

Intergenerational mobility during South Africa's mineral revolution

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For much of the nineteenth century, the territories that made up South Africa were largely agricultural. Cape Town and to a lesser extent Port Elizabeth were the only manufacturing centers. This changed with the discovery of diamonds in 1867 and, twenty years later, the discovery of gold in the South African interior, shifting the locale of economic power from the south-eastern coast to the northern interior.

We want to know more about who benefited from this shift in economic prosperity. We know that the mineral revolution resulted in ethnic inequalities – we can see this for example in the growth and then spectacular decline of the Basotho economy – and we know about the opulence of the Randlords. Whites, who held the political power in the four states that would in 1910 become the Union of South Africa, clearly benefited most from the diamond and gold boom but within this group we do not really know who the main economic beneficiaries of South Africa's mineral revolution and consequent industrial take-off were. This is important because periods of rapid economic growth tend to be associated with reductions in poverty and improved social mobility. Yet as we show here, it is not always the poorest members of society who benefit most.

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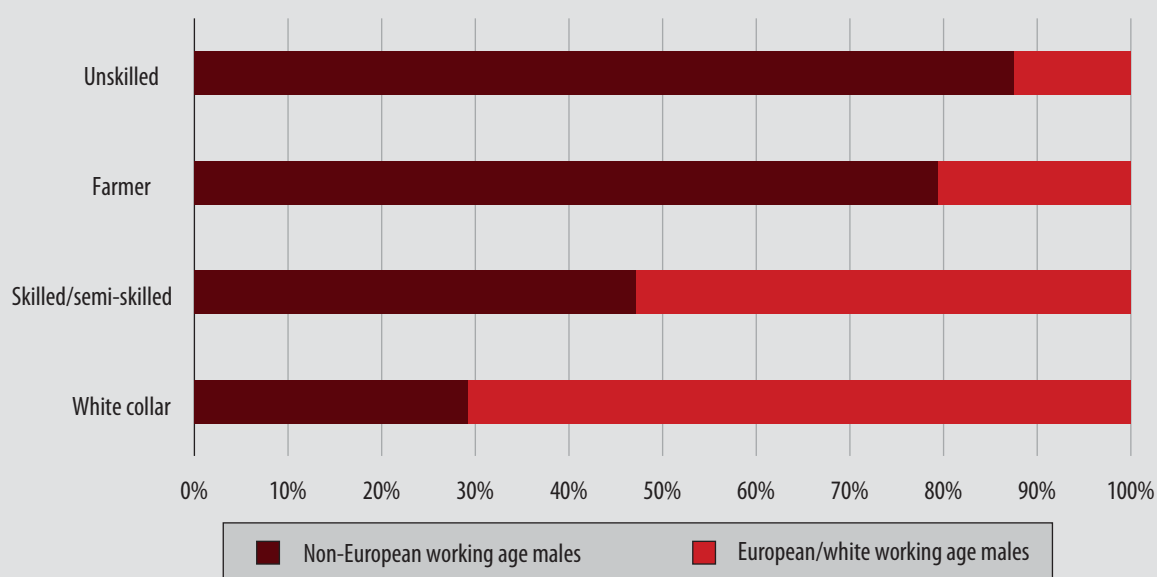
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1. How do we measure intergenerational mobility in the past?

Using a novel dataset of genealogical records, we measure both the absolute and relative social mobility of white South Africans during this revolutionary period in the country's economic history. We use a sample of males³ from the South African Families (SAF) database.⁴ The SAF was compiled over several decades by amateur and professional genealogists who relied predominantly on church baptism and marriage records, and civil birth, baptism and death records.⁵ The database we use contains complete family registers of all settler families and their descendants until 1910 and provides information on demographic events for family members. We identify father-son pairs for whom we have complete information on occupational attainment. Occupations are grouped into four categories: white-collar, farmer, skilled and semi-skilled, and unskilled.

It must be noted that the genealogies that make up the SAF database are limited to families of European (or white) origin only; black, colored and Indian population groups of South Africa are not recorded in these registers.⁶ One concern is that by focusing the analysis on whites only, we may over- or under-estimate the extent of mobility across all population groups. Figure 1 provides a breakdown, by race, of the number and proportion in each of our four occupational classifications. By 1911, at the end of our period of investigation, non-white males were predominantly employed in subsistence agriculture (80% of all farmers) or unskilled (mining) labour (87.5% of all unskilled labour). This suggests that most of the mobility experienced by this group would have been limited to movements within and between these occupational groups as upward mobility of black, coloured and Indian males, because of segregation, job reservation and other discriminatory policies, was severely suppressed.

FIGURE 1: Structure of the labour market by race according to the Census of the Union of South Africa, 1911



³ Information on female employment is often missing or incomplete in historical records, as is the case here.

⁴ Original sources available from the Genealogical Institute of South Africa, 2014

⁵ A full account of the digitization of the data is provided in Cilliers (2016).

⁶ However, several of these "European" lineages are reported to have slave or Khoisan ancestors. See Heese (2013).

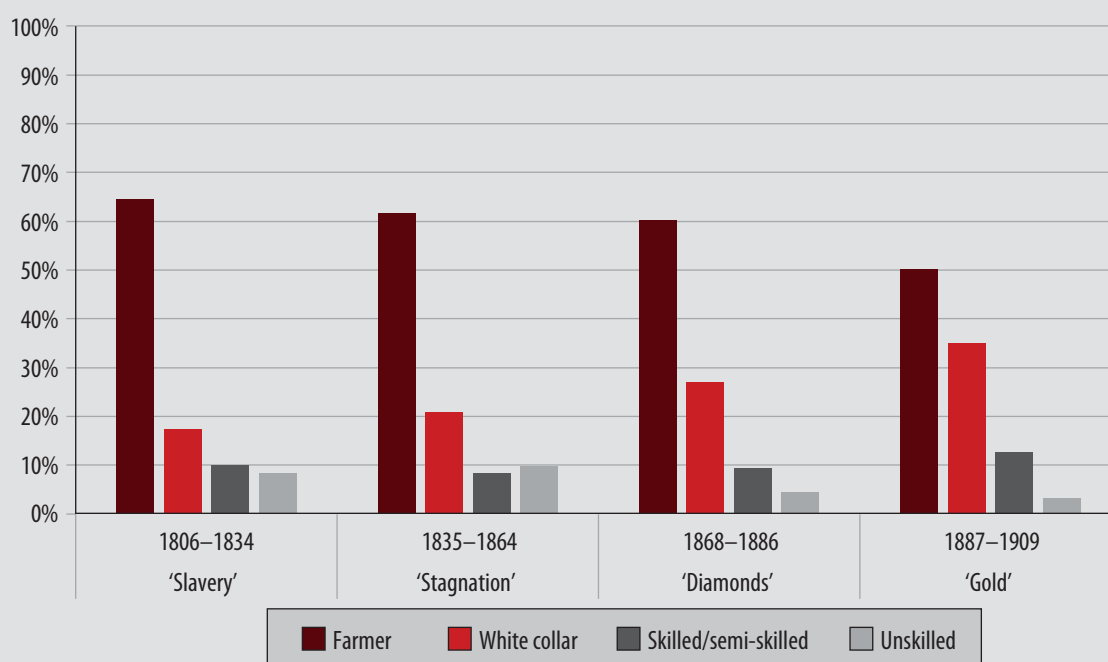
Our empirical analysis is carried out in four steps: absolute mobility is calculated using discrete category contingency tables; relative mobility is distinguished from absolute mobility by adjusting the marginal frequencies of the tables to see how much mobility would have occurred if the distribution of occupations remained the same over time; Altham statistics are calculated to measure the strength of the overall relationship between fathers' and sons' occupations; and binomial logistic regressions are performed to allow for the inclusion of additional control variables.

2. Did mineral discoveries affect intergenerational mobility?

To investigate the prospects of social mobility at a time when the South African economy was undergoing substantial transformation, we divide the period into four phases. These cohorts, according to son's year of birth, are intended to capture four periods of industrialization, which for simplicity we call the "Slavery" period (1806–1834), the "Stagnation" period (1835–1867), the "Diamonds" period (1868–1886) and the "Gold" period (1887–1909). The sample sizes for all occupational groups according to period are shown in Figure 2.

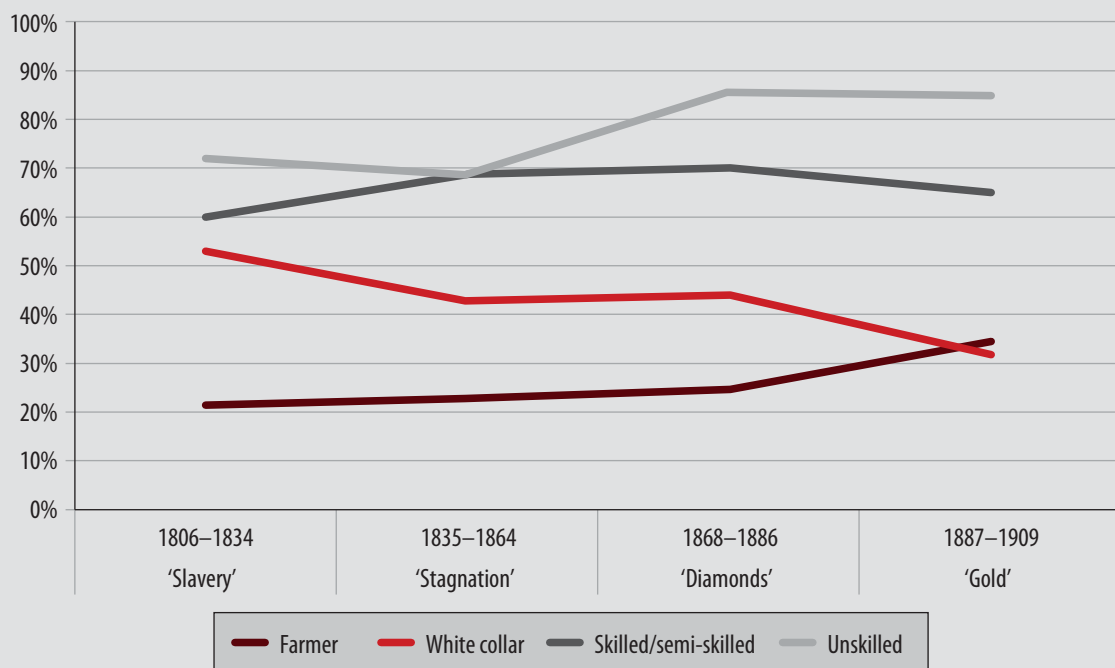
We see overall growth in the size of the white-collar group matched by a reduction in the size of the farming class over time, gradually at first, from roughly two thirds of the sample in the "Slavery" period to around half in the "Gold" period. The unskilled class unsurprisingly makes up only a small proportion of the labour market for whites, as these positions were generally filled by other race groups. Even so, we see a reduction in the size of this group over time. This is possibly an indication of the upward occupational mobility that would have taken place as a result of the changing structure of the labour market. While we do not rank the occupational groups, we use the term "upward" mobility here since a movement from the unskilled into any of the other categories almost certainly constituted an improvement in socio-economic status.

FIGURE 2: Size of occupational groups by period (percentages)



Turning to our two-generational analysis, the results of which are summarized in Figures 2 and 3, we find increasing social mobility over time becoming significant following the mineral revolution that began in 1868. Structural changes in the labor market by definition cause intergenerational occupational mobility. Absolute mobility is therefore defined as mobility resulting from changes in the structure of the labor market. Relative mobility, on the other hand, is intergenerational occupational mobility that is net of these changes. Relative mobility could have various causes, such as a reduction of the barriers to mobility, an expansion of the educational system offering new opportunities to the less affluent, the diminishing importance of social networks, or the growing importance of achievement over ascription by birth influenced by the changing formal and informal institutions of the society. While mobility of farmers increased in absolute terms – by the final period 35% of sons of farmers left farming compared to 21% initially – it is the decline in mobility of white collar workers and the increase in mobility of unskilled and skilled and semi-skilled workers that stand out.

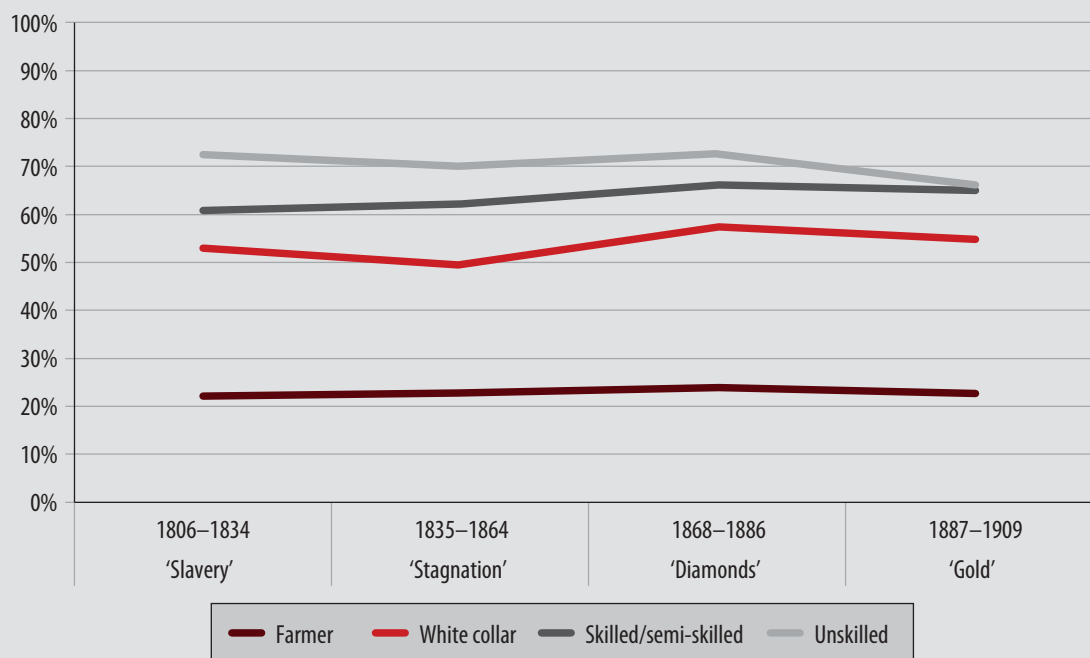
FIGURE 3: Absolute intergenerational mobility: proportion of sons experiencing occupational mobility, by father’s occupational group, over time.



Only part of these changes can be attributed to a shift in the structure of the labour market making new high-skilled jobs available. If we again consider mobility over time, now holding the occupational structure of the society constant, we see that of farmers experienced virtually no improvements in relative mobility over time. This is not entirely surprising given the value of the productive land which they would not have parted with easily. It is difficult to imagine that the son of a farmer, who stood to inherit at least some portion of his father’s land, would seek out a formal education in order to pursue a career as a doctor or lawyer. Rather, the declining role of agriculture in the economy obliged some sons of farmers to take up a new occupation.

Where mobility for sons of farmers was as a result of the structural changes in the labour market, some of the mobility for the sons of skilled and semi-skilled workers was net of these changes. Sons of skilled and semi-skilled workers were able to improve their occupational status relative to their fathers, as barriers to entry into the upper classes appear to have been low for this group.

FIGURE 4: Relative intergenerational mobility: proportion of sons experiencing occupational mobility, by father's occupational group, over time.



3. Why did sons of skilled and semi-skilled workers prosper?

We investigate three possible explanations for these heterogeneous results: geography, inheritance practices, and migration. Location seems to have mattered. Those residing in close proximity to the diamond mines in Kimberley benefitted the most in terms of increased mobility, while those further afield appear to have been largely unaffected.

Given the partible inheritance system, according to which the spouse of the deceased inherited half of the estate and the children split the other half, it is possible that first-born sons may have been more likely to inherit land, and would therefore have been less likely to move up in society. We test whether sibling rank plays a role and the results are insignificant: we find that later-born sons were neither more nor less likely to be socially mobile than first-born sons. Sons of farmers were likely to stay on farms regardless of birth order.

Immigrant status, whether or not a person had a locally-born father, also partly explains relative upward social mobility. Sons of immigrants, notably those from England, France and Germany, were likely to experience higher rates of upward social mobility and lower rates of downward mobility. There are various possible reasons for this. Immigrants may have been better educated and thus able to take advantage of the demand for skilled positions opening up in and around the mines. They may have had more access to capital through links to bigger cities. They may have had wider social networks. While non-immigrants may have already been in possession of assets which discouraged their transitioning into other occupations, as in the case of farmers' career opportunities being limited by land ownership. Understanding the precise reasons for this greater mobility of middle-class immigrants should be the subject of future research.

4. How can these historical examples help policy makers today?

The main result from the study is that the effects of a rapid economic transformation are heterogeneous. It is not necessarily those at the bottom of the distribution that benefit most; as we see, despite the rapid changes, a large group of white unskilled labourers remained immobile. This group would later become known as the 'poor white', and have significant political influence well into the twentieth century. The lesson here is that only those with the requisite skills and education will benefit from a rapidly changing economic structure. Trickle-down cannot happen if those at the bottom do not have the capabilities to benefit from higher growth.

A second lesson is that certain formal and informal institutions may hinder prospects for mobility. Property rights can prevent certain groups, such as farmers in this case, from benefitting from the upward mobility that an expanding secondary and tertiary sector might offer. Urbanised skilled and semi-skilled workers with fewer sunk costs in land and agricultural skills, were quicker to adapt to the changing economic landscape. Rural development programmes that aim to improve the social mobility of the poor may be less effective if the institutions that govern the incentive to remain farm-bound are not addressed.

Finally, the study suggests that immigration is an important component of industrialisation. Although no causal claim can be made, the higher probability of mobility for sons of first-generation immigrants suggests, at the very least, that these individuals had an important role to play in the structural transformation of the economy in a period when human capital levels were low. Given the current poor performance of the South African education system, skilled migration to South Africa may be one policy mechanism to foster faster growth.