

# Resource Rents, Coercion, and Local Development

Evidence from Post-Apartheid South Africa

*Paulo Bastos*  
*Nicolas Bottan*



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## Abstract

This paper examines how the dismantling of coercive institutions associated with the end of apartheid in South Africa in 1994 affected the distribution of rents from natural resource exports. It identifies the interplay between coercive institutions and natural resource rents as an important driver of local development. Using data from the 1996 census, the paper documents large income gaps between communities located just-inside and just-outside

the former self-governing territories set aside for black inhabitants. Examining relative changes between 1996 and 2011, the paper finds that spatial income convergence was considerably stronger among marginalized communities with higher initial exposure to resource rents. These results accord with standard bargaining theory in which the dismantling of coercive institutions improves the negotiating position of unionized workers in the mining industry.

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# Resource Rents, Coercion, and Local Development: Evidence from Post-Apartheid South Africa\*

Paulo Bastos<sup>†</sup>

Nicolas Bottan<sup>‡</sup>

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<sup>†</sup>Development Research Group, The World Bank, 1818 18th Street NW, Washington DC, United States.  
E-mail: pbastos@worldbank.org.

<sup>‡</sup>Department of Economics, University of Illinois at Urbana-Champaign, Illinois 61801, United States.  
Email: bottan2@illinois.edu.

# 1 Introduction

A growing body of evidence reveals that current economic underdevelopment can be traced back to specific historical episodes, with long-lasting impacts typically arising through either domestic institutions or cultural traits (Hall and Jones, 1999; Acemoglu et al., 2001; Dell, 2010; Nunn, 2008, 2009, 2014). Less attention has focused on uncovering specific channels by which a bad legacy can be turned into a relatively more prosperous future. In this paper, we identify the interaction between the dismantling of coercive institutions and the distribution of rents from natural resource exports as an important driver of the development path of marginalized communities following the end of apartheid, the system of racial segregation enforced in South Africa between 1948 and 1994.<sup>1</sup>

Apartheid legislation classified inhabitants into racial groups and institutionalized segregation of residential areas, enforced by means of forced removals and strict control of population movements. In 1970, black people were deprived of their citizenship, legally becoming citizens of one of ten tribally based self-governing homelands, four of which became nominally independent states.<sup>2</sup> At the same time, they were prevented from working outside the corresponding homeland, unless a pass for a particular area was issued. Black inhabitants were granted inferior property rights, while labor legislation severely restricted their pay and access to skilled and semi-skilled occupations. Supply of public goods was segregated, with markedly inferior provision to black people. In the aftermath of the 1994 democratic elections, all homelands were legally reintegrated into South Africa, and the newly elected government assumed responsibility for the effective dismantling of coercive institutions previously imposed on marginalized racial groups.

Using community-level data from the 1996 and 2011 population censuses, we provide quantitative evidence on the legacy of apartheid. In October of 1996, just over one year after Nelson Mandela took office as the first President elected in a fully representative democratic election, communities located just-inside and just-outside the former homelands exhibited large differentials with regard to the racial composition of the population, income per capita and several other socio-economic indicators. Fifteen years later, these gaps remained sizable in general, but income convergence occurred at a different pace across local communities of the former homelands.

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<sup>1</sup>Racial segregation in South Africa began in colonial times under Dutch and British rule. However, apartheid as an official policy was introduced following the 1948 general election. Although the official abolishment of apartheid occurred in 1990, with repeal of the last set of the remaining apartheid laws, the effective end of the regime is widely regarded as arising from the democratic general elections of April 1994.

<sup>2</sup>Throughout this paper we will adopt the term *homelands* to designate the ten self-governing territories set aside for black inhabitants, noting however that these areas are also commonly referred to as *bantustans* (Clark and Worger, 2011)

Our main interest lies in the evolution of these spatial income disparities in the post-apartheid period, when coercive institutions imposed on marginalized racial groups were progressively dismantled and labor union activity was empowered. Examining relative changes in real per capita income between 1996 and 2011, we find that spatial income convergence was considerably stronger among previously marginalized communities with higher initial exposure to resource rents—as measured by a larger share of initial employment in the mining industry. This finding holds irrespective of whether we consider: (1) the universe of local communities; (2) a restricted sample of local communities located just-inside and just-outside the former homelands; or (3) a sample composed only of communities from the former homelands.

The evidence we document is in line with bargaining theory emphasizing the interaction between the strength of coercive institutions and the distribution of resource rents through collective wage negotiations. In the model, domestic unionized producers and foreign producers supply a homogeneous commodity to a global integrated product market. Imperfect competition in the product market generates rents that workers may capture in the form of higher wages. The wage premia—defined as wages in excess of what workers would earn elsewhere in the labor market—is determined through Nash bargaining, and then the firms set the employment (and output) levels unilaterally as part of the product market game with domestic and foreign competitors. The advent of democracy, accompanied by several legislative interventions aimed at leveling the historically uneven bargaining field, leads to significant improvements in the negotiating position of the union, which is therefore able to capture a larger share of resource rents.

In this framework, unionized wages would also be expected to rise in the face of increased resource rents following international price shocks. However, in the absence of changes in institutions governing collective bargaining, these marginal rents would accrue mainly to workers and mine owners from non-marginalized racial groups, who had stronger bargaining power to begin with and resided outside the former homelands. The evidence we provide reveals that initial exposure to resource rents—as measured by the initial employment share in the mining industry—is a robust positive driver of local income growth for black communities in the former homelands, not of local per capita income growth in general. This points to a key role of the interaction between coercive institutions and the distribution of rents, rather than just variation in the volume of resource windfalls.

We provide further evidence on the specific mechanisms emphasized by the model by examining complementary individual-level data from the 10% sample of the 1996 population census. Consistent with the existence of large resource rents in the mining industry, we document a large wage premium associated with employment in this sector. In line with the expected impacts of coercive institutions, we document a large income gap against

black male workers, who also benefit from a smaller wage premium when employed in the mining industry. These patterns are robust to the inclusion of controls for individual attributes and occupational categories.

While suggestive of the importance of coercion and rent-sharing in the resource industry, the differential income path of former homeland communities in democratic South Africa could at least in part reflect alternative explanations that operate at the community-level. First, they might be explained by government interventions aimed at addressing the historically uneven access to infrastructure.<sup>3</sup> In the South African context, Dinkelman (2011) shows that mass roll-out of the electricity grid to rural households in KwaZulu-Natal generated sizable employment gains among females and led to pay rises among males. If improvements in access to infrastructure are correlated with initial employment in the mining industry, our estimates would be biased. Second, since the homelands were spread across the country, the effects of their progressive integration in the South African economy might be expected to depend on relative changes in the degree of proximity to markets and connectivity (Harris, 1954; Krugman, 1991; Hanson, 1996; Fujita et al., 2001; Redding and Sturn, 2008). Third, the end of apartheid might lead to migration flows from the former homelands. Heterogeneity in the demographic composition of these flows across locations might challenge our interpretation of the results.

To further strengthen the credibility of our empirical findings, and to assess the role of these alternative explanations, we use the community-level data to provide several additional pieces of evidence. First, we show that our results remain unaltered when accounting for changes in access to several infrastructure items, notably electricity, piped water, refuse and phone. Second, we show that the main findings hold when accounting for the role of market access and connectivity, while also providing evidence that greater proximity to markets was associated with stronger income growth. Third, we find little evidence that population growth differed systematically across local communities from former homelands with varying degrees of exposure to resource rents; and show that our results remain robust when accounting for changes in the size and attributes of the local population. Finally, we perform a placebo test where we find that initial shares of employment in other sectors, where the collective bargaining mechanism is less prevalent, are not associated with stronger income growth.

This paper relates to different strands of existing research. In a recent survey to the literature on historical development, Nunn (2014) emphasizes that while most studies have established how the influence of specific historical episodes persists over long periods of time through their effects on domestic institutions or cultural traits, there is comparatively

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<sup>3</sup>At the time of the 1994 democratic elections, over two thirds of black households did not have access to electricity (Dinkelman, 2011).

little evidence helping us understand when history persists and when it does not. This paper contributes to fill this gap in the literature, notably by identifying specific factors that helped mitigating the legacy of apartheid in South Africa. In doing so, our paper also relates to the literature on international trade and wages in unionized labor markets (Brander and Spencer, 1988; Mezzetti and Dinopoulos, 1991; Gaston and Trefler, 1995; Naylor, 1999; Lommerud et al., 2003; Lommerud et al., 2006a,b; Bastos and Kreickemeier, 2009; Bastos et al., 2009; Bastos and Wright, 2012).

While primarily focused on how the interplay between exposure to resource spoils and the strength of coercive institutions shaped the path of local income, this paper also relates to the literature studying the empirical relation between market access and economic performance (Fujita et al., 2001; Redding and Sturn, 2008; Donaldson, 2015). In particular, the fall of apartheid and the progressive integration of the former homelands in the South African economy provides a unique setting for examining the relation between increased market access and regional income convergence in a developing country context.

Finally, our paper speaks to a rich literature on the economic impacts of natural resource abundance (Sachs and Warner, 1997; Lederman and Maloney, 2007), notably with the strand of empirical research emphasizing the interplay between resource abundance and institutions in shaping economic and social outcomes (e.g., Vicente, 2010; Michaels, 2011; Caselli and Michaels, 2013). While the long-lasting effects of coercive institutions historically linked with resource extraction may be described as a curse for marginalized communities in the former homelands, this paper suggests that the interaction between resource abundance and the progressive dismantling of these institutions in democratic South Africa have played an important role in mitigating such adverse impacts.

The remainder of the paper proceeds as follows. Section 2 provides background on the rise and fall of apartheid, and describes key features of the mining industry and the institutional setting governing labor relations. Section 3 outlines a simple theoretical model of coercion and rent sharing to guide the empirical work. Section 4 describes the data employed, before section 5 provides descriptive statistics on the evolution of local income gaps between communities located just inside and outside the former homelands. Section 6 provides econometric evidence on the role of the interplay between the dismantling of coercive institutions and exposure to resource rents in shaping the relative income path of communities from the former homelands. Section 7 discusses and examines the role played by several alternative explanations. The last section concludes the paper.

## 2 Historical background

### 2.1 The rise and fall of apartheid

Apartheid was enforced through several pieces of legislation introduced by National Party governments that ruled South Africa from 1948 to 1994. It considerably strengthened the racial segregation that began under Dutch and British colonial rule.

The Population Registration Act of 1950 classified inhabitants into four racial groups—white, black, colored and indian—and introduced an identity card for all adult citizens specifying their race.<sup>4</sup> In the same year, the Group Areas Act institutionalized racial segregation of residential areas. Each race was allotted its own territory, which was later used as a basis for forced removals.

Public goods provision was highly segregated. The Reservation of Separate Amenities Act of 1953 made it possible to reserve municipal grounds according to race, leading to separation of buses, hospitals, beaches and park benches. Black people were offered services markedly inferior to those of white people, and to a lesser extent to those of indian and colored people. The Bantu Education Act of 1953 introduced a separate education system for black pupils, directed to preparing them for lives as a laboring class. In 1959 separate universities were created for black, colored and indian people, while existing universities were prevented from enrolling additional black students.

Through the homeland system, the National Party government sought to divide South Africa into separate nation-states. The Bantu Authorities Act of 1951 created separate government structures for white and black citizens. The Promotion of Black Self-Government Act of 1959 proposed self-governing Bantu units, which would have devolved administrative powers with the promise of later autonomy and self-government. The Black Homeland Citizenship Act of 1970 deprived black people of their citizenship, who legally became citizens of one of ten tribally based self-governing homelands. Figure 1 depicts the geographic location of each of these ten homelands.

The homelands accounted for about 13 percent of the land, a small share compared to the population (Clarck and Worger, 2011). Four homelands were declared independent states by the South African government: Transkei in 1976, Bophuthatswana in 1977, Venda in 1979, and Ciskei in 1981. In parallel with the creation of the homelands, there was a massive program of forced relocation: between the 1960s and 1980s, millions of inhabitants were forced from their homes, many being resettled in the homelands. The government aimed for a total removal of the black population to the homelands (Clark and Worger, 2011).

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<sup>4</sup>For further details on the content of each piece of legislation described in this section see Horrell (1978), Clark and Worger (2011) and the references there.



Black people were prevented from running businesses or being employed in white areas, unless a pass for a particular area was issued. A black person working in a white-designated area without a pass was subject to arrest and trial for being an illegal migrant, which would frequently lead to deportation to the corresponding homeland and prosecution of the employer. As detailed below, labor legislation severely restricted the levels of pay and access to good jobs by black people. These institutions restricted wages, access to skilled jobs and the right to quit a job by black workers. Unionization of black workers was illegal until the early 1970s.

Black labor unions formed in the 1970s and 1980s, such as the National Union of Mine workers, assumed an increasingly prominent role in economic and political protests from the mid-1980s (MacShane et al., 1984; Clark and Worger, 2011). Although the official abolishment of apartheid occurred in 1990, with repeal of the last set of the remaining apartheid laws, the effective end of the regime is widely regarded as arising from the democratic general elections of April 1994 (Clark and Worger, 2011).<sup>5</sup> In the aftermath of the 1994 democratic elections, all homelands were legally reintegrated into South Africa, and the newly empowered government assumed responsibility for basic service provision for all citizens. The country was constitutionally redivided into new provinces. These are displayed in Figure 2.

## 2.2 The mining industry

South Africa has some of the world's largest mineral reserves, and is a leading producer of a range of mineral commodities such as gold, platinum and diamonds (US Department of Interior, 1996, 2011). In segregated South Africa, the prosperity of the white minority was intimately linked with a system that generated large profits through the exploitation of black workers, and in turn used those profits to secure exploitation, frequently through police force (Clark and Worger, 2011). Apartheid legislation preserved and expanded coercive institutions that had long been a feature of the mining economy, when a powerful network of laws barred black workers from skilled occupations (Mines and Works Act 1911). Black underground workers in the gold mining industry were among the most exploited: according to historical accounts, in 1972 their wages were about 18 Rands per month, less than the two shillings six pence they had been making in 1902; and while African miners earned monthly salaries of about 18 Rands, white miners made 400 Rands per month.<sup>6</sup>

In 1996, the industry accounted for about 8% of GDP and 43% of exports (US De-

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<sup>5</sup>The anniversary of the elections, 27 April, is celebrated as a public holiday in South Africa known as *Freedom Day*.

<sup>6</sup><http://overcomingapartheid.msu.edu/sidebar.php?id=65-258-5&page=3>

partment of Interior, 1996). These shares remained fairly similar by 2011 (US Department of Interior, 2011).<sup>7</sup> During this period, about 80% of mineral output was sold in export markets (US Department of Interior, 1996; 2011). The bulk of production and exports have been controlled by a relatively small number of privately-owned mining investment houses (US Department of Interior, 1996). Black ownership continues to be very limited today, despite recent legislative initiatives aimed at increasing it, notably under the Black Economic Empowerment program. From the early 2000s, the mining industry benefited from a favorable evolution of international prices; for instance, the real price of gold in US dollars more than tripled between 1996 and 2011.

### **2.3 Institutional setting governing labor relations**

Several coercive institutions governing labor relations were introduced before the apartheid. These institutions restricted wages, access to skilled jobs and the right to quit a job by black workers. Since the early decades of the twentieth century, black workers did not have access to skilled work (Mines and Works Act, 1911; Apprenticeship Act, 1922) and were not allowed to break an employment contract (Native Labour Regulation Act, 1911). Black workers were not included in the legal definition of employee and hence could not become members of legally registered labor unions. They were not officially recognized in labor negotiations (Industrial Conciliation Acts, 1924 and 1937) and were prevented to engage in strike activity (War measure 145, 1942). Coercive institutions were further strengthened by apartheid legislation, which reserved specific jobs and occupations to specific racial groups and turned the homelands into pools of cheap migrant labor (Group Areas Act, 1950, Native Labour Settlement of Disputes Act, 1955; Industrial Conciliations Act 1956 and Bantu Laws Amendment Act, 1970). These pieces of legislation made it impossible for non-white workers to obtain any legal representation through many of the white-led unions (Clark and Worger, 2011).

Following a long series of illegal strikes, and under pressure of workers and employers alike, in the 1970s the government started to allow for some legal representation of black workers (Industrial Relations Regulation Amendment Act, 1973; Industrial Conciliation Amendment Act, 1979; Labor Relations Amendment Act, 1981). The National Union of Mine workers was created in 1982 and it is part of an alliance with the Congress of South African Trade Unions. By 1984, over half a million black workers were members of organized trade unions. Empowered by a progressively larger membership—reaching about 2.5 million members by the early 1990s—black labor unions played a very important

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<sup>7</sup>Official estimates indicate that the sector currently accounts for about one million jobs (500 thousand direct and an equal amount indirect) and about 18% of GDP (8.6% direct, 10% indirect and induced). For more information see <http://www.southafrica.info/business/sectors/mining.htm>.

role in the political process leading to the end of apartheid (Clark and Worger, 2011).<sup>8</sup>

The advent of democracy was followed by numerous legislative initiatives aimed at dismantling coercive institutions and leveling the historically uneven bargaining field (ILO, 2002; Clark and Worger, 2011). In 1994, the Interim Constitution Act 200 of 1993 came into effect and changed the constitutional basis of the South African legal system. It became clear that the Labour Relations Act of 1956 was not in line with the new constitutional order (ILO, 2002).

The bill of rights of the 1996 constitution prohibited the state from discriminating on any grounds, and contained an explicit focus on labor rights, notably by imposing fair labor practices, the right to unionize and the right to strike. The new constitution served as the basis for new pieces of labor legislation that effectively dismantled coercive institutions governing labor relations (Labor Relations Act 1995; Basic Conditions of Employment Act 1997; Employment Equity Act 1998) and were later followed by programs of affirmative action directed to empower previously marginalized racial groups (Black Economic Empowerment 2003, 2007).<sup>9</sup>

While the institutional changes governing collective bargaining affected all sectors of the economy, it is important to emphasize several features that are specific to the mining industry. First, historical accounts suggest that coercive institutions governing labor relations before the end of apartheid were particularly strong in this sector (Clark and Worger, 2011).<sup>10</sup> Second, since South Africa is a leading mineral producer and exporter and the bulk of production and exports have been controlled by a relatively small number of privately-owned mining investment houses, the industry generated relatively large product market rents that might be shared with workers through collective bargaining. Third, the mining industry is characterized by the highest degree of unionization among all economic sectors—with unionization rates of over 70% both in 1996 and 2011 (see Table 1).

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<sup>8</sup>Moll (1996) and Schultz (1997) provide some evidence on the role of unions in wage setting before the end of apartheid.

<sup>9</sup>See ILO (2002) for a detailed account of laws governing collective bargaining in South Africa.

<sup>10</sup>In a recent public intervention at the Chatham House in 28 April 2014, NUM's President Senzeni Zokwana explained that the industry was very racist during apartheid, and gave the example of the Mines and Works Act, which prohibited black workers from holding high positions. In the same intervention he stated that the "mining industry has been transformed since the end of apartheid, with vast improvements in workers rights and issues of health and safety, and the NUM has played an important role in bringing about the changes." He further added that "the NUM has mobilized against three main issues. First, it fought against racism to improve the treatment of black workers under the apartheid system. Secondly, it campaigns against the class system, as mineworkers struggle economically due to the inequalities of the system. Thirdly, it works to overcome gender inequality."

### 3 A theory of coercion and rent sharing

To guide our empirical analysis, we outline a bargaining model of unionized international oligopoly, drawing on McDonald and Solow (1981) and Brander and Spencer (1988).<sup>11</sup> We use the model to examine the interplay between coercive institutions and collective bargaining in determining labor market outcomes in the natural resource industry. In addition, we examine if and how international price shocks, driven by exogenous shocks to global demand or foreign marginal costs, might affect domestic unionized wages in the context of this framework.

#### 3.1 Model setup

Consider a natural resource industry comprising  $n$  domestic producers and  $n^*$  foreign firms, each supplying a homogeneous commodity to a globally integrated product market. The industry of interest is small relative to the economy as a whole. There are unspecified barriers facing new firms, and hence product market rents are not eroded by entry. The mode of product market competition is Cournot.

The inverse demand function in the industry is given by

$$p = a - bY = a - b(ny + n^*y^*) \quad (1)$$

where  $a, b > 0$ ,  $Y$  denotes total sales by home and foreign firms,  $y$  is the output of the representative domestic firm and  $y^*$  is the output of the representative foreign firm.

Labor is the only variable factor of production. The marginal product of labor is constant, and is normalized to unity so that we can discuss output and employment interchangeably. Producers must also incur a fixed cost associated with natural resource extraction.<sup>12</sup> Domestic producers operate in a unionized labor market, while the foreign producers can recruit workers from a competitive labor market. We assume that the labor union cares both about wages and employment levels, and adopt a Stone-Geary utility function to represent union preferences:

$$U = (w - \bar{w})^\theta ny^{(1-\theta)} \quad (2)$$

where  $w$  is the negotiated wage;  $\bar{w}$  is the reservation wage of unionized workers, defined as what they would earn elsewhere in the labor market; and  $ny$  is the level of employment

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<sup>11</sup>There is a vast theoretical literature on unionized oligopoly, including contributions by Davidson (1988), Dowrick (1989), Mezzetti and Dinopoulos (1991), Naylor (1999), Lommerud et al. (2003), Lommerud et al. (2006a,b), Bastos and Kreckemeier (2009) and Bastos et al. (2009).

<sup>12</sup>This assumption approximates the short-run conditions of an industry operating with excess capacity of a fixed factor of production (Dowrick, 1989).

in the unionized sector. The parameter  $\theta \in (0, 1)$  represents the relative importance of wages over employment for the labor union.<sup>13</sup>

Domestic wages and employment levels can be described as the outcome of a two stage game. In the first stage, the domestic firms and the union bargain over wages through a Nash bargaining process taking as given the competitive wage abroad. In the second stage, each firm chooses its output (and hence employment) taking as given the wage rate and the output of the domestic and foreign competitors. We solve by backward induction.

### 3.2 Production

Profits of the representative domestic firm are given by  $\pi = (p - w)y - F$ , where  $F$  is the fixed cost of production. Foreign producers can recruit workers from a competitive labor market at the (exogenous) wage  $w^*$ . Hence profits of each foreign firm are given by  $\pi^* = (p - w^*)y^* - F^*$ . Profit maximization leads to the reaction functions of each firm:

$$y = \frac{a - w}{b(1 + n)} - \frac{n}{1 + n}y^* \quad (3)$$

$$y^* = \frac{a - w^*}{b(1 + n^*)} - \frac{n}{1 + n^*}y \quad (4)$$

By solving (3) and (4), we may obtain the equilibrium output of each firm for given wage rates at home and abroad:

$$y = \frac{a - (1 + n^*)w + n^*w^*}{b(1 + n + n^*)} \quad (5)$$

$$y^* = \frac{a - (1 + n)w^* + nw}{b(1 + n + n^*)} \quad (6)$$

As would be expected, domestic employment levels and profit rates decrease in  $w$  and increase in  $w^*$ , while the converse happens with foreign employment and profits.

### 3.3 Collective bargaining

Assuming zero disagreement payoffs, the generalized Nash product can be expressed as

$$N = U^\beta (n\pi)^{1-\beta} = [(w - \bar{w})^\theta ny]^\beta [n((a - b(ny + n^*y^*))y - wy)]^{1-\beta} \quad (7)$$

where  $\beta \in [0, 1]$  denotes the relative bargaining power of the union. Maximization of (7) with respect to  $w$  yields the following equilibrium negotiated wage:

$$w = \left(1 - \frac{\beta\theta}{2 - \beta}\right)\bar{w} + \frac{\beta\theta}{(1 + n^*)(2 - \beta)}(a + n^*w^*) \quad (8)$$

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<sup>13</sup>Pemberton (1988) shows that (2) can be derived as the maximand of a “managerial union” with union leaders who are interested in size (employment) and union members (represented by the median worker) who are interested in excess wages, where  $\theta$  corresponds to the relative bargaining power of workers and leadership. Note that  $\theta = \frac{1}{2}$  corresponds to a rent-maximizing union.

### 3.4 Dismantling of coercive institutions

The advent of democracy in South Africa was followed by numerous interventions aimed at leveling the historically uneven bargaining field. Labor market outcomes were affected via two channels. First, changes in legislation governing union activity directly caused an increase in the bargaining power of unionized labor,  $\beta$ . Second, the abolishment of mobility restrictions for workers in the former homelands, along with the elimination of the restrictions on the type of jobs they would gain access to, led to an increase in the reservation wage of unionized workers,  $\bar{w}$ . Straightforward computations show that, all else being equal, both these forces contribute to an unambiguous increases in the negotiated wage and union utility, while lowering domestic profits and employment levels.

### 3.5 International price shocks

Consider now the effects of movements in international prices, which we assume are driven by exogenous shocks to global demand,  $a$ , and/or foreign marginal costs,  $w^*$ .<sup>14</sup> From (8) we observe that:

$$\frac{\partial w}{\partial a} = \frac{\beta\theta}{(1+n^*)(2-\beta)} > 0 \quad (9)$$

$$\frac{\partial w}{\partial w^*} = \frac{n^*\beta\theta}{(1+n^*)(2-\beta)} > 0 \quad (10)$$

An increase in global demand or a positive shock to foreign marginal costs leads to a higher international price. This leads to an increase in domestic production and quasi-rents, and hence to a higher negotiated wage. From (9) and (10), we further observe that these positive effects on union wages are strictly increasing in  $\beta$ . The more powerful the union, the stronger its ability to benefit from these resource windfalls.

## 4 Data

For the main analysis in this paper, we build a community-level panel data set using the community profiles from the 1996 and 2011 population censuses run by Statistics South Africa. In their original format, the community profiles (at the sub-place level) provide aggregated category counts for each variable in the census. South Africa is divided into 9 provinces (equivalent to states), 266 municipalities and over 21,000 communities (sub-places). Each community has a population of 2,000 individuals on average, though there is

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<sup>14</sup>During the period of analysis, the emergence of China and the resulting increase in global demand for natural resources is perhaps the clearest empirical counterpart to an exogenous shock to global demand (see, e.g., Autor et al, 2013).

significant heterogeneity. The census includes data on demographics, labor market (including employment, industry and salary), and access to infrastructure, among other. Using cartographic data on communities and former homeland boundaries we identified which communities were located inside and outside the former homelands. In the next section we document the extent to which the data are consistent with the historical accounts of the apartheid.

The geographic community definitions changed from 1996 to 2011. We use official cartographic data to match communities over time. For the analysis presented in the paper, we match the 2011 data to the 1996 data by the nearest centroid.<sup>15</sup> We allow for multiple matches, and therefore there is not a one-to-one correspondence between local communities.<sup>16</sup> Our final sample is comprised of almost 16,000 communities, observed both in 1996 and 2011. Appendix Table A1 provides summary statistics on these data.

Our main variable of interest is the growth of income per capita at the community-level. This variable is defined as the difference in the natural logarithms of population-weighted income per capita between 2011 and 1996. Since data on income are grouped in categories (e.g. no income, 1 to 4800 rand a year, and so on), we take the mid-point of each category.<sup>17</sup> All income values are expressed in December 2012 prices (obtained from Statistics South Africa). To provide complementary evidence on the specific mechanisms we emphasize, we also use data from the 10% sample of the 1996 population census.

## 5 The legacy of apartheid: Size and evolution of local development gaps

We document the evolution of development differentials across communities located just-inside and just-outside the former homelands. Communities are grouped in one-kilometer bins with respect to the minimum linear distance to the former homeland border. Our aim is to verify the extent to which the data are consistent with numerous historical accounts pointing to a tragic legacy of apartheid through the various repressive mechanisms discussed above. The use of these descriptive diagrams focusing on communities located just-inside and just-outside the former homelands makes it possible to minimize

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<sup>15</sup>The centroid of the community is defined as the central point (i.e. latitude and longitude) of the community polygon.

<sup>16</sup>In Appendix Table A2, we present results for different matching techniques and find that the main findings remain unchanged across definitions.

<sup>17</sup>For example, category 1 to 4800 rand would take the value of 2400.5, and so on. The maximum category of income is truncated at its value. We count all missing values as zero when calculating the community's per capita income. In Appendix Table A3, we show that our main results are robust to imputing missing values by the community average instead.

heterogeneity with respect to geographic and climatic conditions.<sup>18</sup>

Figure 3 documents the extent to which black people were geographically segregated as a result of the homeland system. We observe that the large differences that existed in 1996 persist after a period of 15 years, though the share of black citizens increased in communities just-outside of the former homelands. Similar persistent gaps can be observed in several other dimensions.

Figure 4 depicts levels of income per capita, where former homeland communities fare significantly worse both in 1996 and 2011. In 1996, the average per capita income just-inside and outside the homelands was 4,526 and 20,651 rand, respectively. At the border the difference was almost 14,000 rand. In 2011, per capita income increased to 12,134 and 41,322 rand, respectively. Although the gap at the border increased in absolute terms to around 29,000 rand in 2011, it fell in relative terms from about 5 times to 3.5 times, indicating that former homeland communities have converged in income per capita during this period.

This catching up is clearly observed in Figure 5: while real per capita income grew overall during this period, growth rates were considerably stronger among former homeland communities. This figure also shows that there has been significant heterogeneity in income growth across former homeland communities. Our main interest is in evaluating the extent to which the interaction of the dismantling of coercive institutions and exposure to resource rents contributed to explain this heterogeneity in spatial income convergence.

## 6 Resource rents, coercion, and the path of local income

In this section we provide visual and econometric evidence that the interplay between the dismantling of coercive institutions and the distribution of resource rents played an important role in shaping the development path of marginalized communities following the end of apartheid.

### 6.1 Empirical strategy

Let  $y_{i,t}$  denote the logarithm of real per capita income for community  $i$  in period  $t$  (where  $t = 1996, 2011$ ). We are interested in the drivers of spatial income convergence among communities marginalized during apartheid, that is, in explaining  $\Delta y_i = y_{i,11} - y_{i,96}$ . To

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<sup>18</sup>This analysis is purely descriptive. The gaps documented should not be interpreted as the precise causal impacts of apartheid institutions on local socioeconomic outcomes. While there is no doubt that apartheid institutions contributed to explain the large development differentials observed between communities just-inside and just-outside the former homelands, these gaps might partially reflect other sources of underlying heterogeneity across communities.



this end, we estimate an equation of the form:

$$\Delta y_i = \alpha_0 + \theta \text{homeland}_i + \gamma \text{mining}_{i,96} + \beta \text{homeland}_i * \text{mining}_{i,96} + \phi_p + \lambda X_i + \delta_i + \Delta \varepsilon_i \quad (11)$$

where:  $\text{homeland}_i$  is a dummy variable indicating whether community  $i$  belongs to a homeland; and  $\text{mining}_{i,96}$  is the employment share of the mining industry of that community in 1996, aimed at capturing initial exposure to resource rents. Our main coefficient of interest,  $\beta$ , measures the difference in the average effect of a higher initial exposure to resource rents for communities located inside the former homelands relative to those outside. The error term would be comprised of  $\delta_i$ , capturing unobservable community characteristics, and  $\varepsilon_i$  a random error term. In order to avoid potential biases as a result of the unobservable term  $\delta_i$ , we account for several initial (and current) factors included in matrix  $X_i$ . We include initial community characteristics in 1996 such distance to border of the homeland, share of white, colored and indian or asian population, age distribution, share of level of education of household head, share employed, share male, real per capita income, total population, percent connected to electric grid, piped water and have no refuse. In some specifications, we also include similar 2011 controls (expect income per capita) to account for changes in these attributes. Given the sizable differences documented in section 5, all controls are interacted with the homeland indicator to account for different trajectories inside and outside of the former homelands.<sup>19</sup> Standard errors are clustered at the municipality-homeland area in order to account for both current and former geo-political borders, where we can expect stronger spatial correlation.<sup>20</sup>

In Figure 6 we present the average share of employment in mining in 1996 for communities just-inside and just-outside of former homelands. There does not appear to be systematic differences in shares of employment in mining on either side of the former homeland border. The main results of the paper are previewed in Figure 7, where we present income growth by initial share of employment in mining of the community.<sup>21</sup> We observe that communities with a relatively high share of employment in mining which are inside former homelands experienced higher income growth rates in real per capita income. In addition, we do not observe systematic differences in per capita income growth by share of employment in mining outside of former homelands.

<sup>19</sup>Abel (2015) finds that more ethnically diverse communities within former homeland areas are positively correlated with measures of social capital near areas affected by forced relocation. These findings reinforce the need to allow for interactions between control variables and the homeland indicator.

<sup>20</sup>Results are similar when clustering at the municipality level or at more disaggregated levels, such as the main place.

<sup>21</sup>A community is classified as having a high share of employment in mining if that share is above the 90th percentile in 1996.

## 6.2 Main results

To assess the extent to which spatial income convergence was stronger among former homeland communities with higher initial exposure to resource rents we estimate (11) by OLS. Our analysis focuses on the sample of communities within 30 kilometers from the homeland border (on either side) in order to minimize other sources of underlying heterogeneity.<sup>22</sup> The resulting estimates are presented in Table 2. We observe that communities inside homelands tended to experience faster rates of growth than communities outside, though the estimated coefficient is close to zero and not statistically significant when including municipality fixed effects and 2011 controls. Our main coefficient of interest, the interaction between the homeland indicator and the initial share of employment in mining, consistently suggests that income convergence was faster for homeland communities with higher initial exposure to resource rents. These results are robust to accounting for initial community conditions (in column 1), including province or municipality fixed effects to account for unobserved geographic heterogeneity (columns 2 and 3), and accounting for community characteristics in 2011 (in column 4). The estimates from column 4 in Table 2 imply that, for a community located inside a homeland, increasing the share of employment in mining by one standard deviation (0.103) is related to a 4.2 percentage point higher total growth rate during the 1996-2011 period.

In Table 3, we examine the sensitivity of our estimates for different samples of communities with regard to their distance to the border of former homelands. Reassuringly, our point estimates remain quite stable when narrowing the distance to 15 kilometers (column 1), including the entire country (column 4) or restricting to communities within homeland territories (column 5). Even though we are controlling for several community level characteristics, including distance to the homeland border and province (or municipality) fixed-effects, there might be other underlying unobservable heterogeneity at the community level driving our results. To better account for any underlying heterogeneity that otherwise cannot be measured, in Table 4 we use different functions of the distance to the homeland border and different functions of the geographic coordinates (Dell, 2010).<sup>23</sup> The results reported in this table show that our findings remain unchanged to the inclusion of these alternative measures.

Another potential concern is that our main variable of interest for capturing exposure to resource rents—the share of employment in mining in 1996—could potentially yield misleading results given that unemployment was high during the 1990s. An alternative measure of exposure would be based on the unconditional (on being employed) share of employment in mining for a community. The results for using this alternative measure

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<sup>22</sup>This is the sample used in the descriptive diagrams presented in the previous sections.

<sup>23</sup>Function of the latitude and longitude of the center of each community.

are presented in Table A4 of the Appendix. Both the direction and the magnitude of the estimated relation between employment in mining and per capita income growth are similar to those obtained using the (conditional) measure of employment in mining. For example, increasing the (unconditional) share of employment in mining by one standard deviation in a community located inside a homeland (0.037) is associated with a 4.8 percentage point higher growth rate, similar to that obtained using the conditional measure of employment in mining.

### 6.3 Complementary evidence from individual-level data

To shed light on the underlying mechanisms driving the interaction between the dismantling of coercive institutions and rent-sharing we use individual-level data from the 10% sample of the 1996 South African population census. We restrict the sample to men between the ages of 15 and 65, working as an employee (i.e. not self-employed or working in a family business). In Table 5 we present results for regressing the log of individual wage on indicator variables for black, working in mining industry and its interaction.<sup>24</sup> In alternative specifications we account for individual attributes such as age, highest attained education indicators, occupation indicators, and province or district fixed-effects.

Consistent with the presence of resource rents in the mining industry and with the high degree of unionization relative to other industries, we find a large wage premium of around 40 percent associated to employment in this industry. At the same time, there is a large income gap against black workers of approximately 50 percent—in line with the lasting impacts of coercive institutions in place before the end of apartheid. We also observe that black mining workers initially benefited less from resource rents than non-blacks. This individual-level evidence is therefore fully consistent with the mechanisms emphasized in the main analysis of the paper.<sup>25</sup>

## 7 Alternative explanations

Though our results point to the importance of the interaction between the dismantling of coercive institutions and rent-sharing in the mining industry, the heterogeneity in spatial income across former homeland communities could in part be reflecting alternative ex-

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<sup>24</sup>Note that income is available in categories. We imputed the mid-point of each category and truncated the highest category at its initial value (that is, 30,001+ rand was assigned value of 30,001).

<sup>25</sup>We would have liked to use similar data from the 2011 census in order to examine how the wage premium for black mining workers evolved over time. Unfortunately, the 2011 individual-data released by Statistics South Africa do not contain information on industry of employment or occupation. While this information was part of the census questionnaire, it has been excluded by Stats SA from the released files due to incomplete coding.

planations. In this section, we discuss and examine the extent to which these alternative factors could be driving our results. Importantly, the fact that we use community-level data in the main analysis makes it possible to account for competing explanations that operate at this level of aggregation. This would be unfeasible with individual-level data: since black people are highly concentrated in space, any factor influencing community-level income that is correlated with employment in mining might confound individual-level estimates; and since individual-level data lack precise geographic identifiers, these factors could not be accounted for in the estimation.

### 7.1 Access to infrastructure

The period of analysis witnessed numerous government interventions aimed at addressing the historically uneven access to infrastructure. In line with historical accounts, Figure 8 documents large initial gaps between communities just-inside and just-outside the former homelands with regard to access to the electric grid, refuse, and piped water. However, this figure also documents considerable convergence in access and use of these infrastructure items over the period of analysis. If improvements in access to infrastructure are correlated with initial employment in the mining industry, our estimates would be biased.

In order to account for these factors we include the respective infrastructure variables for the years 1996 and 2011, both interacted with the former homeland indicator.<sup>26</sup> Table 6 presents the results, where from column 1 to 3 we include each infrastructure variable separately, and in column 4 we include all of them together (though these are not reported to avoid clutter). The corresponding estimates for the coefficients of those variables as well as our initial coefficients of interest are reported. Note that when accounting for changes in access to infrastructure, the point estimates for our coefficients of interest do not change substantially relative to our original estimates.

When considering the estimates for the correlation between our infrastructure variables and income growth, we find that our results are consistent with the existing evidence. These estimates have to be interpreted with caution since there may be other unobserved heterogeneity related to the expansion of infrastructure. Dinkelman (2011) evaluates the effect of rural electrification in KwaZulu-Natal, a former homeland, on employment. The study finds negative correlations between electrification and employment rates for males when estimating by OLS. This is consistent with our results, where greater access to electricity does not have a positive relation with income trajectories for former homeland communities. On the other hand, increasing access to having a refuse or piped water do not appear to be significantly related to income growth.

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<sup>26</sup>Using the absolute change or the percentage change in access yields similar results.

## 7.2 Access to markets and connectivity

Since the homelands were spread across the country, the effects of their progressive integration in the South African economy might be expected to depend on their proximity to markets and connectivity (Harris, 1954; Krugman, 1991; Hanson, 1996; Fujita et al., 2001; Redding and Sturn, 2008; Donaldson, 2015). Failing to account for these mechanisms might bias our estimates, notably if initial employment in mining were correlated with proximity to markets and roads of the corresponding communities. Even though we initially accounted for the distance of the community to the border of the homeland, this measure does not necessarily capture the effect of the integration of former homeland communities in the South African economy.

To capture a community's access to markets, we calculate its distance to the ten largest cities in terms of population in South Africa.<sup>27</sup> The linear distances are weighted by the city's population. Figure 9 describes this measure for the sample of communities near the former homeland borders. Communities located inside homeland areas appear to have worse access to major cities, though there is substantial variation inside and out.

In a similar way, we account for the connectivity of each community, defined as proximity to main road. Formally, this measure is defined as the linear distance in kilometers of a community to the nearest main road (in 2001 as defined by Statistics South Africa). Figure 10 describes this measure and shows a similar pattern to that found with distance to major cities. However, the difference between communities just-inside and outside the homelands is substantially larger in this case.

Table 7 presents regression results that account for the introduction of these variables. In column 1 we include the measure of distance to major cities and the interaction with the homeland indicator. Both covariates are statistically significant. The closer a community is to a major city, the stronger is its growth in income. This effect is even more pronounced for communities located inside homeland areas. A potential concern is that this measure might not properly account for heterogeneity in transport infrastructure across regions. To account for this, in column 2 we include distance to main roads and its interaction with the homeland indicator. We observe that these measure are not statistically distinguishable from zero. Finally, column 3 includes both measures together and the results remain unaltered. These results provide further evidence supporting the importance of market access for economic growth. Furthermore, notice that the estimates for our variables of interest remain unchanged throughout.

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<sup>27</sup>In order, the cities are Cape Town, Durban, Johannesburg, Soweto, Pretoria, Port Elizabeth, Pietermaritzburg, Benoni, Tembisa, and East London.

### 7.3 Migration and demography

The dismantling of apartheid might be expected to induce migration flows from the former homelands. As suggested above, heterogeneity in the demographic composition of these flows across locations—notably differential migration movements from homelands with high initial exposure to resource rents—might challenge our interpretation of the results. To further examine the importance of this alternative explanation, we estimate (11) using population growth over 1996-2011 as the dependent variable (instead of income growth).

The results are presented in Table 8. We find that former homeland communities appear to experience somewhat lower rates of population growth, though these are imprecisely estimated. Perhaps more importantly, the estimated coefficients for the initial share of employment in mining and its interaction with the homeland indicator are also not statistically significant. These results provide little support to the migration channel.

Even though the change in population does not appear to be statistically different between communities within former homeland areas, it is possible that the composition of migrants was different. One might also worry that differences in fertility/mortality rates across communities in homeland areas could be behind similar rates of population growth. An alternative source of bias could be the provision of social grants for certain segments of the population, like old-age pensions. While we have already shown that our results survive the inclusion of 1996 and 2011 controls for the demographic composition of the population, we might still worry that such changes might be positively correlated with the initial share of employment in mining.

In order to address these issues, we explore how initial exposure to resource rents relates to the change in the population age structure of communities inside and outside the former homelands. In particular, we estimate the same model as before, but using the change in the share of individuals in different age categories between 1996 and 2011 as the dependent variable. The results are presented in Table 9. In column 1, we observe that the share of children between the ages of 0 to 9 did not change at a significantly different rate for communities within homeland areas that had different exposure to resource rents. This suggests that differential fertility rates between communities just-inside homeland areas are not driving the similar evolution in population growth. Similarly, it appears that the age structure remains similar between communities just-inside the homelands.<sup>28</sup>

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<sup>28</sup>In column 4, the total effect of employment in mining for communities inside homelands is not statistically significant (p-value= 0.149).

#### 7.4 Placebo: Initial employment in other sectors

The results above suggest that there is a significant positive interplay between the dismantlement of coercive institutions (as measured by communities located in homeland areas) and the higher exposure to resource rents (captured by the initial share of employment in the mining industry). This is consistent with an explanation based on increased bargaining power of labor unions coupled with greater availability of product market rents in this sector.

To further validate our interpretation of these results, in Table 10 we present the coefficient for the effect of increasing the initial share of employment in different sectors for income growth of communities located inside homelands. Since these sectors would not be expected to have comparable product market rents that might be potentially shared with workers via collective bargaining, the observation of positive and significant effects for the share of employment in other sectors might challenge our interpretation of the basic results. Reassuringly, we only find positive and significant estimates for the mining sector. Both manufacturing and community services have relatively high rates of unionization (over 40% in 1996), but greater exposure to these sectors is associated with lower rates of income growth. This suggests that the interplay between the increased bargaining power of unions and their stronger ability to benefit from resource rents are indeed driving our results.

## 8 Conclusion

A growing body of literature reveals that current economic underdevelopment is deeply rooted in specific historical episodes. Less attention has focused on uncovering specific channels by which these negative impacts can be countervailed. In this paper we have made two main contributions. First, we have quantitatively documented the legacy of apartheid in South Africa, as revealed by the large and lasting development gaps between communities located just-inside and just-outside the former homelands. Second, we have identified the interaction between the dismantling of apartheid institutions and the distribution of natural resource rents as an important driver of local income per capita in the 1996-2011 period. The importance of this mechanism for future patterns of local development would depend on the evolution of global commodity prices, as well as other factors influencing product and labor market outcomes in the mining sector.

## Appendix

### A.1 Summary statistics: Regression data

This section presents summary statistics on the data used in the regression analysis.

### A.2 Matching communities between 1996 and 2011 census

As explained in Section 4, the geographical definitions for communities changed between the 1996 and 2011 census. In this section we explore how different strategies of matching communities over time affects our estimates. In our main analysis, we match 2011 communities to 1996 by nearest centroid. It is possible that many communities from 2011 match to the same community in 1996. When this is the case, the groups of 2011 communities are aggregated into one unit. Additionally, it is possible that a number of communities from 1996 find no matches, in which case they are dropped from the sample.

A second matching strategy employs the use of cartographic data for both censuses. We calculate the areas of community polygons from 2011 inside 1996 community polygons. If over 75% of the area of a 2011 community is contained in a single 1996 community, then it is matched to that community. As before, it is possible that several 2011 communities match to a single 1996 community. Additionally, it is possible that communities from both years find no match or do not reach the threshold and are dropped.

For robustness, in Table A.2 below we present the two most common specifications presented in the paper: including 1996 controls and municipality fixed effects, and also including 2011 controls for each community matching strategy. The strategies described above are denoted Centroid and Area>75%, respectively. The first two columns correspond to the initial estimates presented in columns 3 and 4 of Table 2. Noticeably, the point estimates do not change significantly across the various community matching strategies. In addition, they remain quite stable even when restricting the sample to unique matches between censuses (columns 5 and 6).

### A.3 Additional robustness checks

In constructing the data set used in the main analysis, we count all missing values as zero when calculating the community's per capita income. In Table A3, we show that our main results are robust to imputing missing values by the community average instead. Another potential concern is that our main variable of interest for capturing exposure to resource rents—the share of employment in mining in 1996—does not account for unemployment. An alternative measure of exposure would be based on the unconditional (on being employed) share of employment in mining for a community. Table A4 presents



the results obtained when using this alternative measure. We observe that both the direction and the magnitude of the estimated relation between employment in mining and per capita income growth is similar to those obtained using the (conditional) measure of employment in mining.

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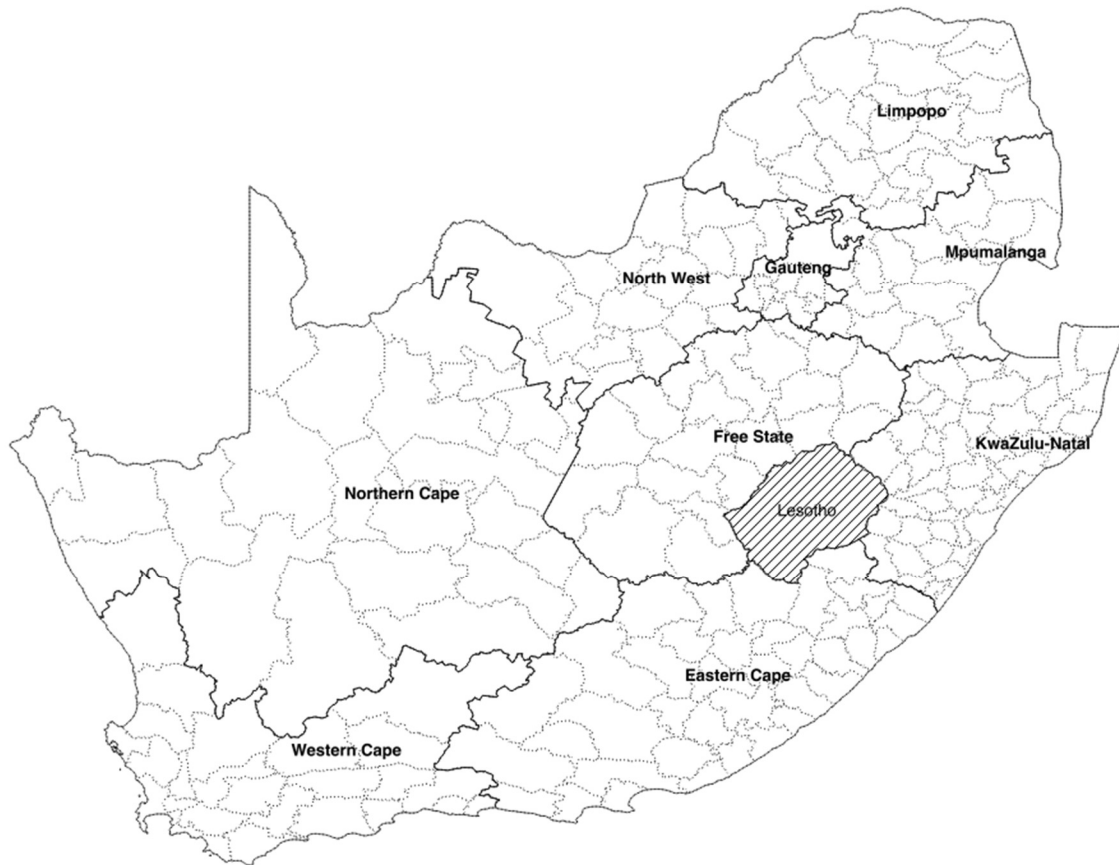
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Figure 1: South Africa's former homelands



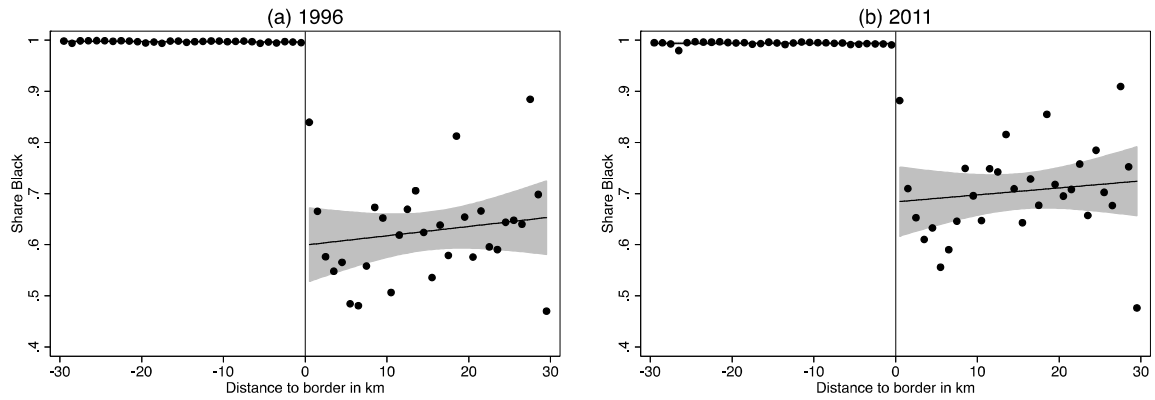
Notes: Shaded areas represent former homelands, non-shaded areas represent former states. Dashed area corresponds to Lesotho. Map generated by authors using shape-files obtained from Statistics South Africa and *The Directorate: Public State Land Support*.

Figure 2: South Africa's current administrative divisions



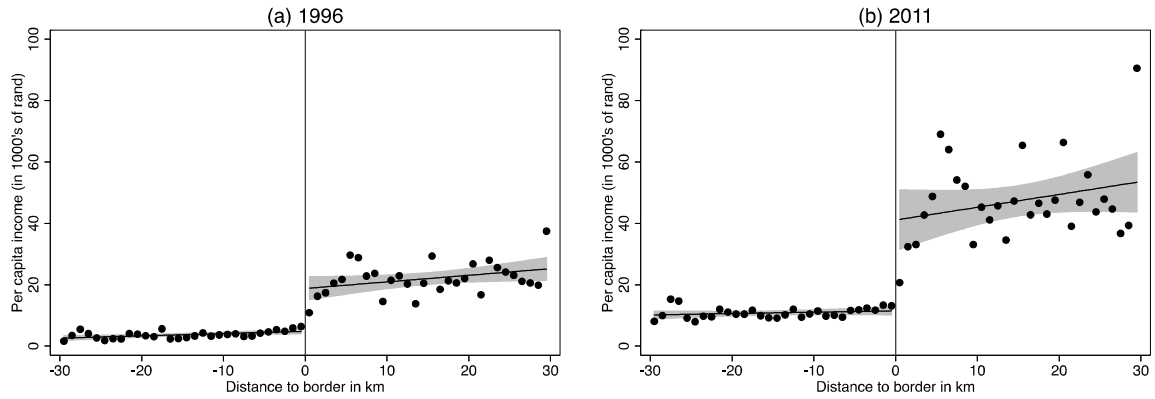
Notes: Solid lines mark provinces (9), whose names are displayed. Dotted lines denote municipalities (266). Map generated by authors using shape-files obtained from Statistics South Africa.

Figure 3: Share black population



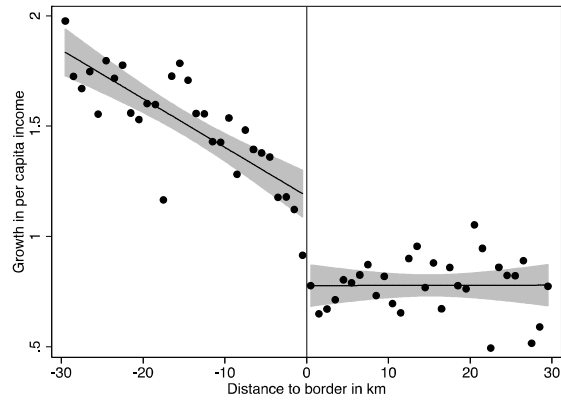
Notes: Each dot represents population-weighted community averages for 1 km bins. Negative distances correspond to communities inside homelands. Linear fit and 95% CI represented by line and shaded area, respectively.

Figure 4: Per capita income



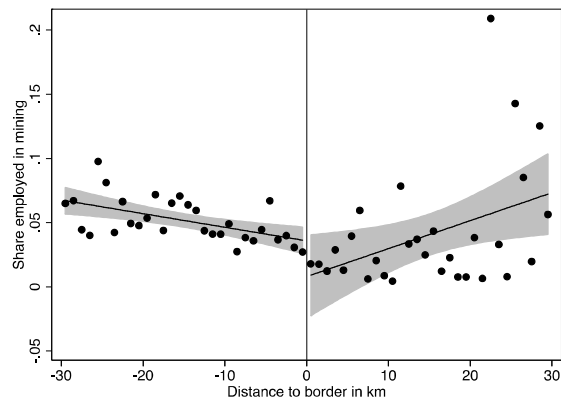
Notes: Income expressed in December 2012 rand. Each dot represents population-weighted community averages for 1 km bins. Negative distances correspond to communities inside homelands. Linear fit and 95% CI represented by line and shaded area, respectively. Per capita income measured at 2012 prices.

Figure 5: Growth of per capita income, 1996-2011



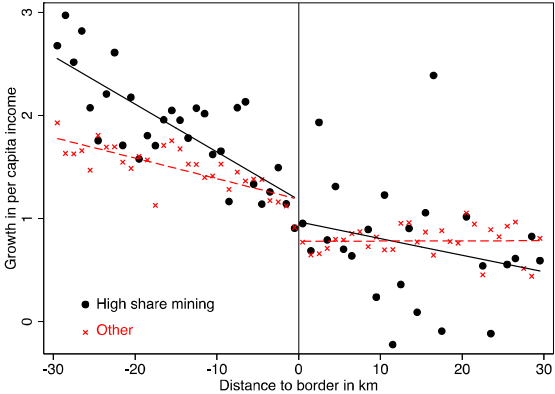
Notes: Growth of per capita income from 1996 to 2011. Each dot represents population-weighted community averages for 1 km bins. Negative distances correspond to communities inside homelands. Linear fit and 95% CI represented by line and shaded area, respectively. Per capita income measured at 2012 prices.

Figure 6: Share of employment in mining in 1996



Notes: Each dot represents population-weighted community averages for 1 km bins. Negative distances correspond to communities inside homelands. Linear fit and 95% CI represented by line and shaded area, respectively.

Figure 7: Growth of per capita income by initial share of employment in mining, 1996-2011

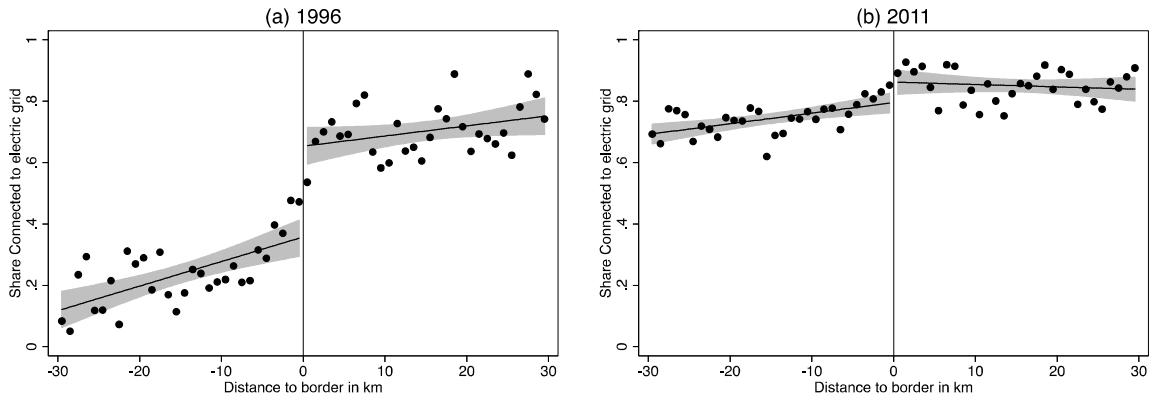


Notes: Each dot (or cross) represents population-weighted community averages for 1 km bins for communities with high share in mining or other (where high share is define as having employment above the 90<sup>th</sup> percentile of employment in mining). Negative distances correspond to communities inside homelands. Linear fit represented by solid (dashed) line for communities with high share in mining (other communities).

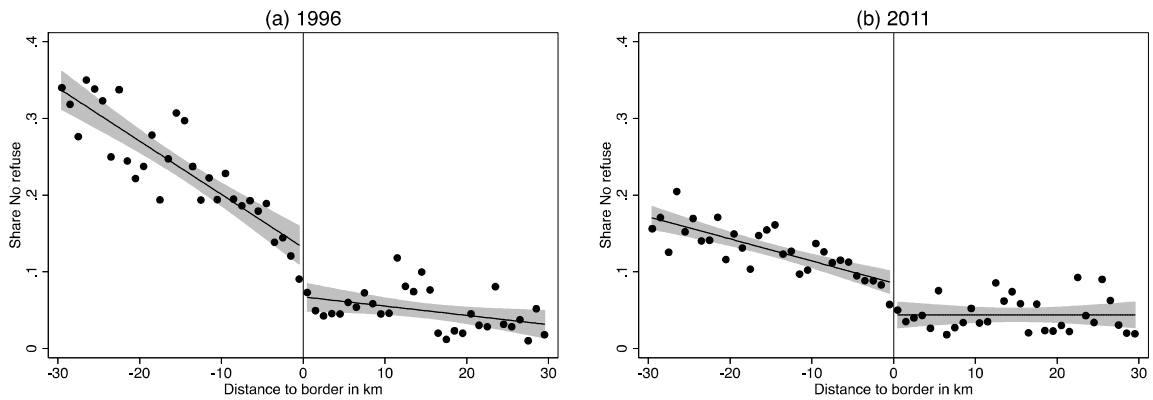


Figure 8: Access to infrastructure

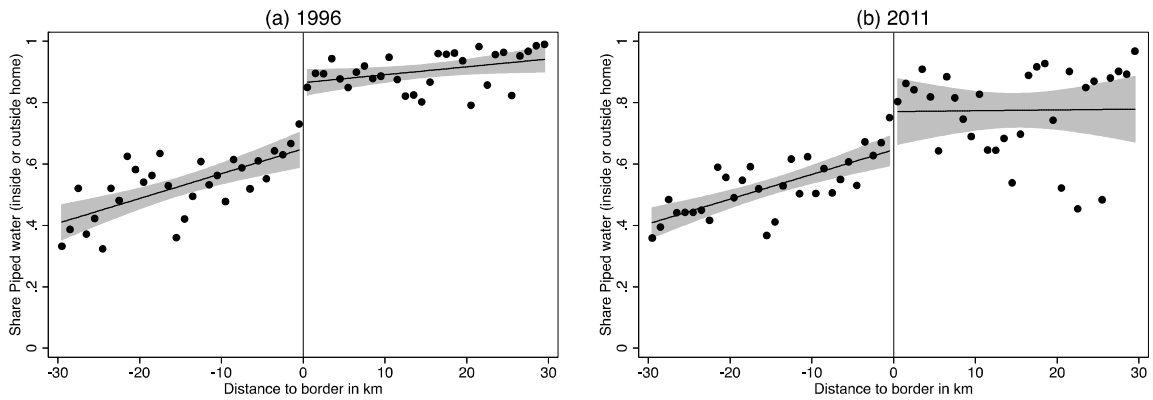
A. Share connected to electric grid



B. Share no refuse

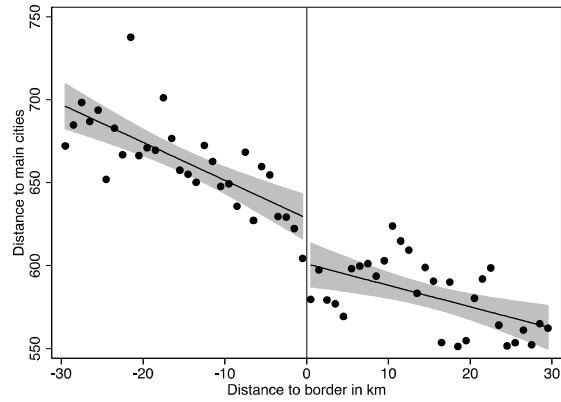


C. Share piped water



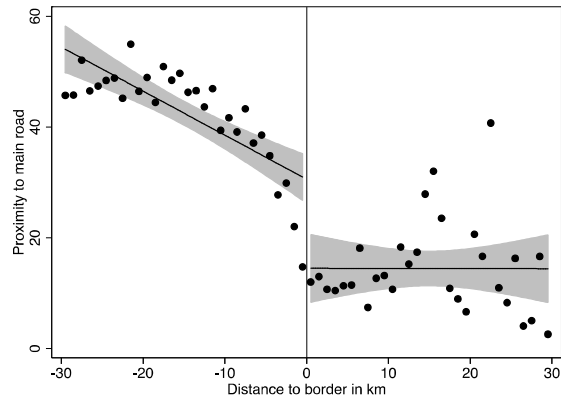
Notes: Each dot represents population-weighted community averages for 1 km bins. Negative distances correspond to communities inside homelands. Linear fit and 95% CI represented by line and shaded area, respectively.

Figure 9: Distance to main cities



Notes: Distance to main cities is defined as the population weighted (linear) distance to the 10 largest cities of South Africa. Each dot represents population-weighted community averages for 1 km bins. Negative distances correspond to communities inside homelands. Linear fit and 95% CI represented by line and shaded area, respectively.

Figure 10: Distance to main roads



Notes: Distance to main roads is defined as the (linear) distance to a main road in 2001 as defined by Statistics South Africa. Each dot represents population-weighted community averages for 1 km bins. Negative distances correspond to communities inside homelands. Linear fit and 95% CI represented by line and shaded area, respectively.

Table 1: Unionization shares by industry

	1996	2011
Mining and quarrying	0.71	0.75
Agriculture, hunting, forestry and fish	0.07	0.06
Manufacturing	0.43	0.36
Electricity, gas and water supply	0.44	0.47
Construction	0.20	0.11
Wholesale and retail trade	0.25	0.18
Transport, storage and communication	0.46	0.29
Financial intermediation, insurance, etc.	0.23	0.22
Community, social and personal services	0.41	0.57
Private households	0.12	0.00

Notes: Share of unionized workers by industry. Own calculations based on 1996 October Household Survey and 2011-q1 Labor Force Survey.

Table 2: Relation between initial share of employment in mining and growth in per capita income (1996-2011)

	(1)	(2)	(3)	(4)
<hr/>				
Dep. Var.: Growth in per capita income (1996-2011)				
<hr/>				
Homeland (=1)	1.049**	1.152**	0.660	-0.032
	[0.491]	[0.469]	[0.454]	[0.970]
Share Employed mining <sub>1996</sub>	-0.210	-0.004	-0.447*	-0.103
	[0.215]	[0.247]	[0.258]	[0.226]
Homeland*Share Employed mining <sub>1996</sub>	0.641**	0.540*	0.840***	0.510**
	[0.291]	[0.324]	[0.284]	[0.241]
Observations	9,583	9,583	9,583	9,558
R-squared	0.592	0.599	0.634	0.711
<hr/>				
1996 Controls	Yes	Yes	Yes	Yes
2011 Controls	-	-	-	Yes
Province FE	-	Yes	-	-
Municipality FE	-	-	Yes	Yes

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). The dependent variable is the difference in log per capita income for 2011-1996. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. 2011 controls include: same as 1996 except for per capita income (which is excluded). All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

Table 3: Robustness to sample selection

	(1)	(2)	(3)	(4)	(5)
Dep. Var.: Growth in per capita income (1996-2011)					
Homeland (=1)	1.256** [0.508]	0.660 [0.454]	0.841** [0.423]	1.433*** [0.454]	
Share Employed mining <sub>1996</sub>	-0.120 [0.243]	-0.447* [0.258]	-0.497*** [0.190]	-0.356** [0.154]	
Homeland*Share Employed mining <sub>1996</sub>	0.604** [0.267]	0.840*** [0.284]	0.952*** [0.219]	0.766*** [0.188]	0.363*** [0.111]
Observations	7,338	9,583	12,003	15,854	10,340
R-squared	0.646	0.634	0.636	0.644	0.614
1996 Controls	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes
Sample	<15 km	<30 km	<60 km	All SA	only HL

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression where the sample is restricted to communities within  $X$  kilometers of the former homeland borders (on both sides), as indicated in the sample row. Column 5 restricts the sample to communities inside former homelands. The dependent variable is the difference in log per capita income for 2011-1996. All regressions include 1996 controls and municipality fixed effects. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

Table 4: Robustness to spatial controls

	(1)	(2)	(3)	(4)	(5)
Dep. Var.: Growth in per capita income (1996-2011)					
Homeland (=1)	0.660 [0.454]	0.728 [0.462]	1.189** [0.504]	0.691 [0.449]	0.660 [0.448]
Share Employed mining <sub>1996</sub>	-0.447* [0.258]	-0.443* [0.257]	-0.216 [0.207]	-0.513** [0.260]	-0.544** [0.262]
Homeland*Share Employed mining <sub>1996</sub>	0.840*** [0.284]	0.848*** [0.282]	0.655** [0.286]	0.915*** [0.285]	0.957*** [0.288]
Observations	9,583	9,583	9,583	9,583	9,583
R-squared	0.634	0.635	0.593	0.636	0.637
1996 Controls	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes
f(Distance to homeland border, in km)	Linear Inter	Cubic Inter	Cubic BSpline	X,Y,XY	Cubic X,Y,XY

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). The dependent variable is the difference in log per capita income for 2011-1996. Columns 1 to 3 include different functions of the linear distance between communities and the homeland borders. Columns 4 and 5 instead include different functions of the geographic coordinates (lat./lon. – X/Y). All regressions include 1996 controls and municipality fixed effects. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

Table 5: Initial wage differentials, individual level data, 1996

	(1)	(2)	(3)	(4)
Dep. Var.: Log(Income)				
Black (=1)	-1.002*** [0.004]	-0.509*** [0.003]	-0.553*** [0.004]	-0.590*** [0.004]
Mining (=1)	0.489*** [0.012]	0.374*** [0.010]	0.426*** [0.010]	0.417*** [0.011]
Black*Mining	-0.247*** [0.013]	-0.082*** [0.011]	-0.093*** [0.011]	-0.114*** [0.011]
Observations	378,125	357,240	357,240	357,240
R-squared	0.188	0.49	0.504	0.529
Individual controls	-	Yes	Yes	Yes
Province FE	-	-	Yes	-
Municipality FE	-	-	-	Yes

Notes: The estimation method is OLS. Data from the 1996 population census 10% sample. Sample of males between 15 and 65 years old, employed in firm/company (not self-employed or family employed). Individual controls include age, age squared, indicators for highest achieved education, and occupation indicators. Robust standard errors in parentheses. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

Table 6: Access to infrastructure

	(1)	(2)	(3)	(4)
Dep. Var.: Growth in per capita income (1996-2011)				
Infrastructure variable:	Electric grid	No Refuse	Water	All
Homeland (=1)	1.422** [0.635]	0.866 [0.545]	1.098** [0.535]	1.371** [0.632]
Share Employed mining <sub>1996</sub>	-0.684*** [0.228]	-0.552** [0.245]	-0.583** [0.246]	-0.690*** [0.225]
Homeland*Share Employed mining <sub>1996</sub>	1.072*** [0.257]	0.942*** [0.273]	0.974*** [0.276]	1.076*** [0.257]
Share <i>Infrastructure</i> <sub>1996</sub>	-0.007 [0.088]	-0.025 [0.156]	-0.153 [0.100]	
Homeland*Share <i>Infrastructure</i> <sub>1996</sub>	-0.013 [0.095]	0.135 [0.162]	0.017 [0.105]	
Share <i>Infrastructure</i> <sub>2011</sub>	0.670*** [0.124]	-0.668*** [0.222]	-0.069 [0.098]	
Homeland*Share <i>Infrastructure</i> <sub>2011</sub>	-0.722*** [0.132]	0.751*** [0.228]	0.046 [0.102]	
Observations	9,562	9,562	9,562	9,562
R-squared	0.641	0.637	0.636	0.642
1996 Controls	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). Column 4 includes all infrastructure variables (coefficients for these not presented). The dependent variable is the difference in log per capita income for 2011-1996. All regressions include 1996 controls and municipality fixed effects. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1



Table 7: Access to markets and connectivity

	(1)	(2)	(3)
<hr/>			
Dep. Var.: Growth in per capita income (1996-2011)			
<hr/>			
Homeland (=1)	1.552*** [0.495]	0.701 [0.468]	1.552*** [0.497]
Share Employed mining <sub>1996</sub>	-0.472* [0.249]	-0.452* [0.254]	-0.465* [0.250]
Homeland*Share Employed mining <sub>1996</sub>	0.907*** [0.276]	0.862*** [0.279]	0.908*** [0.277]
Distance to major cities	-0.002** [0.001]		-0.002* [0.001]
Homeland*Distance to major cities	-0.001*** [0.000]		-0.001*** [0.000]
Distance to main road		-0.001 [0.001]	-0.001 [0.001]
Homeland*Distance to main road		-0.001 [0.001]	0.0002 [0.001]
Observations	9,583	9,583	9,583
R-squared	0.636	0.635	0.636
<hr/>			
1996 Controls	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). The dependent variable is the difference in log per capita income for 2011-1996. Distance to major cities defined as the population-weighted average of the linear distance from given community to the 10 largest cities in South Africa (as explained in section 7.2). Distance to main road is the linear distance from given community to the nearest main road as defined by Statistics South Africa in 2001. All regressions include 1996 controls and municipality fixed effects. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

Table 8: Population growth, 1996-2011

	(1)	(2)	(3)	(4)
<hr/>				
Dep. Var.: Population growth (1996-2011)				
<hr/>				
Homeland (=1)	-1.028	-0.655	-1.32	-5.966
	[1.189]	[1.163]	[0.955]	[3.941]
Share Employed mining <sub>1996</sub>	0.336	0.205	-0.200	0.029
	[0.230]	[0.263]	[0.341]	[0.323]
Homeland*Share Employed mining <sub>1996</sub>	-0.255	-0.261	0.014	0.035
	[0.269]	[0.302]	[0.341]	[0.328]
Observations	9,598	9,598	9,598	9,570
R-squared	0.132	0.141	0.207	0.514
<hr/>				
1996 Controls	Yes	Yes	Yes	Yes
2011 Controls	-	-	-	Yes
Province FE	-	Yes	-	-
Municipality FE	-	-	Yes	Yes

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). The dependent variable is the difference in log population for 2011-1996. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. 2011 controls include: same as 1996 except for per capita income (which is excluded). All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

Table 9: Change in population age structure, 1996-2011

	(1)	(2)	(3)	(4)	(5)
	Age	Age	Age	Age	Age
Dep. Var.: change in share	0-9	10-19	20-39	40-59	60+
Homeland (=1)	-0.066	0.147**	0.041	-0.087	-0.047
	[0.047]	[0.057]	[0.102]	[0.061]	[0.031]
Share Employed mining <sub>1996</sub>	0.025*	0.047	-0.039	-0.039**	-0.005
	[0.014]	[0.034]	[0.043]	[0.016]	[0.014]
Homeland*Share Employed mining <sub>1996</sub>	-0.034**	-0.052	0.038	0.060***	0.002
	[0.016]	[0.033]	[0.043]	[0.020]	[0.013]
Observations	9,598	9,598	9,598	9,598	9,598
R-squared	0.443	0.557	0.359	0.418	0.396
1996 Controls	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). The dependent variable is the difference in the percentage of population in given age group for 2011-1996. All regressions include 1996 controls and municipality fixed effects. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

Table 10: Placebo test using initial employment share in other industries

	(1)	(2)	(3)	(4)
Dep. Var.: Growth in per capita income (1996-2011)				
Coefficients for: Share Employed <i>sector</i> + HL*Share employed <i>sector</i>				
<i>Sector:</i>				
Mining <sub>1996</sub>	0.398** [0.199]	0.504** [0.213]	0.351** [0.161]	0.315** [0.145]
Manufacturing <sub>1996</sub>	-0.128 [0.135]	-0.273** [0.129]	-0.111 [0.133]	-0.208* [0.118]
Agriculture <sub>1996</sub>	0.190 [0.126]	0.160 [0.126]	0.163 [0.130]	0.116 [0.124]
Construction <sub>1996</sub>	-0.102 [0.152]	-0.057 [0.150]	0.033 [0.147]	0.060 [0.139]
Retail <sub>1996</sub>	0.032 [0.147]	0.126 [0.147]	0.063 [0.140]	0.023 [0.126]
Community, social & personal services <sub>1996</sub>	-0.087 [0.124]	-0.147 [0.127]	-0.256** [0.107]	-0.386*** [0.097]
Observations	9,583	9,583	9,583	9,558
R-squared	0.595	0.604	0.638	0.715
1996 Controls	Yes	Yes	Yes	Yes
2011 Controls	-	-	-	Yes
Province FE	-	Yes	-	-
Municipality FE	-	-	Yes	Yes

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). The coefficients presented correspond to the sum of the coefficient for the share of employment in given sector in 1996 (e.g. mining) and the interaction of the homeland indicator with the share employment in the sector in 1996. The dependent variable is the difference in log per capita income for 2011-1996. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. 2011 controls include: same as 1996 except for per capita income (which is excluded). All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

Table A1: Descriptive Statistics, regressions data

	Inside Homeland		Outside Homeland	
	1996	2011	1996	2011
Per capita income	4.526	12.134	20.651	41.322
	[5.388]	[9.136]	[18.447]	[43.463]
Per capita income (impute by mean)	4.622	12.350	21.858	43.281
	[5.485]	[9.943]	[19.792]	[45.482]
Share Employed mining	0.042		0.030	
	[0.103]		[0.092]	
Share (Uncond.) Employed mining	0.005		0.010	
	[0.037]		[0.041]	
Share Employed manufacturing	0.106		0.158	
	[0.109]		[0.128]	
Share Employed agriculture	0.056		0.092	
	[0.087]		[0.187]	
Share Employed construction	0.094		0.069	
	[0.071]		[0.050]	
Share Employed retail	0.130		0.150	
	[0.077]		[0.068]	
Share Employed community	0.281		0.202	
	[0.177]		[0.121]	
Share Black	0.997	0.992	0.622	0.746
	[0.022]	[0.026]	[0.392]	[0.311]
Share White	0.001	0.003	0.198	0.128
	[0.012]	[0.015]	[0.310]	[0.225]
Share Indian/Asian	0.001	0.002	0.145	0.090
	[0.006]	[0.008]	[0.309]	[0.217]
Share Colored	0.002	0.002	0.034	0.031
	[0.014]	[0.015]	[0.127]	[0.094]
Share Age 10-19	0.258	0.224	0.194	0.167
	[0.041]	[0.042]	[0.051]	[0.043]
Share Age 20-39	0.274	0.301	0.354	0.375
	[0.075]	[0.075]	[0.074]	[0.084]
Share Age 40-59	0.119	0.155	0.176	0.200
	[0.025]	[0.033]	[0.050]	[0.051]
Share Age 60+	0.070	0.082	0.071	0.079
	[0.023]	[0.033]	[0.045]	[0.051]
Share HH head education: incomplete primary	0.187	0.316	0.143	0.228
	[0.087]	[0.077]	[0.091]	[0.086]
Share HH head education: complete primary	0.073	0.059	0.065	0.048
	[0.027]	[0.015]	[0.033]	[0.019]
Share HH head education: incomplete secondary	0.278	0.319	0.315	0.302
	[0.089]	[0.052]	[0.099]	[0.075]
Share HH head education: complete secondary	0.111	0.164	0.205	0.242
	[0.075]	[0.073]	[0.115]	[0.088]
Share HH head education: higher ed.	0.040	0.041	0.117	0.114
	[0.052]	[0.046]	[0.111]	[0.117]
Share Employed	0.413	0.552	0.738	0.739
	[0.179]	[0.158]	[0.192]	[0.149]

(Table A1 continued)

	Inside Homeland		Outside Homeland	
	1996	2011	1996	2011
Share Male	0.459 [0.034]	0.470 [0.032]	0.491 [0.055]	0.495 [0.040]
Share Connected to electricity grid	0.325 [0.347]	0.800 [0.271]	0.690 [0.325]	0.839 [0.210]
Share No refuse	0.176 [0.232]	0.098 [0.149]	0.050 [0.100]	0.045 [0.074]
Share Piped water	0.599 [0.399]	0.624 [0.347]	0.899 [0.201]	0.808 [0.291]
Total population	1,614.7 [2,759.5]	2,140.1 [3,761.2]	2,879.0 [4,944.0]	4,989.4 [6,885.0]

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Sample of communities within 30 kilometers of the former homeland borders (on both sides). Income expressed in December 2012 rand. Due to data availability, education variables are for total population and not household head in 2011. Employment by sector not available for 2011. The definition for connection to piped water changed between 1996 and 2011.

Table A2: Robustness to different community matching definitions

	(1)	(2)	(3)	(4)	(5)	(6)
<hr/> <b>Dep. Var.: Growth in per capita income (1996-2011)</b> <hr/>						
Homeland (=1)	0.660	-0.032	-0.297	-0.206	0.866	-0.888
	[0.454]	[0.970]	[0.539]	[1.136]	[0.574]	[1.001]
Share Employed mining <sub>1996</sub>	-0.447*	-0.103	-0.677**	-0.363	-0.306	0.013
	[0.258]	[0.226]	[0.302]	[0.230]	[0.227]	[0.237]
Homeland*Share Employed mining <sub>1996</sub>	0.840***	0.510**	0.941***	0.692***	0.671***	0.461*
	[0.284]	[0.241]	[0.314]	[0.255]	[0.249]	[0.261]
Observations	9,583	9,558	7,094	7,071	6,072	6,049
R-squared	0.634	0.711	0.614	0.714	0.630	0.702
1996 Controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
2011 Controls	-	Yes	-	Yes	-	Yes
Geographical match type	Centroid	Centroid	Area>75%	Area>75%	Area>75%	Area>75%
Other restrictions	-	-	-	-	Unique	Unique

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). Definitions for Geographical match type: (1) Centroid: each community from 2011 is matched to the nearest 1996 community centroid. (2) Area>75%: If over 75% of the area of a 2011 community is contained in a single 1996 community, these are matched (note that several communities from 2011 can match a single 1996 community). Unique: restrict sample to one-to-one matches only. The dependent variable is the difference in log per capita income for 2011-1996. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. 2011 controls include: same as 1996 except for per capita income (which is excluded). All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

Table A3: Robustness to imputing missing income responses by community mean

	(1)	(2)	(3)	(4)
<hr/>				
Dep. Var.: Growth in per capita income (1996-2011)				
<hr/>				
Homeland (=1)	2.162*** [0.567]	2.300*** [0.577]	1.852*** [0.563]	1.472* [0.753]
Share Employed mining <sub>1996</sub>	-0.523*** [0.179]	-0.354* [0.212]	-0.779*** [0.235]	-0.198 [0.216]
Homeland*Share Employed mining <sub>1996</sub>	0.975*** [0.257]	0.897*** [0.289]	1.189*** [0.263]	0.621*** [0.227]
Observations	9,583	9,583	9,583	9,558
R-squared	0.585	0.593	0.631	0.716
<hr/>				
1996 Controls	Yes	Yes	Yes	Yes
2011 Controls	-	-	-	Yes
Province FE	-	Yes	-	-
Municipality FE	-	-	Yes	Yes

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). The dependent variable is the difference in log per capita income for 2011-1996. Per capita income imputes missing by the average per capita income of a community (instead of with zero). 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. 2011 controls include: same as 1996 except for per capita income (which is excluded). All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1



Table A4: Robustness to using unconditional employment in mining

	(1)	(2)	(3)	(4)
<hr/>				
Dep. Var.: Growth in per capita income (1996-2011)				
<hr/>				
Homeland (=1)	1.428*** [0.530]	1.610*** [0.530]	0.971** [0.467]	0.300 [0.966]
Share (Uncond.) Employed mining <sub>1996</sub>	-0.761* [0.445]	-0.431 [0.495]	-1.241*** [0.471]	-0.499 [0.456]
Homeland * Share (Uncond.) Employed mining <sub>1996</sub>	2.298*** [0.565]	2.291*** [0.582]	2.274*** [0.558]	1.808*** [0.543]
Observations	9,619	9,619	9,619	9,593
R-squared	0.592	0.6	0.634	0.711
<hr/>				
1996 Controls	Yes	Yes	Yes	Yes
2011 Controls	-	-	-	Yes
Province FE	-	Yes	-	-
Municipality FE	-	-	Yes	Yes

Notes: Data from the 1996 and 2011 population census at the community (sub-place) level. Each column corresponds to a separate OLS regression using a sample of communities within 30 kilometers of the former homeland borders (on both sides). The dependent variable is the difference in log per capita income for 2011-1996. The share of unconditional employment in mining for 1996 is defined as the number of individuals employed in mining over total population. 1996 controls include: linear distance to former homeland border, share of white, colored and Indian/Asian population, share by age group (0-9, 10-19, 20-39, 40-59, 60+), household head education, share employed, share male, per capita income, total population, share connected to electricity grid, share no refuse, share with piped water. 2011 controls include: same as 1996 except for per capita income (which is excluded). All control variables are interacted with the homeland indicator. Regressions are weighted by community population in 1996. Heteroscedasticity robust standard errors in brackets clustered at the municipality-homeland level. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1