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ABSTRACT

Economic globalization is defined as the co-movement of prices across a large number of countries (O'Rourke and Williamson, 2002). This research note identifies the period when South African prices began to move in unison with those of the country's lead trading partner or, in other words, when South Africa globalized. We find that South African wheat prices started reflecting UK trends soon after the discovery of diamonds and gold in the interior of the country. The mineral revolution, it seems, was responsible for integrating the broader South African economy – here proxied by agricultural prices – into the global economy. We further show that this integration was not confined to Cape Town; the coming of the railways ensured that markets in the larger Western and Eastern Cape and, importantly, the town of Kimberley, were well integrated with those in Cape Town. We therefore establish the start of South Africa's globalization in the 1870s.

Keywords: F63, N17
JEL codes: globalization, trade, periphery, colonialism, railways, Africa

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WHEN DID GLOBALIZATION BEGIN IN SOUTH AFRICA?[4]

When did South African markets integrate into the global economy? This simple yet important question has not, as far as we know, received a satisfactory answer. The discovery of diamonds after 1870 established a mining industry reliant on international commodity prices, but globalization is a diffuse phenomenon that should arguably involve non-mining activities as well. Here we focus on agricultural markets, specifically the wheat market. In line with the economic history literature, we define economic globalization as the co-movement of prices across a large number of countries (O'Rourke and Williamson, 2002; O'Rourke and Williamson, 2004). Using the co-movement of Cape Town wheat prices with those of England, South Africa's main trading partner at the time, we show that South Africa began to globalize during the 1870s. We also show that this integration into the global economy was associated with inland rail links between grain markets in Cape Town, Kimberley and various other towns.

The date we determine for South Africa's globalization will depend on the definition we use. If we define it simply as "the opening up of trade routes", then we may find, as some researchers suggest, that globalization begins at the end of the fifteenth century, when Europeans discovered the routes to the Americas and around the southern tip of Africa to the East (De Vries 2010). Adam Smith noted that "the discovery of America, and that of a passage to the East Indies by the Cape of Good Hope, are the two greatest and most important events recorded in the history of mankind" (1776, IV.7.166).

But distant empires were connected long before this, for example by the voyager Zheng He in the fourteenth century (Finlay, 1991), by the Venetians trading in the fifteenth century (Tracy, 1993), by the Ottomans (İnalcık and Quataert, 1994), and by the travellers on the Silk Route (Christian, 2000). And even further back, vast territories were conquered and goods were moved across long-distance trade routes, for example by Rameses II, Alexander the Great and Julius Caesar.

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Without a cogent definition of globalization, it is difficult to agree on when it started. Economic historians have therefore agreed on a definition that is testable: the co-movement of prices across borders. When a price shock in one region has an immediately spill-over effect in another region, those two regions are said to be economically integrated, i.e. when a country's prices co-move with world prices, that country is globalized.

The literature has, however, focused almost entirely on the developed world. The consensus, according to O'Rourke and Williamson (2001), is that globalization between the leading economies – England, the Western European countries and North America – began around the middle of the nineteenth century. Historians tend to agree. Osterhammel and Petersson (2005: ix), for example, argue that the early history of globalization was "not merely about imperial expansion" but also about "the emergence and growth of a world economy". They note that "various empires slowly became enmeshed into even more extended webs of exchange", and that although trade by land and sea has gone on since antiquity, "integrated world markets for goods, capital, and labor were unknown before the middle of the nineteenth century".

Integration began with a confluence of mid-nineteenth-century events: the dropping of trade barriers as the free trade movement gained momentum in the British parliament, the reduction in trans-Atlantic transport costs with the coming of the steamship, and the influx of vast quantities of raw materials from the colonies, which boosted industrial growth in Britain and at the same time opened up new markets for British manufactured goods (Crafts, 2004; O'Rourke and Williamson, 2005; Jacks *et al*., 2010; Frankema *et al*., 2015). The first phase of globalization was underway.

When did South Africa join this globalising world? Hitherto there has been no definite answer, and we aim to provide one. We start by looking at the trade history of southern Africa and then at the history of settlement and trade in South Africa.

From ancient times, traders criss-crossed southern Africa, carrying gold and ivory from the kingdoms of Mapungubwe and Great Zimbabwe to the Arab traders in the port cities of Kilwa Island, off the coast of present-day Tanzania, and the Island of Mozambique (Sutton, 1997; Huffman, 2009), but the documentation of international trade networks began only with the rounding of the Cape of Good Hope by European explorers in search of a route to the East. For more than 150 years, however, the trade between Portuguese, Dutch and English merchants and indigenous coastal groups was not steady but only incidental, and often violent.

When Europeans settled permanently at the Cape in 1652, their aim was to establish a small refreshment station under the auspices of the Dutch East India Company, to provide a more regular supply than was available from the local tribes. Soon after settlement, however, the Commander released Company servants to become free burghers, starting a process of conquest and land acquisition in South Africa that continued for over three centuries. During 143 years of Dutch rule, settler territory and numbers expanded, buttressed by the importation of slaves from the East Indies, to reach roughly 15,000 by 1795 when the British first gained control (Ross, 2010).

The Cape Colony became part of the British Empire and its population continued to expand. On the frontier, pressure for farm land became intense, leading to a series of frontier wars, exacerbated by the arrival in 1820 of British settlers (Müller, 1986). Small towns dotted the countryside, but production was mainly agricultural. During most of the seventeenth, eighteenth and early nineteenth centuries, exports were limited to grains and wine. Manufactures were mostly imported.

Unhappy with British rule and the emancipation of slaves in 1834, several thousand frontier farmers of Dutch origin trekked across the Orange River deeper into the interior, where they founded two Boer republics, the South African Republic in 1852 and the Orange Free State in 1854. The Colony of Natal, on the eastern coast, was proclaimed a British colony in 1843. By the 1860s, then, the Cape Colony was the economic hub of a vast but sparsely populated interior.

Mineral discoveries substantially altered the economic landscape (Feinstein, 2005; Fourie and Van Zanden, 2013). The discovery of diamonds drew people from the Cape and abroad into the interior in search of riches, founding new towns like Kimberley that, by the 1891 census, was the second largest town in South Africa. The discovery of gold on the Witwatersrand during the 1880s had an even greater effect. By the time of unification in 1910, Johannesburg was the largest city and the economic centre of southern Africa (according to the 1911 South African Census, it had 121,857 whites compared with Cape Town's 64,619).

Was this the beginning of globalization for South Africa? Some would argue that the Cape Colony at least was already globalized when it was founded: the settlement was run by the world's first multinational company, the Dutch East India Company, its inhabitants were either descendants of European settlers or slaves from Malaya, Indonesia, India, Mauritius, Madagascar and Mozambique (Baten and Fourie, 2015), and its surplus commodities – wheat, wine and meat, and luxuries such as ivory and aloe – were sold to European and Batavian markets. But will that argument stand up to scrutiny if we use O'Rourke and Williamson's definition of globalization (2002)? Can we say that the Cape Colony was globalized in the technical sense – in other words, were its markets integrated into the global market?

Before we answer this, we must first explain why economic integration is important. Adam Smith (1776) was the first to point out that international trade can lead to specialisation and growth and, since then, several trade models have provided theoretical explanation and empirical evidence of the benefits of cross-country trade and market integration. We will mention only one recent model developed by Jacks *et al*. (2011). This model, using a long-term series of wheat prices, finds that poor countries are more volatile than rich ones and that more integrated markets are less volatile. Isolation from the global market can lead to large fluctuations in prices and this impedes a country's growth.

Can we establish when Cape markets became integrated with international markets? We know that these markets were not internationally integrated during the eighteenth century: prices at the Cape were kept artificially low by the Company (in the hope of earning monopsonistic profits when goods were resold to the foreign ships docking in Table Bay). Because of this, the price series available for wheat, the largest export, reveals little change over the century (Van Duin and Ross, 1987; Du Plessis and Du Plessis 2012). To test for co-movement between Cape and world prices during that time would therefore be futile.

Our attention thus shifts to the nineteenth century, which is when the prices for a group of Western countries first began to move together. We first investigate exports, using figures obtained from the colonial Blue Books. Before the discovery of minerals in South Africa in the late 1860s, export volumes were small and limited to a few commodities; as Figure 1 shows, both exports and imports rose steeply after 1870, with the discovery of diamonds, and again after 1886, with the discovery of gold. The Second South African War (1899–1902) severely damaged the country's productive capacity, reducing exports and increasing imports. By 1909, however, exports had recovered and imports had fallen, resulting in a sizeable positive trade balance.

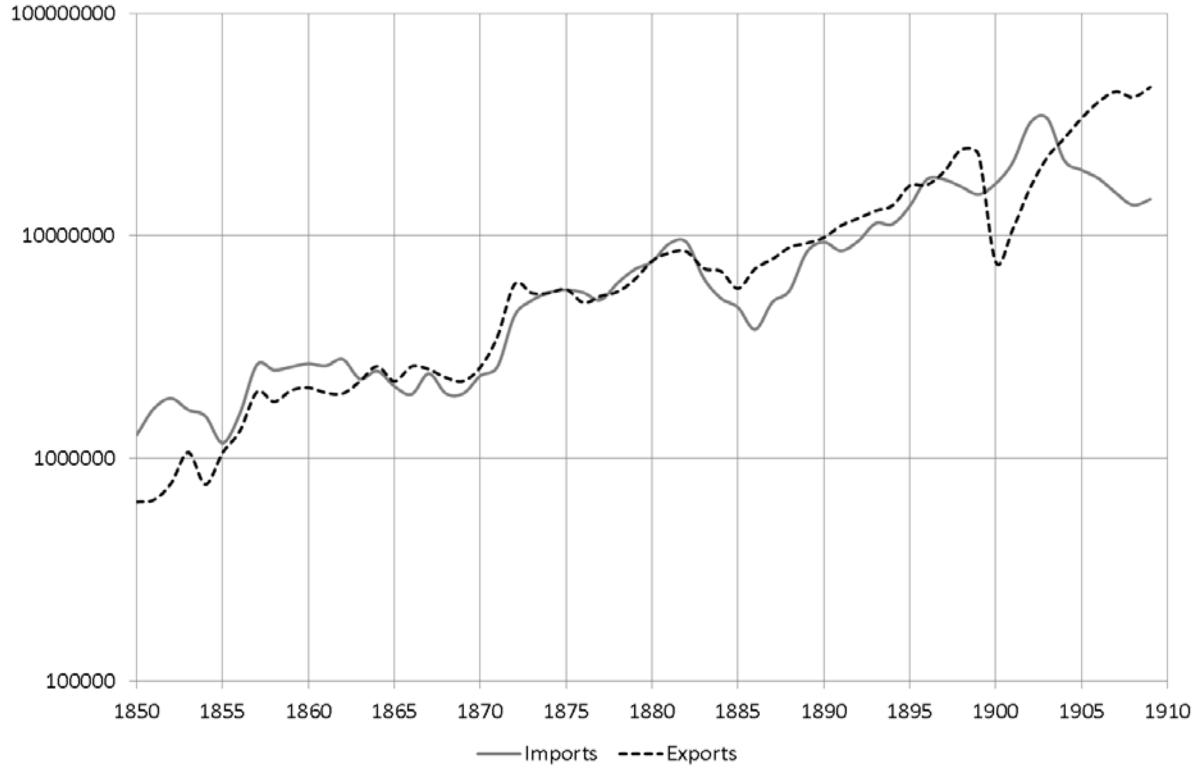

Figure 1. Exports and imports of goods (excluding specie) from the Cape Colony, 1850–1909
Source: CGH Blue Books (1909)

When, then, did South African markets integrate into the global economy? To answer this question, we use annual wheat price data for the Cape Colony (from 1836) and Natal (from 1852), obtained from De Zwart (2011). We compare the South African series with an annual wheat price series for the UK, which was the colonial ruler and also South Africa's main trading partner. We compiled the UK series from monthly wheat prices for 12 UK cities obtained from Jacks (2006). The South African series is adjusted to the same unit of measurement, and both series are logged. Figures 2 and 3 present the results.

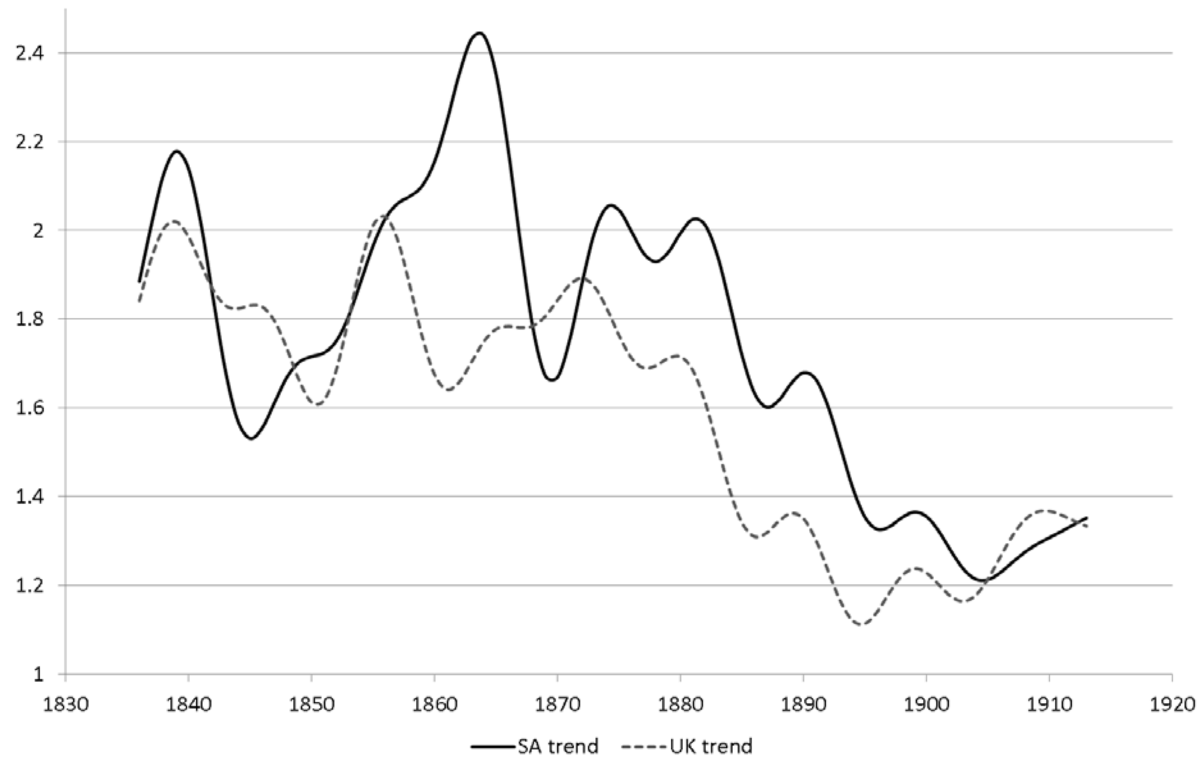

Figure 2. Trends for South African and United Kingdom wheat prices, 1836–1913

Figure 2 shows a distinct change around 1872, when exports of diamonds first reached more than £1 million. Little correlation between South African and UK wheat prices is visible before 1872, but we can see a positive correlation emerging during the early 1870s. The correlation coefficient supports this visual inference: between 1836 and 1871 it is a positive but statistically insignificant 0.05, but between 1872 and 1913 it changes to a positive and statistically significant 0.86, suggesting strong co-movement between the South African and UK prices.

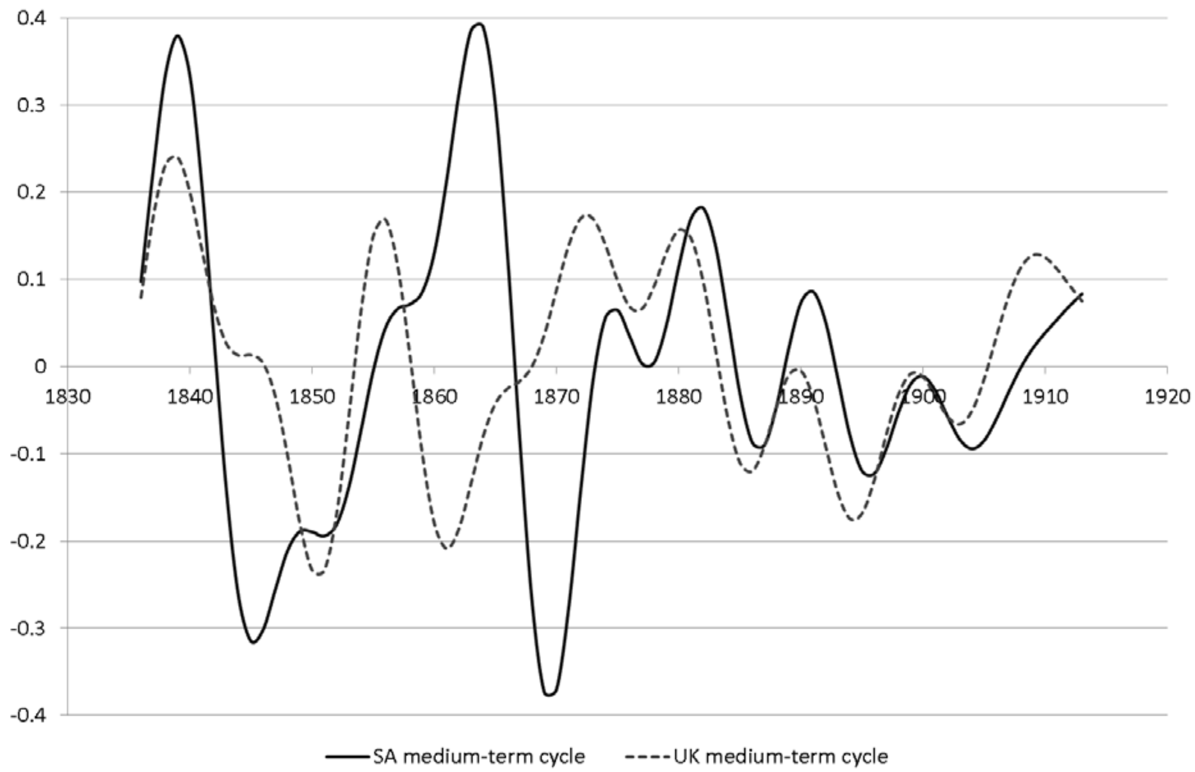

Figure 3. Medium-term cycle trends for South African and United Kingdom wheat prices, 1836–1913

Figure 3 shows the result of using a frequency filter to extract medium-term information from the time-series data.[5] Frequency filters are used to extract information relevant to a specific period: a high-frequency filter extracts only short-term fluctuations, ignoring long-term trends, and a low-frequency filter does the reverse. To define a 'medium-term' period, we follow Comin and Gertler (2003), who defines business cycles as fluctuations over a period of between eight and fifty years. Boshoff and Fourie (2010) show the importance of considering these longer-term fluctuations, so-called medium-term cycles, contained in the long-term trend of eighteenth-century South African data. We use the filter suggested by Christiano and Fitzgerald (2003), which outperforms the filter of Baxter and King (1999) when extracting information for medium- to longer-term periods.

The filtered series confirms the unfiltered evidence of Figure 2. There is no correlation between the medium-term cycles of South Africa and the UK before 1870. By the mid-1870s, however, following the discovery of diamonds and the rapid growth of trade (Figure 1), we see strong co-movement between the two series, suggesting closer medium-term integration with the UK market.

[5] In time-series parlance, we sought to extract only that component of the spectral density that relates to low-frequency variation.

What explains this price co-movement? Technological developments in South Africa and elsewhere may have contributed. The first telegraph line was installed in 1860 between Simon's Town and Cape Town for the benefit of shipping and commerce (Huurdeman, 2003: 116). Further lines were soon installed between the main towns along the South African coast and others followed the construction of the railways into the interior during the 1870s and 1880s. A telegraph connection to London, though, was only completed in 1885.[6]

But the most far-reaching technological change, as regards globalization, was in shipping technology. Shipping efficiency, most notably the arrival of steam technology, had increased substantially between the seventeenth and nineteenth centuries, and further improvement during the 1840s and 1850s was due to increased ship size (from 120 tons to 500 tons) and an improved load factor (from 60% to 80%) (North, 1968: 965). Refrigeration and harbour infrastructure also improved. In 1870, the Alfred Basin in Table Bay harbour was completed, improving the speed at which cargo could be loaded. In 1969, the Suez Canal also opened, although this would have been a negative shock for South Africa who had benefited considerably from being located on the route between Europe and the East.

In looking for our globalization date we have considered only prices of wheat, a widely traded commodity, and those prices only in Cape Town and Durban, arguably the South African port cities most strongly connected to international markets. This may be problematic. We would like to know whether the rest of South Africa, and the other commodities, were equally well integrated into the world economy, but data limitations prevent us from comparing several commodities for different towns across South Africa with markets elsewhere over the same period. However, the *Agricultural Journal* of the late nineteenth century did publish monthly prices of several commodities for a dozen or more South African towns. The series is not complete for an extended period, but it does allow us to compare trends for some products in some Cape Colony towns, as we show in Table 1.

Table 1. Contemporaneous correlation (in log first differences) of agricultural prices in South African towns with prices in Cape Town, 1897–1906

Town	**Wheat**	**Mealies**	**Mutton**	**Beef**
Aliwal North	**0.42**** **-0.18**	0.11 -0.18	0.03 -0.18	0.14 -0.18

[6] The Cape Town to Kimberley railway line was also completed in 1885.

Beaufort West	**0.45** -0.19**	**0.35* -0.18**	0.24 -0.2	0.11 -0.19
Burgersdorp	-0.18 -0.24	**0.74** -0.25**	-0.13 -0.17	0.27 -0.19
Clanwilliam	**0.37* -0.19**	0.33 -0.23	0.09 -0.18	**0.51** -0.19**
Colesberg	**0.61** -0.19**	**0.35* -0.2**	-0.29 -0.2	-0.06 -0.29
Cradock	**0.40* -0.22**	0.06 -0.21	0.06 -0.19	0.31 -0.28
Dordrecht	**0.38** -0.17**	-0.17 -0.19	-0.34 -0.18	-0.16 -0.21
East London	0.1 -0.17	0.16 -0.17	**0.38** -0.17**	0.03 -0.17
Graaff-Reinet	0.14 -0.17	0.2 -0.17	0.17 -0.17	**0.51** -0.17**
Grahamstown	-0.1 -0.26	0.09 -0.17	0.09 -0.19	0.1 -0.19
Kimberley	**0.27* -0.17**	**0.30* -0.17**	0 -0.17	-0.02 -0.17
King William's Town	**0.42** -0.21**	-0.09 -0.17	0.06 -0.17	0.19 -0.17
Malmesbury	**0.46** -0.17**	**0.32* -0.18**	**0.32* -0.17**	0.12 -0.17
Mossel Bay	-0.01 -0.18	-0.04 -0.17	0.23 -0.17	**0.37** -0.17**
Port Alfred	-0.09 -0.38	-0.16 -0.2	-0.01 -0.21	0.12 -0.2
Port Elizabeth	0.32 -0.32	0.2 -0.18	0 -0.24	0.27 -0.24
Queenstown	-0.09 -0.17	**0.28* -0.17**	0.04 -0.17	0.05 -0.17
Tarkastad	0.26 -0.18	0.08 -0.18	-0.31 -0.18	0.27 -0.18
Vryburg	0.22 -0.23	0.29 -0.19	-0.04 -0.19	-0.32 -0.19
Worcester	**0.41** -0.19**	0.14 -0.18	-0.06 -0.19	0.22 -0.18

* Statistically significant at 10%, ** 5%

Three general inferences may be made from Table 1. Firstly, as expected, we find that Western Cape agricultural markets were quite well integrated internally, as evidenced by the significant correlation between Malmesbury, Clanwilliam, Worcester and Cape Town.

Secondly, we find that the wheat and maize markets of major towns located on the main railway lines were integrated with those of Cape Town, particularly those of Beaufort West and Colesberg and, more importantly, the key market of Kimberley. Thirdly, we find that Eastern Cape wheat and maize markets were on the whole less well integrated with Cape Town markets, though the towns with good railway links, notably Aliwal North, but also Cradock, Dordrecht and King William's Town, did have significant connections with the market in Cape Town. However, wheat and maize prices in the major Eastern Cape towns of Port Elizabeth, East London and Graaff-Reinet were not strongly influenced by Cape prices. Looking at the meat prices, we find some links between Graaff-Reinet's beef market and East London's mutton market and those of Cape Town.

As noted above, the calculations in Table 1 rely on a large sample of towns, but this sample suffers from many missing data points. This limits our analysis to short-term correlations. To analyse longer-term equilibrium relationships, we would need a complete data series over an extended period, and such data are available for only five of the towns: Cape Town, Kimberley, Queenstown, Graaff-Reinet and East London.

For those towns we were able to estimate a long-term equilibrium relationship, using the method suggested by Pesaran *et al*. (2001). These results confirm that Eastern Cape wheat markets were not integrated with Cape Town's but that there was a long-term relationship between Kimberley's wheat and maize prices and those of Cape Town. In fact, the results shown in Table 2 suggest that this longer-term correlation was much higher than is suggested by the short-term correlation between Kimberley and Cape Town shown in Table 1. From 1901 to 1903 Kimberley prices were much higher than Cape Town's, but from 1904 to 1906 they returned to levels similar to those of 1897 to 1900, again closely matching Cape Town prices (see Figure 4). The longer-term results also suggest a connection between Graaff-Reinet mutton prices and those of Cape Town, which is consistent with the evidence in Table 1.

Table 2. Pesaran, Shin and Smith (2001) bounds tests for long-term cointegrating relationships between Cape Town prices and a selection of other towns (F-statistic reported)

Town	Wheat	Mealies	Mutton	Beef
Kimberley	5.09*	8.17*	5.01	2.96
Queenstown	3.47	2.80	4.94	1.91
East London	1.75	NA	2.12	1.64
Graaff-Reinet	0.09	2.66	8.04*	1.65

* Statistically significant at 10%, using Narayan (2005) small-sample critical value bounds for F-statistic: [4,29; 5.08]

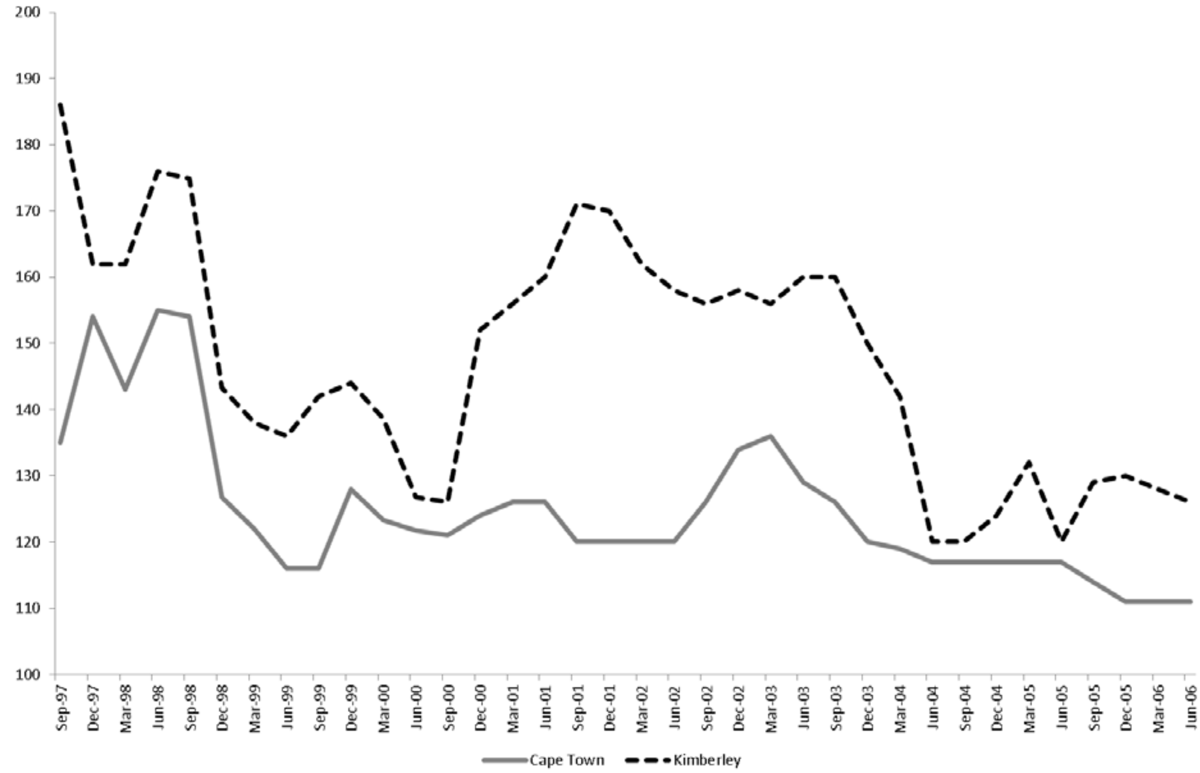

Figure 4. Wheat prices in Cape Town and Kimberley, 1897–1906

These results show that product markets in the interior were fairly well integrated by the turn of the century, despite the destruction and displacement caused by the Anglo-Boer War of 1899–1902. Other factors that will have greatly aided this co-movement of prices were the development of the railway and the removal of tariff and other barriers between the British Cape Colony and the newly conquered British interior. With this internal market integration, South Africa's interior began to experience the benefits of the globalization that had started with the port cities in the 1870s.

Our results have shown that South Africa, at least those parts well connected to Cape Town, became globalized according to the O'Rourke and Williamson (2002) definition immediately following the discovery of diamonds in the interior, not very long after the first era of globalization began in the leading economies. Whether this was because of the diamond discoveries and the rapid expansion of the interior economy, which resulted in a surge in international trade, or because other factors, such the telegraph, the railway and decreasing freight costs (Fourie and Herranz-Loncan, 2015), are beyond the scope of this research. The Anglo-Boer War also removed barriers that blocked trade flows in the interior, opening up the rest of the South African economy to globalization. By the beginning of the twentieth century, South Africa's major cities were fully integrated into the first truly global market.

The extent to which domestic and international economic, technological and geopolitical events *caused* South Africa to globalize is for future research to investigate. Here we simply establish the date the process started. We have shown that, if we can rely on wheat prices as a proxy for all other products, South Africa's first era of globalization began during the early 1870s.

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