

# South African growth accelerations, 1700 to 2050

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## Abstract

South Africa has experienced a handful of economic windfalls. This paper shows that these are due to a combination of strong external growth, and domestic once-off events – the discovery of diamonds and gold, and the dividend of re-entry into the global economy following the end of Apartheid. Accelerations, and indeed, long-term growth has always been associated with external growth. In common with the international experience, financial liberalisation and stronger property rights have supported growth accelerations.

These accelerations have been typically around 3 per cent in per capita terms, softer than in other emerging markets, and have been associated with increased inequality. Slower population growth means that in absolute terms, during the most recent acceleration (2000 - 2007) economic growth was approximately 4.5 per cent. With population growth declining, future accelerations are likely to be in this area.

## 1 Introduction

*South Africa has advanced politically by disasters and economically by windfalls* CW de Kiewiet

Is economic growth a smooth inexorable force along a predefined equilibrium saddle path? Or, a bumpy ride of half-baked starts and sudden pauses and reversals? Theory has tended towards the former: countries should grow by some combination of their pre-programmed attributes of labour, capital and technology. There may well be business and financial cycle fluctuations around this trend, but in general growth is smooth and predictable.

In contrast, the emerging market experience, particularly over long time horizons, has tended to be more like the bumpy ride. [Jerven \(2010\)](#) finds evidence of periodic growth spurts in Africa between 1690 and 2010. [Pinkovskiy and Sala-i Martin \(2014\)](#), for example, demonstrate a ‘growth spurt’ in Africa from around 1995, which led to a structural decline in poverty. [Hausmann et al. \(2005\)](#) undertake a cross-section analysis and show that emerging markets experience reasonably regular accelerations.

This matters. Policy prescriptions often rely on the idea of a smooth growth path. In such a world, fiscal and monetary policy should respond to this smooth growth path through countercyclical measures. But what if there is a secular boom; or secular stagnation?

The empirical literature has often explained these booms and busts as simply bad management. The Great Depression was arguably exacerbated by an inappropriate monetary response (Friedman, 1968; Bernanke, 2002). The Asian economic crisis, for example, seems clearly a case of an inappropriate policy stance (a fixed exchange rate), followed by painful and complex economic adjustment (Kaminsky and Reinhart, 1999; Reinhart and Rogoff, 2009, 2014).

Reluctantly accepting the empirical facts, advances in theory have proposed a number of potential reasons for the bumpy ride. The most notable is Aguiar and Gopinath (2007) that, for emerging markets, ‘the cycle is the trend’. Their argument is that emerging markets experience regime switches – and in particular that trend growth shocks are the root of fluctuations rather than transitory fluctuations around a trend.

Yet, even for advanced economies there is clear evidence of rapid expansions and declines in growth. ?, for example, show that the United Kingdom experienced a boom.

In the United States, the long uninterrupted 2 per cent a year expansion described in the literature seems to have hit a rough patch. Summers describes this as a secular stagnation.

This literature focuses on the ‘boom and bust’. But it is also an empirical regularity that some emerging markets experience periodic, structural upswings with no hangover. The expansion of China and India. Etc.

I use a data set stretching back to 1700 to identify economic windfalls, and construct a new measure of the financial cycle that begins in 1700.

## 1.1 What can we learn from these long cycles?

The findings in this paper suggests that South Africa experienced an agricultural takeoff in the 1700s and again in the early 1800s, a mining takeoff in the mid- and late 1800s, an industrial takeoff in the 1960s and a services takeoff in the 2000s.

Some stylised facts emerge about South African long-run growth:

- Global growth is the single most important long-run determinant of South African growth. The growth spurts map directly to the three ‘industrial revolutions’ – the mid eighteenth century boom, the
- Accelerations are slower than in other emerging markets, both in per capita and in absolute terms.
- Accelerations are related to strong increases in exports to GDP. These are often related to substantial increases in global demand. The exception was a strong rise in exports during the 1970s??
- Policy changes. Apartheid significantly set back growth in a number of interlinked ways, but I show that it had a significant impact on growth during the 1980s. Conversely, the end of apartheid accelerated growth, particularly a series of post-Apartheid reforms.

And the next takeoff? This long-run growth analysis allows for some tentative policy conclusions:

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- There is little chance the next takeoff will be industrial???. Takeoffs to date have been The point I want to make is that well the world is changing – is digital the next big thing?

This paper contributes to three interlinked literatures. The first is the growth literature, particularly in emerging markets. The second is the historical literature. The final one is the large literature on ‘potential growth’. It differs from the this literatue in that we estimate long-run GDP growth rates in **per capita** terms, rather than potential GDP growth rates in real terms. Our approach is arguably more consistent with the growth literature.

South Africa presents a unique case study in this literature. It is both African country and an emerging market. It is, however, interesting because it has not had significant takeoffs similar to other countries.

## 2 Related literature

### 2.1 What is a growth acceleration?

Rostow (1959, 1990) popularised the idea of stages of growth, noting that many European countries experienced a ‘takeoff’ – the transition from a ‘traditional society’ to a modern-based society.

One of the earliest contributions to this literature Pritchett (2000) speaks of the ‘searching for hills among plateaus, mountains, and plains’, and calls them growth transitions. Hausmann et al. (2005) defines the periods of rapid economic growth as ‘accelerations’. In their methodology, accelerations are defined as periods where growth exceeds 3.5 per cent a year for at least seven years. Jerzmanowski (2006) uses a Markov-switching approach to find economic accelerations in the empirical literature. Jones and Olken (2008) note ‘start-stop’ growth, noting that ‘all but the richest countries experience both growth miracles and failures’. They use Bai-Perron statistically methods and the Penn World Tables to identify when growth periods take place. Aizenman and Spiegel (2010) calls them ‘takeoffs’.

Berg et al. (2012) approaches the question from a different angle – noting that emerging markets experience periodic bursts of growth, their question is ‘what sustains this growth’, that is what predicts growth *duration*.

Economic accelerations should be distinguished from ordinary business cycle upswings and downswings. Business cycles are cyclical fluctuations in growth, driving by changes in the terms-of-trade, demand for goods, or international financial conditions. In contrast, economic accelerations are less common, and create long-lasting changes in living standards. For this reason, output data and trade data are not sufficient. This data needs to be overlaid with measures of living standards.

## 2.2 How often do they occur?

Economic accelerations are relatively infrequent, taking place approximately twice a century (Pritchett, 2000; Hausmann et al., 2005; Aizenman and Spiegel, 2010).

Decade	Asia	Africa	Mid. E	Europe	Latin A	Other	Total	Episode	Observations
1950's	8.33	6.25	16.67	12.82	3.57	14.29	8.44	13	154
1960's	5.13	3.7	4.48	0.76	2.63	8.7	3.33	23	691
1970's	2.86	2.51	5.26	0	2.66	2.33	2.42	23	952
1980's	4.43	0.56	1.02	2.78	0.92	0	1.56	16	1026
1990's	2.5	1.14	0	4.26	5.26	5.56	2.92	8	274
Total	4.09	1.91	3.61	2.34	2.4	3.55	2.68	83	3097
Episodes	21	18	10	12	17	5	83		
Observations	514	944	277	513	708	141	3.097		

## 2.3 Why do they occur?

The economic acceleration literature talks of ‘preconditions’ – i.e. political, economic, social and technological changes that create the right conditions for a spurt of economic growth.

Takeoffs are also often synchronised, that is that many countries experience accelerations at the same time.

## 2.4 The approach in this paper

These approaches are arguably not appropriate for the South African context. For one, South Africa has had only one economic acceleration large enough to qualify by the measure proposed by Hausmann et al. (2005) (average per capita PPP growth of more than 3.5 per cent for seven years), during 2000 – 2009. We adjust the threshold for South Africa downwards, and use a threshold of 3.0 per cent for the growth acceleration:

- *Acceleration*  $\dot{y}_t > 3.0\%$  for at least seven years
- *Expansion*  $0 < \dot{y}_t < 3.0\%$  for at least seven years
- *Decline*  $\dot{y}_t < 0\%$  for more than three years

Alternatively periods where growth is 2.5 percentage points higher than the previous period.

For example, the doubling in per capita GDP from the end of the Second Boer War (1902) to the beginning of the Second World War (1939) is a significant growth expansion, but it was slow and steady. Per capita growth averaged 1.9 per cent, close to the US long-term average of 2 per cent.

## 3 The data

Data over such a long period is difficult to compile.<sup>1</sup> There have, however, been a number of (sometimes heroic) attempts to construct long-run South African data. South African economic history, and by extension the data, divides relatively neatly into six periods<sup>2</sup>: (i) the pre-colonial period (prior to 1652); (ii) the Dutch Colonial Period, stretching from 1652 to the first British Occupation in 1795; (iii) The British Colonial Period (1806 to 1910 – excluding the interregnum between 1795 and 1806); (iv) Union of South Africa in 1910 to the election of the National Party (1910 to 1948); (v) National Party rule to democracy (1948 to 1994); (vi) The democratic period (1994 onwards).

In the next few sections, I briefly summarise the existing data sources. Unfortunately, pre-colonial data is still particularly difficult to find, and so we begin with the Dutch Colonial period. At the end of the section, we collate the various data sources to present a consolidated per capita GDP, population, export and inequality indices for the period 1700 to 2017.

### 3.1 Data on GDP per capita

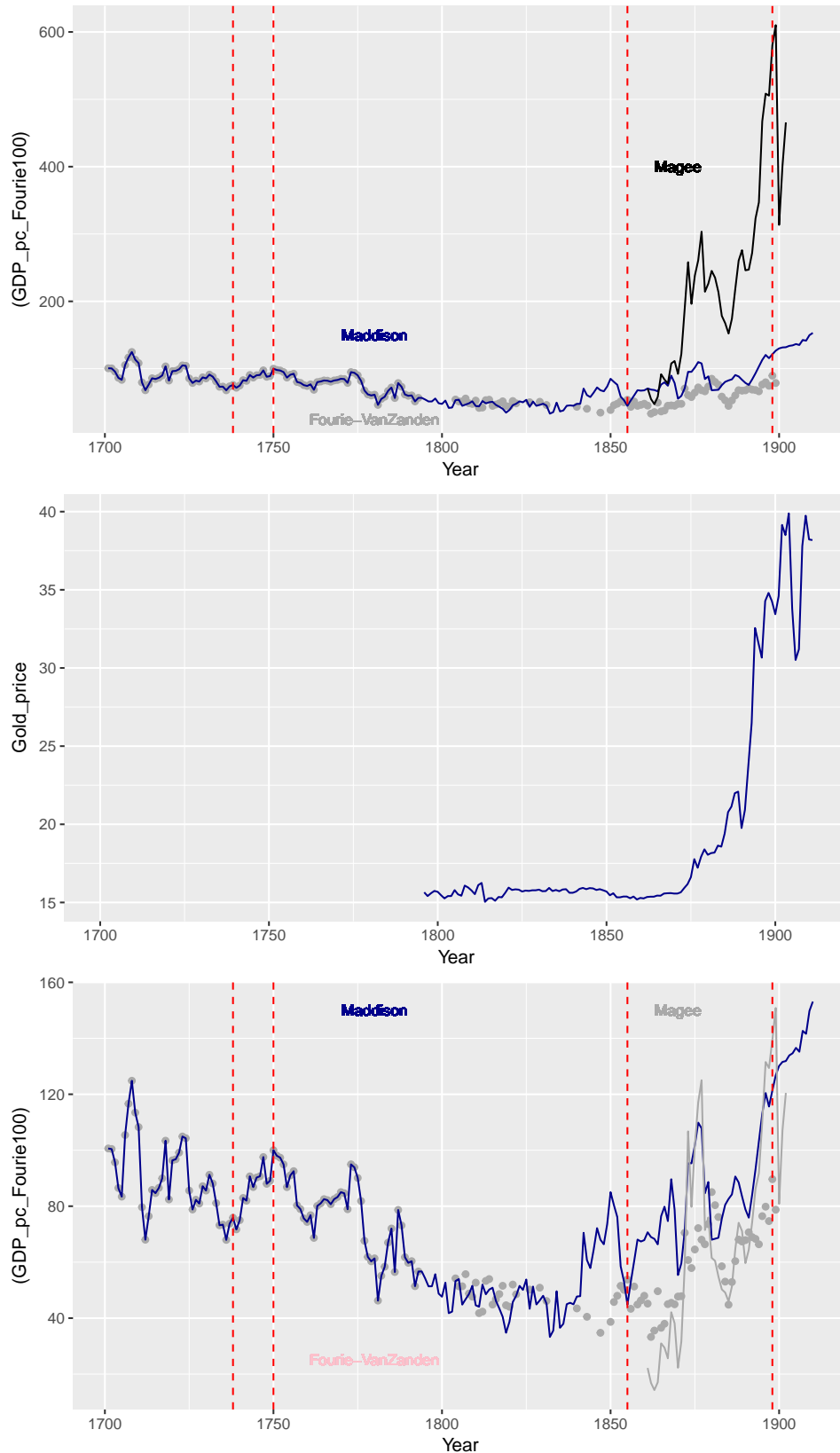
#### 3.1.1 The Dutch Colonial Period, 1652 – 1795

[Fourie and Obikili \(2019\)](#) provide a careful comparison of the different approaches to long-term data collection. A particular challenge in the South African context is the poor data on black South Africans. For example, agricultural output figures include only white farms. That said, economic statistics are not the only source of information, and they note the use of complementary data sets to measure living standards, including height statistics.

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<sup>1</sup>I have made all the data cited here available at

<sup>2</sup>See, for example, the discussion in [Terreblanche \(2002\)](#)



**Figure 1:** Pre-Union per capita GDP

The figure compares three per capita data series for pre-Union ‘South Africa’ – (1) [Fourie and Van Zanden \(2013\)](#) (2) [Bolt et al. \(2018\)](#); and (3) [Magee et al. \(2016\)](#). [Fourie and Van Zanden \(2013\)](#) form the basis for [Bolt et al. \(2018\)](#), and hence are similar. [Magee et al. \(2016\)](#) is in turn based on [Greyling and Verhoef \(2015\)](#). The unadjusted [Magee et al. \(2016\)](#) data suggests a substantial jump in output per capita (*top panel*). This appears to be largely explained by a spike in the gold price towards the end of the nineteenth century (*middle panel*). Once the [Magee et al. \(2016\)](#) data is adjusted for this spike, the three estimates show relatively similar trends (*lower panel*).

The careful collation of statistics on exports, imports, prices, production and population contained in [Ross and van Duin \(1987\)](#) form the basis of most of the GDP series constructed for the Dutch Colonial Period.

Their estimates form the basis for [Fourie and Van Zanden \(2013\)](#), who use a system of national accounts framework to calculate income and production in the eighteenth century Cape Colony. In terms of their estimates, the total population of the Cape rose from 4,500 to nearly 50,000 by 1795. Gross domestic product is estimated using the output approach, summing value added in agriculture, ‘government’, industrial activities (e.g. beer brewing and construction) and other services. During this period, the ‘government’ was the Dutch East India Company, the main administrative entity for most of the duration of the period.

The estimates from [Fourie and Van Zanden \(2013\)](#) should be read together with similar exercises to collate data on wages ([Du Plessis and Du Plessis, 2012](#); [De Zwart, 2013](#)), monetary statistics ([Havemann and Fourie, 2015](#); [Swanepoel, 2017](#)) and the wealth estimates contained in [Fourie \(2013\)](#).

[Fourie and Van Zanden \(2013\)](#) form the basis for the South African component of the Maddison project,<sup>3</sup> and this provides a broadly comparable data set for a reasonably long period.

### 3.1.2 The British Colonial Period, 1806 to 1910

The period between 1795 and 1806 was particularly turbulent. In 1795, France occupied the Netherlands. Seeing an opportunity, Great Britain occupied the Cape until 1803. Under the Treaty of Amiens, the British handed the Batavian Republic in 1803 (the Batavian Republic was the Revolutionary period Dutch state). This was relatively shortlived. The British invaded again in 1806, and from 8 January 1806 onwards, the Cape was a British Colony. Just over a century later, on 31 May 1910, the Cape Colony merged with three other territories, to create the Union of South Africa. These three were under British control, having previously been Dutch/Afrikaner control: the Transvaal and the Orange Free State had been under local Afrikaner control until the end of the Second Boer War. Natal became British much earlier – in 1843.

To have any appropriate data for nineteenth-century ‘South Africa’, it would be necessary to construct GDP and population series for the both settler and local territories. This is a monumental task – the borders of the settler territories were deeply porous. Indeed, famously, there was an outflow of people from the Cape Colony to Natal, the Orange Free State and the Transvaal from approximately 1838 onwards. While this was more correctly a series of waves of families moving north, often only a few hundred kilometers from Cape Town, it has commonly become known as the ‘Great Trek’.

Borders were also movable, and, to say the least, contentious. On the eastern border of the Cape, between 1779 and 1879 there were a series of wars between settlers and the various local Xhosa-speaking

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<sup>3</sup>This project has collated growth data for 167 countries back as far as 1400 in some cases. This provides a relatively comparable data set across countries.

kingdoms. Similarly there were a series of wars between settlers and the local community in the area now known as KwaZulu-Natal.

Against this background, we date the ‘British Colonial Period’ as being 1806 to 1910, and focus only on the Cape Colony.

Despite these significant challenges, there is a relatively impressive set of attempts to collate macroeconomic statistics for this period. These contributions have been in three areas: GDP estimates, trade estimates and population estimates. We discuss each below.

The Cape Colony and Natal Statistical Yearbook form the basis of a number of estimates, particularly those in [Greyling and Verhoef \(2015\)](#); [Magee et al. \(2016\)](#). [Greyling and Verhoef \(2015\)](#) construct their estimates mid 1800s for both the Cape Colony and Natal, while [Magee et al. \(2016\)](#) use these estimates to compare living standards in the South African colonies to those in the Australian territories. This provides an opportunity to benchmark GDP estimates for two very different environments, in a way that provides insights into both.

[Fourie and Van Zanden \(2013\)](#) also compile data for this period, and provide point estimates of economic output at particular periods. This work feeds through into the collated Maddison project database. That database smooths the data to create an extrapolated smoothed series for the period ([Bolt et al., 2018](#)).

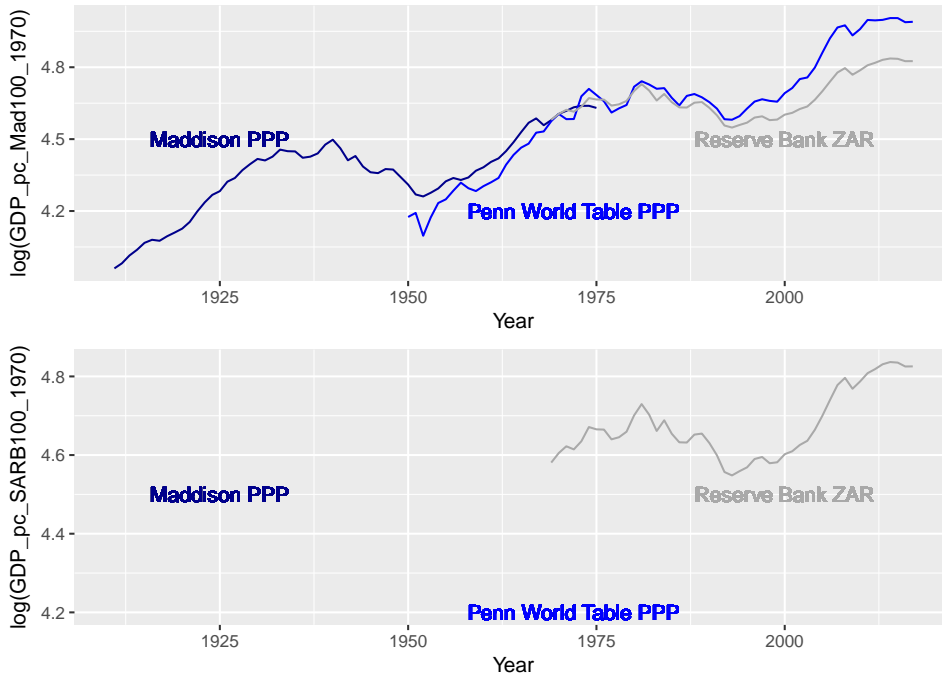
In 1, I compare the three estimates – [Fourie and Van Zanden \(2013\)](#)’s point estimates, the Maddison smoothed estimates ([Bolt et al., 2018](#)) and the [Greyling and Verhoef \(2015\)](#); [Magee et al. \(2016\)](#) estimates. It is immediately apparent that the latter shows a substantial and somewhat surprising *quadrupling* of output per person in the last decades of the nineteenth century. It was an extraordinary period – the gold rush certainly caused living standards to rise. However, the estimates of the other two researchers suggest a strong rise of about 20 per cent in output per person. Moreover, while output grew substantially, population also grew as Johannesburg was deluged with immigrants coming to find their fortune.

It appears that the increase in growth estimated by [Magee et al. \(2016\)](#) is almost entirely due to the booming gold price. It does seem that the researchers have inadvertently calculated a nominal output series. By adjusting their estimates for the price of gold (as a proxy for output prices), the three sets of estimates are now more similar. As a result, the Maddison numbers appear to be the most reliable, and these are the ones used in the analysis.

### 3.1.3 1910 to 1948

For the period 1911 to 1950, I use a combination of data sets. Statistics South Africa was created with Union in 1910, and economic data was compiled, albeit not along the scheme used in the post-War period (Keynes had not yet even published *The General Theory*). The GDP series constructed by [Boshoff and Fourie \(forthcoming\)](#) provides a useful starting point. However, two additional data sets are particularly





*Figure 2: Post-Union data*

There are three post-Union estimates of GDP per capita are presented in purchasing power terms – from the Maddison project, the Penn World Tables, and the IMF

useful – (i) the exports to GDP series found in [Reinhart and Rogoff \(2014\)](#), which is based on the data in ?; and the (ii) inequality data set found in XXX.

### 3.1.4 1948 – present

The Second World War ended in 1945, ushering a period of peace and prosperity. Most European Countries had new borders. The War also led to significant improvements in data collection and collation. For this reason, international statistical data from around 1946/1947 is relatively consistent and comparable. For South Africa, the period is most notable for the 1948 election, which ushered in a period of National Party rule.

The data for this period is substantially better than previous periods. Annual data from 1947 is published by the South African Reserve Bank. A detailed explanation of this data can be found in their publication [South African Reserve Bank \(2010\)](#).

The Penn World Tables project<sup>4</sup> provides consistent data for a cross section of countries from 1950 onwards. This includes critical growth variables for South Africa such as GDP per capita in purchasing power parity (PPP) terms. while the International Monetary Fund data and the IMF data from the package *IMFdata*.

From 1960, the data improve substantially. The Reserve Bank Quarterly Bulletin provides a consistent, usually quarterly, series across all variables, and the scheme adopted in 1960 is still largely the

<sup>4</sup>The Penn World Tables data set used in this paper is from the *R* package *pwt*

Table 1: Summary of Post-union economic growth

Decades	PPP	ZAR PC	Pop. growth	PPP + Pop
1911-1919	1.8			
1920-1929	2.9			
1930-1939	0.8			
1940-1949	-1.3			
1950-1959	0.9		2.5	3.4
1960-1969	3.0		2.7	5.7
1970-1979	0.8	0.8	2.7	3.5
1980-1989	0.4	0.0	2.4	2.8
1990-1999	-0.2	-0.7	2.1	1.9
2000-2009	2.8	1.9	1.2	4.0
2010-2018	0.7	0.6	1.3	2.0
Post-Union				
1911-2017	1.1			
Post-Apartheid				
1994-2017	1.7	1.1	1.4	3.1
Accelerations*				
1922-1930	3.0			
1960-1970	3.2		2.7	5.9
2000-2008	3.6	2.4	1.3	4.9

\* See discussion below

template for the quarterly updates that the Reserve Bank publishes in the modern era. This gives nearly sixty years of data, or 240 data points. This provides a very useful data set for the modern era, and most of the work on modern South African economic growth uses this data set.

In Table 1, we provide summary statistics on the growth per capita in PPP terms, in nominal rand terms (from 1970 onwards) and compare it to population growth.

The decline in population growth is particularly notable, as is the two ‘good’ decades (the 1960s and the 1990s) – whereas the remaining period of economic growth was pedestrian at best.

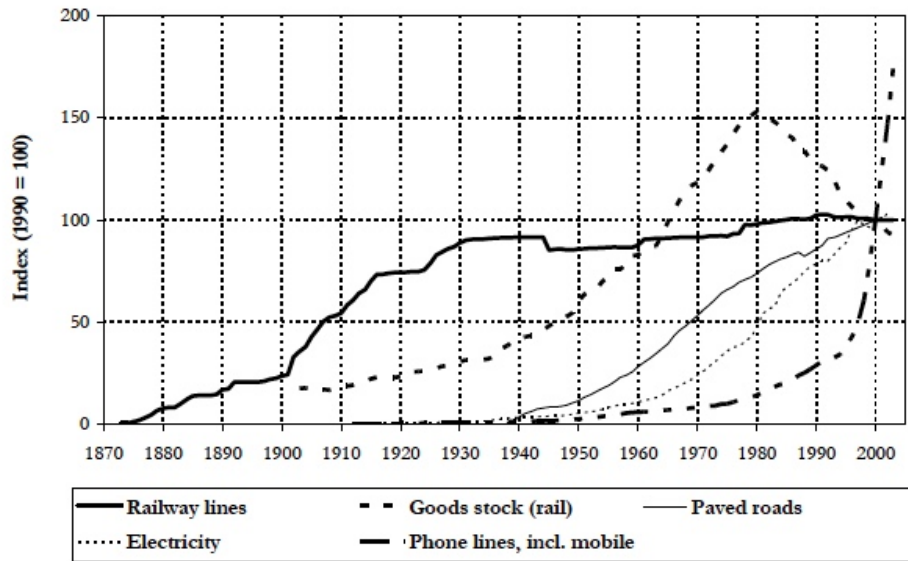
## 3.2 Additional data

### 3.2.1 Global growth

Global growth estimates are derived from the Maddison and Penn World Tables. Global growth is assumed to be a function of trading partners – the structure of South African trade is particularly towards the United Kingdom, although in recent years strong demand from Asia for gold and metal related products has stimulated demand.

### 3.2.2 Population

Population estimates for this time are also from [Ross and van Duin \(1987\)](#), which feed through into the Maddison project data.



*Figure 3: Infrastructure by type, 1870 to 2005*

As the economy developed, different types of infrastructure was built by successive administrations.

Source: Perkins et al. (2005)

### 3.2.3 Fiscal accounts

Reinhart and Rogoff (2011) use data from Page (1919) and elsewhere to construct a long-term debt-to-GDP analysis.

### 3.2.4 Infrastructure

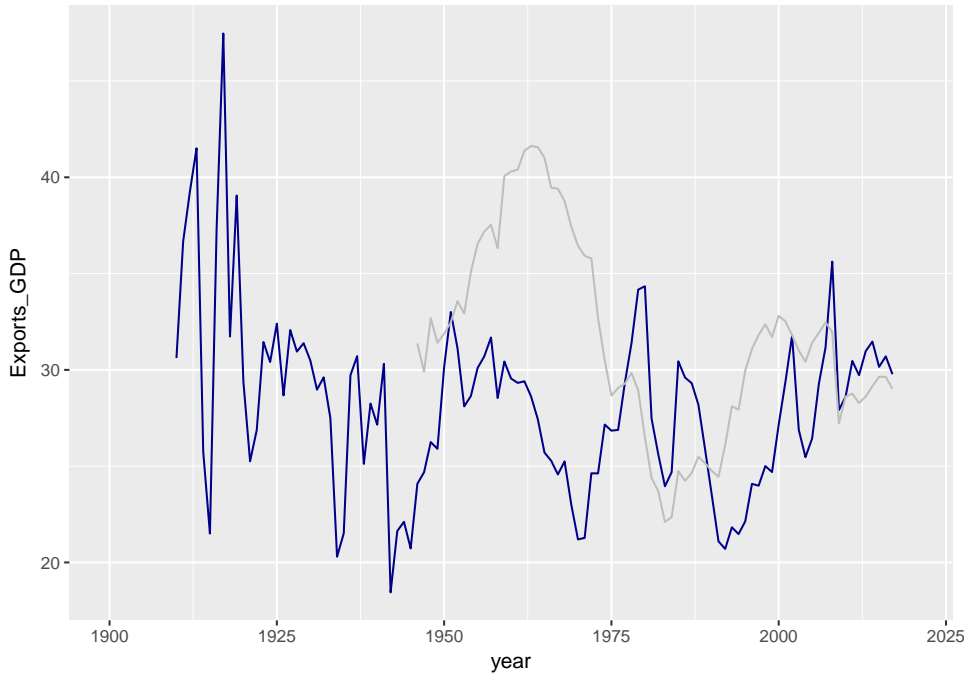
There is a well-established literature on the interrelationship between infrastructure and economic growth. Perkins et al. (2005) collates extensive infrastructure data from 1870 to 2005, which I present in Figure 3.

This can be complemented by data from the Blue Books, and the Ross and van Duin (1987) information that collates the role of state, together with information from Page (1919) and Reinhart and Rogoff (2011).

### 3.2.5 Trade

Trade and terms of trade data can also be obtained. Ross and van Duin (1987) provide an estimate of export prices from 1749 to 1793, as ‘exports in money value’. The Colony was not a significant export hub – distance from Europe and a lack of ready to ready marketable commodities meant that it mainly focussed on the domestic market. Nevertheless, as recorded in (Ross and van Duin, 1987, Appendix 5, Table 2), there were exports of grain before 1749, overwhelmingly wheat.

Thus, in calculating terms of trade, I use a wheat price until 1749, noting that the majority of



*Figure 4: Exports*

The figure summarises the main long-term economic data collated for this paper.

exports were wheat. From 1749 until 1800s, I construct export and import baskets using the trade data estimates in [Ross and van Duin \(1987\)](#). From the 1800s, I use the estimates of trade activity in [Page \(1919\)](#) and prices contained in [Clark \(2004\)](#) to estimate the export prices of agricultural exports. From 1860 onwards, the export basket changes significantly, as diamonds begin to dominate exports, and then from around 1890, gold becomes the dominant export. Indeed, gold remains the single largest export item by value from 1890 until today. (FIGURE ON PERCENTAGE OF EXPORTS).

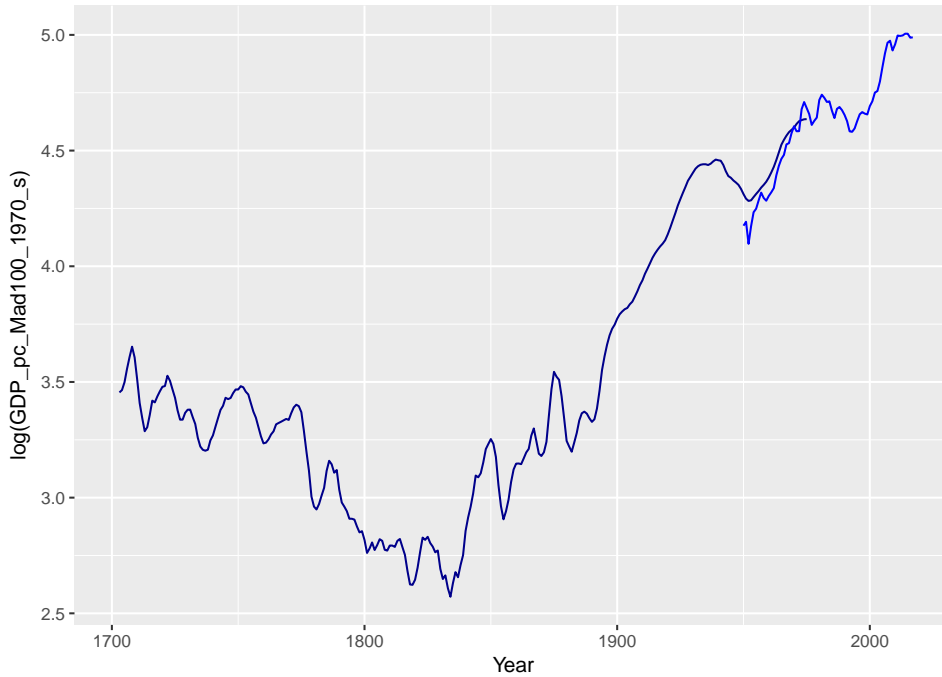
### 3.3 Summary of data

Figure ?? summarises the compiled data sets, noting the existing long-run data set that is available for South Africa.

## 4 Results

### 4.1 The accelerations: growth > 3.0 per cent

The six accelerations are presented in Figure ??. The diamond boom and the gold boom stand out as substantially larger than all the other economic accelerations in South African history. GDP per capita doubled during the six short years of the diamond boom. Interestingly, the gold boom of 1891 to 1897 was less significant, with per capita GDP rose by more than half from 1891 to 1897. The remaining four accelerations were all between 3 and 3.6 per cent.



*Figure 5: Summary of data*

The figure summarises the main long-term economic data collated for this paper.

The results are presented in two parts. First, we discuss each acceleration in some detail, where possible drawing lessons for future accelerations. Secondly, we undertake econometric analysis of the determinants of the accelerations.

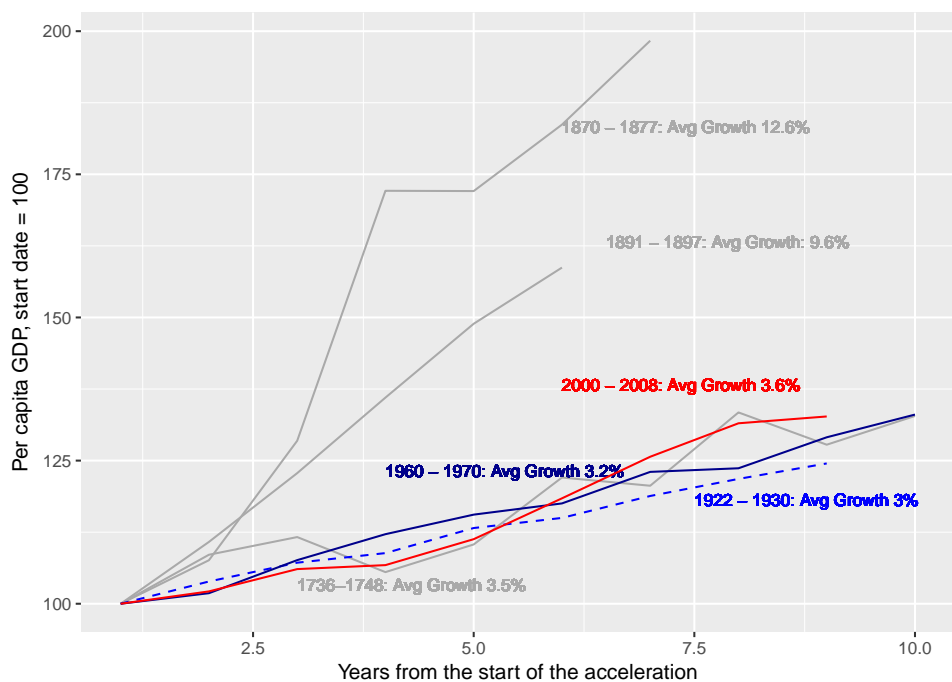
#### 4.1.1 The 1736 – 1748 acceleration

In 1755, the government of the Cape Colony issued a sumptuary law. The text stated that the ‘splendour and pomp amongst various company servants reach such a peak of scandal’, while visitors noted the sheer magnificence of the homes, clothes and carriages (Fourie and Von Fintel, 2010). These great homes can still be seen today. This capped the end of a great leap forward in the wealth of the Cape, which had come a long way from the refreshment station of 1652.

By 1755, the Cape had experienced a nearly unbroken 11 year expansion. The strongest period of growth took place between 1741 and 1748. The need for law to ban the display of fine clothes reflects Cape Town nearly a century after it was established a refuelling station – a small but ‘remarkably’ wealthy city at the centre of an expanding colony.

Indeed, the 1736 – 1748 acceleration is reasonably well-covered in the literature, (Du Plessis and Du Plessis, 2012; ?; ?; ?). The slow collapse of the Dutch East India Company (VOC) created substantial new opportunities. Many of the sailors working of the ships left the Company, and exploited many of these<sup>5</sup> The city became rapidly more cosmopolitan, as more immigrants arrived, swelling the ranks of

<sup>5</sup>Including the author’s maternal ancestor, a German-speaker who arrived in Cape Town in 1735 as a VOC soldier, and became a wealthy merchant in downtown Cape Town.



**Figure 6:** *The six accelerations*

The figure presents the six identified economic accelerations. The accelerations are defined as period of per capita GDP growth of more than 3 per cent for a minimum of 7 years. Given the data issues, the three pre-Union accelerations are indicated in grey

the original settlers.

The expansion of the Colony is shown in Figure 7. Gradually through a number of forces, the boundaries widened, and a domestic economy developed.

French Huguenots arrived in early 1688. Hausmann (2018) argues that the arrival of the Huguenots diversified the local skills base substantially, bringing knowledge of a whole new industry: wine-making. This is borne out in the export records compiled by Ross and van Duin (1987), who note a substantial increase in both wine production and the number of vines from about 1740 onwards. By 1749 wine made up about half of all exports.

Granting of land title was also an important reform. McLachlan (2018) provides an extensive discussion on the development of land rights in the Cape. As the Cape expanded, there was pressure to provide security of tenure for non-indigenous settlers. Farmers could essentially lease farms (for a fee) from around 1713 onward. The provided farmers with exclusive control of relatively large areas of land – a minimum of 6,000 acres (2,420 hectares). In 1732, these rights were strengthened. It was essentially a long-lease, and improvements could be sold but not the underlying property. In 1743, Van Imhoff allowed the conversion of these long leases to essentially freehold. Each piece of land could not exceed 60 morgen and had to be surveyed.

The VOC also gradually liberalised the economy, allowing non-indigenous settlers more and more rights to trade, farm and work in the settlement. Monetary arrangements were also strengthened, and



*Figure 7: The boundaries of the Cape settlement*

The Cape expanded during the course of the early eighteenth century, stimulating economic activity

Source: Fourie (2013)

the introduction of domestic currency was initially reasonably successful (Havemann, 2014).

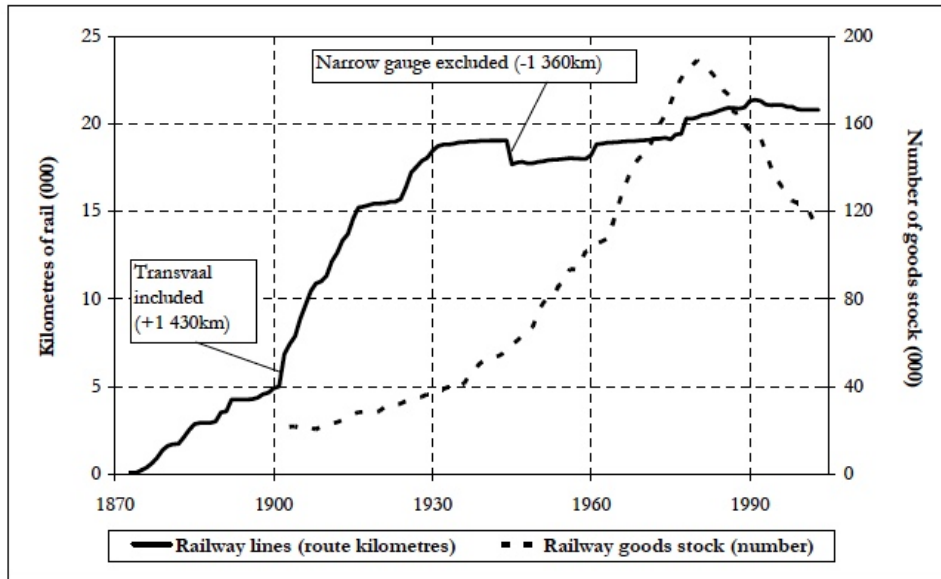
(Du Plessis and Du Plessis, 2012) focus on the long-run increase in living standards during the course of the eighteenth century. But they note a reasonably sharp increase in living standards in about 1740 to 1743.

#### 4.1.2 The 1870 – 1877 acceleration

The two nineteenth century accelerations are exhaustively covered in the literature, and indeed Kiewiet's famous quote at the beginning of this paper refers to South Africa's two great windfalls – the discovery of a diamonds in 18XX and the discovery of gold in 18XX. These two events transformed a group of struggling colonies at the edge of Africa into thriving economies, and set the scene for the Union of South Africa in 1910, and modern industrial South Africa.

**REVISE** The decade of 1871–1880 was a period of expansion and prosperity in South Africa. While Europe, the USA and Britain suffered a severe depression with falling general price levels between 1873 and 1879, South Africa was only moderately affected. The explanation is to be found in the expanding wool and ostrich feather industries, and in the late 1860s, the discovery of diamonds.

Production and export of diamonds was rapid: between 1866 and 1870 the average annual export of diamonds was  $\hat{\text{€}}35\,700$ , but rose to  $\hat{\text{€}}1\,306\,000$  between 1871 and 1875 and to  $\hat{\text{€}}3\,242\,000$  between 1881 and 1885. By 1885 diamond exports comprised 40 per cent of total exports from South Africa at a time when the international economies of the USA, Germany, Japan and Britain experienced strong growth and prosperity. The Cape economy benefited from the influx of entrepreneurs, capital and labour,



*Figure 8: Expansion of the railways*

Construction of railways accelerated between 1900 and 1920, largely paid for by the strong revenues from mining.

Source: Perkins et al. (2005)

but also witnessed massive speculation in all spheres of business, especially by the banks. The 1870s was a decade of exceptional prosperity – diamonds brought new wealth, wool prices rose steadily and the production of mohair, hides and skins as well as ostrich feathers showed strong signs of growth.

**REVISE** A spirit of optimism emerged when the Cape Colony was granted responsible government in 1872. The severe depression of the post-Franco-German war of 1870 impacted on European demand for Cape products, but did not stem the tide of speculation and confidence. Schumann observed: in 1878 an unprecedented boom period commenced in South Africa, with the establishment of numerous new companies in the diamond fields. By 1881 more than R12 000 000 had been invested in the diamond industry, of which R6 500 000 was incorporated in the Cape Colony.

**REVISE** Total discounts of Cape banks rose from R5 389 000 in 1875 to R10 536 000 in 1881 (Schumann 1951:240-256).

Then followed a deep crisis: the ‘diamond crisis’. The depression lasted from 1881 to 1886. Insolvencies rose from 259 in 1880 to 1 000 in 1883 and remained in excess of 700 every year between 1884 and 1886. Unsound banking practices resulted in heavy losses to the banks. Discounts of the Cape banks declined from R10 536 000 in 1881 to R3 000 000 in 1887. The severity of the depression was exacerbated by a modest recession in Europe and the USA, which ended in a full depression until 1886. The restoration of the ZAR independence ended the flow of British funds into the region and reduced purchasing power. A drought also affected the region adversely between 1883 and 1886 (Schumann 1938:282-286).

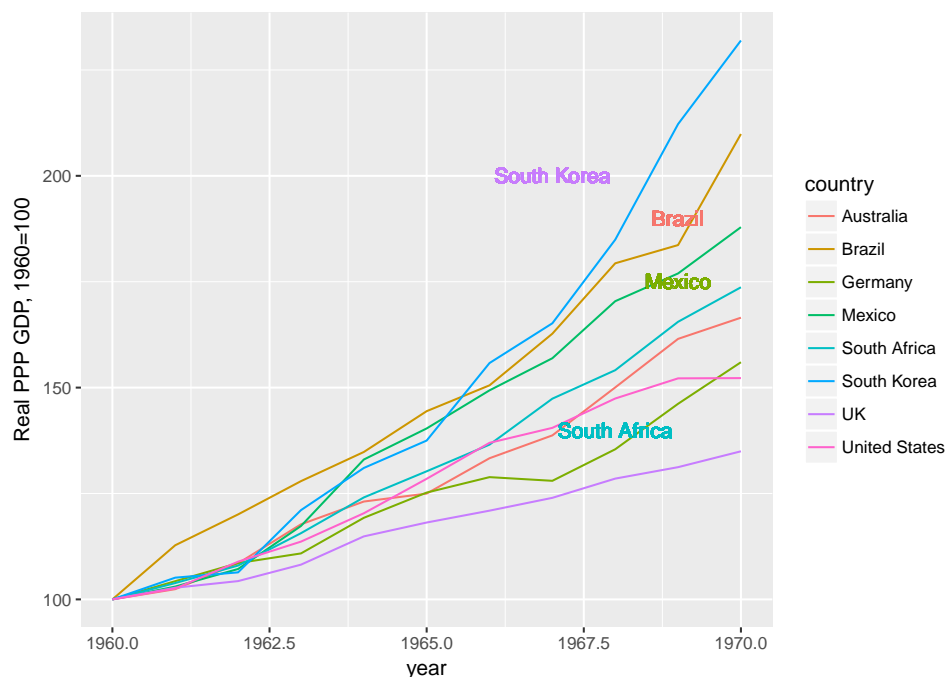


### 4.1.3 The 1891 – 1897 acceleration

Between 1886 and 1890 £22 634 000 was invested in the industry, but rose to £104 337 00 in 1900 and £121 488 000 in 1910 – 75 per cent of which was foreign capital (Schumann 1951:169). A substantial proportion of this capital was directed through the imperial banks in the Cape Colony. The completion of railway links between Cape Town and Kimberley, and between the ports of Cape Town, Port Elizabeth, East London and Durban by 1895, served to open the market and integrate transaction flows in an unprecedented way (Solomon 1983:33, 53-54). The prosperity was accompanied by massive speculation, and banks again provided credit without insisting on prudent guarantees. By the end of 1887 270 gold mining companies were established and had a market capitalisation in excess of £24 million by the end of 1889. This upward trend in the financial cycle had to come to an end early in 1889 financial speculation collapsed and prices of gold shares and of land and prospecting companies crashed. In contrast to the 1881 diamond crisis, the crisis of the late 1880s was purely of a financial speculative nature.

An economic depression followed in 1890. Government revenue, imports and rail traffic declined marginally, but exports were not completely terminated. The depression in Britain in 1890 had a limited impact, and by 1893 the economy was back on track (Schumann 1938:87-90). Gradual economic contraction manifested towards 1896. Several factors had an impact on the contraction of credit: the Jameson Raid in 1896 unsettled business confidence, the rinderpest cattle disease caused widespread cattle deaths, a drought occurred simultaneously and tension between the Boer Republics (the ZAR and the Orange Free State) led to the closure of the drifts, disrupting road transport of goods into the interior or outward to the coastal ports. When the political tension between Britain and the Boer Republics reached a point of no return, the Anglo-Boer War of 1899-1902 broke out. This war had a devastating impact on the economies of the Boer Republics, and brought gold production to a complete standstill. During the war the economies of the Boer Republics were almost completely devastated by the "scorched earth" policy of the British forces, while prosperity reigned in the two British colonies: the Natal Colony and the Cape Colony.

Collaboration between private enterprise and the colonial governments of the Cape and Natal had resulted in the construction of approximately 110km of railway lines in and around Cape Town and Durban between 1860 and 1867. Extending the line from Wellington to Kimberley (900km) was a massive undertaking, but tax revenues flowing from the diamond mines allowed it to proceed. The railway line reached Kimberley in 1885. Between 1875 and 1885, the average annual growth rate in South Africa's railway lines was 29 per cent.



**Figure 9: 1960s growth acceleration**

In common with many countries, South Africa experienced a strong upswing in growth between 1960 and 1970. It was, however, slower than peer emerging markets, but quicker than advanced economies such as Australia, the UK and the US.

#### 4.2 The 1922 – 1930 acceleration

#### 4.3 The 1960 – 1970 acceleration

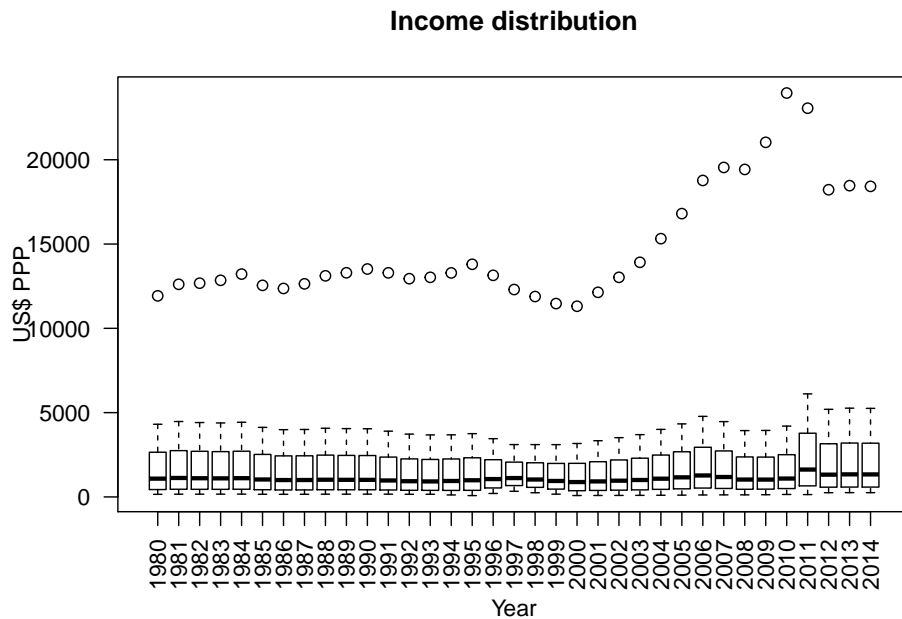
The 1960s and 1970s were boom years for the South African economy. From 1964 to 1974, foreign investment contributed 8 percent of the country’s gross domestic investment. Foreign investment averaged 14 percent during the first five years of the 1970s and peaked at 24.5 percent in 1975-76, before collapsing to 2 percent during the unrest after Steve Biko was killed in 1977.

Foreign investment brought with it technical expertise. Some economists attributed much of South Africa’s annual growth during the 1960s and 1970s (which averaged 4.5 percent and sometimes topped 5.5 percent) to this infusion of technical know-how.

#### 4.4 The 2000 – 2007 acceleration

The most recent acceleration was the 2000 to 2008 acceleration. GDP per capita growth averaged 3.8 per cent over the period, reaching a peak of 6.4 per cent in 2005 and 6.1 per cent in 2005. It remains South Africa’s most significant economic expansion since the diamond and gold accelerations of the late 1800s.

The first is a benign global environment. After the turbulence of the Asian financial crisis of 1998/9, global growth recovered strongly from 2000 onwards. Commodity prices



**Figure 10:** *Income distribution: 2000s*

The acceleration appeared to have increased inequality. Incomes in the top deciles rose faster than those in lower deciles.

The second was the significant restructuring of the South African economy that took place in the 1994 to 2000 period (??). The incoming post-apartheid government instituted a range of economic reforms. Amongst these was a significant reduction in the fiscal deficit, and a sharp fiscal consolidation. The literature highlights that such policy measures have two effects, which work in opposite directions. The first is the Keynesian/Krugman effect – that fiscal contractions harm growth by taking out aggregate demand. The second effect is a financial markets effect – fiscal contractions lead to a reduction in long-term interest rates. This, in turns, spurs a cycle of healthy investment-led growth.

The expansion in economic growth appears to be largely related to an expansion in total factor productivity. In 2002, ? noted the rise in productivity growth, in part because South Africa integrated into the global economy.

The fiscal consolidation was accompanied by a reduction in interest rates.

This period is relatively intensively researched, in part because the government commissioned a series of studies at the twentieth anniversary of democracy. By that stage, economic growth was comfortably around 3 per cent per year. The general consensus was that this was ‘not enough’. The literature shows that productivity growth was particularly strong, substantially stronger than in both the preceding and subsequent periods (see Table 2); inequality rose, particularly *within group*.

Table 2: Productivity growth estimates, different periods

Study	Method	Period	TFP growth (%)
Steenkamp (2018)	CES	2000Q1-2017Q1	Factor Augmenting: 1.7% Hicks neutral: 1.6% Harrod neutral: 1.6% Solow neutral: 1.3%
Botha et al. (2018)	Cobb-Douglas	2000-2017	1.1% on average for the period 1990-1999: 0.4% 2000-2008: 2.0% 2009-2013: 0.2%
Anvari, Ehlers and Steinbach (2014)	CRS Cobb-Douglas	1990-2013	
Kemp and Smit (2016)	Cobb-Douglas	2001-2014	2001-2003: 1.1% 2004-2005: 1.9% 2006-2007: 1.4% 2008-2010: -0.2% 2011-2014: 0.0%
Gabriel (2017)	CGE model	1993-2013	1993-2013: 1.2% 1998-2013: 1.2% 2003-2013: 0.6% 2008-2013: 0.1%
Tsebe and Biniza (2015)	Index based	1994-2013	0.5% p.a

## 5 Econometric evidence

The relationships between the variables can be assessed more formally econometrically. The econometric methodology is important – the pre-1947 data is not

### 5.1 Specification

$Acceleration_t =$

LHS: Acceleration RHS: Controls what of these three things increases the probability consistently

In Table 3, I present preliminary regressions on the conditions that are associated with accelerations. It is important to highlight that these do not *necessarily* imply causation. That said, there is a persistent and positive relationship between accelerations and global growth.

In specification (1) to (3), we present the logistic regression results showing that the extension of property rights had a substantially positive effect on growth. However, this variable becomes statically insignificant in specifications (4) and (5), which are limited samples of post-Union data.

I then test for terms of trade effects. There is evidence that it is global demand that matters, not export prices; that is to say it is a quantity not a price effect. This is in line with more recent literature that finds a complex relationship between price effects (e.g. exchange rate depreciations) on exports. I also test for the role of infrastructure, in light of findings by Perkins et al. (2005); ?. Their analysis shows complex causality. Economic booms often provide the impetus for infrastructure expansion in part because government revenue rises, providing the fiscal space for an infrastructure expansion. In turn, this expansion brings with it more growth and new opportunities, an a virtuous cycle can ensue. There

[1] 0.1505683

=====				
Dependent variable:				
-----				
	Acceleration			
	(1)	(2)	(3)	(4)
-----				
Property_rights	2.117*	2.213*	2.279*	2.218*
	(1.278)	(1.282)	(1.275)	(1.277)
Terms_of_trade_NEW	-0.010			-0.009
	(0.008)			(0.008)
d_Terms_of_trade		-0.849		
		(2.457)		
Infrastructure_index			0.0004	
			(0.001)	
d_log_Infrastructure_index_t_1				7.841*
				(4.729)
I(d_Weighted_World_1950_10 * 100)	0.806***	0.595***	0.527**	0.767***
	(0.265)	(0.189)	(0.234)	(0.268)
Constant	-2.004***	-2.249***	-2.236***	-2.085***
	(0.349)	(0.278)	(0.279)	(0.358)
-----				
Observations	317	317	317	317
Log Likelihood	-138.727	-139.342	-139.278	-137.198
Akaike Inf. Crit.	285.453	286.685	286.556	284.396
=====				
Note:		*p<0.1; **p<0.05; ***p<0.01		

Table 3: Preliminary regressions

appears to be some, albeit weak, relationship between feedback – that is that output growth leads to infrastructure growth.

The results here also suggest that infrastructure leads growth. However, one should be careful not to interpret these results as implying causality. Probits are not designed for the purpose of causality. Rather, they suggest correlation or at best association – an increase in infrastructure spending is thus associated with an increased probability of a boom; and the increase

## 6 Conclusion

*One tentative conclusion from this [economic acceleration] literature is that what matters for getting growth going may be different from what is important to keep it going. Berg et al. (2012)*

The South African growth literature has tended to focus on how to raise the growth rate. This paper takes a different approach – we argue rather that, as with many emerging markets, and to paraphrase Pritchett (2000), economic growth can be seen as a series of peaks, plateaus and valleys.

It is difficult to draw definitive lessons for modern day growth over such a long period. However, some notable similarities for the accelerations stand out:

Financial liberalisation and opening of the economy spurred growth. From the loosening of the strictures of the Dutch East India Company in the early 1700s to the opening up of the post-Apartheid economy, a central theme is that opening up to the world helps growth. The short-term losses were more than offset by longer term productivity benefits as the economy became more competitive.

Accelerations were correlated with waves of immigration. Correlation is not causation – indeed, strong growth would attract more skills, and in turn the skills influx would create further growth. However, there are clear instances of immigration, notably the French refugees.

Despite decades and decades of attempts to diversify the economy, South Africa's export basket, and revealed comparative advantage, is *remarkably* persistent. Wine exports made up about half of exports in 1750. It was displaced by gold from 1880. A single product, *Vin de Constance*, a sweet dessert wine from the Groot Constantia winery was sold to the King of Prussia in 1750 and is still sold today.

In the South African context, growth often accrues unequally. In the most recent acceleration, income inequality rose significantly. Tax rates were lowered at top incomes, exacerbating the effect. This tax decrease also structurally reduced personal income tax revenue, and tax revenue was particularly affecting during the 2008 slowdown.

## References

- Aguiar, M. and Gopinath, G. (2007), ‘Emerging market business cycles: The cycle is the trend’, *Journal of Political Economy* **115**(1), 69–102.
- Aizenman, J. and Spiegel, M. M. (2010), ‘Takeoffs’, *Review of Development Economics* **14**(2), 177–196.
- Berg, A., Ostry, J. D. and Zettelmeyer, J. (2012), ‘What makes growth sustained?’, *Journal of Development Economics* **98**(2), 149–166.
- Bernanke, B. S. (2002), ‘On Milton Friedman’s ninetieth birthday’. Remarks at the Conference to honor Milton Friedman, University of Chicago.
- Bolt, J., Inklaar, R., de Jong, H. and van Zanden, J. L. (2018), ‘Rebasing “maddison”: new income comparisons and the shape of long-run economic development’, *GGDC Research Memorandum* **174**.
- Boshoff, W. and Fourie, J. (forthcoming), The South African economy in the twentieth century, in ‘The South African business cycle’, Springer, chapter 18.
- Clark, G. (2004), The price history of english agriculture, 1209–1914, in ‘Research in Economic History’, Emerald Group Publishing Limited, pp. 41–123.
- De Zwart, P. (2013), ‘Real wages at the cape of good hope’, *tijdschrift voor sociale en economische geschiedenis* **10**(2), 28–58.
- Du Plessis, S. and Du Plessis, S. (2012), ‘Happy in the service of the Company: the purchasing power of VOC salaries at the Cape in the 18th century’, *Economic History of Developing Regions* **27**(1), 125–149.
- Fourie, J. (2013), ‘The remarkable wealth of the dutch cape colony: measurements from eighteenth-century probate inventories 1’, *The Economic History Review* **66**(2), 419–448.
- Fourie, J. and Obikili, N. (2019), ‘Decolonizing with data: The cliometric turn in African economic history’, *Handbook of Cliometrics* pp. 1–25.
- Fourie, J. and Van Zanden, J. L. (2013), ‘Gdp in the Dutch Cape Colony: The national accounts of a slave-based society’, *South African Journal of Economics* **81**(4), 467–490.
- Fourie, J. and Von Fintel, D. (2010), ‘The dynamics of inequality in a newly settled, pre-industrial society: the case of the cape colony’, *Cliometrica* **4**(3), 229–267.
- Friedman, M. (1968), ‘The role of monetary policy’, *The American Economic Review* **58**(1), 1–17.
- Greyling, L. and Verhoef, G. (2015), ‘Slow growth, supply shocks and structural change: The gdp of the cape colony in the late nineteenth century’, *Economic History of Developing Regions* **30**(1), 23–43.

- Hausmann, R. (2018), Development collective know-how and us, *in* 'London School of Economics Lecture Series'. Conference paper.
- Hausmann, R., Pritchett, L. and Rodrik, D. (2005), 'Growth accelerations', *Journal of Economic Growth* **10**(4), 303–329.
- Havemann, R. (2014), 'The exchange control system under apartheid', *Economic History of Developing Regions* **29**(2), 268–286.
- Havemann, R. and Fourie, J. (2015), The Cape of perfect storms: colonial Africa's first financial crash, 1788–1793, Working paper 511, Economic Research Southern Africa, Cape Town.
- Jerven, M. (2010), 'African growth recurring: an economic history perspective on African growth episodes, 1690–2010', *Economic History of Developing Regions* **25**(2), 127–154.
- Jerzmanowski, M. (2006), 'Empirics of hills, plateaus, mountains and plains: A markov-switching approach to growth', *Journal of development economics* **81**(2), 357–385.
- Jones, B. F. and Olken, B. A. (2008), 'The anatomy of start-stop growth', *The Review of Economics and Statistics* **90**(3), 582–587.
- Kaminsky, G. L. and Reinhart, C. M. (1999), 'The twin crises: the causes of banking and balance-of-payments problems', *American Economic Review* **89**(3), 473–500.
- Magee, G. B., Greyling, L. and Verhoef, G. (2016), 'South Africa in the Australian mirror: per capita real GDP in the Cape Colony, Natal, Victoria, and New South Wales, 1861–1909', *The Economic History Review* **69**(3), 893–914.
- McLachlan, J. N. (2018), The history of the occupation of land in the Cape Colony and its effect on land law and constitutionally mandated land reform, PhD thesis, University of Pretoria.
- Page, W. (1919), *Commerce and Industry: A Historical Review of the Economic Conditions of the British Empire from the Peace of Paris in 1815 to the Declaration of War in 1914, Based on Parliamentary Debates*, Vol. 1, Constable.
- Perkins, P., Fedderke, J. and Luiz, J. (2005), 'An analysis of economic infrastructure investment in south africa', *South African Journal of Economics* **73**(2), 211–228.
- Pinkovskiy, M. and Sala-i Martin, X. (2014), 'Africa is on time', *Journal of Economic Growth* **19**(3), 311–338.
- Pritchett, L. (2000), 'Understanding patterns of economic growth: searching for hills among plateaus, mountains, and plains', *The World Bank Economic Review* **14**(2), 221–250.



- Reinhart, C. M. and Rogoff, K. S. (2009), *This time is different: Eight centuries of financial folly*, Princeton University Press, Princeton.
- Reinhart, C. M. and Rogoff, K. S. (2011), 'From financial crash to debt crisis', *American Economic Review* **101**(5), 1676–1706.
- Reinhart, C. M. and Rogoff, K. S. (2014), 'Recovery from financial crises: Evidence from 100 episodes', *American Economic Review* **104**(5), 50–55.
- Ross, R. and van Duin, P. (1987), 'The economy of the cape colony in the eighteenth century'.
- Rostow, W. W. (1959), 'The stages of economic growth', *The economic history review* **12**(1), 1–16.
- Rostow, W. W. (1990), *The stages of economic growth: A non-communist manifesto*, Cambridge university press.
- South African Reserve Bank (2010), 'South africa's national accounts 1946–2009: An overview of sources and methods', *Pretoria: South African Reserve Bank* .
- Swanepoel, C. (2017), *The private credit market of the Cape Colony, 1673-1834: wealth, property rights, and social networks*, PhD thesis, Stellenbosch: Stellenbosch University.
- Terreblanche, S. J. (2002), *A history of inequality in South Africa, 1652-2002*, University of Kwazulu Natal Press.