons that will never return: the impact of farm mechanization on employment, incomes and population distribution in the Western Transvaal." In: *Journal of Southern African Studies*.
- Dell, Melissa (2010). "The Persistent Effects of Peru's Mining Mita." In: *Econometrica* 78.6, pp. 1863–1903. ISSN: 0012-9682.

- Domar, ED (1970). "The causes of slavery or serfdom: a hypothesis." In: *The Journal of Economic History* 30.1, pp. 18–32.
- Duncan, David (1995). *The Mills of God: The State and African Labour in South Africa, 1918-1948*. 2nd. Johannesburg: Witwatersrand University Press.
- Evans, I (1997). *Bureaucracy and Race: Native Administration in South Africa*. Berkeley: University of California Press.
- Friedman, Milton (1962). *Capitalism and Freedom*. Chicago: University of Chicago Press.
- Giliomee, Hermann (1995). "Democratization in South Africa." In: *Political Science Quarterly* 110.1, pp. 83–104.
- Giliomee, Hermann and L Schlemmer, eds. (1985). *Up against the fences*. New York: St Martin's Press.
- Greenberg, Stanley (1980). *Race and State in Capitalist Development: South Africa in Comparative Perspective*. Yale University Press.
- Greif, Avner and David D. Laitin (2004). "A Theory of Endogenous Institutional Change." In: *The American Political Science Review* 98.4, pp. 633–652.
- Habakkuk, H.J. (1962). *American and British Technology in the Nineteenth Century*. London: Cambridge University Press.
- Hornbeck, R. and S. Naidu (2013). "When the Levee Breaks: Labor Mobility and Economic Development in the American South." In: *American Economic Review (forthcoming)*.
- Horner, D and A Kooy (1980). "Conflict on South African mines, 1972-1979." In: *SALDRU Working Paper* 29, pp. 1972–1979.
- Lacey, Marian (1981). *Working for boroko: The origins of a coercive labour system in South Africa*. Johannesburg: Ravan Press (Pty) Limited.
- Lemon, Anthony (1984). "State Control over the Labor Market in South Africa." In: *International Political Science Review* 5.2, pp. 189–208.
- Lombard, J.A. and J.J. Stadler (1980). *The Role of Mining in the South African Economy: A Study prepared for the Chamber of Mines of South Africa*. Bureau of Economic Policy and Analysis, University of Pretoria.
- Lowenberg, Anton D. (1997). "Why South Africa's Apartheid Economy Failed." In: *Contemporary Economic Policy* 15.3, pp. 62–72. ISSN: 10743529.
- Magruder, JR (2012). "High unemployment yet few small firms: The role of centralized bargaining in South Africa." In: *American Economic Journal: Applied Economics* 4.3, pp. 138–66.
- Mariotti, M. (2010). "Estimating the elasticity of substitution in the South African manufacturing industry during Apartheid, 1950 — 1985." In: *Economic History of Developing Regions* 27.2, pp. 47–60.
- Moore, Barrington (1966). *Social origins of dictatorship and democracy: lord and peasant in the making of the modern world*. Boston: Beacon Press.
- Morrell, Robert (1988). "The Disintegration of the Gold and Maize Alliance in South Africa in the 1920s." In: *The International journal of African historical studies* 21.4, pp. 619–635.
- Naidu, S., S. Turban, and L. Wilse-Samson (2014). "Labor Conflict and the Economic Incidence of Institutional Change: Evidence from South Africa."

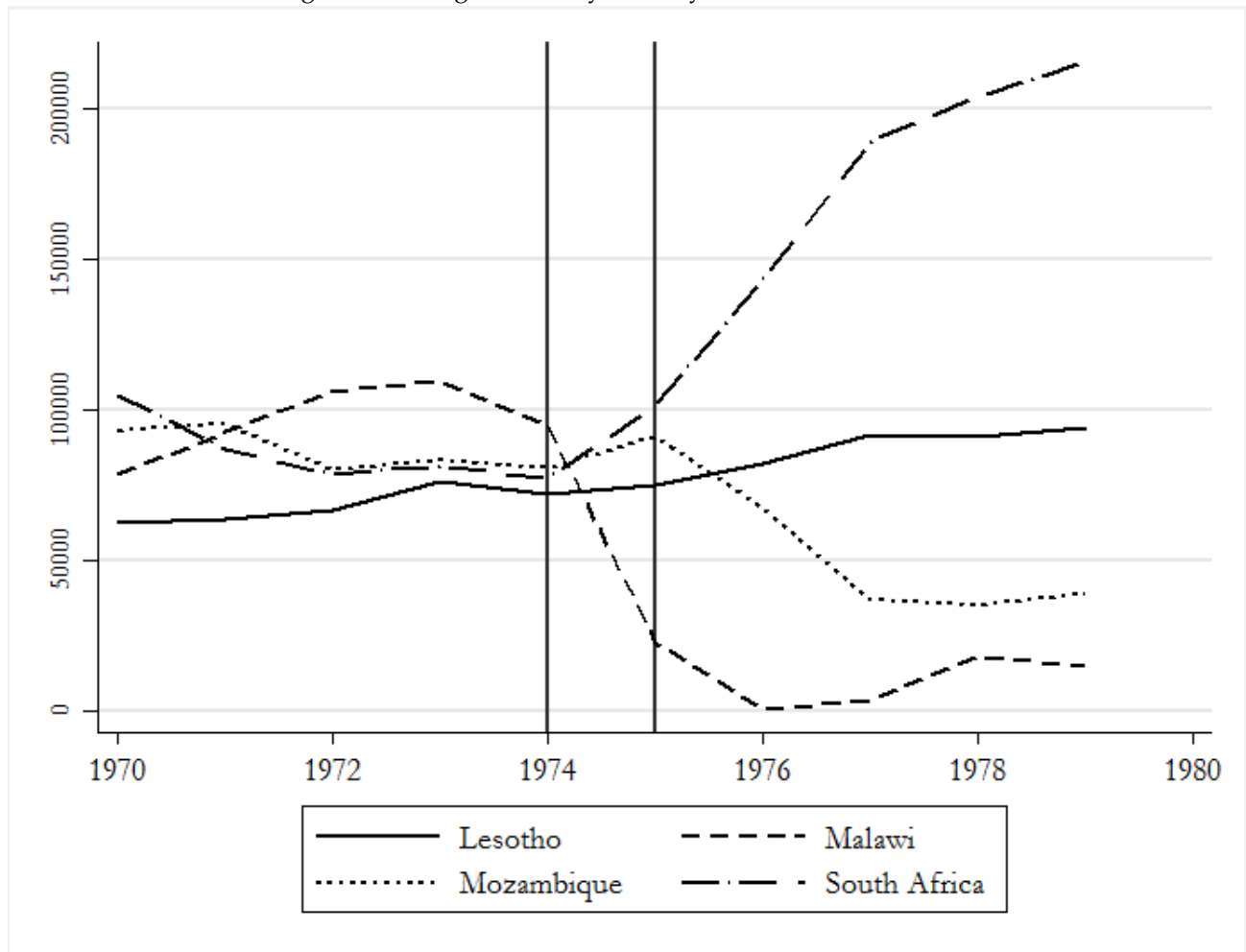
- Nohlen, Dieter (1999). "Elections in Africa, A Data Handbook — South Africa." In: pp. 1–54. ISSN: 1488-2329.
- O'Meara, Dan (1996). *Forty Lost Years: The Apartheid State and the Politics of the National Party, 1948-1994*. Ravan Press.
- Onselen, C Van (1996). *The seed is mine : the life of Kas Maine, a South African sharecropper, 1894-1985*. New York: Hill and Wang.
- Pickles, J (1988). "Recent changes in regional policy in South Africa." In: *Geography* 73.3, pp. 233–239.
- Price, TW (1953). "The South African General Election, 1953." In: *Parliamentary Affairs* 6.3, p. 258.
- Rooyen, Johann Van (1994). *Hard Right: The New White Power in South Africa*. Cape Town: David Phillip Publishers.
- Savage, Michael (1986). "The Imposition of Pass Laws on the African Population in South Africa 1916-1984." In: *African Affairs* 85.339, pp. 181–205.
- Schirmer, Stefan (2004). "Motives for mechanisation in South African agriculture, 1940—1980." In: *African Studies* 63.1, pp. 3–28. ISSN: 0002-0184.
- Schoeman, B.M. (1977). *Parlementere verkiesings in Suid-Afrika 1910-1976*. Pretoria: Aktuele Publikasies.
- Siebert, WS (1987). "Black trade unions and the wage gap in South Africa." In: *Managerial and Decision Economics* 8.1, pp. 55–65.
- Spandau, A (1980). "Mechanization and labour policies on South African mines." In: *South African Journal of Economics* 40.1, pp. 110–120.
- Steinfeld, Robert J. (2001). *Coercion, Contract, and Free Labor in the Nineteenth Century*. Cambridge, UK: Cambridge University Press.
- The Surplus People Project (1983). *Forced Removals in South Africa: Vols 1-5*. Cape Town: Surplus People Project.
- Wilson, F (1972). *Labour in the South African Gold Mines, 1911-1969*.

Figure 1: Open and closed districts (Source: Crush (1993).)



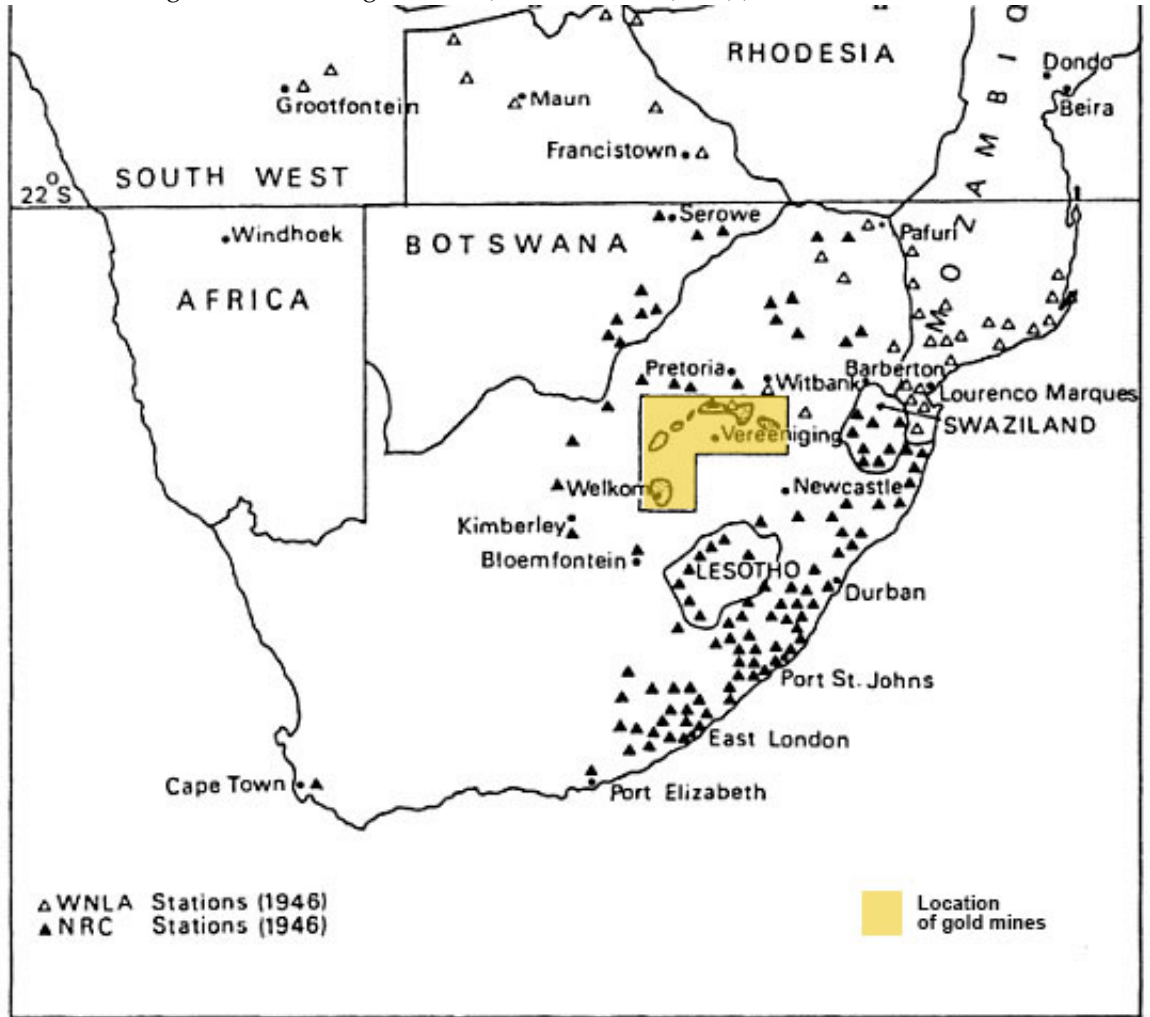
Notes: I georeferenced the map from Crush (1993) using Map Warper (<http://mapwarper.net/>). I intersected it with the district map shapefile to obtain the set of open/closed/high potential districts. I checked the resulting set of open districts against lists of recruiter licenses (issued under the 1911 Native Labour Recruiting Act) I was able to locate in the TEBA archive at the University of Johannesburg as well as the station level recruiting data available there. I checked the list of high potential districts against TEBA's 1977 memo "Recruiting in South Africa".

Figure 2: Mining Recruits by Country



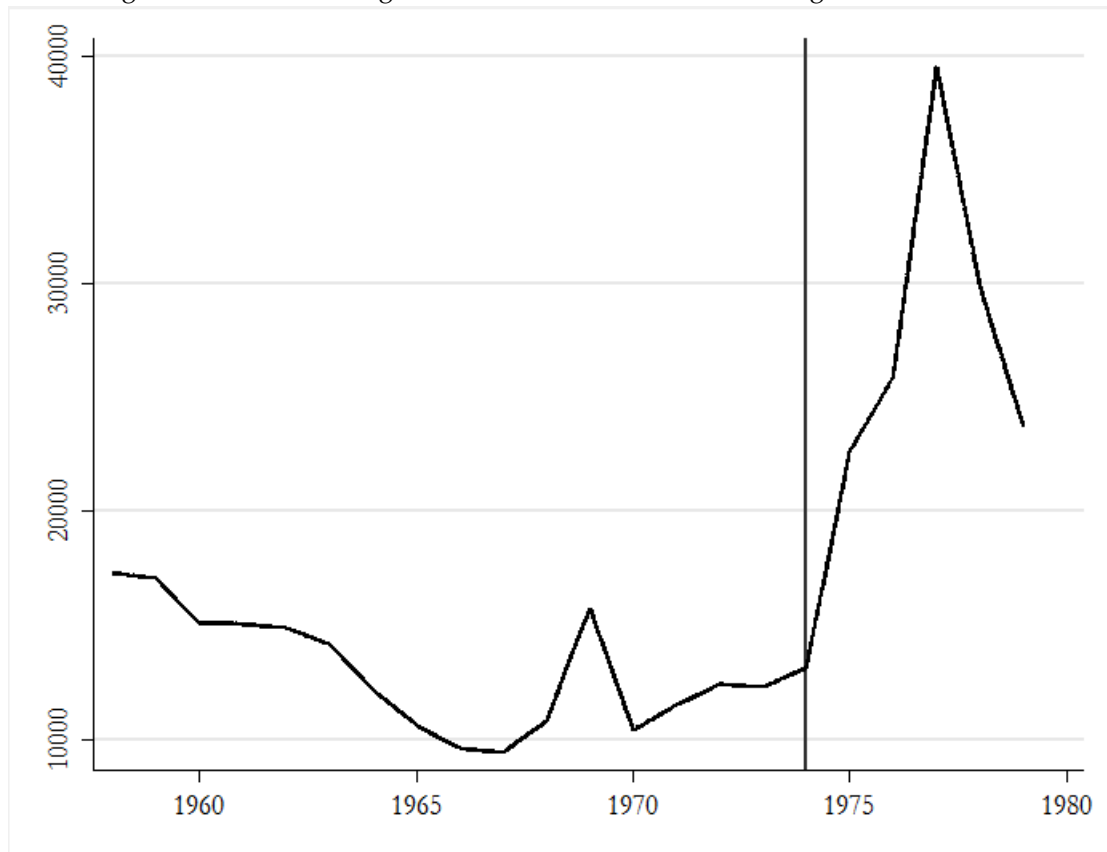
Notes: Data are drawn from the Annual Reports of the Chamber of Mines. Graphed are the series for the 4 major source countries. Not shown are Botswana, Swaziland, Zimbabwe and 'others'.

Figure 3: Recruiting Stations (Source: Crush (1993).)



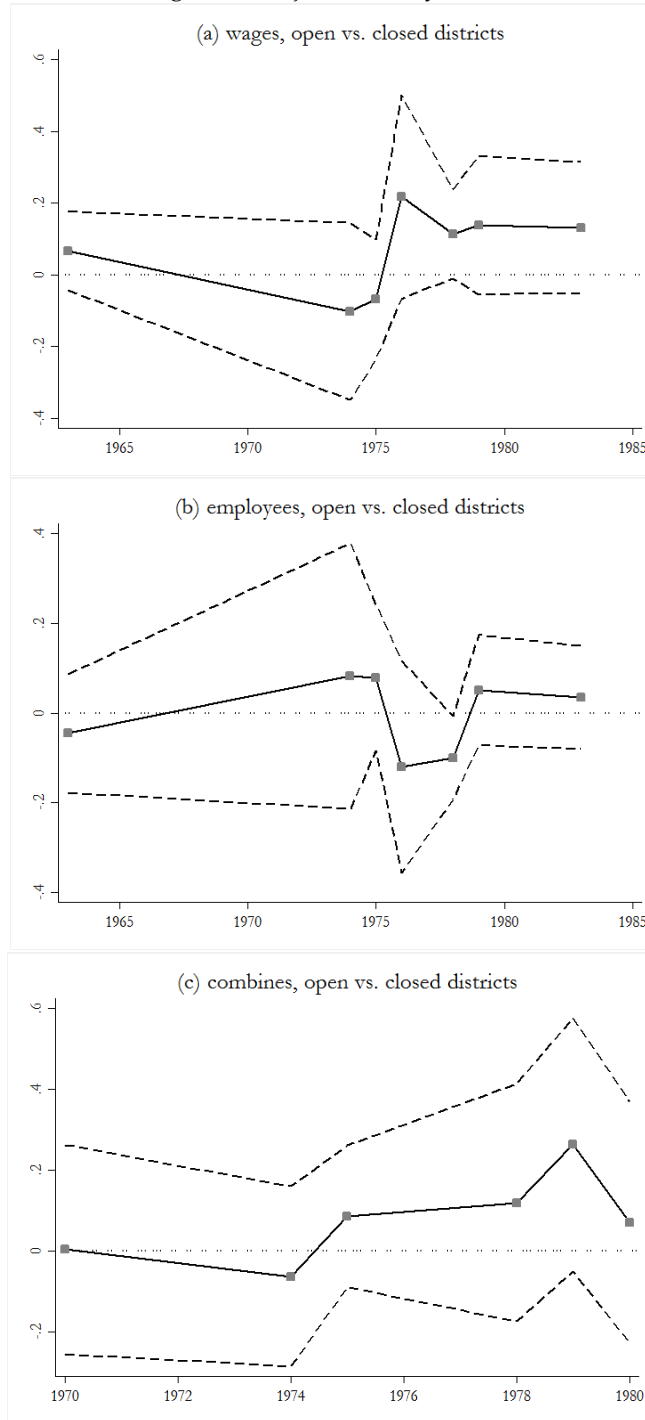
Notes: Plotted are the stations of the Native Recruiting Corporation (NRC) and the Witwatersrand Native Labour Association (WNLA). The former recruited primarily from within South Africa (south of the 22° S line of latitude) while the latter recruited primarily outside of South Africa.

Figure 4: Median Mining Recruits at South African Recruiting Stations



Notes: Graph shows the median number of recruits from NRC regional offices in South Africa forwarded to the mines. The data was compiled from the TEBA archive at the University of Johannesburg.

Figure 5: Adjustment Dynamics



Note: The coefficients are graphed according to estimating Equation 5. Confidence intervals correspond to 5% bands. Outcomes are for black regular farm workers and are relative to 1972. Data are from the Censuses of Agriculture 1963-1983.

Table 1: Difference open v closed, 1972

Panel A: Baseline comparison						
	(1)	(2)	(3)	(4)	(5)	(6)
	Farm size	Wages per worker	Farm workers	Tractors	Combines	Ag incomes
Open	-0.459** (0.192)	-0.284*** (0.109)	0.569** (0.221)	-0.201 (0.143)	-0.656*** (0.180)	-0.218*** (0.0705)
Observations	255	250	256	240	240	294
R ²	0.024	0.047	0.020	0.008	0.044	0.052

Panel B: Comparison including economic region fixed effects						
	(1)	(2)	(3)	(4)	(5)	(6)
	Farm size	Wages per worker	Farm workers	Tractors	Combines	Ag incomes
Open	-0.0516 (0.169)	-0.0578 (0.0637)	-0.127 (0.226)	0.0410 (0.156)	-0.0774 (0.254)	-0.141** (0.0676)
Observations	255	250	256	240	240	294

Robust standard errors. * p < 0.10, ** p < 0.05, *** p < 0.01

Note: 'Open' is a dummy for whether the district was open to mine recruiting at 1970. The regressions control for maize production in 1963 and year interactions, and weights for the 1960 black rural population. The regression controls for economic region fixed effects. Errors are clustered at the district level.

Table 2: Estimated differences in Wages and Workforce by Open status

Panel A: Wages and Workers			
	(1)	(2)	(3)
	Per Cap Wage	Black Employees	Wage Bill
Post × Open	0.152** (0.0723)	-0.0868* (0.0507)	0.0646 (0.0658)
Observations	1738	1749	1753
R ²	0.924	0.973	0.979
Panel B: Combines and Tractors			
	(1)	(2)	(3)
	Combines	Power Combines	All tractors
Post × Open	0.172* (0.0938)	0.137 (0.131)	0.0170 (0.0264)
Observations	1487	1060	1708
R ²	0.969	0.958	0.989

Note: Errors clustered at district level. * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions have log outcomes. Outcomes for Panel A are for black regular employees on farms. Post × Open is a dummy for whether the district was open to mine recruiting in 1970 interacted with the years 1976 to 1979. Each regression includes district and economic region × year fixed effects, and year by maize production in 1963 interactions. Errors are clustered at the district level. Outcomes are relative to 1972.

Table 3: Estimated differences in Wages and Workforce by Open status, relative to 1972.

	(1) Per Cap Wage	(2) Black Employees	(3) Wage Bill
1963 × Open	0.0669 (0.0547)	-0.0456 (0.0662)	0.0263 (0.0844)
1974 × Open	-0.102 (0.124)	0.0824 (0.148)	-0.0179 (0.0827)
1975 × Open	-0.0680 (0.0832)	0.0792 (0.0815)	0.0162 (0.0648)
1976 × Open	0.217 (0.142)	-0.120 (0.118)	0.101 (0.111)
1978 × Open	0.114* (0.0621)	-0.100** (0.0465)	0.0171 (0.0725)
1979 × Open	0.139 (0.0965)	0.0512 (0.0617)	0.190* (0.114)
1983 × Open	0.131 (0.0916)	0.0344 (0.0575)	0.168* (0.101)
Observations	1738	1749	1753
R^2	0.925	0.973	0.979

Errors clustered at district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Note: All regressions are log outcomes for black regular employees on farms. Open is a dummy for whether the district was open to mine recruiting in 1970. Each regression includes district and economic region × year fixed effects, and year by maize production in 1963 interactions. Errors are clustered at the district level. Outcomes are relative to 1972.

Table 4: Estimated differences in Combines and Tractors by Open status, relative to 1972

	(1) Combines	(2) Power Combines	(3) All tractors
1970 × Open	0.00320 (0.130)		0.00884 (0.0407)
1974 × Open	-0.0634 (0.111)	-0.143 (0.139)	-0.0133 (0.0280)
1975 × Open	0.0856 (0.0877)	-0.0447 (0.197)	0.0159 (0.0310)
1978 × Open	0.120 (0.147)	0.00442 (0.170)	-0.0142 (0.0447)
1979 × Open	0.263* (0.157)	0.141 (0.232)	0.0740 (0.0520)
1980 × Open	0.0707 (0.150)		-0.00393 (0.0519)
Observations	1487	1060	1708
R ²	0.969	0.958	0.989

Errors clustered at district level. * p < 0.10, ** p < 0.05, *** p < 0.01

Note: All regressions are log outcomes. Open is a dummy for whether the district was open to mine recruiting in 1970. Each regression includes district and economic region × year fixed effects, and year by maize production in 1963 interactions. Errors are clustered at the district level. Outcomes are relative to 1972.

Table 5: Estimated differences in Wages by Open status: Robustness to alternative specifications

Panel A: Wages per worker				
	(1)	(2)	(3)	(4)
	Baseline	Tenancy end	Ag incomes	ex. TBVC
Post × Open	0.152** (0.0723)	0.154** (0.0727)	0.158** (0.0733)	0.152** (0.0721)
Observations	1738	1738	1725	1718
R^2	0.924	0.925	0.924	0.923
Panel B: Employment				
	(1)	(2)	(3)	(4)
	Baseline	Tenancy end	Ag incomes	ex. TBVC
Post × Open	-0.0868* (0.0507)	-0.0848* (0.0505)	-0.0840 (0.0515)	-0.0868* (0.0505)
Observations	1749	1749	1736	1729
R^2	0.973	0.973	0.971	0.970
Panel C: Combines				
	(1)	(2)	(3)	(4)
	Baseline	Tenancy end	Ag incomes	ex TBVC
Post × Open	0.172* (0.0938)	0.170* (0.0917)	0.170* (0.0927)	0.172* (0.0936)
Observations	1487	1487	1483	1482
R^2	0.969	0.969	0.968	0.968

Note: Errors clustered at district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All regressions are log outcomes for black regular employees on farms. The ‘treatment’, is an interaction of open status with the years 1976 to 1979. Each regression includes district and economic region × year fixed effects. Column (1) is our baseline specification. Column (2) includes year interactions with a dummy for tenancy ‘reform’ as set out in appendix C. Column (3) for the level of white agricultural incomes in 1970 and year interactions. Column (4) runs the baseline specification excluding districts within Transkei, Bophutatswana, Venda or Ciskei. Errors are clustered at the district level. Outcomes are relative to 1972.

Table 6: Placebo: Estimated differences in Wages and Workforce by High potential status, relative to 1972.

Panel A: Wages and Workers			
	(1)	(2)	(3)
	Per Cap Wage	Black Employees	Wage Bill
Post × highpot	-0.0563 (0.0406)	-0.00311 (0.0293)	-0.0596 (0.0414)
Observations	1738	1749	1753
R^2	0.923	0.972	0.979

Panel B: Combines and Tractors			
	(1)	(2)	(3)
	Combines	Power Combines	Tractors
Post × highpot	-0.0678 (0.0562)	-0.105 (0.101)	-0.0197 (0.0194)
Observations	1487	1060	1708
R^2	0.968	0.958	0.989

Note: Errors clustered at district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All regressions are log outcomes. The 'treatment', is an interaction of 'high potential for recruiting' status with the years 1976 to 1979. High potential status is as defined by the mine labor recruiter. Each regression includes district and economic region × year fixed effects, maize suitability fixed effects, and weights by black rural population. Errors are clustered at the district level. Outcomes are relative to 1972.

Table 7: Mine-level regressions.

	(1)	(2)	(3)
	Ore mined	Number of Strikes	# Injured or killed
Post \times MM67	-0.0128** (0.00628)	0.00639 (0.00520)	0.197* (0.102)
Observations	450	416	416
R ²	0.768	0.274	0.204

Note: Standard errors clustered at gold mine level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All regressions are log outcomes. The 'treatment', Post \times MM67, is the share of workers at that mine in 1967 originating from Mozambique or Malawi interacted with a dummy for the years 1976–1979. The outcome in the first column is the tons of ore mined (in 000s). The second column outcome is a count of the number of strikes at that mine, the third is the total number injured or killed in strikes at that mine. Each regression includes mine and year fixed effects. Outcomes are relative to 1973.

Table 8: Election outcomes.

Panel A: Open vs closed districts		
	(1) Right Share	(2) NP and left
Post \times Open	-0.0324** (0.0138)	0.0340*** (0.0126)
Observations	655	655
R^2	0.949	0.832
Panel B: Mine districts vs all others		
	(1) Right Share	(2) NP and left
1966 \times <i>minedistrict</i>	0.252 (0.588)	-0.00160 (0.0155)
1974 \times <i>minedistrict</i>	-0.267 (0.186)	0.0221 (0.0156)
1977 \times <i>minedistrict</i>	-0.198 (0.162)	0.0170 (0.0138)
1981 \times <i>minedistrict</i>	0.318** (0.140)	-0.0298 (0.0338)
1987 \times <i>minedistrict</i>	0.425*** (0.149)	-0.118** (0.0507)
Observations	354	766
R^2	0.915	0.729

Note: The 'treatment', Post \times Open, is an interaction between open to recruiting status, and dummies for the 1977 and 1981 election years. *minedistrict* is a dummy taking on 1 if the electoral division (magisterial district) contained a gold mine. The outcome in the first column is the vote share of parties defined as right of the National Party, the second is the vote share of the National party and parties to its left. Each regression includes electoral division and year fixed effects. The regressions also control for maize production in 1963 and year interactions, and weights for the 1960 black rural population. Errors are clustered at the electoral division level. Outcomes are relative to 1970.

A Data Appendix

Table A.1: Summary of data sources.

Data Source	Dates:	Key Variables	Geography
TEBA annual reports to board ($T = 23$)	1957- 1979	· recruiting numbers, · remittances	regional office
Annual report Chamber of Mines ($T = 14$)	1964 - 1983	· Mine output · Capex · Profit	mine
Censuses of Agriculture ($T = 11$)	1963 - 1983	· Wages, Employees · Output by Crop · Machines	district
Stats SA Pop Trends ($T = 7$)	1904 - 1960	· population by urban- rural status by race	district
Gov Gazettes, Schoeman (1977) ($T = 7$)	1961- 1987	· vote share by party	electoral division
Horner(1980)	1972-79	· Strikes, Injuries	mine
Map of open or closed districts	1970	· Open or closed · Closed with potential	district

B Notes on White Politics

I Historical Background

I briefly outline some of the main cleavages in white politics while noting that undoubtedly the most important aspect of South African politics before 1994 was that the majority of the population was entirely disenfranchised.⁵⁸

The Union of South Africa was formed in 1910 when the four British colonies (two of which had been Boer republics before the Anglo-Boer War of 1899-1902) were joined. The South African Party was in power from 1910 to 1924⁵⁹ until it was defeated by the National Party - Labour Party 'Pact' government (Nohlen, 1999, p. 818).⁶⁰ The Pact governed until 1932 when Hertzog's National Party and Smuts' South African Party formed the 'fusion government', which would form into the United Party. This led the hardliner Nationalists to break away as the 'Purified' National Party under D.F. Malan.⁶¹ South Africa's entry into WWII on the side of the British again led many Afrikaners to split from the United Party in 1939, but Smuts became Prime Minister under a United Party-Dominion Party-South African Labour Party coalition government from 1939-1948. The Purified National Party members joined with refugees from the United Party to form the reunited NP from 1940.

It was this National Party which won power (in coalition with the Afrikaner Party) in 1948 and initiated the policy of "Apartheid". The NP would govern until 1994. The United Party, which received more votes than the National Party in 1948, but won fewer constituencies, weakened over time and dissolved in 1977. Opposition to NP rule from further left came in the shape of the Liberal Party (from 1953), which was succeeded by the Progressive Party (from 1959), the Progressive Federal Party (from 1977) and the Democratic Party (from 1989). Opposition to NP rule from the right came in the shape of the Reformed National Party (HNP) (formed 1969) and the Conservative Party (CP) (formed in 1982). These parties would split the right-wing vote in the 1980s. Davies et al. (1976) and O'Meara (1996) are important references for an analysis of intrawhite political economy. Botha (1996) provides a review of the party system.

II Geography and gerrymandering.

Information on the delimitation of political boundaries is provided by Christopher (1983) who provides a history of the work of the various Delimitation Commissions and reapportionments to the four provinces based on census returns. Delimitation

⁵⁸South Africa at the turn of the 20th century was not unique in having a restricted franchise. Compare reconstruction in the US South; that women were widely still denied the vote; and the various Colonial empires throughout the world. There were some important (non-monotone) developments in suffrage over this time period. White women could vote from 1930. All Cape 'Europeans' received equal, direct and secret suffrage from 1931. Black voters in the Cape province were removed from the roll in 1936 and 'coloureds' in 1956 (the South Africa Act Amendment Act was passed in 1956 after the Supreme Court threw out the first such act in 1951). The age of voting was reduced to 18 from 21 in 1958.

⁵⁹Though it was part of a minority government between 1920 and 1921.

⁶⁰The National Party was formed on the basis of Afrikaner opposition to South African support for the British in WW1 (Nohlen, 1999).

⁶¹"Left-leaning" pro-British SAP members broke away to form the "Dominion Party".

was based on the number of white adults (white males, then white adults, white union nationals, and from 1952 number of registered white voters). Christopher (p.216) states that in the period in which Black and 'Coloured' voters were on the roll in the Cape, they were 'of limited influence [...] as they rarely formed more than one-fifth of the electorate of any constituency'. Note that delimitation happened in two stages: first, apportionment to provinces. Second constituency boundary drawing for each province. Christopher notes various delimitation battles waged resulting in apportionments, 'first to the benefit of Natal and the Transvaal, and more recently to the benefit of the Cape Province. The implications of this state of affairs are evident in the present struggles between the Transvaal and Cape wings of the National Party over the interpretation of party policy.' Christopher (1983) (p. 210). Particularly noteworthy was the power of the Delimitation Commission to 'load' or 'unload' a constituency by up to 15%, based on a set of factors, with a net effect of 'favoring' rural constituencies.⁶² A particular concern was the "unloading" of rural Cape seats.⁶³ Another important consideration is that when Transkei, Bophutatswana and Venda received 'independence' in 1977, constituency boundaries had to be redrawn (see the work of the Fourteenth Delimitation Commission).

⁶²See also Price (1953)

⁶³Note, according to the Constitution Amendment Act of 1965, 'special electoral divisions' could receive a 30% loading. Christopher (1983) (p.214) observes 'the unloading of the rural constituency and the corresponding loading of the urban constituency is a markedly persistent and vital factor in all delimitations since Union.' As he goes on to observe, while the 1961 Republic referendum returned 52.1% in favour of leaving the Commonwealth and becoming a Republic, in constituency terms the results corresponded to 65.3% in favor.

C Ending Labor Tenancy on Farms

White farmers were an important political constituency in Apartheid South Africa. According to Crush and Jeeves, “every South African government after Union taxed the gold mines in order to subsidize farming”. It was not enough that the 1913 Land Act denied blacks the rights to own land outside the reserves — an area comprising 7.5% of the country alone. A constant refrain from white farmers throughout the first half of the 20th century was the need for the South African government to provide them with more ‘cheap labor’.

Various institutional arrangements were created and elaborated towards this end. The forms of tenure were still rooted in the paternalist relations inherited from the colonial era — blacks on white farms were tenants and squatters, sharecroppers, or migrants (there was no way ‘up the ladder’ (Alston and Kauffman, 1997) since blacks could not own land).⁶⁴ Frequently the compensation provided by the farmers was far inferior to that offered by industry or mining, and farmers relied instead on the system of labor controls to sustain the viability of their low proffered pay (hence many marginal farms were kept afloat). This was particularly the case for farmers using labor-intensive techniques such as those operating the sugar plantations in Zululand, and maize and potato farmers. Farmers would also tend to favor the use of migrant labour where: production processes were labor intensive⁶⁵; where land was more valuable; and where migrant labour was accessible — that is, the borders with (then) Rhodesia, Nyasaland and Mozambique.

Labor tenancy was an important institutional feature of many parts of the country. Notes Atkinson (2007) (p.30), “[t]he system of labour tenancy did not take hold very extensively in the Cape Province or the Free State, but it was a pre-eminent form of labour organisation in northern Natal and most of the Transvaal. Labour tenancy involved workers residing on white farms, with a period of service of up to 180 days per year on the farm. During the rest of the year, the tenant was free to seek outside employment.”

As agriculture mechanized, aided by generous state assistance in the form of cheap credit, and wage labor became more widespread, farmers began to not have use of large amounts of “surplus labor”. The state’s drive for mechanization of agriculture starting from the 1960s included the incremental (across districts) outlawing of the “labor tenant” relationship on farms. Under the terms of section twenty-two of the *Bantu Laws Amendment Act* (Act No. 42 of 1964), Bantu Affairs Commissioners were authorized to choose to stop new tenancy contracts, and/or outlaw tenancy altogether. The table at the end of this section presents a timeline for the ending of tenancy around the country, a process finally completed in 1979. These changes led to farm evictions, the elimination of ‘black spots’ and the deepening of unemployment in the homelands. Once it was no longer possible to be a labor tenant, the *Illegal Squatters Act of 1951* and the *Trespass Act of 1955* provided for summary eviction from a farm. Between 1960 and 1983, more than 3.5m people were forcibly moved into the Bantustans (The Surplus

⁶⁴See Onselen (1996) for a description of the hardships black farmers endured during this time.

⁶⁵The maize fields of Eastern Transvaal, and the sugar plantations of Northern Natal.

People Project, 1983). As Atkinson (2007) explains:

Official policy was aimed at tying much-needed workers to the farms; at the same time, the National Party government endeavoured to remove 'surplus' people (typically, independent black labour tenants and their families) to the homelands. There have been various estimates of the scale of forced removals. It is possible that around 1.4 million labour tenants and squatters were removed between 1960 and 1974 [...] Between 1964 and 1970, labour tenants decreased from 163,000 to 27,585 [...] the changeover from squatting to labour tenancy, and thereafter to wage labour, brought in each instance diminished access for black rural labourers to subsistence production, whether in the traditional black farming areas or in the reserves, and to grazing and cultivation rights on European farms.

Timeline of Tenancy "Reform"

<u>districts</u>	<u>year</u>	<u>notes</u>
All	1956	1956 Act "required the registration of all labour-tenant contracts and the establishment of Labour Tenant Control Boards in each district to administer this and to take responsibility for pegging the number of labour tenants allowed per farm in each district. In addition farmers were prohibited from taking on any additional rent-paying tenants" p. 94 Unterhalter, E. "Forced Removal"
Area under the Jurisdiction of the Bantu Affairs Commissioner at Delmas; Groblersdal (excluding the Magisterial District of Bronkhorstspuit); Warm Baths.	1966	Under the powers vested in me by section twenty-seven bis (1) (b) of the Bantu Trust and Land Act, 1936 (Act No. 18 of 1936); as inserted by section twenty-two of the Bantu Laws Amendment Act, 1964 (Act No. 42 of 1964). I, Mr CHIEL COENRAAD BOTRA, Minister of Bantu Administration and Development, do hereby declare that, as from the first day of July, 1966, no labour tenants shall be employed on land in the areas specified in the schedule hereto
Witbank	1966	"no further labour tenants' contracts shall be entered into and no further labour tenants shall be registered in respect of land subject to the provisions of Chapter IV of the said Bantu Trust and Land Act, 1936, in the area under the jurisdiction of the Bantu Affairs Commissioner of Witbank."
Standerton	1966	"as from the first day of January, 1967, no further labour tenants' contracts shall be entered into and no further labour tenants shall be registered in respect of land subject to the provisions of Chapter IV of the said Bantu Trust and Land Act, 1936, in the area under the jurisdiction of the Bantu Affairs Commissioner of Standerton."
Vereeniging	1966	"as from the first day of January, 1967, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner of Vereeniging and to which the provisions of Chapter IV of the said Bantu Trust and Land Act, 1936, apply."
Kranskop	1967	"no further labour tenants' contracts shall be entered into and no further labour tenants shall be registered in respect of land subject to the provisions of Chapter IV of the said Bantu Trust and Land Act, 1936, in the area under the jurisdiction of the Bantu Affairs Commissioner, Kranskop"
Brits	1967	"from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Brits..."
Nigel	1967	"as from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Nigel"
Evaton	1967	"do hereby declare that as from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Evaton."
Bergville	1967	"from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Bergville"
Tzaneen, Middelburg (Tvl)	1967	"do hereby declare that as from the first day of December, 1967, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioners, Tzaneen and Middelburg (Tvl)"
White River	1967	"as from the first day of the month following that in which publication hereof takes place, no further labour tenants' contracts shall be entered into and no further labour tenants shall be registered in respect of land subject to the provisions of chapter IV of the said Bantu Trust and Land Act, 1936, in the area under the jurisdiction of the Bantu Affairs Commissioner, White River."
Potchefstroom	1967	"as from the first day of November 1967, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Potchefstroom"
Krugersdorp	1967	"do hereby declare that as from the first day of the month following that in which publication hereof takes place, no further labour tenants' contracts shall be entered into and no further labour tenants' shall be registered in respect of land subject to the provisions of chapter IV of the said Bantu Trust and Land Act, 1936, in the area under the jurisdiction of the Bantu Affairs Commissioner Krugersdorp."

Bethlehem, Bethulie, Bloemfontein, Boshof, Bothaville, Brandfort, Bultfontein, Clocolan, Dewetsdorp, Edenburg, Excelsior, Fauresmith, Ficksburg, Fouriesburg, Frankfort, Harrismith, Heilbron, Hennenman, Hertzogville, Hobhouse, Hoopstad, Jacobsdal, Jagersfontein, Kestell, Koffiefontein, Koppies, Kroonstad, Ladybrand, Lindley, Marquard, Memel, Odendaalsrus, Parys, Paul Roux, Petrusburg, Philippolis, Reddersburg, Reitz, Rouxville, Sasolburg, Senekal, Smithfield, Steynsrus, Thaba Nchu, Theunissen, Trompsburg, Ventersburg, Viljoenskroon, Virginia, Vrede, Vredefort, Warden, Wepener, Wesselsbron, Winburg, Zastron	1967	"as from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the areas specified in the Schedule hereto"
Bethal	1968	"do hereby declare that as from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Bethal"
Carolina	1968	"as from the first day of September 1968, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Carolina"
Potgietersrus	1968	"do hereby declare that as from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Potgietersrus"
Marico	1968	"do hereby declare that as from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Zeerust"
Balfour; Heidelberg (Transvaal)	1968	"as from the first day of the month following that in which publication hereof takes place no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioners, Balfour and Heidelberg (Transvaal)"
Thabazimbi	1968	"as from the first day of the month following that in which publication hereof takes place no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Thabazimbi"
Port Elizabeth, Uitenhage	1968	"as from the first day of the month following that in which publication hereof takes place no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioners, Port Elizabeth and Uitenhage"
Bronkhorstspuit	1968	"do hereby declare that as from the first day of November 1968, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Bronkhorstspuit"
Weenen	1968	"as from the first day of January 1969, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Weenen..."
Barberton	1968	"publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Barberton, and to which the provisions of Chapter IV of the said Bantu Trust and Land Act, 1936 apply."
Pretoria	1969	"as from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Pretoria"
Stockenstrom	1969	"as from the first day of the month following that in which publication hereof takes place, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Stockenstrom"
Entonjaneni	1969	"as from the first day of January 1970, no labour tenants shall be employed on any land which is situated in the area under the jurisdiction of the Bantu Affairs Commissioner, Entonjaneni"
Amersfoort, Beifast, Bochum, Buschbuckridge, Duiwelskloof, Ermelo, Louis Trichardt, Lydenburg, Messina, Nelspruit, Pietersburg, Piet Retief, Soekmekaar, Volksrust, Wakkerstroom, Waterval Boven, Babanango, Camperdown, Dannhauser, Dundee, Estcourt, Greytown, Howick, Ixopo, Ladysmith, Ngotshe, Newcastle, Paulpietersburg, Pietermaritzburg, Port Shepstone, Richmond (Natal), Stanger, Umzinto, Utrecht and Vryheid.	1970	"that as from the first day of August 1970, no further labour tenants' contracts shall be entered into and no further labour tenants shall be registered in respect of any land situated in the areas specified in the Schedule hereto, and to which the provisions of Chapter IV of the said Bantu Trust and Land Act, 1936, apply. P. H. TORLAGE, Member of the Bantu Affairs Commission."
Entire country	1979	"(a) that, with effect from the date of promulgation of this notice, no further labour tenants' contracts shall be entered into and no further labour tenants shall be registered in respect of land in any area in the Republic; and (b) that no labour tenant who is registered as such in terms of the provisions of the Act on the date of promulgation of this notice and is a party to a labour tenants' contract shall be employed on any land in the Republic after the date of expiry of the period which has been agreed upon in the said contract, or after 30 August 1980, whichever date may be the earlier."

D Protecting white labor

A bestiary of controls. The controls protecting white labor were numerous and wide-ranging. Various authors date the start of the labor architecture to the white mining strike of 1922 against proposals of the mining companies to increase the use of ‘non-white’ labor. The strike was suppressed – by the military — and wages fell. In 1924 the incumbent SAP party was defeated by a coalition ‘Pact’ government of the farmer-friendly NP and the white-worker-protecting Labour Party. A corporatist labor structure was then introduced in the *Industrial Conciliation Act (1924)*. This Act introduced an architecture of bargaining councils between employer associations and (white) trade unions. The IC Act became the mechanism for the color bar (job reservation for whites) fixed on an industry by industry basis between the relevant white employer and white union. Argues Mariotti (2010), “The IC Act allowed for industries and trade unions to come together to negotiate on general work conditions including the reservation of work for whites and on the relevant wage rate to be paid.” Collective bargaining agreements negotiated between a representative trade union and employer association were made binding on non-union members through application of the *ergo omnes* principle.⁶⁶ The Pact government also introduced the *civilized labor policy* which entrenched affirmative action for whites in particular within government and parastatal jobs.

Later, the *Factories, Machinery and Building Work Act (1941)* required separate at-work amenities for different racial groups (e.g. cafeteria, restrooms, entrances were all separated by races). Mariotti (*ibid.*) argues that these added fixed costs dissuaded many small firms from hiring multiracial workforces. She also notes that the *The Apprenticeship Act of 1944* excluded blacks from artisanal careers. A linked (and crucial) component of discrimination against blacks, coloureds and indians by the white state was the radically inferior provision of public education relative to whites. This policy began to be reversed initially at the beginning of the 1970s, but the largest changes only followed the Soweto Riots of 1976 (sparked by the introduction of compulsory Afrikaans language instruction in black schools). The number of black female school teachers increased between 1985-1990 from around 30,000 to 80,000 (and black male school teachers increased from about 20,000 to 50,000). All other teacher series are flat (and, in fact white school teachers decline) (Crankshaw, 1997). The discussion in Case and Deaton (1999) is also highly informative.

Labor reform from the 1970s and the Wiehahn and Riekert Commissions. The end of Apartheid is overdetermined. Pressures on Apartheid spatial geography towards the end of the 1970s included: local and domestic opposition to the homeland system; economic deterioration within the homelands; pressures for migration emanating from ‘severe droughts in the early 1980s’; increased urban black militancy; and stronger black trade unions (Pickles, 1988). Lowenberg (1997) and Mariotti (2010) argue that white support for job discrimination declined over the apartheid period as

⁶⁶For estimates of the effects of this legislation (which persists today, but without the racial elements), see for example Magruder (2012) who finds large and significant negative impacts on employment.

whites moved from semi-skilled to skilled work — they suggest that increased education led Afrikaans whites into more skilled occupations, and skilled workers supported allowing African workers into semi-skilled occupations. We note though that a large number (as many as 40%) of Afrikaners in the labor force worked in the state sector and likely may have opposed political change (on these grounds alone). The Riekert and Wiehahn Commissions recommended in 1979 that government end job reservation (companies were increasingly flouting these restrictions in the 1970s).

The *Riekert commission's* mandate was to consider the institutional framework for manpower utilization — excluding those aspects that would be dealt with under the terms of reference of the Wiehahn Commission into labor legislation. An important outcome of the commission, as detailed by Pickles (1988), was the renewed push for industrial decentralization through incentives organized according to the logic of 'regional labour markets'. Pickles (p.236) reports that to some extent the high incentives offered were 'effective' — between 1978 and 1984 'the proportion of manufacturing industry located in decentralised areas' increased from 12.9 per cent to 19.3 per cent. Siebert (1987) documents how the real black/white wage gap in mining and manufacturing narrowed after 1975.

E Extracts from the Chamber of Mines annual reports

In this section I provide primary source evidence of the strategic concerns of the mining industry as they were felt in real time using extracts from the annual reports of the Chamber of Mines between 1971 and 1987.

His excellency Dr H. Kamuzu Banda, Life President of the Republic of Malawi, was the guest of the South African mining industry on 18th April, 1971 [...] Dr Banda toured the East Rand mining areas and visited the Rand Refinery where, at luncheon, he was presented with an inscribed gold paper knife by the President of the Chamber [...]
Chamber of Mines South Africa, 82nd Annual Report, 1971.

There was again a marked decline in the number of Bantu workers it was possible to attract to the mines from within South Africa. The main reason is the continuing strong demand for labour from all sectors of the economy. There was no shortage of work for labourers from the South African homelands and for many of them there was a choice of jobs available. Fortunately mining employment lost nothing of its attraction for work seekers from outside South Africa [...]
Presidential Address, June 1972, Chamber of Mines South Africa, 82nd Annual Report, 1971.

On 4th April, 1974, a Skymaster aircraft belonging to Mine Labour Organisations (Wenela) Limited and carrying time-expired Malawian repatriates from Francistown to Blantyre in Malawi crashed shortly after take-off. Two members of the crew and 74 Malawians were killed [...] Apparently as a direct result of the air disaster at Francistown on 4th April, 1974, the engagement of labourers in Malawi for employment on the mines was suspended by the Malawian authorities and no further engagements took place throughout the remainder of the year.
Section on Black Labour, from 1974 Annual report.

Pay increases accounted for the major share of last year's record increase in working costs. Black wages are now rising fast. [...] Black novices engaged for underground work has now been raised 140 per cent since March 1973. Proportional increases have been accorded by mining houses to those who have advanced on the promotional ladder [...] One can only be saddened by the irony that this period of encouraging advance should have been punctuated latterly by sporadic outbreaks of violence [...] The interruption to engagements in Malawi has resulted in the number in employment falling below requirements at the present time [...] An event of major significance for Southern Africa was the coup d'état in Portugal [...] remains to be seen what the consequences will be for Mozambique from which comes about 20 per cent of the Blacks engaged by the Chamber's mine labour organizations [...]

[The industry] has to grant appropriate wage increases because it must give a reasonable return for work done and compete in the labour market if it is to maintain production [...] seeking to offset pay increases by increasing productivity and efficiency...fuller utilization of existing machinery and greater mechanization in the future
Presidential Address 1974, Chamber of Mines South Africa, 84th Annual Report, 1973.

It is indeed ironical, and sad, to recall that some of these recent outbursts of violence were connected in one way or another with rates of pay, and occurred at the very time that major improvements in pay scales were in the process of being granted [...] other outbursts, however, appear to have been essentially tribal clashes [...] mere differences in timing of changes between adjacent mines may give rise to unrest, as also may differences in the rate of pay between adjacent mines, even for a single class of work [...] Such unrest may easily also be converted into tribal clashes if, through false rumour, the story goes around that workers from one tribe are being singled out for preferential treatment.
Speech by B.E. Hersov, 1974, Council member Chamber of Mines, 84th Annual Report, 1973

The time has clearly gone by, never to return, when we sought to control the level of costs in the industry by keeping wages down. We have got to control costs in future, not by low wages, but by high productivity...We are not going to be able to count to the same extent than as in the past, although we will still have to count on it to quite a considerable extent — on solving our problems by a great influx of totally unskilled workers, a great many of them foreign [...] increase the percentage of Black workers who are South Africans, and we should increase the time they spend in the industry, so that the skills they acquire when working with us are not allowed to go to waste [...] increasing numbers of workers full-time [...] you have got to house them with their families, and there we need the co-operation of the Government[...]

Speech by H.F. Oppenheimer Council member Chamber of Mines, 1975, Chamber of Mines South Africa, 85th Annual Report, 1974.

“The strength of gold on world markets [...] has helped the mining industry to meet the twin problems of Black labour shortage and unprecedented inflation [...] working costs per ton milled rose by over 25 per cent [...] high general inflation [...]and] considerable wage increases given to the labour force on the mines, and especially to Black workers [...]

Capital expenditure is also increasing rapidly. Last year declared expenditure increased to R196 million compared with R106 million in the previous years [...] reflects the considerable efforts being made to improve the productivity of labour [...] High levels of capital expenditure will be a feature of the years ahead [...]

In reviewing salaries and wages this year, the Chamber had much in mind the appeal by the Hon. the Prime Minister, Mr B.J. Vorster, for restraint on the part of both employer and employee [...] wage increases for Blacks have been a feature of the past two years. Wages were twice increased in 1974 and again from the current pay month. In all, wages are now more than four times those paid prior to May 1973 [...]

The interdependence that exists with neighbouring territories is of mutual importance but it is quite clear that we should also compete more effectively for South African labour in order to increase the proportion of South Africans employed and to channel to South African areas some of the benefits of increased wages [...] Inevitably the bulk of mining labour will remain migratory for many years to come but it is hoped that a core of stable South African employees can be built up on longer life mines. Discussions on this subject are in progress with the Government. We are specially interested in the prospect of attracting workers from farming areas, particularly those where there is unemployment or underemployment. We are seeking ways to achieve this without disturbing the legitimate interests of the farmer [...]

Strikes and disturbances on the mines resulted in a number of deaths during the year [...] the great majority arose from inter-tribal clashes and not from dissatisfaction over the conditions of employment.” [...] The industry has agreed to support research and development to the amount of R150 million over the next ten years. The principal aim of the new programme is the improvement of job opportunities and working conditions through the introduction of mechanization and better methods of mine planning.” [...]

Inflation remains the arch enemy of gold mining [...] the Chamber supports fully the collective programme of attack on inflation on all fronts[...] The industry has moved away from total reliance on the low wage, labour intensive structure [...]

Presidential Address 1975, Chamber of Mines South Africa, 85th Annual Report, 1974.

In his Presidential address a year ago, my predecessor [...] stated the objective of ensuring that at least 50 per cent of Black employees came from South Africa and Transkei. That target has been exceeded [...] a result of more competitive wages paid and the improved conditions on mines [...] The increased wages paid on the mines have created further opportunities for Black employees to save and during the year savings or remittances paid out by TEBA in home territories exceeded R100m[...]

Investigations relating to the Black labour force continue to be directed at establishing the factors which contribute to labour productivity and job satisfaction. The improved supply of labour over the past few months, the smaller percentage of foreign labour, the tendency

towards shorter contracts and the increasing degree of mechanization in mines, are all factors that give added urgency to this work [...]

the geographical and occupational restrictions on the mobility of labour should be eased [...]
Presidential Address June 1977, Chamber of Mines South Africa, 87th Annual Report, 1976.

despite the containment of wage and salary increases in 1977 to between 5 and 6 per cent, a large number of mines have reported that the introduction of the eleven-shift fortnight has pushed up working costs. To maintain production many mines had to increase their underground labour force and to step up overtime payments. As a result the total wage bill last year increased by 15 per cent [...] the drop in productivity directly attributable to the eleven-shift fortnight has been in excess of six per cent [...]

The Chamber submitted detailed evidence to the Wiehahn Commission of Enquiry into labour legislation and the Riekert Commission of Enquiry into legislation affecting the utilization of manpower [...] welcomes these urgent enquiries aimed at the removal of discrimination in the workplace [...] non-White workers must be absorbed into the skilled labour pool.

Despite prevailing restrictions [...] the industry [...] seeks a progressive increase in the labour force permanently housed on the mines [...] and] to encourage the migratory worker to return regularly to the job for which he is trained and adopt mining as full-time employment [...] High turnover is costly to mines and, despite some improvements, South African workers tend to stay at work for shorter periods than their counterparts from most neighbouring countries [...]

Presidential Address 1978, Chamber of Mines South Africa, 88th Annual Report, 1977.

The labour trend for the past two years clearly indicates reduced turnover as workers remain in service for longer periods with a concomitant reduction in training costs and increased productivity through stability.

Section on Black Labour, from 1979 Annual report.

It is now generally acknowledged that South Africa's capacity for economic expansion and growth is limited by a major physical constraint, namely the acute shortage of skilled and professional manpower [...] the problems of the mining industry cannot be overstated [...]

demand for employment in the mining industry has increased as a result of greatly improved earnings, and improved living and working conditions [...] one consequence is that mining is increasingly being perceived as a career, and large numbers of men are making repeated use of re-employment guarantees which enable them to return regularly to the same mine to do work for which they have been trained [...]

Presidential Address 1980, Chamber of Mines South Africa, 87th Annual Report, 1979.

Total strength on the mines for which TEBA recruited labour reached a record high during 1981 of 470000. At the same time, the stability of the labour force improved further as mineworkers tended to remain at work for longer periods [...] on 16 per cent of those engaged during the year were newcomers to the industry.

Section on Black Labour, from 1981 Annual report.

Working costs per ton on the gold mines escalated by 471 per cent between 1970 and 1981, a compound average of more than 17 per cent per annum. This has eroded the profitability of the gold mining industry [...] despite the fall of over 30 per cent in the Rand/US dollar exchange rate since the beginning of 1981"

Speech by Council member Mr B.E. Hersov, Chamber of Mines 92nd Annual Report, 1981.

The gold mines have been caught in a relentless squeeze between the falling gold price and rising working costs [...] due to the continued high general rate of inflation and the higher cost of mining at greater depths. Wage increases also had a significant impact on costs [...]

In the field of labour and industrial relations the past year has seen intensified efforts to combat the skilled manpower shortage through stepped-up training programmes in the mining

industry[...] Individually and collectively therefore, South Africa's mining companies have embarked on a major effort to raise the standards of competency in the industry [...]

South Africa's mining industry was, for the most part, able to accommodate the very high inflationary cost increases during the 1970s, since the prices received for its major products, notably gold and diamonds, rose ahead of the rate of inflation which prevailed. This situation has suddenly and dramatically been reversed [...] working costs on the gold mines alone rose by more than 75 per cent over the five-year period 1977-1981 in which the general rate of inflation increased by 65 per cent. At the same time, real benefits did accrue as the industry seized the opportunity provided by higher gold prices to increase wages, improve the living and working conditions of employees, stabilise the labour force, and embark on capital expenditure programmes designed to extend the lives and earning ability of the gold mines.

Presidential Address 1982, Chamber of Mines South Africa, 92nd Annual Report, 1981.

Payments made by TEBA in 1987 in the form of compulsory deferred pay (60 per cent of earnings have to be repatriated in terms of the laws of Lesotho, Mozambique and Malawi), money sent home by remittances, as well as savings and benefit paymentes, totalled R589.4 million.

Over R1 billion was paid out to mineworkers and their dependents through TEBA filed offices and TEBA-CASH during the year. Most of this money went to rural areas where economies are often stagnant [...] TEBA engaged about 60 per cent of the industry's labour requirements within South Africa and its internal states, and some 40 per cent in Lesotho, Mozambique, Botswana, Malawi and Swaziland.

Section on Labour, from 1987 Annual report.

The gold mines are at present short of several hundred blasting certificate holders, resulting in substantial production loss [...] the significance of the blasting certificates is that it not only opens the door to the job of supervisory miner but to all jobs above that on the production side of mining, right up to the position of mine manager. Thus the removal of the last legal impediment to the employment of people of colour in all jobs in mining can come none too soon. The full and final removal of legislated job reservation in the industry is of course also important for our relations with our unions, a subject which has been the focus of international interest as a result of last year's strike called by the National Union of Mineworkers [...]

The Chamber was instrumental through its input to the Wiehahn Commission in 1979 in persuading the Government to extend full trade-union rights to black workers in 1980 [...] However, last year the NUM initiated a costly three-week strike involving close on 40 per cent of the workforce on the Chamber's member gold and coal mines. the industry sought to view and handle the strike as an industrial dispute, but the evident underlying aim with the strike was to demonstrate wide worker support for an agenda ranging from sanctions to seizure of control of the national economy [...] The philosophy behind sanctions, disinvestment and other forms of punitive action is tortuous at best, but it achieves a height of cynicism when accompanied by demands for greater recognition of and more comprehensive dealings with unions that advocate these measures [...] The problems on which I have dwelled are of course very much a function of the continuing impasse in our national politics [...]

Presidential address June 1988, Chamber of Mines South Africa, 98th Annual Report, 1987.

The NUM was recognised by the Chamber on 9 June 1983 in respect of 6000 employees [...] by the end of 1984 the NUM had a verified membership of 40000 [...] by the middle of 1987 its membership had grown to 187000 [...] dominated the industrial relations scene, both nationally, through its influence in COSATU, and in the industry, with its membership at one stage approaching 40 per cent of the black workforce on the gold mines and collieries which are members of the Chamber.

Violent confrontations between workers in our hostels have occurred intermittently over the years, but by the early 1980s the incidence had fallen markedly. However, since 1985 there has been a resurgence of violence taking us back to the unacceptable levels of the mid-1970s
Addendum to the Presidential Address 1988, Chamber of Mines South Africa, 98th Annual Report, 1987.