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Savings and economic growth: a historical analysis of the relationship between savings and economic growth in the CAPE Colony economy, 1850-1909.

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Abstract

The sub-optimal savings propensity in South Africa the past three decades causes concern for the ability of the country to support its economic development. An historical analysis of the development of the savings' trends in South Africa may assist in understanding the historical roots of the phenomenon. Apart from general descriptions of the nature of economic activity in the Cape Colony very little is known about the role financial sector development and savings played in the growing colonial economy. This paper explores the performance of the economy of the Cape Colony between 1850 and 1909, through the business cycles, financial sector stability, the nature and extent of economic activity and seeks to explain the relationship between savings and economic growth. The question is whether the general view that 'financial development is robustly growth promoting' can be substantiated in the last half of the nineteenth century Cape Colony? It contributes to the economic history literature on the colonial past of South Africa by using newly compiled data on the GDP of the Cape Colony during the last half of the nineteenth century. The paper finds that despite the expectations in the literature that financial deepening contributes to economic growth; the Cape Colony did not display such causal relationship between savings and economic growth in the period under review. The paper shows the different forms of savings in the colony and the trend of savings behavior in the period amidst the development of a relatively robust financial sector.

Keywords: Cape colony, economic growth, financial deepening, gross domestic product, savings.

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1. Introduction

There is an absolute dearth of a systematic understanding of the nature and extent of economic growth of South Africa before the formation of the Union in 1910. Economic historians have not yet attempted to compile the gross domestic product of the territories and colonies that formed the Union of South Africa in 1910. Apart from De Kock (1924) and Schumann (1938) who explored only aspects of the economic development of the pre-union economy, the extent of the GDP of the Cape Colony (and also any of the other territories and colonies since the seventeenth century) remains unknown territory. Even the latest attempt to produce an economic history of South Africa (Feinstein, 2005) affords only 0,02% of this attempt to the period prior to 1652 and another 0.08% to the period between 1652 and 1913, since his concern is with labour and not the actual nature of the economy and the nature of its growth and development. Several studies explored the development of the banking system (Arndt, 1928; Jones, 1996; Solomon, 1983) but no investigation attempted to understand the relationship between the growth of the economy and savings. Schuman

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(1938:37) relied on indices to illustrate the 'general line of growth' such as population growth, the volume and value of domestic and foreign trade, the development of transport and increases in banking activities. No GDP data has ever been compiled for the Cape Colony during the nineteenth century and no attempt was made to investigate the relationship between savings and the performance of the economy. The current concern with the underperforming savings propensity of South Africa (Mail & Guardian, 2012; Cronjé & Roux, 2010; MISTRA, 2012) calls for a deeper understanding of the roots of the relationship between economic growth and savings in South Africa. This paper investigates that relationship in the last half of the nineteenth century in the Cape Colony in order to establish a point of reference to the savings-growth trajectory in South Africa.

The South African financial system is widely acknowledged as highly sophisticated, but has also displayed dramatic changes recently. Beck, Levin and Loayza (2000) assessed the effect of financial intermediary development on economic growth, capital growth, productivity growth and private savings rates. A robust positive link was identified between financial intermediary development and real GDP growth and total factor productivity growth, but less so between financial intermediary development and physical capital accumulation or private savings rates.

In the current discourse about a higher economic growth rate for South Africa, a higher savings rate is considered a prerequisite. Higher savings is the trade-off between current consumption and future resources. The current savings rate in South Africa is discouragingly low. The question arises what the legacy of savings and economic growth was in nineteenth century South Africa? This paper investigates the following research question: What was the relationship between savings in the Cape Colony and economic growth during the last half of the nineteenth century? Does a causal relationship emerge between economic growth and savings? Since no comprehensive statistics are available for this period, a new dataset is compiled for the Cape Colony between 1850 and 1909.[3]

In this paper an investigation will be conducted into the historical data on personal savings in the pre-1910 South African Cape Colony. Historical data was collected on different types of personal savings, such as savings in savings deposits at banks, at savings and people's banks, Exchequer and Trust companies and building societies. The Cape colony had a well-developed financial system, through small local unit banks and later the British imperial

[3] The aim is to repeat this study for the other territories that eventually entered into the Union of South Africa in 1910, i.e. the Natal Colony, The Orange Free State and the Transvaal Colony.

banks, which allows analysis on the impact of financial development on the economy, as well as comparisons with the more recent tendencies. The article will survey and describe the nature of financial markets in the colony and seek to explain the link between this development and savings and economic growth. The goal of this article is to examine the long-run causality between financial development and economic growth over the period 1850 –1909 in the Cape Colony. It is important to determine whether financial development matters for economic growth and if there is evidence of bi-directional causality between financial development and economic growth or whether financial development led to growth in the short-term, but in the long term, it is bi-directional causality. This is important to understand that policies aiming at improving financial markets (economic growth) will have a significant effect of economic growth (financial development).

The relationship between finance and growth has been a field of interest throughout the development of modern economics. There is consistent agreement that financial deepening and financial efficiency has a positive impact on growth. Economists have long debated the empirical importance of the relationship between financial development and economic growth. There are two distinct views of the finance-growth nexus in the traditional development economics. The first, supply-leading view was first proposed by Schumpeter (1911) who contends that services provided by financial intermediaries are essential drivers of innovation and growth. A number of studies have suggested that financial sector development is not only a good predictor, but also a leading factor in economic growth. The second demand-leading view suggests that the rise in the demand for financial services resulting from economic growth is the major driving force behind the development of the financial sector.

The next phase in the analysis of the relationship between finance and growth is to examine whether the effectiveness of financial development in promoting economic growth depends on the structure or level of development of the economy. There are authors who conclude that countries at the early stage of development benefit more from financial development, see McKinnon, 1973; Fry, 1995). Odedokun (1996), Suleiman and Abu-Qarn (2005), Ghirmay (2004). Christopoulos and Tsianos (2004), Habibullah and Eng (2006) and Agbetsiafa (2003) mostly conducted investigations only in developing countries and found that in almost all their research, financial development contributed to economic growth. More recently, Zang and Kin (2007), Ang and McKibbin (2007), Güryay et al (2007), Odhiambo (2004) and Suleiman and Abu-Qarn (2007) examined the causality between financial development and economic growth in developing countries, and found no statistically

significant evidence of a positive causality running from financial development to economic growth at all.

If it is found that there is a relationship between finance and growth, the more interesting question is in what direction does the causality between finance and growth run. Unidirectional means that only either the supply-led or demand-led hypotheses can be confirmed. Bi-directional causality suggests a two-way causal relationship between financial development and economic growth. In more recent studies results indicated that finance can also affect economic growth at a certain stage of development only to find the reverse later on. As real growth occurs, the supply-leading pattern gradually becomes less significant and a demand-following one occurs. Thus, in the early stages of development, financial development is expected to lead to economic growth, while the reverse occurs in more advanced stages of development. A country with a well-developed financial system could experience high economic growth through technological change, as well as product and service innovations, which will in turn create a high demand for financial services. As the financial sector responds to these demands, it will stimulate economic performance.

2. A brief overview of the theories.

The theoretical relationships between financial development and economic growth have been analysed extensively in the literature and can be summarized under four hypotheses. The following review of the literature is based on Chuah and Thai, 2004.

The conventional view of the supply-leading hypothesis postulates that the direction of causality flows from financial development to economic growth. In a world with no frictions caused by transaction, information, and monitoring costs and perfect information, no financial intermediaries are needed. If those costs are sufficiently high, no exchanges among economic agents will take place. The need to reduce those costs for exchanges to take place has led to the emergence of financial institutions and markets constituting the financial sector. A well-developed financial sector provides critical services to reduce those costs and thus to increase the efficiency of intermediation. It mobilizes savings, identifies and funds good business projects, monitors the performance of an economy, facilitates trading, diversifies risks, and encourages exchange of goods and services. These services result in a more efficient allocation of resources, a more rapid accumulation of physical and human capital, and faster technological innovation, thus inducing faster long-term economic growth. In this article it is thus important to identify whether the cost of transactions outweigh the advantages of ease of transactions.

The demand-following hypothesis postulates that economic growth leads to financial development. Robinson already argued in 1952 (1952:67-142) that the development of the real economy induces increased demand for financial services, which in turn, generate the introduction of new financial institutions and markets to satisfy that increased demand for financial services. Demetriades and Hussein, confirmed this position in 1996.

Third, the bi-directional causality hypothesis is a combination of the supply-leading and demand-following hypotheses. Greenwood (1990 and 1997) postulated that financial deepening and economic growth are mutually or bi-directionally caused (Greenwood and Jovanovic, 1990; Demetriades and Hussein, 1996; Greenwood and Smith, 1997). Financial deepening gradually induces economic growth, and this, in turn, feeds back and induces further financial deepening.

Fourth, the independent hypothesis postulates that financial deepening and economic growth are causally independent**.** Lucas (1988) argued that, at best, financial deepening plays a limited role in economic growth, while Stern (1989) ignores the role of financial development in the growth process. Lucas makes a distinction between 'growth effects' - changes in parameters that alter growth rates along balanced paths - and 'level effects' - changes that raise or lower balanced growth paths without affecting their slope (Lucas 1988:12). This is very similar to identifying a long term relationship and short-term adjustment process using a VAR, as will be done in the paper. Savings rates are seen as level effects (which transposes in the present context to the conclusion that changes in the discount rate, *i,* are level effects. Lucas disputed the idea that barriers to trade, such as the lack of financial institutions, act as a limitation on growth and the removal of the barriers to trade act as a key explanation of rapid growth episodes. According to the neoclassical growth model, removal of barriers is a level effect, analogous to a one-time shifting upward in production possibilities, and not a growth effect. The level effects can be drawn out through time through adjustment costs of various kinds, but not so as to produce increases in growth rates that are both large and sustained. Lucas argues the removal of an inefficiency that reduced output by five percent (an enormous effect) spread out over ten years results in simply a one-half of one percent annual growth rate stimulus. Inefficiencies are important and their removal certainly desirable, but the familiar ones are level effects, not growth effects (Lucas 1988:13 -15). Stern (1989) was critical of the idea of savings causing growth, due to the results of cross-sectional correlations only significant for richer countries (Stern 1989: 618-621). He emphasises the role of agriculture as a growth factor (Stern 1989: 626 – 628).

3. Economic development in the Cape Colony.

The economy of the Cape Colony developed as an agricultural economy since VOC rule in the seventeenth century. The Cape economy was the most advanced in 'South Africa' by 1850. The total population in 1850 was 285 279 and rose to more than 2,4 million by 1909. All population data is compiled from the official population censuses done in 1850, 1853, 1856, 1865, 1875, 1880, 1885, 1889, 1891 and 1904. No other official censuses were done. By 1865 67.19% of the employed Cape population was engaged in agriculture, and this declined to 64.19% in 1909. The indefinite (including children) and unemployed population changed from 90.32% in 1850 to 34.70% in 1904, meaning that 65% of the population was employed in 1904.

Table 1: Population in Cape Colony: Total and Economic Activities. [4]

Year	Total Population				%People engaged in:					
	Total	Male	Female	Employed	Agricult	Manufact	Commerce	Prof	Domestic	Indefinite
1850	285279	141609	143670	27612	81.06	3.55	15.39			90.32
1853	224827	113240	111587	30943	74.25	3.14	22.61			86.24
1856	267096			44055	76.35	3.38	20.26			83.51
1865	566158	290966	275192	130562	67.19	10.10	5.27	3.58	23.85	64.01
1875	720984	369628	351356	337914	61.89	7.18	3.94	2.34	24.64	53.13
1880	876080									
1885	1252347									
1889	1458823									
1891	1525739	766598	759141							
1904	2409804	1218940	1190864	1573719	64.15	11.30	4.4	2.43	17.71	34.70

Source: CGH Blue Books, several. [5]

Agricultural production consisted primarily of the cultivation of fruit and the production of wine, wheat, stock and sheep farming as well as small-scale maize and sugar production. The wine industry was stimulated by imperial preference under British colonial rule, but was removed in two stages between 1825 and 1831, which resulted in a drastic decline in wine exports (Houghton 1971:46). Wool exports soon replaced wine as the major export

[4] In this article the population information is provided for completeness, to emphasise the small employment portion of the population and the big dependence on agricultural activities. In contrast to most modern day analysis where per capita data is normally used, the empirical analysis is done not including population data due to the erratic nature of the data. See for example the negative growth in the population between 1850 and 1856.

[5] The population statistics are incomplete, because official censuses were only taken in 1865, 1875, 1891 and 1904 in the Cape Colony.

commodity from the Cape Colony (Kirk 1980:22 -29). Agriculture dominated economic activity in the Cape until the discovery of diamonds in 1867 and gold in 1886, after which mining activities served to stimulate commercial and financial enterprise. The business cycles of the Cape economy subsequently reflected the boom and bust of wool farming and financial speculation brought about by the mineral revolution.

By 1850 agriculture dominated economic activity in the Cape Colony and stimulated commercial activities in the coastal towns. The decade of the 1850s opened with yet another frontier war, which persisted until 1853. The economic impact of the war was positive, since it stimulated military expenditure by the colonial authorities in the region. Increased demand for subsistence goods stimulated businesses in Port Elizabeth and Grahamstown (Mabin and Conradie 1992). Around Cape Town agriculture was dominated by the production of wheat and to a lesser extent other winter cereals such as barley, rye and oats, fruit and wine farming, but the town itself was the main center for manufacturing and commerce in the colony.

Manufacturing was elementary, such as brick fields; fish curing for export; flour mills; soap and candle factories; snuff mills and iron and brass foundries. Similar basic manufacturing activities were also conducted in the districts serving the dispersed farming communities' needs for processing of agricultural products or manufacturing of farming implements, wagons, furniture or stone-quarrying. In comparison to neighbouring African territories the Cape Colony could be described as industrially advanced, but in comparison to the situation a century later, industrialisation was rudimentary, small-scale and dispersed. This was because transport was inadequate – the first railway line was constructed between 1860 and 1863 between Cape Town and Wellington and Wynberg (Wickens 1983:204). Commerce was primarily restricted to the port towns – Cape Town and Port Elizabeth – and Grahamstown. In the port towns wholesale enterprises developed a lucrative two-way trade by importing manufacturing commodities from Britain and Europe and exporting wines, wool, hides and skins and ivory and other local products (Houghton 1971:3 – 4). Although most of the capital required for the development of the Eastern Cape had its origin outside the colony, the close correlation between the growth of the bank deposits and the expansion of trade and economic development in the region suggests that the area was generating substantial capital towards its own needs (Webb 1992:17).

By 1850 a variety of financial institutions were offering savings facilities in the Cape Colony and expanded rapidly across the colony by 1910. No formal savings institutions existed under Dutch rule, but the first financial institution, the Lombard Bank, was established by the

Dutch East India Company in 1793 to address the prevailing scarcity of money in the colony. It was purely a loan bank which granted loans to colonists at five percent interest against mortgage bonds or other suitable security (de Kock 1924:21). When the Cape was colonised by the British in 1806, the dysfunctional Lombard Bank was succeeded in 1808 by the state-controlled Bank of Discount. The bank accepted deposits from the public, primarily the agricultural community. Money was deposited on fixed deposit for periods of no less than three months at five percent interest on sums of more than 1,000 riksdalers (Arndt 1928:486). A definite savings propensity was demonstrated: by December 1811 deposits reached 157,000 riksdalers and by 1823 1,400,000 riksdalers. These deposits facilitated the bank's discounting for trade purposes (Arndt 1928:488). The Cape government used savings for short-term credits and encouraged saving among the poorer classes. By offering a secure savings facility at a reasonable interest rate, the government hoped to promote savings for old age and precautionary spending (Arndt 1928:488).

One of the features of the post-slavery economic growth was the establishment of local banks and insurance companies, which resembled the British financial institutions demonstrating the influence of British immigrants to the colony. Financial deepening was beginning to take shape in response to improved economic performance. (demand-led) The first private savings bank, the Cape of Good Hope Savings Bank, was established in Cape Town in 1831. The stated aim of the bank was to mobilise deposits from all segments of the community, including tradesmen, labourers, charitable societies and even slaves. The bank accepted small deposits (as little as a sixpence) at an initial rate of four percent per annum. The growing economic activity in Grahamstown, Somerset East, Stellenbosch and Graaff-Reinet led to the opening of branches in those small towns (Arndt 1928:489-491). In 1838 the Eastern Province Bank was established in Grahamstown and in 1847 the Port Elizabeth Bank, signifying the thriving commercial activity in the Eastern Cape. By 1850 both banks had emerged as banks of deposit, mobilising the savings of more than only successful merchants. Webb observed: "As such, the banks' role in fostering economic expansion was considerably enhanced, while the loan of such funds contributed significantly to the growing profitability of these institutions" (Webb 1992:6-13, 17).

The economic upswing stimulated by the frontier war was followed by a recession, with adverse effects on the colonial economy. The severity of the recession was tempered by the so-called 'wool boom' of the 1850s. Wool exports, primarily to the central market in London (Kirk 1980:228), from the Eastern Cape alone rose from 1 961 175 kilograms of wool at a value of £212 166 in 1850 to 8 817 185 kilograms valued at £1 213 410 in 1860 (Webb 1992:47). Newly established local banks which emerged during this boom period soon

suffered in the following depression – ten banks were established in the Eastern Province between 1857 and 1862 alone and by 1862 a total of 29 local banks did business in the colony (Schumann 1938:366). The 1860s was a period of "… intense depression … the state of trade in Cape Town and the colony generally, has been unprecedently depressed …" (SBA: INSP 2/1/7). A severe drought brought an end to the soaring wool prices (SBA: ARCH 1/4GMO) which led to a recession between 1862 and 1869, but by the end of the 1860s the discovery of diamonds and improved wool prices ushered in an unprecedented upward trend in the business cycle (Schumann 1938:72-73). It was generally observed that the local banks had more capital than they could employ profitably, or "… far beyond the legitimate business requirements of the country" (SAB: ARCH 1/4GMO).

Insurance companies had been active in the Cape since the beginning of the 19th century when British insurance companies began sending agents to the Cape. By 1897 more than 50 foreign insurance companies were represented in the Cape alone. The South African Fire and Life Assurance Company, established in 1831, was the first South African insurance company. Others, such as the Cape of Good Hope Fire Insurance Company (founded 1835), the Equitable Fire and Life Assurance & Trust Company (established 1844) and the Mutual Life Assurance Society of the Cape of Good Hope (now Old Mutual) in 1845, followed suit (Vivian 1995:17-19). Premiums paid by policy holders constituted a special form of savings. By the end of the 19th century life insurance, protection against fire and marine insurance were the principal areas for which provision was made (Vivian 1995:21).

Table 2 below illustrates the level of insurance performance between 1893 and 1907 in the Cape Colony.

Table 2: Performance of Life Insurance companies, 1893–1907 Cape Colony

	1891	**1893**	**1895**	**1897**	**1899**	**1901**	**1903**	**1905**	**1907**
No of policies	18 814	22 534	27 821	31 873	36 123	49 720	66 716	83 010	84 560
Foreign	9 518	12 526	13 184	15157	16 995	18 524	22 268	23 253	24 939
Local	9 296	10 008	14 637	16716	19 140	31 196	44 442	59 737	59 621
Sums assured	£8 734	£10 181	£10 806	£12233	£13 193	£14 766	£18 213	£19 815	£20 936
Foreign	£4 340	£5 590	£5 762	£6 505	£7 217	£8 111	£9 979	£9 938	£10 491
Local	£4 394	£4 591	£5 044	£5 723	£5 976	£6 654	£8 234	£9 876	£10 444

Source: Cape of Good Hope, Colonial Secretary's Ministerial Division: Returns under the Assurance Act, 1891, for the years ended 1891-1907

Other financial service intermediaries emerged. The first trust company or board of executors in South Africa, the South African Association for the Administration and

Settlement of Estates, was formed by 22 Cape Town residents in 1834 and specialised in the administration of estates. The demand for their services led to the establishment of boards of executors in various towns in the Cape Colony. Between 1834 and 1899 about 30 trust companies and boards of executors were formed, such as the Port Elizabeth Assurance and Trust Company (established 1852), the Graaff-Reinet Board of Executors (established 1856) and the Malmesbury Board of Executors and Trust Company (established 1864). These companies accepted funds on fixed deposit at competitive interest rates (Ehlers 2000:4-5, 29).

The building society, established to provide savings for housing, was another English institution brought to the Cape Colony by British immigrants. The earliest building societies, developed on the lines of the British terminating variety, were established in Natal (1858) followed by societies in Port Elizabeth (1862) and Queenstown (1864). These early building societies evolved into permanent societies over time (Edginton 1951:21-23). The early terminating societies typically wound up as soon as all the members had been provided with houses. In the case of permanent building societies, they obtained funds through the accumulation of small savings in savings accounts and on fixed deposits (Edginton 1951:48-50). The savings accounts offered by building societies could not be used as transaction accounts for withdrawals by cheque or draft and earned the lowest interest rate available due to the easy access to withdrawals (Edginton 1951:167).

The commercial banking landscape changed when the imperial banks entered the Cape Colony from 1861. From this time on it is possible to consider the supply-led explanation for financial development. The London and South African Bank opened for business in Cape Town in 1861 and the Standard Bank of British South Africa was established in October 1862 in Port Elizabeth. In the case of both these banks the motive for their establishment originated in the Cape Colony but the capital had to be raised in England. In contrast to the local banks in the colony, the imperial banks' capital bases were considerably larger. The local banks were unit banks, restricted to one town or district and were set up with local capital. A large number of local banks were started with capital of £50 000 or less. There were, however, exceptions such as the Commercial Bank of Port Elizabeth and the South African Bank, which each had capital of £100 000 (Arndt 1928:241-243). These local banks served local needs by providing a limited range of services – fundamentally the same services offered by traditional British commercial banks. The banks facilitated commercial transactions and provided short-term credit to farmers and merchants, issued bank notes and accepted deposits.

The imperial banks had a much stronger capital base. The London and South African Bank and the Standard Bank were started with nominal capital of £400 000 and £1 000 000 respectively (Arndt 1928:255-257). More imperial banks followed later, viz. the Oriental Bank Corporation (1873), the bank formed to take over the OBC's business in South Africa, the Bank of Africa (1879) and the African Banking Corporation (1890). As pointed out, the imperial banks did not introduce new banking functions to the Cape, but operated as an extension of the English banking tradition. These banks' functions were to provide short-term loans, collect deposits to extend loans and facilitate the making and receipt of payments. The innovations they introduced at the Cape were organisational and included larger capital bases, branch banking and limited liability (Jones 1996:3-6).

The imperial banks could weather the depression of the 1860s and absorbed almost all the small local unit banks, assisted by their extensive and growing branch networks. There was considerable opposition to this concentration movement. By the close of the 19th century none of the local banks in the Cape remained in business, except for the Stellenbosch District Bank. The imperial banks accepted deposits only on fixed term on which interest was earned. These deposits found their way to the banks predominantly from the middle class in society (Jones 1996:94). The commercial banks did not offer ordinary savings accounts then. Funds in current accounts represented the working capital of businessmen. Ordinary small savers thus lost the personal relationship they had with their local banks.

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 £35 700, but rose to £1 306 000 between 1871 and 1875 and to £3 242 000 between 1881 and 1885. By 1885 diamond exports comprised 40% 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, 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. 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 £12 000 000 had been invested in the diamond industry, of which £6 500 000 was incorporated in the Cape Colony.

Banks provided credit freely. In the speculative environment banks expanded credit freely and accommodation bills were in general use. Several other savings banks, such as the Kimberley Savings Bank or Good Templars Savings Bank (established 1878), Du Toit's Pan Savings Bank (established 1879) and the Grahamstown Savings Bank (established 1873) opened for business in the colony (Jones 1996:494). The private savings banks established later paid good interest on savings deposits and catered for the smaller saver. The Good Templars Savings Bank, for example, catered for working men and encouraged saving for unforeseen circumstances and property acquisition. Available figures for this savings bank show steady growth. In its first year of business, 1878, the bank received £8 000 on deposit from 550 depositors. Deposits increased to £13 800 in 1879, £25 000 in 1880, £38 000 in 1881 and £50 000 in 1882 (Worger 1987:155-156).

Apart from the private institutions mentioned above, the Cape Colonial Government established another savings institution towards the end of the 19th century in the form of the Cape Government Savings Bank. Established in 1875 for the deposit of small savings at interest guaranteed by government, this institution accepted deposits in savings accounts of amounts not less than one shilling. The total deposit was limited, however, to £200 without interest and as soon as a deposit reached £250, including interest, no further interest was paid. After its first full year in operation, 1876, the bank had 31 branches, 576 depositors and deposits totaling £8 028. In 1883 the bank had grown to 58 branches, with 1 984 depositors, and it held £27 796 in deposits. In 1883 the government savings banks became part of the post office system and continued business on the basis described above. The interest rate, fixed by the government periodically, did not exceed five percent and was paid only on amounts in excess of £1. The Post Office Savings Bank grew steadily during the period under review, as can be seen in the table below. The growing use of this savings bank is also shown in the average balance held by each depositor. During its first year of operation the average balance held by each depositor was £20 (SBA *GMO3/1/29, no.72/93)*. By 1893 this amount had risen to £37.

Table 3: Bank Activities, 1884 -1909.

Year	No. Branches	No. Accounts Open	Amount at Credit & Interest £
1884	112	4775	93226
1893 - 1894	231	38925	1133159
1993 - 1904	345	99421	2447712
1907 - 1909	364	101533	2125382

Source: Arndt 1928:496

Banks often granted advances to diamond companies on the security of claims and investors received advances on shares of the same companies (Arndt 1928:286-287). Total discounts of Cape banks rose from £5 389 000 in 1875 to £10 536 000 in 1881(Schumann 1951:240-256). The cyclical prosperity was also supported by good production and international sales at high prices for wool and ostrich feathers. In 1871 the annexation of the Zuid-Afrikaansche Republiek (ZAR), two subsequent wars with the indigenous people (the most notorious were the 1879 Anglo-Zulu war and the first war of independence against the Transvaal Republic, 1880 -1881), acted as a stimulus for capital inflows from Britain (SBA: GMO 3/1/1/9: No 72/79). These wars disrupted society, caused massive loss of life and property, and also cost the British government £5 500 000. A substantial portion of this was spent in 'South Africa'. The Cape Colony, where the imperial banks had their head offices, benefited most. Speculation in diamonds and land was rife. This over-extension of credit and speculation was bound to lead to a crisis.

Banks cautiously started to contract credit in fear of liquidity problems, and the stock market showed signs of uncertainty. The war with the ZAR ended and independence was restored to the Transvaal Republic, but the first insolvency occurred in Grahamstown. 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 £10 536 000 in 1881 to £3 000 000 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).

The recovery was dramatic: with the discovery of gold on the Witwatersrand, the structure of the South African economy changed fundamentally. Substantial capital inflows followed the

establishment of deep-level gold mines. 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% 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 (Solomon1983:33, 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.

The war had the expected impact on the colonies: war demand was pent-up, leading to massive demand for goods and services after 1902. British expenditure on a military force exceeding 200 000 soldiers (equal in number to approximately 25% of the entire South Africa population) provided a massive stimulus for consumption, trade and production. The post-war boom was short-lived, though, since a recession set in by 1903 and continued through a cyclical downturn that lasted until 1909. Schumann (1938) observed: “The sudden introduction of purchasing power from overseas and the accompanying remarkable

expansion of credit both in the Cape and Natal evidently caused the inflation of internal prices, and this, together with the large import of goods, meant flourishing conditions for the commercial and industrial interest, as well as the farmers of Natal and the Cape" (Schumann 1938:93). This feeling of optimism resulted in the extension of bank credit, extensive speculation in land, massive immigration and an import drive. In 1903, 71 081 immigrants landed at the Cape ports, in 1904 another 42 938 arrived and in 1908 some 27 192 more. These immigrants were flocking to the British colonies and a territory of mineral wealth. The depression that followed was not caused by any particular recognisable external event, but was only a cyclical reaction forced by the massive economic disequilibrium. The depression was the most prolonged depression experienced in South Africa. It has been explained by the complete destruction of the interior, despite the relatively early return to production of the gold mines.

4. Model and economic variables used in the article.

4.1 Data and economic variables used

Principal among existing econometric studies on finance and growth is the seminal paper by King and Levine (1993), which is in the tradition of cross-country empirical studies of economic growth. King and Levine (1993) identified four different financial development indicators: (i) the ratio of liquid liabilities to nominal GDP; (ii) the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets; (iii) the ratio of credit to the non-financial private sector to total domestic credit (excluding credit to money banks); and (iv) the ratio of credit to the non-financial sector to nominal GDP (King and Levine 1993:717-732). In developing countries, a large component of the broad money stock is currency held outside the banking system. In principle, a rising ratio of broad money to income may reflect the more extensive use of currency, rather than an increase in the volume of bank deposits. Therefore, in order to obtain a more representative measure of financial development, currency in circulation should be excluded from the broad money stock, because it is not intermediated through the banking system. Following this principle all currency in circulation was excluded and only Paper currency in the banks (PaperC) is used as a financial indicator.

National Savings (SAVR) has three components: household savings, corporate savings and government savings. No information on corporate savings is available, but since the data from banks captures all savings it was not necessary to distinguish between the different contributors. Savings were calculated as fixed deposits at banks, excess deposits in the different savings banks and the government surplus or deficit before borrowing.

In terms of data used, most of these studies used, as the indicator of economic growth, either real GDP or real GDP per capita, and in this paper the GDP (LGDP) is used, with the inclusion of the inflation rate as an additional variable. The population is excluded from the analysis due to the low numbers and also significant variation due to underreporting or inaccurate data collection.

Other studies added certain macroeconomic indicators, such as interest rates, a price index that measures the inflation rate and indicators of other sectors of the economy. In line with Luintel and Khan (1999:381-387), the interest rate will be used to measure financial repression. A positive real interest rate increases financial depth through the increased volume of financial savings mobilisation, and promotes growth through increasing the volume and productivity of capital. In this article, the deposit rate in the United Kingdom (UKirate) was considered to be the nominal interest rate, since the banks in the Cape Colony were British-controlled. The consumer price index (CPI), trade openness through exports minus imports (Open) and the value of animal stock (Astock) (an alternative for financial savings) were added as variables. When the real interest rate is low, inflation is higher and the return on savings will be lower, but the investment in animal stock may be higher. This may lead to a decrease in financial savings and the impact on economic growth must be determined.

The data compiled and reconstructed for the Cape Colony as used in this article, is in Annexure 1 at the end of the article.

5. Model specification.

This paper uses the vector autoregressive regression (VAR) model to explore the association and casual relationship between financial development and economic growth. The advantages of using the multivariate vector autoregressive framework in economy are that it can deal with simultaneity problem between financial development and other domestic variables and thus avoid the difficult task of determining which variables are truly exogenous, and it permits the identification not only of the short-term effect but also the long-term cumulative effect of financial development on domestic variables by allowing interaction among these variables.This method has been proven in the literature to be the best when studying this type of relationship (see for example Granger,1969), especially the ones involving tests of causality between variables.

In a VAR model, all variables are considered a priori as endogenous to allow causality in both directions (**Sims, 1980)**. A VAR of order p i.e. VAR(p) can be written as:

$$Y_t = \Phi_1 Y_{t-1} + ... + \Phi_p Y_{t-p} + e_t \quad (1)$$

where: Y_t is a vector of endogenous economic variables, and

Y_{t-1}, Y_{t-2}, . . . , Y_{t-p} are the lags of Y_t .

The model in equation (1) is known as the reduced form of VAR. A VAR(2) model (bivariate VAR) can be specified as:

$$\begin{aligned} y_t &= b_{10} - b_{12} x_t + \gamma_{11} y_{t-1} + \gamma_{12} x_{t-1} + \varepsilon_{yt} \\ x_t &= b_{20} - b_{21} y_t + \gamma_{21} y_{t-1} + \gamma_{22} x_{t-1} + \varepsilon_{xt} \end{aligned} \quad (2)$$

where: y_t and x_t are both considered as endogenous and exogenous variables simultaneously, and

y_{t-1} and x_{t-1} are their respective lags.

A VAR is a system of many dynamic equations; therefore it is important to inquire into and test the exogeneity of some variables with respect to others and to uncover what the feedback mechanisms are; this is what is termed as the Granger causality test (**Granger, 1969**). In this case we can test whether x_t "Granger-cause y_t." The test involves testing whether the coefficients of x_t and x_{t-1} in equation (2) are statistically equal to zero. If these coefficients are different from zero then x_t "Granger-cause y_t". This is what we refer to as unidirectional causality. Bi-directional causality occurs when x_t "Granger-cause y_t" and y_t "Granger-cause x_t."

All variables used in a VAR model are supposed to be stationary – i.e. integrated of order zero noted as I(0). However, when two or more variables in a system are cointegrated of order one i.e. I(1), a good approach is to use the standard Johansen test and model the system using a vector error correction model (VECM).

The methodology used in this paper starts by identifying the order of cointegration of variables involved in the system. If the variables are I(1) and there is no cointegration using the Johansen test, then a standard VAR model on differenced variables is used. If the variables are I(1) and there is at least one cointegrating vector, then we construct a VECM

and analyse the structural relationship between the variables of interest. However, if the variables are stationary at level, we will then have to directly specify a VAR in levels and perform structural analysis. The variables used in this paper are: SAVR (the indicator of financial sector development), GDP (nominal GDP), OPEN (trade balance), PAPERC (Paper currency as an indicator of the M_2 money supply), UKIRATE (interest rate in the UK), and ASTOCK (Nominal value of Animal stock).

5.1 The stationary test

Since time-series data used in the first stage of this research involves testing for the order of integration, by testing for stationarity. This requires the testing of the order of integration of the data set defined as the logarithm of the levels of the variables, the so called unit root tests. A stationary series is said to be integrated of order (d) if it achieves stationarity after being differenced (d) times. Many studies have shown that models with non-stationary variables tend to produce non-stationary results. This paper will employ the Augmented Dickey-Fuller (ADF) statistic to test stationarity. These tests will be conducted in three steps: firstly, it will test the model with only an intercept, secondly, with an intercept and linear trend, and thirdly a restricted model with neither an intercept nor a linear time trend, in order to determine the degree of integration of the data series. Table 4 presents the results of the Augmented Dickey-Fuller test of the various variables for the period 1856–1909. The results of the tests for all the variables and for the three different alternative models are presented in Table 4, first for the logarithmic level (the savings rate, UK interest rate and CPI rate are not logarithmed since they are expressed in percentages), and then in first differences.

Table 4: Augmented Dickey-Fuller unit root test results

Unit-root tests at logarithmic levels			
Variables	Intercept	Intercept and trend	None: Restricted model
Savings rate	-7.5476*	-7.6683*	-7.4542*
GDP	-0.8750	-3.4589*	2.9279*
Open	-1.5660	-1.9922	-1.3869
CPI rate	-6.4637*	-6.4093*	-6.5182*
Paper currency	-2.2992	-4.2507*	0.5903
UK interest rate	-5.0557*	-5.3854*	-1.4365
Animal stock	-1.4490	-2.8291	1.1375
Unit-root tests at first differences			
Variables	Intercept	Intercept and Trend	None: Restricted model
Savings rate	-12.5170*	-12.3912*	-12.6409*
GDP	-6.5341*	-6.4577*	-5.9218*

Open	-4.8704*	-5.0128*	-4.8282*
CPI rate	-7.2240*	-7.2021*	-7.3021*
Paper currency	-6.3323*	-6.2695*	-6.3355*
UK interest rate	-8.2065*	-8.2065*	-8.2859*
Animal stock	-5.2704*	-5.2704*	-5.1704*

Note: * Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationary. Critical values are -3.560019, -2.917650 and -2.596689 for the first, second and third models, respectively.

First differencing the series removes the non-stationary components in all cases and the null hypothesis of non-stationarity is clearly rejected at the 5% significance level, suggesting that all the variable are integrated of order I(1). There is an exception for CPI rate, savings rate and UK interest rate, where the tests indicate that they are I(0), but the robustness of the models allows for the treatment of variables as I(1) and for the cointegration analysis to be conducted.

5.2 Lag length selection

The selection of the optimal lag length is extremely important and careful attention to non-normality, autocorrelation, heteroskedasticity and stability of the root is needed. The paper used several criteria in order to determine the maximum lag length.

The sequential modified LR test statistic, Akaike Information criterion (AIC), and the Schwarz Bayesian information criterion (SC) were used in order to determine which appropriate maximum lag length to use for each variable.

Table 5: VAR Lag Order Selection Criteria

Lag	LR	AIC	SC
0	NA	48.1751	48.4534
1	603.6562	34.4199	36.6461
2	116.8941	32.7795	36.9536
3	131.7758	29.4193	35.5413
4	75.51244	27.1078	35.1777
5	**74.01620***	**21.8367***	**31.8544***

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
AIC: Akaike information criterion
SC: Schwarz information criterion

The model is initially estimated with a large number of lags, which are then reduced until the optimal lag length is found. The lag length suggested by AIC and SC is 5, but inspection of autocorrelation and normality of residuals in Table 6 indicated a lag length of 1 also to be optimal. The optimal lag lengths were chosen according to the LM(1) Lagrange Multiplier

version of first-order serial correlation test. Theoretically, a lag of one year makes more sense, since annual data is used.

Table 6: VAR Residual Serial Correlation LM Tests

Lags	LM-Stat	Probability
1	**113.3623***	**0.0000**
2	70.99169	0.0216
3	52.83606	0.3282
4	60.21505	0.1308
5	**99.22398***	**0.0000**

* indicates lag order selected by the criterion

5.3 The bivariate cointegration test

After establishing that all the variables are stationary, the second stage of the research involves investigating bivariate cointegration utilising the Johansen maximum likelihood approach. Cointegration is a test to determine whether there is any long-term relationship among the variables – i.e. among the savings indicator and the explanatory variables (GDP, inflation, interest rate, openness, animal stock and money supply). In the identification of the model several technical tests need to be performed in order to obtain a correctly specified model.

The Johansen maximum likelihood cointegration technique is used to test for the existence of cointegration as well as the number of cointegrating vectors. It allows the simultaneous estimation of a system involving two or more variables, and tests for the presence of more than one cointegrating vector in a multivariate system. Also important in the formulation of the dynamic model is to determine whether an intercept and/or a trend should enter either the short run or the long run or, or both models. The Johansen test of both rank order and the deterministic components is performed and the Pantula principle applied. The trace statistics and maximum eigenvalue test for all three models are presented in table 7. The trace test tests the null hypothesis of r cointegration vectors against the alternative hypothesis of n cointegration vectors. The trace statistic considers whether the trace is increased beyond the r^{th}. The null hypothesis is that the number of cointegrating vectors is less than or equal to r. The maximum eigenvalue test, on the other hand, tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of r + 1 cointegrating vectors.

Table 7: Johansen maximum likelihood cointegration test

Trace Test					Maximum eigenvalue				
Null	**Alt Hyp**	**Model 2 No Intercept, No Trend**	**Model 3 Intercept, No trend**	**Model 4 Intercept, Trend**	**Null**	**Alt Hyp**	**Model 2 No Intercept, No Trend**	**Model 3 Intercept, No trend**	**Model 4 Intercept, Trend**
H_0: r = 0	Ha :r = 1	221.7672 (0.0000)	187.3836 (0.0000)	411.6039 (0.0000)	H_0: r = 0	Ha :r > 0	86.1216 (0.0000)	83.5050 (0.0000)	257.7530 (0.0001)
H_0: r = 1	Ha :r = 2	135.6456 (0.0001)	103.8786 (0.0123)	153.8509 (0.0000)	H_0: r ≤1	Ha :r > 1	50.6573 (0.0031)	43.4121 (0.0203)	56.8986 (0.0014)
H_0: r = 2	Ha :r = 3	84.9883 (0.0107)	**60.4666* (0.2213)**	96.9523 (0.0114)	**H_0: r ≤ 2**	Ha :r > 2	**32.6385* (0.0887)**	**26.6462* (0.2828)**	38.9414 (0.0425)
H_0: r = 3	Ha :r = 4	52.3499 (0.0708)	33.8203 (0.5117)	58.0109 (0.1411)	H_0: r ≤ 3	Ha :r > 3	24.6189 (0.1482)	16.8435 (0.5934)	26.4620 (0.2097)
H_0: r = 4	Ha :r = 5	27.7310 (0.2535)	16.9768 (0.6418)	31.5489 (0.4131)	H_0: r ≤ 4	Ha :r > 4	16.7351 (0.2492)	8.7623 (0.8511)	16.7798 (0.4764)
H_0: r = 5	Ha :r = 6	10.9959 (0.5425)	8.2146 (0.4427)	14.7691 (0.5938)	H_0: r ≤ 5	Ha :r > 5	7.8621 (0.5643)	6.5745 (0.5406)	8.2388 (0.7996)
H_0: r = 6	Ha :r = 7	3.1338 (0.5560)	1.6401 (0.2003)	6.5303 (0.3961)	H_0: r ≤ 6	Ha :r > 6	3.1338 (0.5560)	1.6401 (0.2003)	6.5303 (0.3961)

Note: r is the number of cointegrating vectors
(Probabilities in parentheses)
*Indicates the first time that the null cannot be rejected

Both the trace test and the maximum eigenvalue test statistics reject the null hypothesis of non-cointegration (i.e. r = 0) at the 5 % level of significance. The trace test and probabilities indicates two cointegrating equations at the 5% level and the maximum eigenvalues confirm the trace test results. According to the trace test results, Model 3 is found as the best model for the analysis. The best model is thus one with an intercept, but no trend and two cointegrating equations. The maximum eigenvalues test confirmed Model 3 as an acceptable model, but Model 2 with no intercept and no trend and with two cointegrating equations is also recommended.

5.4 VAR on Cointegrated Variables

After identifying two cointegrating relationships among the variables in the system, we use a vector error correction model (VECM) that characterises the equilibrium relationship between our variables of interest, namely financial development and economic growth. The VECM model has two parts: the cointegrating relations part (cointegrating equations), which describes the long-run dynamics between the two cointegrating relations; and the VAR part, which describes the short-run dynamics between these variables. The coefficients of the cointegrating equations represent the speed of adjustment in response to a deviation from long-term equilibrium. The speed of adjustment can be useful for policy analysis. The output of the first part of a VEC model is reported in Table 8 below.

Table 8: Long-term relations from the VECM

Cointegrating Equation:	CointEquation1	CointEquation2
SAVR(-1)	1.0000	0.0000
LGDP(-1)	0.0000	1.0000
CPI(-1)	0.3682 [3.8239]	0.0117 [0.4413]
LOPEN(-1)	1.28E-07 [1.47656]	-2.14E-08 [-0.8974]
PAPERC(-1)	11.3745 [1.8097]	4.9284 [2.8562]
UKIRATE(-1)	3.4408 [4.2380]	1.6075 [7.2122]
LASTOCK(-1)	-6.8092 [-3.0941]	-3.4218 [-5.6638]

[ ] denotes the t-statistics

The results reported in Table 8 show that there was a stable long-term relationship between savings and the GDP in the Cape Colony during the last half of the nineteenth century. The results show that in the long run, inflation, the UK interest rate, and the animal stock are the main drivers of financial development (saving) in the Cape Colony, while paper currency, the UK interest rate and animal stock are the main drivers of economic growth in the Cape Colony in the long run. The two more important variables that drove both the saving and economic growth in the Cape Colony were found to be the UK interest rate and the animal stock. This observation has a very significant implication: savings in kind other than in monetary assets constituted a substantial form of savings in the colonial context at the end of the nineteenth century.

The results indicate that the trade balance and paper currency should be treated as weakly exogenous variables in the cointegrating model. Animal stock is a strong explanatory variable for both savings and economic growth, and clearly indicates the importance of animal stock in the developing settler colony during the last half of the nineteenth century... The presence of the two cointegrating equations between savings and GDP should be noted, although the direction of causality cannot be determined from these results.

Table 9 reports the output of the second part of the VECM -- i.e. the coefficients of the two cointegrating equations as well as the coefficients of the short-run dynamics.

Table 9: Short-run dynamics

Error Correction:	D(SAVR)	D(LGDP)
CointEq1	-0.5129 [-2.5559]	0.0050 [0.5268]
CointEq2	2.2379 [2.5063]	-0.0309 [-0.7291]
D(SAVR(-1))	-0.4387 [-3.1814]	0.0017 [0.2642]
D(LGDP(-1))	2.4975 [0.8108]	0.1988 [1.3614]
D(CPI(-1))	-0.0649 [-1.2614]	0.0032 [1.3014]
D(LOPEN(-1))	-9.01E-07 [-0.5272]	-2.46E-08 [-0.3030]
D(PAPERC(-1))	0.8098 [0.1788]	0.3168 [1.4751]
D(UKIRATE(-1))	-0.3176 [-0.4759]	-0.0184 [-0.5808]
D(LASTOCK(-1))	-5.3677 [-1.3539]	-0.0083 [-0.0441]

The coefficient of the first cointegrating equation (identified as savings) has the expected sign (negative) and is statistically significant. This is an indication that there is a correction mechanism to any external shock that may affect savings. The magnitude of the coefficient of the first cointegrating equation suggests that the speed of adjustment is rather sluggish. Savings were not rapidly recovering from weakened economic performance. This slow speed indicates that there are some impediments to financial sector development. To our surprise, we found that the coefficient of the second cointegrating equation is statistically insignificant, indicating that there is no adjustment back to the long-run equilibrium position after a shock to the GDP occurred. This means that the late nineteenth century Cape economy was extremely volatile over the short run. Although we have found that financial development depended largely on animal stock and the UK interest rate, the most important question is whether this financial development led the economic growth or was it the reverse trend? The answer to this question is found in the next section

5.5 The causality test

Granger (1969) developed a relatively simple test that defined causality as follows: a variable y_t is said to Granger cause x_t if x_t can be predicted with greater accuracy by using past values of the y_t variable than not using such past values, all other terms remaining unchanged.

$$Yt = \alpha + \delta t + \phi 1Yt - 1 + \cdots + \phi pYt - p + \beta 1Xt - 1 + \cdots . + \beta Xt - q + et$$

Here *X* Granger causes *Y* if any or all of $\beta_1,\ldots.\beta_q$ are statistically significant. Using the 5% level of significance, then if any of the P-values for the β coefficients were less than 0.05, a conclusion can be made that Granger causality is present. If none of the P-values is less than 0.05 then the conclusion would be that Granger causality is not present.

The null hypothesis tested is formally one of Granger non-causality. That is, *X* does not Granger causes *Y* if past values of *X* have no explanatory power for the current value of *Y*.

H_0: $\beta_1 = \ldots. \beta_2 = \beta_q = 0$

The Granger causality test examines whether or not past changes in one variable help to explain current changes in another variable, over and above the explanation provided by past changes in it. Engle and Granger (1987) show that if two series are individually I(1) and cointegrated, a causal relationship exists in at least one direction, but it does not indicate the direction of causality between variables. The direction of causality can be detected only through the error correction model derived from the long-run cointegrating vectors.

The long-run causal relationship between financial development (savings) and economic growth will be determined through the error correction term. In this article the Granger causality tests are tested by the joint significance of the error correction term and the lagged variables in each VECM variable through a joint Wald or F-test, sometimes mentioned as a measure of strong Granger causality.

Table 10: VEC Granger Causality/Block Exogeneity Wald Tests

	Dependent Variable						
	D(SAVR)	**D(LGDP)**	**D(CPI)**	**D(LOPEN)**	**D(PAPERC)**	**D(UKIRATE)**	**D(LASTOCK)**
D(SAVR)		0.7916	**0.0162***	***0.0547****	0.7710	**0.0376***	**0.0468***
D(LGDP)	0.4175		0.2919	0.5905	0.9620	0.5165	***0.0573****
D(CPI)	0.2072	0.1931		**0.0166***	0.2809	0.2041	***0.0615****
D(LOPEN)	0.5981	0.7619	0.9041		0.7158	0.9454	0.9244
D(PAPERC)	0.8581	0.1402	0.2024	0.1186		**0.0245***	0.9903
D(UKIRATE)	0.6342	0.5614	0.2103	0.7194	0.2842		0.1459
D(LASTOCK)	0.1758	0.9648	**0.0323***	0.1016	0.3943	0.2624	
ALL	0.3157	0.2333	**0.0002***	***0.0979****	0.8788	**0.0039***	0.1608

***Denotes the rejection of the null hypothesis of no causality at 95%**
****Denotes the rejection of the null hypothesis of no causality at 90%**

Granger causality tests can be inferred either from the (joint) significance of lagged independent variables or from the lagged ECM term. Analysing the overall (joint significance) result row (ALL), no feedback or bidirectional causality exists for savings. Savings has no influence on any of the independent variables in the Cape Colony during the last half of the nineteenth century.. For the variable processes, however, the overall assessment is of unidirectional causality from the variables to savings, or that inflation, the trade balance, the UK interest rate and animal stock caused changes in savings.

Similarly analysing GDP, the overall result row (ALL) indicates no feedback or bi-directional causality, but unidirectional causality is found from animal stock. This confirms a rather underdeveloped, immature economy and the large impact of animals as a store of wealth. Animal stock caused changes in GDP. This is significant in the predominantly rural nineteenth century Cape Colony. Bi-directional causality exists for inflation, the trade balance and the UK interest rate analysed by the joint significance of the lagged independent variables.

.6. CONCLUSION

The economic literature provided ample evidence that the improvement in financial systems contributes to an increase in efficient resource allocation and hence growth. This paper has used a multivariate vector autoregressive (VAR) framework in order to identify the relationship and the causality between financial development (savings) and economic growth in th e Cape Colony for the period 1850 till 1909. The VAR model found cointegration in the economy between Cape Colony savings and GDP, and through the VECM model a stable long-term relationship between savings and economic growth during the last half of the nineteenth century. The short-term feedback effect results indicated that in the case of GDP there is no automatic adjustment back to equilibrium after a shock, and that savings are mostly affected by Savings (t-1) and at a very sluggish speed of adjustment. This trend was clearly illustrated in the slow recovery of the Cape Colony after the dramatic international collapse in wool prices in the early 1860s, and later weakening in the terms of trade between the colony and the metropolis. The settler economy experienced limited financial development by that time and recovery depended on exogenous stimuli.

Using the Granger augmented causality test, no causality were found between savings and GDP (neither uni-directional nor bi-directional) and the impact of animal stock on both savings and GDP was found to be uni-directional. The banking sector was unable to collect savings efficiently as a result of the single unit bank structure of banks and other financial services institutions, such as building societies or agents for insurance companies. The

financial services sector was unable to allocate these to the economy, possibly because of the lack of confidence in the banking sector, although efforts were made to attract savings from the economy, as indicated in the historical description on the emergence of a variety of financial services institutions. It was found that the economic shocks that hit the Colony in the mid-1880s affected the financial sector significantly, as the banks were capitalised overseas and responded to the needs of foreign shareholders as a matter of priority. A seriously weakened economic position of the predominantly agricultural population resulted in protracted recovery in monetary savings as well as an inability to grow the most important form of savings, namely animal stock. The adjustment period after the financial crises took a very long time, as confirmed by the short-term speed of adjustment coefficient. Furthermore, the real interest rate was almost negative throughout the period under review, which explains the sluggish domestic savings recovery. Even when the real interest rate returned to positive the expected economic growth through increased production volumes and improved productivity of capital, overall savings did not recover significantly. Finally, no causality between financial development (savings) and economic growth, as displayed in the economy of the Cape Colony during the last half of the nineteenth century, suggests a very immature economy, an under-developed financial system and no or very little confidence in the banking system. The Cape Colony by 1909 has not yet reached the level of sophistication where financial development could affect economic growth. The results also underline the dependence of the Cape Colony on the agricultural sector of the economy and the dependence on animal stock as a store of value. GDP growth was fairly consistent and overall for the last half of the nineteenth century, relative to other settler economies, quite strong, but yet insufficiently diversified to generate broad-based savings across different sectors of the economy. The period since the mineral discoveries (13 years, including the disruption of the economically devastating South African war) was too short to have a notable impact on savings behaviour and the causal relationship between economic growth and savings. Further studies in the twentieth century will explore the future trend and attempt to establish under which conditions a specific direction of causality can be identified in South Africa.

Appendix 1.

Cape Colony Data							
Year	Total Savings	GDP (nominal)	Trade balance	Animal stock	UK interest rate	CPI rate	Paper currency in circulation
1856	15 211	1 560 098	-261 218	8 620 750	5.9	-5.37	265 850
1857	30 849	2 282 675	-648 786	9 790 370	7.3	13.69	424 943
1858	-65 058	2 146 506	-697 162	10 805 230	4.0	5.20	385 821
1859	-157 716	2 523 258	-557 988	13 161 580	3.4	5.45	346 698
1860	-204 319	2 641 870	-585 504	13 500 140	4.7	3.80	353 467
1861	-169 671	2 687 933	-632 605	13 608 860	5.4	-3.26	376 760
1862	-151 510	2 354 317	-828 167	14 228 120	2.6	3.56	357 955
1863	-191 614	2 656 684	-51 387	12 080 030	5.0	21.96	289 713
1864	-96 224	3 106 743	123 255	11 427 820	7.4	-13.05	312 529
1865	2 045 326	3 054 451	111 663	15 778 260	4.8	-32.38	304 511
1866	2 084 010	3 214 671	650 067	15 962 400	6.6	16.39	273 544
1867	1 931 670	3 243 540	109 476	13 981 400	2.5	-1.81	257 954
1868	1 925 453	2 902 220	350 544	13 304 730	2.8	-24.57	222 349
1869	1 790 522	2 835 055	272 688	11 103 170	3.5	-19.60	223 521
1870	1 771 512	3 250 658	217 456	11 414 540	4.2	-5.88	298 889
1871	2 477 819	4 256 099	946 311	14 994 610	3.2	3.41	958 763
1872	3 675 089	6 813 895	1 680 801	18 401 870	4.6	18.91	1 080 072
1873	3 679 024	7 398 916	401 012	22 213 790	5.3	3.57	1 034 089
1874	4 697 398	6 762 260	-19 468	25 137 350	3.8	16.35	886 697
1875	4 895 572	8 003 416	23 859	31 791 130	3.3	0.83	695 105
1876	4 133 575	8 614 759	-543 774	25 969 310	3.5	2.04	480 106
1877	4 519 650	8 894 406	198 540	24 499 040	3.4	-16.21	518 918
1878	5 802 172	8 969 954	-535 967	25 929 000	3.7	7.87	685 206
1879	6 420 297	9 702 185	-698 314	26 456 380	2.9	3.12	721 469
1880	7 582 081	12 728 236	47 333	27 875 180	2.8	-10.60	848 501
1881	9 670 941	13 595 479	-830 263	28 297 170	3.5	4.22	1 257 486
1882	7 971 065	13 936 823	-865 419	27 408 580	4.5	5.61	942 208
1883	7 205 739	11 407 624	680 907	25 189 780	3.5	0.26	787 130
1884	6 702 769	10 501 194	1 696 674	22 102 550	3.3	-2.72	708 797
1885	5 233 107	9 163 773	1 038 540	23 454 280	3.1	-8.24	529 628
1886	4 897 863	10 286 715	3 326 095	18 175 100	3.3	-3.69	506 532
1887	6 163 229	10 784 423	2 822 839	16 272 220	3.1	-13.44	462 982
1888	8 012 582	12 061 395	3 198 320	17 292 000	3.2	-11.86	662 107
1889	8 903 787	13 668 953	823 017	22 615 700	3.9	-2.80	1 034 849
1890	6 055 496	15 281 076	471 350	23 350 060	4.5	15.73	740 210
1891	6 016 407	16 301 139	2 543 465	25 776 180	3.6	-0.03	489 609
1892	5 855 073	16 633 895	2 490 826	26 034 750	2.6	-0.81	589 853
1893	5 695 452	17 893 770	1 591 718	23 556 010	3.4	-3.11	1 091 517

1894	6 382 891	18 533 490	2 397 893	20 756 450	2.3	3.10	1 129 685
1895	9 105 137	22 667 354	3 185 732	21 582 450	2.0	-3.96	612 266
1896	8 910 659	23 970 202	-983 201	22 974 020	3.2	0.02	762 409
1897	7 226 517	26 213 721	1 504 426	28 709 210	2.8	1.89	834 500
1898	6 725 019	31 054 167	7 802 059	32 833 790	3.3	4.52	845 028
1899	10 537 372	29 460 250	7 876 287	38 415 760	4.3	-8.98	1 120 460
1900	14 106 734	15 813 851	-9 515 129	40 570 780	4.0	3.53	1 361 637
1901	15 947 371	20 192 713	-10 696 381	42 270 650	4.0	-2.56	1 466 816
1902	17 520 160	27 104 104	-15 728 326	50 719 060	3.5	11.94	1 583 316
1903	10 350 213	33 785 911	-11 259 549	51 989 560	3.5	1.29	1 155 238
1904	10 814 428	36 101 407	5 646 318	57 790 100	3.3	-21.79	1 064 091
1905	11 379 032	41 996 645	14 008 246	54 717 770	3.2	-6.63	1 065 249
1906	10 888 092	51 688 034	21 945 821	53 483 630	4.3	-1.00	1 111 180
1907	10 296 711	52 709 766	28 917 658	47 775 450	5.2	5.75	920 021
1908	9 751 329	48 548 752	28 271 704	47 044 610	4.0	0.10	934 729
1909	9 416 270	52 082 903	31 962 242	47 282 230	3.7	8.99	1 084 629

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