

# Does secure property rights cause debt? Evidence from colonial South Africa

## Abstract

Property rights are essential for any economic transaction, also debt transactions. Recently, studies have focussed on finding empirical evidence for the persistence of these property right systems as well as the differences between *de jure* and *de facto* property rights. We propose to study debt transactions and property rights for the early colonial South Africa. Historiography suggest the *de jure* property rights between freehold and loan farms were different, while *de facto* property rights between the types of farms were similar. We exploit the random variation of birth order, specifically being the oldest son, to estimate whether the type of farm, and therefore type of property right, mattered for debt transactions. Our results suggest, and support the historical literature, that the loan farms became as secure in their *de facto* property rights, despite differences in *de jure* property rights. Settlers used these *de facto* property rights to determine collateral for debt transactions, rather than *de jure* property rights.

## Introduction

In order for any transaction, including debt transactions, to occur, an economic system, according to Douglas North (1989), “well-specified and well-enforced property rights”. Ronald Coase (1960), too, concluded that without the delimitation of initial rights no market transactions can take place. Such property right systems evolve, suggested Harold Demsetz (1967), from the “laws, customs and norms of a society”. These authors formed the beginning of a study into property rights as an economic institution and how important they are for economic development.

More recent studies have attempted to find empirical proof to explain the emergence and persistence of property rights systems, and their impact on economic development. Acemoglu, Johnson and Robinson (2001), use settler mortality as an instrument for the initial property rights systems installed by colonial powers and show that this initial system mattered for long-term development. Although not without criticism<sup>1</sup>, this research has spurred research into how property rights systems developed and mattered in different regions.

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<sup>1</sup> Albouy (2012) is one example.

Sokoloff and Engermann (2000) compare different New World economies and found that regions where land was acquired with relative ease, are more affluent today. A key to the Sokoloff and Engermann hypothesis is land abundance and the unequal distribution of factor endowments. Fenske (2012) studied land abundance in nineteenth century Nigeria and he found that the land abundance caused weak property rights in land. This weak property right system caused slaves to be used as collateral for market transactions rather than land.

Land abundance is however not the only influence on long-term persistence of land property rights. In India, different land tenure systems were observed under British rule with different long-term outcomes. Banerjee and Iyer (2005) that established that the historical districts where large landlords (equated with relatively weak property rights) were in control, less investment and productivity is observed post-independence. Dell (2010) showed that large landowners in Peru had well-defined and secure property rights. However, the large landowners, different from India, had the ability to protect their work force from forced labour and in the long run, more public service provision is observed in these regions. These case studies show how social environment (of laws and norms) in which the property right system develops will have different outcomes in the long run.

The evolution of laws governing land ownership in the United States has been the focus of some economic historians. De Soto (2000, Chapter 5) studied how property right laws changed over time in the US and concluded that the property law in the US was successful once it took the social norms of settlers on the frontier into account. Focused on the effect of one particular law, the Homestead Act of 1834, Lamoreaux (2012) showed the allocation of land by the government will be fruitful as long as individuals still believe their underlying rights to the property are secure.

The legal right to use land (or have ownership over it), is however not the only aspect which mattered for property rights and economic development. Hornbeck (2010) demonstrated that it is equally important to have the ability to protect land, than simply the legal right to own it. This ability to protect one's land is especially important for frontier settlements due to the continual expansion and movement of boundaries, with new land available for use and ownership.

The interaction between legal ownership of land and the ability to protect said land is also the focus of Alston, Harris and Mueller (2012) and Dye and La Croix (2014). Alston *et al.* develop a model to investigate how *de jure*, *de facto* and enforcement of property rights

interact during the early settlement periods. Applying their model to Australia, the United States and Brazil, they show how frontiers settled between *de facto* to *de jure* property rights with interaction between individuals (or groups) and the government. Potential conflict arises when those who specify the claims to land is different from those who enforce rights on the land.

Dye and La Croix (2014) apply this model to the colonial South Africa case and develop the model further. They concluded that, instead of following the path from *de jure* to *de facto* rights, a new system developed – the loan farm. They suggest the loan farm system was a response to the ebbing threat of the Khoesan (the indigenous population present at the Cape) and relative value of land outside of the Cape Town and Stellenbosch region.

This paper expands on Dye and La Croix's discussion of property right development at the Cape. We use a novel dataset with information on individuals with different types of land ownership at the Cape – loan farms and freehold farms. This dataset also contains detailed information on individuals' debt levels, our economic variable of interest. In a detailed study on the relationship between property rights and debt, Feder and Feeny (1991) suggest land is only valuable as collateral where uncertainty and asymmetric information is absent with regard to the rights on land. In the Alston, Mueller and Harris model, this would make land valuable for credit transaction where the *de facto* and *de jure* specification and enforcement of property rights are the same. We continue to discuss the two different land policies at the Cape and how they differ in *de jure* and *de facto* property rights. Descriptive evidence suggest the freehold farms, with more *de jure* and *de facto* property rights, had more debt.

The main concern with this descriptive evidence – mainly OLS – is endogeneity. Our second contribution is to use an instrumental variable to establish if the differences in the *de jure* and *de facto* property rights of freehold and loan farms had an impact on credit transactions. We use being the oldest son as an external and random event to possessing a freehold farm. In the patriarchal society of the Cape, oldest sons were favoured to inherit freehold farms despite the Roman Dutch law for equal inheritance between children. Our results support the existing historical literature which suggest that, despite large *de jure* difference between the two systems, the property right ensconced in the loan farms system were viewed similarly to those of the freehold system.

These results contribute to the wider literature on property rights and its impact on economic development. Rather than focussing on macroeconomic variables like GDP growth or public

investments, we focus on the microeconomic variable of individual debt and individual property rights' impact on it. The lack of support for a strong correlation between *de jure* rights for collateral is support for development economic studies like ... who found little support for the theoretical idea of property right and credit markets. Future research might focus on a different aspect of credit markets – social networks. Modern development studies () have moved to looking at social, rather than physical capital, as an enforcement mechanism in credit transactions. It is possible that this was the case in the Cape colony as well.

## **The Land Policies at the Cape**

When the Cape was first settled by Europeans in 1652, the plan was not for it to become a full settlement colony. The *Vereenigde Oostindische Compagnie* (VOC) wanted the Cape to serve as a refreshment station to passing ships between Europe and Asia. Because of the high demand for fresh produce and an inability to increase supply sufficiently, the company released nine company employees to become freehold farmers around the Liesbeeck River in Cape Town, only five years after arrival.

The vision of Company commander, Jan van Riebeeck was small scale farming, modelled from Europe. The plan soon failed. The crops brought with the settlers from Europe were unsuited for the soil and weather patterns of the Cape. More territory was needed. Under Governor Simon van der Stel, European settlement expanded toward the fertile mountainous region of Stellenbosch and the surrounding regions. Here, farmers could claim any cultivated land within three years, without a limit place on the size of these farms. These initial farms were mostly given to settlers in freehold – the only requirement for settlers to relinquish one tenth of the annual grain produced to the Company in Cape Town (Duly, 1968:14). Many of these freehold farmers became known as the “landed gentry”. They owned large swathes of land and many slaves. The nature and size of these freehold farms made them more tradable and the prices of freehold farms increased throughout the period (Guelke, 1989:79).

Although it is unlikely that each farm would have similar soil quality, most had access to a river (Guelke and Shell, 1983). Due to the unavailability of suitable soil in the region, the freehold farm system was terminated to new claims in 1717. Settlers did continue to trade and inherit these freehold farms well after 1717 (Newton-King, 1999:18). The map below show the extent of these freehold farms up to 1750.

[INSERT FIGURE 1 HERE]

The second and, and after 1717, most used form of property at the Cape was loan farms. These loan farms were obtained with relative ease compared to a freehold farms. Loan farms were loaned from the Company from three, six or twelve months at a fixed rate. Duly (1968:15) described the loan farms as inaccurately measured (if measured at all), the size determined by riding half-an-hour on horseback in each direction. He notes: “the system was a form of legalized squatting”. The only parts of loan farms which could legally be sold were the fixed improvements; settlers thus had no *de jure* rights to the land they lived on under the loan farm system.

But, like other colonial land systems, *de jure* and *de facto* rights were not always aligned. Guelke (1976:31) argues that “...[i]n practice there was little distinction between freehold land and *leeningsplaatsen* (loan farms).” In fact, he goes further by saying “...the leases became so secure that the fixed improvements (which could be sold) came to reflect the value of the whole property”. Newton-King (1999:99), in the most authoritative contribution to the history of the Cape frontier, submits the loan farms were similarly secure as the freehold farms.

Guelke (1976) continued to compare the two systems at the Cape. He concluded the freehold farms were more valuable because of their relative closeness to Cape Town. The value of these freehold farms spurred settlers to protect their farms as best they could. The Company initially provided ample military protection to freehold farmers, but as the frontier expanded and the threat from the Khoesan ebbed, farms, especially loan farms, enjoyed less protection (Fourie *et al.*, 2012).

The freehold and loan farms were clearly distinct in their *de jure* property rights. The freehold farms *de jure* enjoyed more secure property rights – they were tradable and inheritable – while the loan farms were not. However, some historical literature suggest *de facto* the loan farms were similar to the freehold farms. We attempt to empirically test these assumptions here. Our main hypothesis is that the freehold farms enjoyed more secure property rights relative to the loan farms. If the freehold farms were more secure, we would expect them to be more valuable collateral for credit transactions.

## **The freehold and loan farm data**

The data we use for our analysis comes from two sources, the genealogical records and the probate inventories. The genealogical records are familial lists from the first settlers with

information on birth, marriage and death dates as well as occupations<sup>2</sup>. Our main variables of interest from the genealogies are whether someone was the oldest son, the number of children and the age of individuals. The second, the probate inventories, list all the assets and debts of an individual at the time of death. Although not without bias, Schuurman (1980) concluded that they "... enable the study of property according to occupation, age and number of children". Cape colony (economic) historians have also used them extensively. Newton-King (1999) used them to study the material life on the frontier. On wealth of the farmers of the Cape, Newton-King (1994) found poor farmers were in the minority and Fourie (2013) found the general wealth levels of settlers were "remarkable".

The main concern for bias in probate inventories is the exclusion of poor individuals, females and the young. Because we are focused on land ownership, the poor are excluded automatically, although we discuss the individuals with no properties to those with properties. The Orphan Chamber inventories are also not the wealthiest individuals at the Cape. Fourie (2013) compared the probate records used here to Stellenbosch probate inventories collected by Krzesinski-De Widt (2002). The Stellenbosch inventories are significantly more affluent than the Orphan Chamber inventories, since these were collected specifically for individuals without a will or where heirs were minors. Females are also excluded from the study, because our instrument of choice is being the oldest son and the comparison is between oldest sons and sons born later. Age is not a big concern either. Swanepoel and Fourie (2015) have shown there is very little differences and no correlation between age and debt levels, while we later also show there is no significant differences in the distribution or level of ages between oldest sons and sons born later.

These inventories offer information on the number of properties owned, the policy under which this property was owned and in some cases the value and size of these properties. For example: Trijntjen Hillebrants (MOOC8/1.12) had one farm named Soedewijk situated in Drakensteijn, which was 60 morgen (the standard prescribed size of farms) and valued at 600 gulden (200 rds), when she died in 1695. More detailed descriptions on farms include the policy under which the farm was obtained from the Company. In this paper, we focused on two policies observed most in the inventories: freehold farms (*eigendom, erfgrondbrief* or

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<sup>2</sup> For detailed information on how the genealogies were compiled and can be used in economic and demographic studies see Cilliers and Fourie (2014), on matching the genealogical records to the probate inventories see Swanepoel and Fourie (2015). Swanepoel and Fourie (2015) also offer an in-depth discussion on the differences and possible biases between the matched and unmatched sample. Their main conclusion was the matched sample were in the middle of the wealth distribution, excluding both the poorest and richest in society.

*transport*) and loan farms (*leeningsplaats, in leening*)<sup>3</sup>. Some inventories listed both types of farms, like Josua Joubert (MOOC8/21.32) owned one farm Welbedagt, situated in Wagenmakers Vallei in the Stellenbosch District and it was owned in freehold. He also owned two loan farms, one Elands Jagt situated next to Molenaars Rivier in du Toits Kloof and another named Varkens Kop situated in the Sneeuberge. Anna Elisabeth Olivier (MOOC8/66.13a) who died in 1820, had one loan farm name Uytvlug situated beneath the Bonteberg and next to the Rietrivier. Table 1 provide a summary of the information available on land ownership from these inventories.

[INSERT TABLE 1 HERE]

Almost 54% of the inventories did not list any properties or land. Looking across the other indicators of wealth, we find further evidence of this bias. Table 2 also provides summary statistics on debt, credit, whether an individual had both credit and debt, the total number of bonds observed in the inventories and other household characteristics like if is a spouse was listed on the inventory and the number of children, split by the type of land owned. The two groups excluded from the analysis below are the individuals with no properties listed, and the individuals were properties are listed, but the policies are unknown. The individuals included are either those with loan farms or freehold properties listed.

[INSERT TABLE 2 HERE]

The individuals with no properties listed were by far the poorest, but by no means excluded from debt transactions. They owned on average 1 slave, while the individuals in the other categories owned more than 5 slaves on average. The mean value of debt for these individuals are 368 rds, while the credit value was even higher at 692 rds; 43% of individuals with no properties were both creditors and debtors and 12% had debt bonds in the inventory. More than three quarters had spouses listed on the inventories (lower than the other groups) and they had an average of 3.12 children. Because we have no information on properties, either because they did not own any or because their properties were not recorded in the inventories, we exclude these individuals from the analysis. Although this is a serious concern when we want to analyse the average level of wealth in the Colony, our purpose here

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<sup>3</sup> Another form was quitrent (*erfpagt*) but less than 100 of these farms are observed. These were mainly loan farms which were converted to freehold farms. Their tenure were closer to that of the freehold farms and we therefore include them as freehold farms.

is more focused: we only aim to compare those who own freehold versus loan farms. This exclusion therefor does not bias our results.

The second group of individuals excluded from the analysis below are those with some properties, but where we do not observe the policy under which this land was owned. They look similar to those with freehold farms – if not slightly richer. They own more slaves than the loan farm individuals, but less than freehold farmers. They have the highest debt of all the groups, but less credit than the freehold individuals. The proportion of individuals with debt bonds and who were both creditors and debtors are between the loan farms and freehold farms. Although the ideal would have been to include them in the analysis, because of the uncertainty which group have similar characteristics we exclude them from the analysis.

The summary statistics clearly show that the freehold farmers are wealthier than their loan farm counterparts<sup>4</sup>. They have on average more properties, slaves, debt, extended more credit and had a higher portion of bonds. Differences are less pronounced when we consider the portion who have spouses listed and the average number of children. Because our analysis is focused on debt, Figure 3 shows the different natural logarithm distributions of debt for these two groups<sup>5</sup>. These distributions support the historiography that claim the freehold farmers were wealthier than the loan farmers. In the next section, we will focus on the correlations between land ownership and debt.

[INSERT FIGURE 3 HERE]

## **Correlations between land ownership and debt**

The descriptive statistics from the probate inventories above suggest freehold farms were owned by the more affluent individuals of the Cape. Before we test the hypothesis that freehold farms (with more secure property rights) had more debt, we first focus on simple correlations between land ownership and debt. Before we focus on the type of land ownership (freehold farms vs loan farms), we look at the number of properties owned.

We also include controls for other wealth variables – the number of slaves owned, the number of debt bonds, if an individual was both a debtor and creditor and also if a spouse was listed on an inventory. We do not control for gender and only focus on males, because of the instrumental variable used later. Swanepoel and Fourie (2015) found a strong correlation

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<sup>4</sup> If individuals owned both freehold and loan farms, we add them to individuals with freehold farms.

<sup>5</sup> Zero debt is replaced with  $1 \times 10 \times e^{-10}$  for positive logarithm values, this caused the spike to the left of the distributions.



between slave ownership and debt, therefore it remains important to control for the number of slaves owned. We divide the number of slaves owned into groups as follows: 0 slaves, between 1 and 4 slaves, between 5 and 10 slaves and more than 10 slaves. We include the number of debt bonds, because bonds were highly correlated with debt transactions regarding land. Individuals with both credit and debt were more likely to have collateral (either land or slaves) and debt will be higher. If a spouse was listed on the inventory, debt was also likely to be higher as it is the accumulated debt of both individuals captured and not just one individual. Historical literature for the period support the hypothesis that individuals with more children were more prosperous. South Africa's fertility decline only happened with the mineral revolution of the late nineteenth century.

The first regression (table 3) shows a strong correlation between the number of properties listed on the inventory and the debt level of the inventory. One additional property is associated with a 58.1% increase in debt. Our other wealth variables, slaves, number of debt bonds and whether the individual was both a debtor and creditor are also strongly correlated with the individual's debt level. Having a spouse listed on the inventory is also correlated with the debt levels. Due to the nature of the data, this might be driven by individuals were both spouses passed away within a short period of each other. The number of children did not matter for debt.

[INSERT TABLE 3 HERE]

Although this support the idea of individuals with collateral having more debt, our main concern here is the type of land an individual owned. First we compare the individuals with freehold farms to those with no properties listed, as well as loan farms to no properties and finally we compare individuals with freehold farms to those with loan farms. Table 4 shows the comparison between individuals with freehold farms or loan farms to those with no properties.

Relative to those individuals with no properties, both the freehold farm owners and loan farm owners have statistically more debt. Individuals with freehold farms have 82.75% more debt than individuals with no properties, while individuals with loan farms have 52.81% more debt. While slave ownership remain important for individuals with freehold farms, the same statistic loses some significance for the individuals with loan farms. The number of debt bonds as well as being both a creditor and debtor are also correlated with higher debt. Similar to before having a spouse also listed on the inventory is associated with more debt. The

number of children does not have a significant correlation for the individuals with freehold farms, but the individuals with more children had less debt if they owned a loan farm. This is further support for the hypothesis that individuals with property, and therefore collateral, had more debt. It does not yet show the difference between freehold and loan farms, or show the causal link between the land ownership and debt.

[INSERT TABLE 4 HERE]

Table 5 shows the differences in debt for individuals with freehold farms to loan farms. This is the first evidence that support the hypothesis that the individuals with freehold farms were wealthier, had better protected property rights and more collateral for debt. The individuals with freehold farms have on average more debt than individuals with loan farms. Slave ownership continue to matter for debt of freehold farmers, while both creditor and debtor have more debt and inventories with spouses listed also have more debt. When comparing these two groups, individuals with more children have less debt.

[INSERT TABLE 5 HERE]

These OLS correlations point to valuable information on freehold, loan farms and debt. On first glance, the individuals with freehold farms were more prosperous and had more debt – supporting the hypothesis that they had better protected property rights. One concern with these correlations are reverse causality. Individuals with freehold farms have more debt because they have more collateral relative to individuals with loan farms. But the reverse is also true. Individuals with freehold farms may have more debt, because they used debt to purchase these farms in the first place. This concern becomes our focus in the next sections were we use instrumental variable analysis to circumvent this endogeneity problem.

## **An instrumental variable approach: Oldest sons, debt and freehold farms**

Too many studies have used the random variation of birth order to study different economic outcomes to list here. These economic outcomes include schooling or returns to education (Black *et al.* 2005), income (Kantarevic and Mechoulan, 2006), labour market outcomes like employment (Black *et al.* 2005) and the decision to migrate (Abramitzky *et al.*, 2012). We propose to use the same instrument, being the oldest son in a family, to look at freehold and loan farm ownership and the respective debt outcomes for these individuals.

We estimate the following equations:

$$\text{Ln(Individual Debt)} = \beta_0 + \beta_1(\text{Owns a freehold farm}) + \beta_2X_i + \mu \quad (1)$$

And

$$\text{Owns a freehold farms} = \beta_0 + \beta_1(\text{Oldest Son}) + \beta_2X_i + \varepsilon \quad (2)$$

Both owning a freehold farm and oldest son are dummy variables, equal to 1 if the individual owned at least one freehold farm and equal to 1 if the individual was the first born son in the family. The vector  $X_i$  include our wealth measurement: slave ownership, whether an individual was both a creditor and debtor and the number of bonds observed by the individual. It further includes whether the oldest son had a spouse listed on his inventory and his number of children. Although we would have liked to control for additional variables, like the land ownership of the father, we are restricted to these variables to have a large enough sample.

For our instrument to estimate the local average treatment effects (LATE), it should comply with the following four assumptions: exclusion restriction, relevance and exogeneity assumptions. The exclusion restriction requires that birth order does not have a direct causal effect on the level of debt. In previous research (Swanepoel and Fourie, 2015), it has been found that debt was a general occurrence at the Cape. The best way to support the exclusion restriction is to look at the debt distribution of the oldest sons versus sons born after. Figure 4 shows these distributions. Table 6 provide the t-test for the size of debts, there is no significant difference between the size of oldest sons and sons born later. Since there is no significant difference in either distribution or size of debt for oldest sons to other sons, we assume there is no direct relationship between being the oldest son and his debt level. We would therefore argue that being the oldest son satisfies the exclusion restriction.

[INSERT TABLE 6 HERE]

[INSERT FIGURE 4 HERE]

For the relevance assumption, the oldest sons need to have a higher probability of owning a freehold farm. The system of inheritance at the Cape was one of partible inheritance derived from Roman-Dutch law. This meant the individual's estate was divided half to the spouse and the equally among the children. Most often the estate was sold in its entirety at auction and the proceeds distributed between the heirs. Despite this, anecdotal evidence have been provided by Newton-King (1994), Dooling (2005), Dooling (2006) and Dooling (2007) that the oldest sons were favoured when it came to the inheritance of property and freehold farms.

Newton-King (1994) showed how older sons inherited the freehold farms, while sons born later inherited loan farms. Dooling (2005) notes how Tobias Mostert's son, Nicolas Gerhardus, inherited his father's farm. Dooling (2005) and Dooling (2007) referred to how in this patriarchal society sons were inevitably favoured before daughters when it came to inheritance. With this anecdotal evidence, we also found a higher probability among oldest sons of owning freehold farms, at 48%, while of sons born later, only 18% owned freehold farms (also in table 6).

The last assumption is the one of randomness. For the oldest son to be a random event it cannot be related to any unobservable family background characteristics. The randomness assumption by definition cannot be tested, but we can investigate if oldest sons had higher skills and higher longevity. Both of these variables are observed from the genealogical records<sup>6</sup> and matched to individuals in the probate inventories. The skills we observe are divided into unskilled or low skills, farmers, medium skilled, highly skilled and professional. If some unobserved ability bias with being the oldest son in a family existed, we would expect the oldest sons to have higher skill levels to sons being born later. We run an ordered logit to test if there are a preference for oldest sons in higher skills categories – table 7. There is no significant difference between older sons have more professional skill levels to sons who were born later.

[INSERT TABLE 7 HERE]

There is also no significant difference in the ages of oldest sons relative to sons born later. Oldest sons' expected age for the period (conditional on reaching 16 years) was 49.83 years, while sons born later lived an average of 48.69 years. Figure 5 shows the age distribution of oldest and non-oldest sons, while table 6 also show the t-test for average ages between these two groups. Both these measures show no significant difference for the oldest sons and sons born later, the strongest evidence that being the first born son was in fact a random event and not related to some unobservable characteristics like ability.

[INSERT FIGURE 5 HERE]

Given the evidence to the assumptions, being the first born son appears to be a valid instrument for the probability of having a freehold farms relative to sons who were born later. Table 8 presents the regression results for the instrumental variable estimation. The result supports the hypothesis that the oldest son had a 23% higher probability to have a freehold

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<sup>6</sup> For more information on these records, see Cilliers (2015).

farm relative to sons born later, significant at 1% level. Individuals with more slaves were also more likely to own freehold farms. Having a spouse listed on the inventory is also associated with higher probability of owning a freehold farm, but none of the other characteristics are associated with a higher probability of owning a freehold farm.

[INSERT TABLE 8 HERE]

The second stage regression however reveal that owning a freehold farm did not matter for the individual's debt level, given the instrumental variable of a being the oldest son. The coefficient on the land policy, or owning a freehold farm is negative – individuals with freehold farms have less debt – and the coefficient is insignificant.

Only the highest group of slave ownership has a significant effect on debt, suggesting the combination of slaves and land ownership mattered for debt. Individuals who were both creditors and debtors had more debt than individuals with only debt and additional bonds caused higher debt. And the spouse listed still remain significant for debt levels. This suggests it was individuals with any collateral that had debt – land slaves, bonds or who were both creditors and debtors. If the individual had a spouse listed it meant additional resources which the creditors could use to assess riskiness and additional collateral from the combined estate. This is more support for the recent literature on early credit markets which suggest credit and debt was not used more by poor as suggested before, but by those with the greatest assets.

The specification tests are also presented in the table. The Cragg-Donald Wald statistic (22.392) is larger than the critical value of 16.38 and the instrument passes the weak instrument test. This suggests being the oldest son in the family is highly correlated with owning a freehold farm. Because we only have one endogenous regressor and one instrument, the specification is just identified. All these test together make the instrument a valid instrument and there is no difference in debt levels for individuals who owned freehold farms and individuals who owned loan farms, after correcting for endogeneity concerns from reverse causality.

The results suggest although at first glance freehold farms were correlated with higher debt, once the endogeneity issue was addressed by using an instrumental variable, the relationship disappears. Economic transactions at the Cape thus considered the *de facto* property rights – where freehold and loan farms property rights have similar rights – rather than the *de jure* property rights as prescribed by the Company. This supports the historical literature of

Newton-King (1999) and Guelke (1976) who suggested the use of loan farms were similar to that of the freehold farms. But it also supports the international literature of de Soto (2000) and Lamoreaux (2012) who suggest property rights are more secure where the norms of society is taking into consideration.

## Conclusion

For any economic transaction to take place, well-defined and well-enforced property rights are required. Many studies have proved that these property rights institutions are rooted in the history of the region. We attempt to study property rights' role in the debt market of the Cape colony. The Cape colony offer an alternative to most of the observed pattern of *de facto* to *de jure* property rights in land. We attempt to further this research into how the property rights influenced economic interaction, specifically debt transactions.

The hypothesis we worked from is that the individuals with freehold farms had more secure property rights. Individuals who owned these freehold farms should have more collateral for debt transactions and therefore more debt. However, historical literature suggest *de facto* rights of loan farms were similar to those of the freehold farms. We also presented support for this evidence. Although the freehold farms appeared to have more debt, once endogeneity concerns were addressed these effects disappeared. This is more evidence that the institution of property right is dependent on the society in which it functions and these rights are perceived and used by individuals will influence economic transactions. The settlers at the Cape used *de facto* property rights rather than *de jure* property rights when they considered the value and worth of collateral for debt transactions.

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Table 1: Descriptive statistics on properties owned, with and without policies

Property Category	Number of Properties	%	Properties with known policies	% Properties with known policies	Loan farms	Freehold farms
No properties	1135	54.15	-	-	-	-
One Property	621	29.63	362	64.64	272	90
Two Properties	209	9.97	127	22.68	95	32
Three Properties	58	2.77	33	5.89	19	14
Four and more properties	73	3.48	38	6.79	15	23
<b>Total</b>	<b>2096</b>	<b>100</b>	<b>560</b>	<b>100</b>	<b>401</b>	<b>159</b>

Table 2: Descriptive statistics of variables of interest by land ownership policies

<b>No Properties</b>					
	Obs.	Mean	Std. Dev.	Min	Max.
Number of properties	755	-	-	-	-
Number of slaves	755	1.38	3.38	0	36
Value of debt	755	367.94	1 275.19	0	20 167
Value of credit	755	691.69	5 612.89	0	103 424
Both debtor and creditor	755	0.43	0.50	0	1
Debt bonds present	755	0.12	0.72	0	11
Spouse listed on inventory	755	0.76	0.42	0	1
Number of children	755	3.12	3.75	0	19
<b>Properties with unknown policies</b>					
Number of properties	281	1.73	1.27	1	9
Number of slaves	281	7.77	10.59	0	73
Value of debt	281	3 732.94	12 594.28	0	135 755
Value of credit	281	4 297.27	17 754.66	0	150 775
Both debtor and creditor	281	0.48	0.50	0	1
Number of debt bonds	281	0.46	1.39	0	13
Spouse listed on inventory	281	0.87	0.34	0	1
Number of children	281	3.01	3.49	0	16
<b>Loan Farms</b>					
Number of properties	259	1.47	0.90	1	8
Number of slaves	259	5.68	7.75	0	45
Value of debt	259	2 318.19	6 967.87	0	85 922
Value of credit	259	1 076.98	5 945.41	0	92 246
Both debtor and creditor	259	0.52	0.50	0	1
Number of debt bonds	259	0.35	1.10	0	11
Spouse listed on inventory	259	0.80	0.40	0	1

Number of children	259	4.34	4.27	0	23
<b>Freehold farms</b>					
Number of properties	113	2.06	1.72	1	12
Number of slaves	113	9.81	10.26	0	60
Value of debt	113	2 875.35	5 414.77	0	35 197
Value of credit	113	5 444.71	27 661.71	0	256 425
Both debtor and creditor	113	0.50	0.50	0	1
Number of debt bonds	113	0.55	1.07	0	6
Spouse listed on inventory	113	0.90	0.30	0	1
Number of children	113	4.26	4.19	0	16

Notes: Number of observations, mean, standard deviation, minimum and maximum statistics

Table 3: OLS regression between the number of properties owned and debt

Dependent variable:	Natural logarithm of individual debt	
	Coefficient	Standard error
Number of properties	0.4578***	0.0641
Zero slaves (ref.)		
Between 1 and 4 slaves	0.3585**	0.1617
Between 5 and 10 slaves	1.0346***	0.1997
More than 10 slaves	0.8551***	0.2493
Number of debt bonds	0.6386***	0.0690
Both debtor and creditor	2.5466***	0.1330
Spouse listed on inventory	0.7352***	0.1805
Number of children in household	-0.0121	0.0185
Constant	1.7651***	0.1711
N	1408	
R-squared	0.3719	

Significance levels: \* 10%, \*\* 5% and \*\*\* 1 %.

Table 4: OLS regression between freehold and loan farms and no properties

Dependent variable:	Natural logarithm of individual debt			
	Freehold farms		Loan farms	
	Coefficient	Std. error	Coefficient	Std. error
Property owned under specific policy	0.6029**	0.2530	0.4240**	0.2116
Zero slaves (ref.)				
Between 1 and 4 slaves	0.5201***	0.1626	-0.0809	0.2779
Between 5 and 10 slaves	1.359***	0.1977	0.5149*	0.2883
More than 10 slaves	1.5267***	0.2325	0.7655**	0.3093
Number of debt bonds	0.6903***	0.0696	0.6117***	0.0843
Both debtor and creditor	2.608***	0.1349	2.2761***	0.2023
Spouse listed on inventory	0.7845***	0.1832	1.0522***	0.2995

Number of children in household	-0.0087	0.0188	-0.0663**	0.0270
Constant	1.8065***	0.1738	3.2165	0.3471
N	1408		653	
R-squared	0.3516		0.2933	

Notes: The reference category for the dummies on loan and freehold farms are the individuals with no properties.

Significance levels: \* 10%, \*\* 5% and \*\*\* 1 %.

Table 5: OLS regression between debt of freehold and loan farms

Dependent variable:	Natural logarithm of individual debt	
	Freehold farms	
	Coefficient	Std. error
Property owned under freehold policy	0.8801**	0.3593
Zero slaves (ref.)		
Between 1 and 4 slaves	-0.0241	0.3506
Between 5 and 10 slaves	0.6151*	0.3713
More than 10 slaves	0.8602**	0.3694
Number of debt bonds	0.5593***	0.0796
Both debtor and creditor	2.5967***	0.2547
Spouse listed on inventory	1.2711***	0.4191
Number of children in household	-0.1176***	0.0348
Constant	2.9941	0.4811
N	434	
R-squared	0.3457	

Significance levels: \* 10%, \*\* 5% and \*\*\* 1 %.

Table 6: T-test of oldest son vs non-oldest sons, debt size, owning a freehold farm and age

	Debt size		Owned freehold farm		Age	
	N	Mean	N	Mean	N	Mean
Not oldest son	638	1535.01	169	0.1834	1152	48.6946
Oldest son	681	1692.86	179	0.4302	1238	49.8334
Combined	1319	1616.02	348	0.3103	2390	49.579
Difference		-156.79		-0.2467		-2.4818
t-stat	-0.411		-5.1443		-1.4662	
p	0.6811		0.0000		0.1427	

Source: debt size and owned a freehold farm from probate inventories; age from genealogical records matched to probate inventories.

Table 7: Ordered logistic regression for oldest and other sons

	Skill level			
	Coefficient	Std. error	Odds ration	Std. error
First son	0.1165	0.2182	1.1235	0.2451
N	313		313	

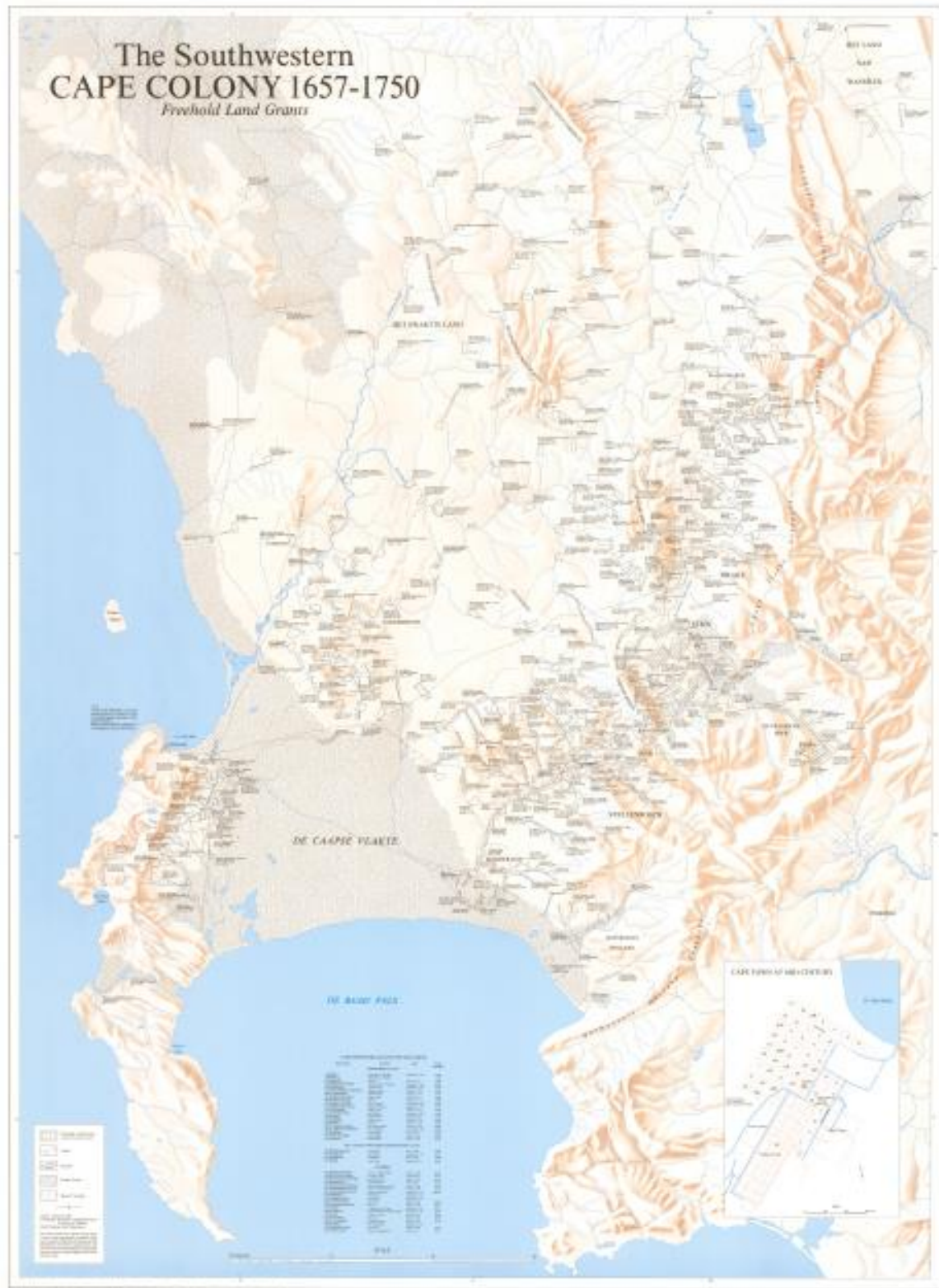
Source: matched sample between genealogical records and probate inventories.

Table 8: Regression results from instrumental variable analysis

First-stage regression Owned a freehold		Second Stage Regression Ln(Debt Value)	
First son	0.2338*** -0.0494	Owned a freehold farm	-1.6521 1.2138
0 Slaves (ref.)	-	0 Slaves (ref.)	-
Between 1 and 4 slaves	0.1595** 0.0693	Between 1 and 4 slaves	0.1034 0.4329
Between 5 and 10 slaves	0.2344*** 0.0704	Between 5 and 10 slaves	0.7512 0.506
More than 10 slaves	0.3469*** 0.0785	More than 10 slaves	1.0783* 0.6346
Both creditor and debtor	-0.0392 0.0500	Both creditor and debtor	2.0072*** 0.292
Total bonds present in inventory	-0.0021 -0.0225	Total bonds present in inventory	0.6539*** 0.1292
Spouse listed on inventory	0.1861* 0.0853	Spouse listed on inventory	1.3521** 0.5636
Children	-0.0069 0.0063	Children	-0.0348 0.039
Constant	-0.1003 0.0930	Constant	3.5116*** 0.5185
N	330		
Under-identification test Anderson canon. corr. LM statistic	21.519		
Chi-square(1) p-value	0.0000		
Weak Identification test Cragg-Donald Wald F- statistic	22.392		
Stock–Yogo weak ID test critical value	16.32		

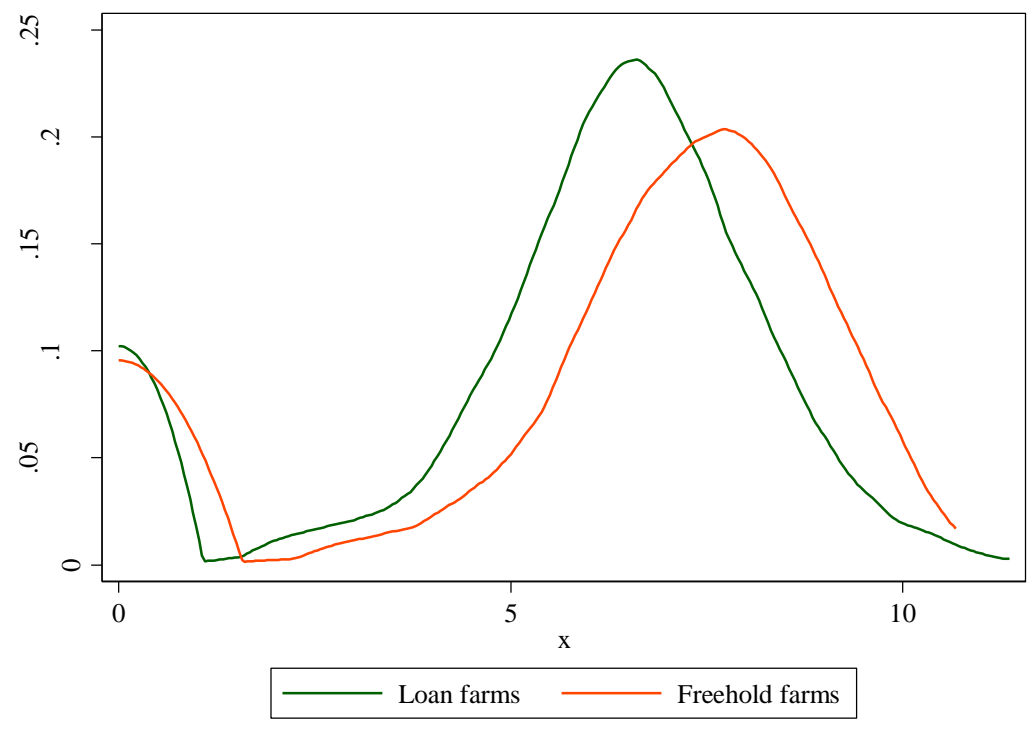
Source: Probate inventories, own calculations. Dependent on son reaching 16 years of age.  
Significance levels: \* 10%, \*\* 5% and \*\*\* 1 %.

Figure 1: Map of freehold farms, 1657 – 1750



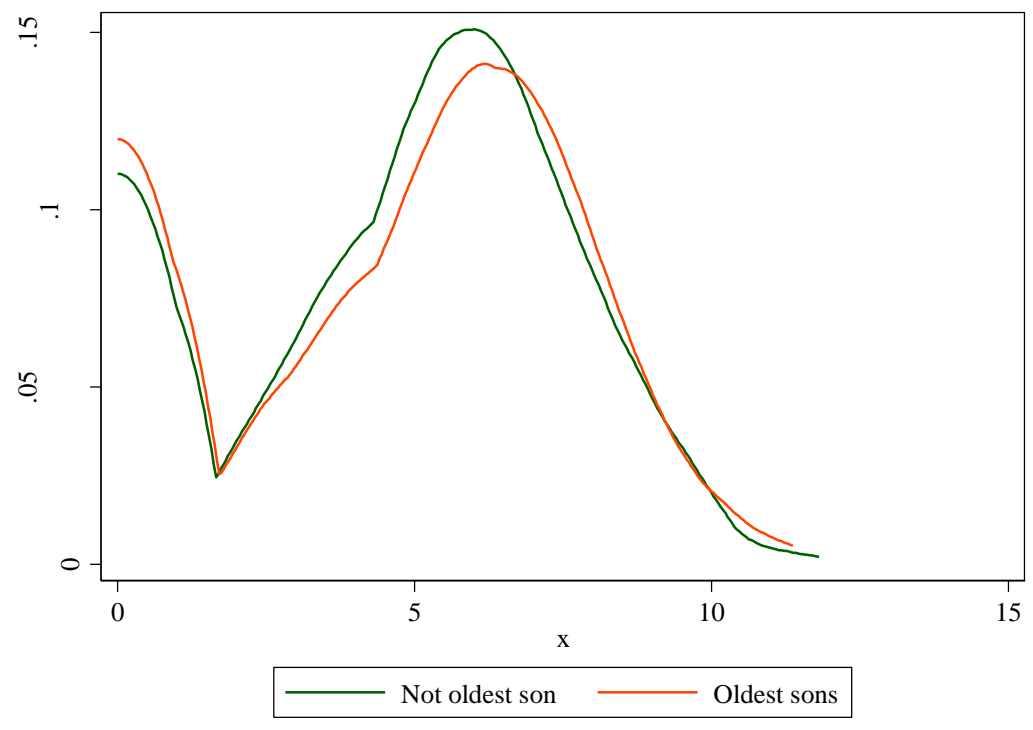
Source: Guelke (1987).

Figure 2: Debt distributions of freehold and loan farms



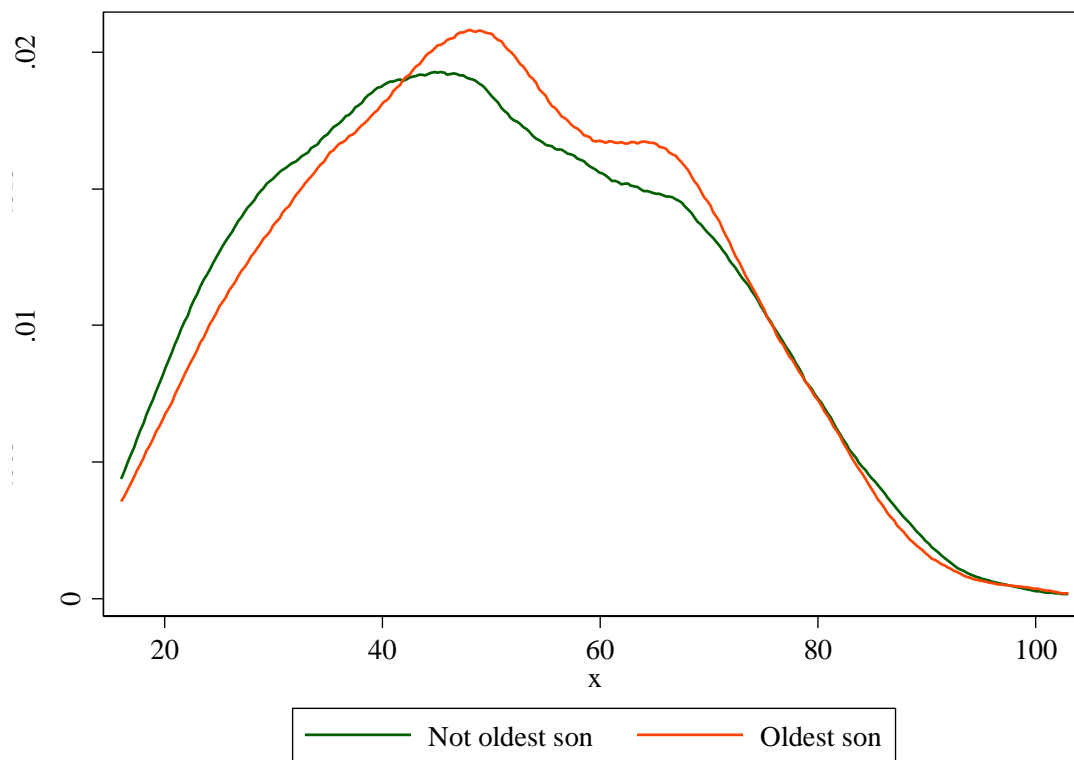
Source: Own calculations, probate inventories

Figure 3: Debt distributions for oldest and non-oldest sons



Source: Own calculations, probate inventories

Figure 4: Age at death distributions for oldest and non-oldest sons



Source: Own calculations, genealogical records