

Financial Innovation in Late-Eighteenth Century Netherlands: The Case of American Land Securities

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Rik Frehen *Tilburg University*

K. Geert Rouwenhorst *Yale School of Management*

William N. Goetzmann *Yale School of Management*

Abstract: The end of the 18th century was one of the most innovative periods in the history of securitization. In The Netherlands, a network of merchant investment bankers developed sophisticated methods for structuring loans based on overseas properties as collateral. In 1793, the Holland Land Company issued two structured notes to purchase millions of acres in Western New York, In 1794 the purchase and development of property in the newly-designated capital city of Washington D.C. was financed by mortgage-backed bonds underwritten by Dutch merchants. We show how these securities built on previous fixed income instruments that were used to finance trade and to speculate in the debt of the United States. The difference in the land securities is that they were used to finance projects that yielded no revenues in the short-term and took decades to realize value.

The notes pose a puzzle about financial innovation. Why did Dutch merchants not use equity finance? We examine two competing theories. Institutional theory explains the structure of the securities by path-dependent development. An equilibrium framework explains the structure as an optimal solution to a contracting problem. We find evidence in favor of the institutional explanation. Empirical evidence about both sets of security issues indicates that equity financing was understood ex post as a better fit to the projects. We attribute the failure to use equity financing at the outset to “equity aversion” in the wake of the early 18th century stock market bubbles. The result suggests that financial crises can lead to long-term effects on the nature of innovation.

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I. Introduction

Empirical studies of financial innovation are necessarily limited to unusual events. Frame and White (2004) argue that most analyses of financial innovation are forced to generalize from a few cases. Lerner and Tufano (2011) articulate this problem and use a set of historical examples – from the emergence of venture capital industry to the appearance of mutual funds, to address costs and benefits of financial innovation. Their approach considers the counterfactual; i.e. what would the economy look like without a specific innovation.

In this paper we take a related approach. We focus on one of the most dramatic periods of financial innovation: the late 18th century capital market in the Netherlands. We study the innovations that led to the creation of property securities issued to finance the acquisition and development of lots in the city of Washington D.C., and the securities used by Dutch investors to purchase and develop multi-million acre tracts of raw land in America. We also consider the counterfactual and ask why fixed income finance was used for projects that would generate little income in the beginning and had long verification horizons.

We consider two competing explanations. The first is an institutional argument and the second is an equilibrium argument. The institutional explanation might be best termed “equity aversion.” The Netherlands turned away from public equity issuance and trading after the crash of 1720, except for a handful of large, long-established issues. Even trade in the equity of East and West Indies Companies diminished to virtually nothing through the 18th century. Financial innovations using the public capital markets over the mid and late 18th century shifted to fixed income instruments. As we show in this paper, these innovations exhibited institutional path-dependency characterized by incremental variations upon accepted forms of investment.

The alternative explanation for the debt-based financing choice is that debt is the expected equilibrium outcome in a setting of information uncertainty and a demand for liquidity. While theories with this outcome are legion, one example we use in this paper is Gorton and Pennachi (1990) who find that debt-like informationally-insensitive

claims will prevail in settings in which there is a demand for money and concerns about adverse selection.

These theories have different empirical implications. The institutional theory requires evidence of a series of formal precedents to the innovation. It also does not imply that the innovation is an optimal solution in any sense. The equilibrium theory does not require formal precedent but does require certain initial conditions, and predicts that the outcome will have certain characteristics – in particular that the debt will be informationally insensitive.

In our tests we collect information about the formal precedents to the innovative securities. We document incremental innovation and show how these innovations addressed certain market needs. Consistent with an institutional explanation, we show how both firms sought to convert to equity-like financing in the years after issuance. The Dutch company used a technique previously employed to provide a residual claim on assets in a closed end portfolio. The American company attempted an initial public offering of the North American Land Company.

Our tests also use price data. We collect a time-series of market quotations for the securities issued by both companies. The price data show two things. First, there are no large shocks indicative of sudden shifts in investor expectations. Their trends follow that of U.S. debt over the period, with some significant variations due to default risk. Second, for the Holland Land Company we are able to extract an equity-like value as a consequence of the conversion. This residual claim suggests that there was a strong demand for an option on the value of American land sales, despite a high consensus assessment of the probability of default and material recovery. We interpret this as a latent demand for right-skewed payoffs of the sort equity – rather than debt -- can provide. We interpret this as evidence against an equilibrium argument that would have exploited the market demand for equity payoffs at issuance.

Our use of historical evidence to examine modern financial innovations is not new. A number of researchers have pointed out that there is much to learn about modern mortgage securitization from the historical mortgage market (c.f. White, 2009, Snowden 1995 and 2009, Fishback et. al. 2001, Goetzmann and Newman, 2010), and Gorton (2009) observes that the crisis of 2008 is best understood in the context of a classic banking panic, which a slightly altered institutional structure. Indeed, the historical precedents of the recent financial crisis are legion: mortgage finance is as old as written history, and banking panics nearly so. The benefit of focusing on the late 18th century Dutch market is precisely that the process of innovation can be clearly traced in historical documents and in public security price quotations. The richness of the historical material allows us to identify specific precedents to an innovation, and then the immediate imitators. It also allows us to observe the social and business network in which the innovations appeared and diffused and also to assess the profitability of certain innovations.

The paper is organized as follows. The next section discusses the historical context of the Dutch market and identifies key precedents to the innovations we study. The third section describes the land securities in detail. Section 4 analyzes the evidence for and against the institutional vs. equilibrium explanations. Section 5 concludes.

II. Historical Background

Our overview of the 18th century Dutch capital markets is necessarily brief¹ and will focus on the appearance of publicly traded, collateralized financial instruments which is the specific context in which the innovation we study appears.

The eighteenth century Dutch capital market began with a speculative financial bubble in new equity shares in the year 1720.² A collapse in share prices was followed by a

¹ Readers are referred to Gelderblom and Jonker (2009) for a more complete description.

period of virtually no equity share floatations and very little trading in existing issues, although Larry Neal's (1993) study of share prices through the 18th century indicate that the market was a relatively efficient one. Two empirical observations demonstrate this institutional shift. In our previous work (Frehen et al 2011), we analyze the trading records of stock in Stad Rotterdam, an insurance company started in 1720. Although the firm exists to this day, the trading records up to the 19th century indicated that 90% of the transactions in the stock occurred during the Dutch Windhandel of 1720. No seasoned offerings took place afterwards to raise capital and very few shares were traded. Second, we examined the *Leydse Courant*, a leading financial periodical of the day where we searched on specific equity-related terms like terms like 'actien'. Beside the Bank of England, South Sea Company, and Dutch East Indies virtually no other shares trades were recorded in the period 1720-1780 indicating that interest in share trading declined considerably as a result of the 1720 crash. Third, we examine the *Amsterdam Price Courant* in the last decade of the 18th century for what securities were quoted. Fourth, a hitherto unused Dutch source -'Nieuwe Nederlandse jaerboeken'- which contains large amounts of contemporary financial developments lists only very few, mostly British, share prices.. This is particularly instructive because a large number of fixed income securities were listed, as well as funds of securities; and virtually no equities. In effect, the Dutch public market of the day offered little or no exposure to equity payoffs – the positive tail of entrepreneurial activity. This pattern is similar in some respects to the refusal of the French to establish a central bank for decades after the Law debacle. The modern capital markets take equity financing for granted, and scholars trace the lineage of stock markets to the Netherlands. It is thus remarkable to note how little equity finance existed in a major capital market in the 18th century.

Riley (1980) observes that by the end of the 18th Century, Amsterdam had become the leading capital market in the world for sovereign debt, some of which was quite innovative. These innovations went hand in hand with the development of financial

² See Frehen et. al (2009) and Gelderblom and Jonker (2009) for a description of the Dutch bubble.

intermediaries we might label today as investment bankers in that they underwrote public security issues, These intermediaries were at first primarily merchants who traded in commodities for whom financial operations were a means to finance and control trade as opposed to serving a “banking” business *per se*.³ Unlike London’s goldsmith’s banks which were deposit-taking institutions, Dutch financiers mainly made and arranged loans and engaged in commerce.

Asset-Backed Securities

A distinct feature of the Amsterdam market was the role played by merchant contracts and commodity collateral in certain loans. An early example of a loan in the Amsterdam market collateralized by a commodity is the 6% 1659 publicly issued security by Johan Deutz to the House of Austria, which was financed by a loan issued at 4%, and collateralized by a monopoly given to Deutz over the product of Austria’s rich quicksilver mines. In effect the loan was a means to secure the monopoly, rather than the principal source of profit by Deutz.⁴ The demand of commodity security for a loan is not surprising in this example, but the financing of the transaction by Deutz’s loan issue is noteworthy in that Deutz’s credit was enhanced not only by the commodity but his ability as a merchant to benefit from the monopoly and thus reduce the uncertainty of loan repayment.

In the 18th century, this commodity-backed structure became a standardized financial product in the Amsterdam market. In the early 18th century, Dutch merchants faced a competitive global market for key commodities from the Americas – particularly sugar and coffee. The erosion of the monopoly of the West Indies Company over Atlantic trade to the Netherlands led to the emergence of independent plantation-owners in Surinam, Essecaibo and Demerary and in certain Caribbean Islands such as St.

³ C.f. Riley (1980)

⁴ See Violet Barbour p. 109.

Eustacia. These independent plantations were financed with a financial innovation for which the Deutz Austrian Loan was the clear precedent. From 1753 to 1795 (when the Dutch relinquished sovereignty over their South American plantations), Dutch merchants floated over 240 “plantation loans” in the public markets. These were debt investments in sugar plantations of Dutch South America and the Caribbean that were collateralized by mortgages on the overseas properties (including land, slaves and capital equipment), and the annual commodity production of the plantation.⁵

An interesting feature of these loans is that the merchants in the commodities trade functioned as financial intermediaries in what we might now call “structured products.” The merchant underwrote the issuance of the loans to the public and served as an administrator and servicer, and as the merchant for the commodities on the exchange. His compensation was a commission on sales of the plantation produce, the rest of the sale proceeds were used to service the debt. Van de Voort notes that the typical interest rate paid by the planters was 5% to 6% as was the rate fixed to bond holders. The typical term was 20 years, with a fraction of bonds each year retired at face by lot. The first of the plantation loans was floated by William Gideon Deutz in 1753, and, according to Van de Voort, ultimately 76 to 80 million guilders of plantation loans were issued by a large number of merchant houses and standard measures of investment safety were applied in the issuance – including a maximum loan to value ratio. They took many forms, and would often pool the mortgages from several plantations into a single negotiatie.

A drop in commodity prices in 1771 and a financial crisis in the Amsterdam market in 1773 led to widespread defaults on plantation negotiaties, and a drop-off – though not a complete disappearance in their issuance. Van de Voort estimates that investors suffered substantial losses; recovering only ¼ of their capital and realizing no more than 3% interest.

⁵ Van de Voort, 1973 is a detailed study of the Dutch plantation loans from which this discussion is taken. See the English summary pp. 218-221. The role of the plantation loans in Dutch financial development is discussed in Rouwenhorst, 2005.

Rouwenhorst (2005) points out the role these plantation loans played in a further financial innovation of the 18th century; closed-end mutual funds; negotiaties that offered a stream of interest derived from a portfolio of traded securities. The first of these Eendragt Maakt Magt, was a purely financial security issued in 1774 by Abraham van Ketwich. It was unrelated to the commodities trade except insofar as it held in its diversified portfolio plantation loans in Essequibo, Berbice and Danish American Islands, along with securitized Danish toll revenues, Russian and German sovereign debt, and Spanish toll revenue bonds.

These loans were not simply pass-through instruments, but fixed-income securities with a stated yield (around 5% in many cases). The revenues from the underlying securities were intended to cover the stated yield. One more peculiarity of the Dutch closed-end funds is worth noting. The income from the underlying securities was further expected to pay for a lottery by which random shares in the negotiatie would be retired at values far above their face. This peculiar feature insured that the return on the pool of bonds stochastically dominated the return distribution for any single loan.

Precedents Further Afield

There are other financial precedents relevant to the issuance of securities in Amsterdam to finance American land purchases. The first is the emergence of land banks in various forms through the 18th century. Only a brief overview is offered here. The first land bank proposals were floated in England around the turn of the 17th century as a means to create money out of real property. One of the early land bank theorists, John Law, regarded the scarcity of money as one of the greatest constraints to commercial development, and the reliance of European economies on the supply of New World silver as a risk to be mitigated by changing the collateral for money from precious metal to real property.

America was one of the first places to implement land banking due to the extreme scarcity of hard specie in the colonies. Beginning in South Carolina in 1712, publicly sponsored land banks were created by colonial governments to issue mortgages in paper currency which could ultimately be used to purchase foreclosed properties. Other colonies immediately followed suit. Parliament was alarmed that the currency of several colonies traded at a discount, reflecting the market perception of their risk. Among other things, the structure of the land bank system imbedded conflicts of interest: local boards appraised properties and made loans. Related lending represented an obvious problem. Parliament outlawed land banks and ultimately all were closed by 1740. Land banks did not make a significant re-appearance until the end of the Ancien Regime and the creation France's revolutionary currency, the assignats.

Other important precedents were the early American land companies that Livermore (1939) argues were innovative corporate structures in their own right. A number of pre and post-Revolutionary companies were formed to claim, develop and settle western lands – the Ohio Company launched by a group of powerful Virginians being among the most well-known. These firms were essentially private equity share-based companies which could conceivably have served as a model for Dutch investors as well. Perhaps also relevant is that the American agent Cazenove began first by purchasing shares in American bridge and toll companies. At the very least the Dutch consortium was familiar with this form of public equity – a form that was also known and practiced on the continent in France.

Although Dutch financiers were not involved in the American land bank experiment or the French assignat system – except perhaps as speculators – these models are relevant in that they demonstrate the active use of property as collateral for publicly traded debt – whether interest-bearing securities or paper money. They indicate that securities collateralized by land were not unknown at the time of the Dutch land loans.

Finally, another relevant precedent is the *Landschaften* of 18th century Prussia studied by Kirsten Wandschneider (2010). She traces the development of these land credit associations to a financial crisis in 1770 that required the restructuring of debt of the landed nobility. This was accomplished through the issuance of public bearer bonds backed by mortgages held by the *Landschaften*. Wandschneider likens them to modern “covered bonds” which have recently been proposed as safer alternatives to mortgage-backed debt. Undoubtedly these were also known to Dutch financiers in the 1790’s.

Dutch Investment in American Debt

The story of Dutch investment in the debt of the early United States is well described by Riley (1978). The first underwriters of American loans in the Netherlands were the firms of W. & J. Willink, N. and J. van Staphorst and De la Lande and Fynje who floated loans for the United States in 1782. These Dutch intermediaries earned commissions as high as 8% for the early floatations and 3% to 5% for later loans.

Even more profitable was the speculation on domestic debt of the United States which Dutch merchants bought at steep discounts at the nadir of American creditworthiness prior to Hamilton’s reorganization of the debt. Over the period 1782 to 1794, Dutch speculators issued a number of negotiatives on the Dutch capital markets backed by the bonds of the United States. These American negotiatives which typically paid a promised rate of interest and were secured with U.S. securities held in trust. Riley points out that the first movers in this securitization of American debt were also major boosters of America. Pieter Stadnitski, a member of the Dutch Patriot faction ultimately aligned with the French Revolution, was not only a major purchaser and securitizer of U.S. bonds but also an enthusiastic pamphleteer who wrote glowingly about the new American democracy and the wonderful American land. Riley calculates that Stadnitski made a killing by buying American paper at 37.5 % of face value and selling it at 60% of face to investors in his negotiatives. His arbitrage was rapidly imitated by other merchants and not surprisingly spreads narrowed. An important feature of these instruments is that they provided for a distribution of residual profits deriving from the

purchase of U.S. bonds at a discount. As prices of U.S. debt rose to par, the capital gain accruing to investors – even after the issuers took their cut as intermediaries – was substantial. Thus there was some “right-tail” to the distribution of expected returns to investing in the debt of the young United States. Their popularity with the Dutch public may have been due as much to this feature as to the conviction that the U.S. was certain to meet its obligations.

The firm of Daniel Crommelin and Sons of Amsterdam was among the several issuers of negotiables backed by U.S. notes. He was aided in this operation in 1794 by an American merchant from Boston, James Greenleaf. Greenleaf was married to a daughter from a prominent Amsterdam banking family and served as U.S. consul to the Netherlands. He knew the Crommelin family through their mercantile dealings in the U.S.. There was an American branch of the family stationed in New York, where part of Greenleaf’s business was also located.

III. Financial Innovation: American Property Securities

The rich data in Dutch archives and the considerable historical research devoted to the history of the Holland Land Company and to the early development of Washington D.C. make it possible to trace in detail the process of innovation leading to the issuance of securities on American speculative lands.

Over the brief period 1793 to 1795, there were four securities floated in the Dutch capital markets that were used to finance speculation on American lands. All of them had characteristics of mortgage securities in that they were collateralized by title to property held in trust in the event of default. Two of these were obligations of the Holland Land Company and two were obligations of James Greenleaf, acting in concert with two other major American land speculators, John Nicholson, comptroller of the state of Pennsylvania and Robert Morris, former Superintendent of the Treasury. Together these three were among the largest property holders in America at the time.

This section describes the development of these securities and their contractual details.

Holland Land Company Negotiations

In 1789 a consortium of leading merchant houses formed to explore land purchases in America. The firms of Stadnitski, Van Staphorst, Van Eeghen, Ten Cate & Vollehoven had all made money buying American funds and issuing negotiatives. They employed an agent to travel to America: Theophile Cazenove who scouted opportunities and began to invest the firm's capital, initially into the canal companies. In April, 1791 they joint-ventured with the Rotterdam firm of Van Beefting and Boom to explore for sugar maple operations with the hope of establishing another source of commodity production in the American forestland. Cazenove also became interested in purchasing undeveloped land for division and sale to immigrants and U.S. settlers. In December of 1792, The Dutch consortium bought 3,300,000 acres in the Genesee River Valley from Robert Morris. That same year the Holland Land Company was created. The five firms brought in the Van Willinks and retained Rutger van Schimmelpenninck as legal advisor.⁶ The share company was formed among the participants and the shares were not publicly issued, so it was, in effect, a private equity company. The firm further formalized its structure in 1796.

The first negotiatives of 3,000,000 guilders was floated in January, 1793 on one million acres of land in the Genesee valley which was valued (or transferred to the trustees of the negotiatie) at 1.2 guilders per acre. In addition 1,200,000 in American funds was transferred to the trustees to cover the costs of paying interest over the first five years.

⁶ This account is taken from Evans pp. 24 and ff.

The first issue was completely subscribed, and a second followed in June.⁷ These were preceded by a promotional pamphlet published by Stadnitski in 1792 extolling the virtues of America, describing the particulars of the settlement process and projections about an increase in the demand for land. Evans (p. 28) notes that Stadnitski's pamphlet describes the speculative profits Morris himself had made – tripling his investment in a million acre purchase via a sale to the British Pultney Company. Accompanying this pamphlet were calculations of expected profits of more than 200% over a nine-year horizon accruing to an investment in 400,000 acres of land in the Genesee valley. Important to our analysis is that this spreadsheet, almost certainly prepared by Stadnitski for a French investment market, shows no positive cash flow for the first five years. Even in an optimistic scenario capital investment was required; hence the necessity of substituting a portfolio of U.S. Deferred debt to address the problem of the mismatch between duration of the debt and the assets. The management fees, in addition to costs were 1% for startup (up front), and .5% for payment of dividends.

The bonds met their minimal obligations by paying interest through 1798, however the land sales to extend the interest payments did not materialize. In 1804 the combined cash reserves for the two loans had decreased to 520,000 Florins due to investment and interest rate payments.⁸ The firm began a buyback program in 1805 to retire a number of the outstanding bonds each year at 40% and 35% respectively on face value by lot. The firm offered bondholders the option to register (or not) for this lottery. Registered bonds received a claim on the residual assets of the firm following the retirement of all remaining bonds. It is not clear what the motivation not to register for the lottery, since unregistered bonds were retired at the same discount to face as registered bonds. Roughly 2/3 of the bondholders accepted this exchange.

⁷ Details of the offering can be found in *Nieuwe Nederlandsche jaerboeken, of Vervolg der merkwaardigste geschiedenissen: die voorgevallen zyn in de Vereenigde provincien, de generaliteits landen, en de volkplantingen van den staet.* 1.-33. deel, 1766-98, Volume 2. P. 1442.

⁸ Evans p. 430

Figure 1 shows the prices as a percent of par value for the two Holland Land Company negotiatives over the period for which we have data. The figure also includes prices for portfolios of deferred 6% U.S. debt issued by Crommelin and Sons for comparison. There are several things to note about the trends in the figure. First, the value of the bonds dropped dramatically from 1796 to 1799, even though the U.S. debt dropped only about 10% over that period. This must reflect, to some extent, a dramatic revision in the expectations about returns to investing in American lands. If there was a bubble in land speculation in that period, it deflated over these three years. Second, political events -- the Napoleonic Wars in particular affected the prices of U.S. securities from 1809 through 1814 in general and indeed the prices of all securities in the Dutch market. The Aakers Land securities eventually recovered with the rest of the market while the Washington D.C. securities did not. Third, there was little effect of the revision of the terms of the negotiatie in 1804 or 1805.

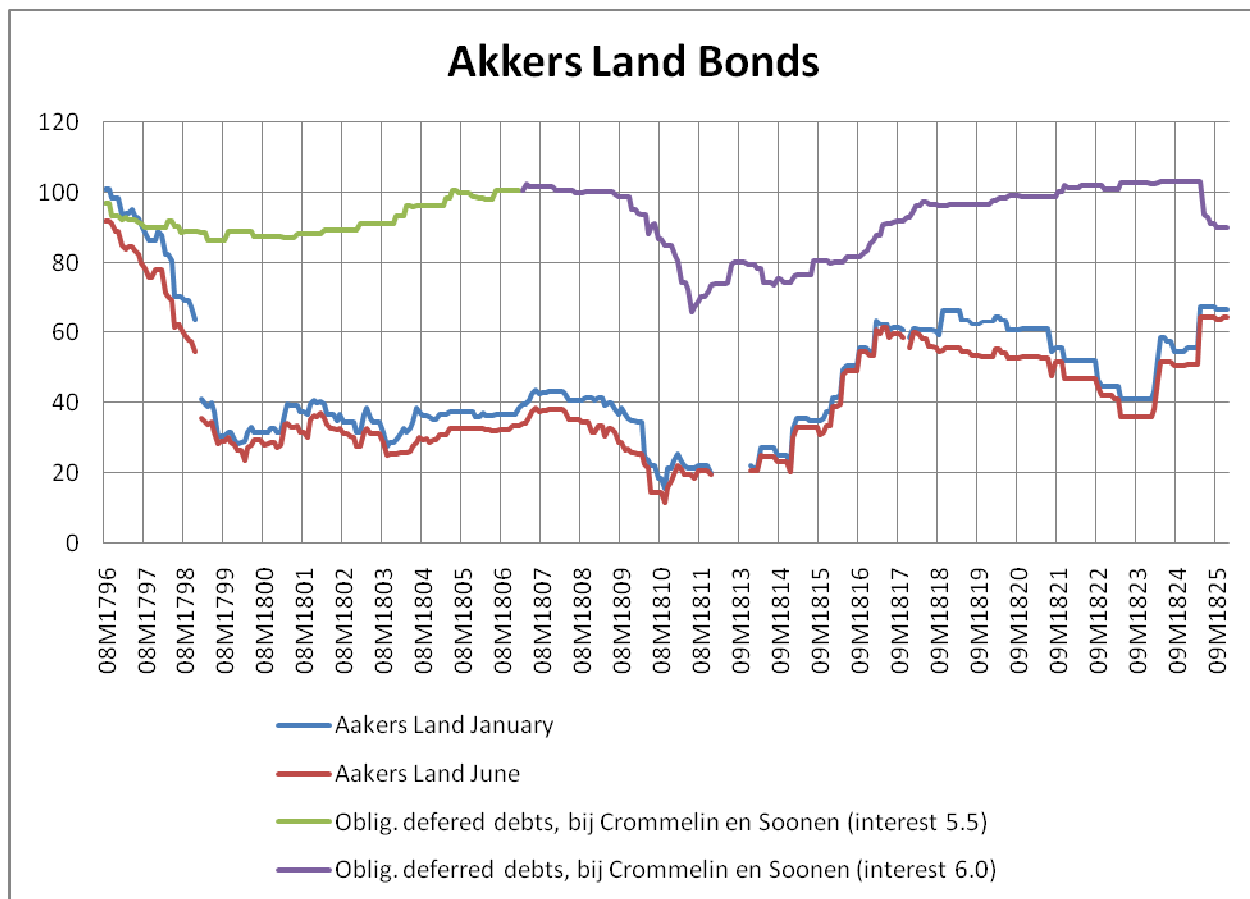


Figure 1

The firm ultimately retired all 3,000 shares of the negotiatie at the price as planned, and in addition there was a substantial residual value. Over a twenty year period, it made periodic payments to investors based upon land sales, which finally wound up in 1858. The amount investors received in total was 6,673,447.5 F. Evans claims that investors made a reasonable return on their investment in the long run, although this interpretation depends on selection of a risk-appropriate discount rate.

Decomposition of Debt and Equity

The re-structuring of the negotiatie in 1805 provide an unusual opportunity to decompose the security prices into a part due to the residual claim and a part due solely to the expected repayment of the reduced face value of the security. After 1810, the

registered and unregistered debt traded at separate prices, with the registered debt commanding a premium. Under the expectation that all registered debt would ultimately be converted, this price differential can be interpreted as a measure of the pure option value of the land portfolio.

Our reasoning is as follows. The securities were being drawn by lot and retired from 1805 onwards at 80-100 bonds per year. The retirement value of the debt each year stepped up by 5% to compensate holders of uncalled bonds for the time value of money (remember that after 1805 no periodic interest payments were made, but the principal increased in its stead). Presumably this feature made them indifferent in 1805 between an immediate call and a call in the future. The unregistered security thus represented a pure discount bond. With no probability of default, and a prevailing 5% long-term discount rate in the market this should trade at any given time for the current recall value.

For example, in 1825 the redemption value was 867.50 (having stepped up from 1805 at 5%/year). We collected prices for the registered and unregistered debt over the period 1815 through 1825.⁹ Figure 2 shows the registered and unregistered negotiable market price as a premium to a par. It indicates that the price of a security in 1825 that could be called next period at 867.50 was trading at about 400. Assuming indifference about the time value of money, this suggests roughly that the market assesses the probability of ever getting paid (under the conservative assumption of zero recovery in default) is roughly 50%. While a more thorough calculus can take into account the sequence of expected bond withdrawals and the potential timing of default, as well as expectations of recovery, by any measure the market placed the chances of getting even the discounted par value back as low. It was virtually trading as a defaulted security.

⁹ Sporadic quotations before and after this period should allow us to extend this data.

In light of this, it is surprising that the value of the residual component should be so high. The registered bonds (roughly 2/3 of the January issue) traded in the high 600's, indicating that the extra value of having a residual claim was practically equal to the market value of the zero-coupon bond claim.

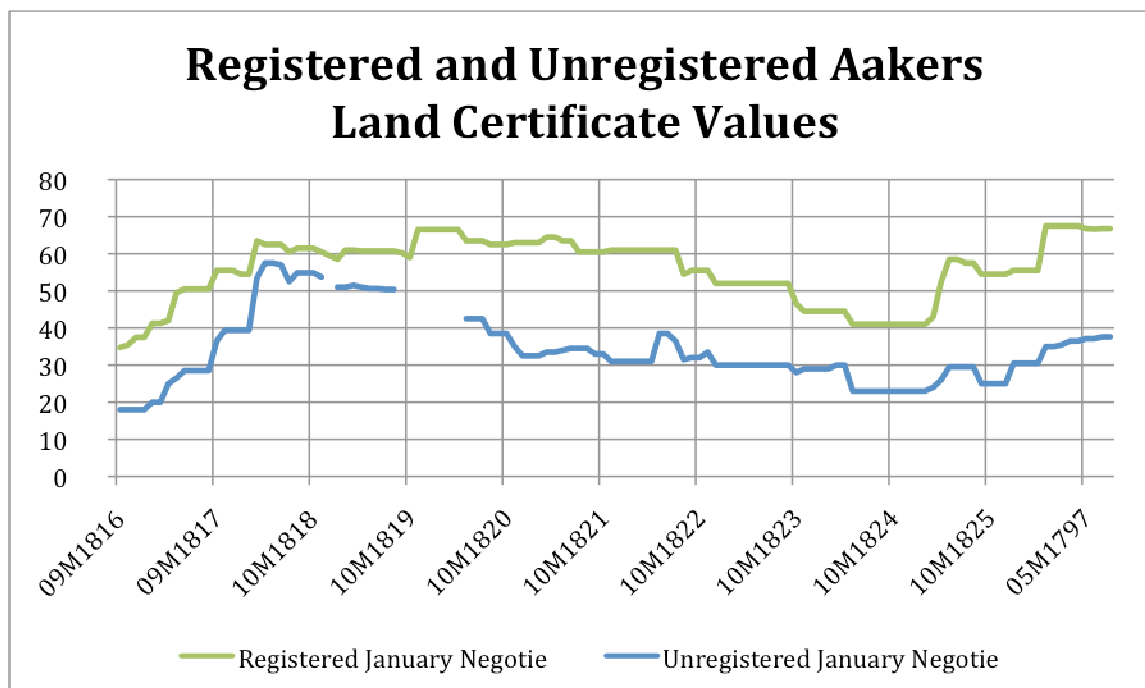


Figure 2

With an implied probability of default (and zero recovery) of 50%, the residual certificates are clearly out of the money options. One should expect the value of the residual claim to decrease as the market implied probability of default increased. This is certainly not the case in the 1819 to 1822 period, when the price of the unregistered securities drop from 50% to 30% while the price of the registered securities remain around 60%. In that period, the market perceives the moneyness of the residual claim as decreasing, but the price does not increase. Some other factor must be causing the value to increase. This is either the consensus forecast of volatility, or a shift in the demand for the option.

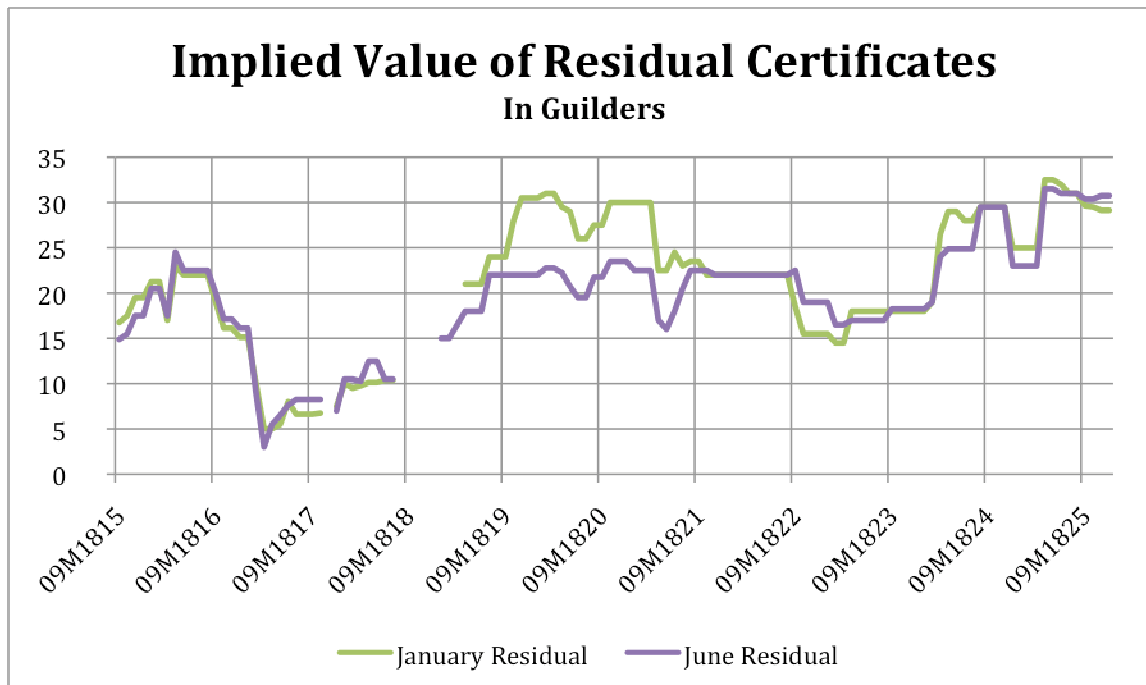


Figure 3

Figure 3 shows the time series of the value of the residual claims for the January and June negotiations. They are highly correlated, indicating that they capture an underlying economic phenomenon – not just the illiquidity of a market, for example.

Washington D.C. Bonds

In 1793, the success of the initial offering of the Holland Land Company negotiatie was demonstrated. In that year, James Greenleaf negotiated for the purchase of 3,000 lots in the new national city of Washington, D.C. while concurrently seeking financing from his former Dutch associates using a vehicle very much like the Akkers Land securities. As before, this involved two types of collateral; one for the interest payments to investors and another for the assets of the negotiatie. Both were held in trust. His efforts at soliciting Dutch financing resulted in two negotiaties – one issued in Amsterdam by the firm of Daniel Crommelin and Sons and the other in Rotterdam issued by Rocquette, Elzevier and Beeldemaker.

Following the pattern of the Holland Land Company group, Greenleaf undertook this issue after purchasing property in concert with two other investors, both major real estate speculators: Robert Morris, former superintendent of the U.S. Treasury, and John Nicholson, comptroller of the state of Pennsylvania. Neither is named in the Dutch issues which treat Greenleaf as the sole borrower. Morris, of course is the speculator who sold the land in New York to the Holland Land Company.

The terms of the Amsterdam loan are known from the proposal drawn up by Greenleaf and presented to the firm (see Appendix A).¹⁰ He proposed a two million guilder loan with a term of 12 years, for which he offered as collateral the 3,000 house lots purchased from the city of Washington. To guarantee the 6% percent interest on the loan over the first six years of the term of the loan, he offered as collateral a portfolio of U.S. government debt and debt of the bank of the United States. He had the right to redeem debt at face value and in so doing redeem a pro-rata share of the title to the land held in trust. Thus, the initial conception of the security was strictly a debt instrument.

The exact nature of the collateral structure is of interest. The title to the financial securities and to the real property was transferred to the trustees of the respective issues. This same structure for the Holland Land Company relied only on a notary who held the land deeds. The transfer of property deeds to Washington D.C. was documented through notarized and witnessed letters from officials in the United States. The squares in which the properties are located were concentrated in the north and east of the city, although Greenleaf's best known development is Greenleaf's point in the city's southwest. A map of the location of the properties is included in the appendix.

The trustees for the loan are Peter Godfrey, Daniel Crommelin and Rutger Jan Schimmelpennink. Godfrey and Crommelin were merchants/bankers issuing the bond, the third was a prominent lawyer and politician who, in the year 1795, the leader of the

¹⁰ Transcribed from the document in the Amsterdam City Archives.

Patriot revolt in the Netherlands against the crown that resulted in the Batavian Republic. He also held shares in the Holland Land Company.

The Greenleaf proposal for the Amsterdam loan provided a small equity-like feature. As bonds were retired by lot, there was an option feature for a small fraction of the bonds retired. The holder had the right to take a Washington city lot instead of the face value of the bond.

The Rotterdam loan was intended to be for one million guilders and pledged 1,500 house lots. It had a term of five years, 5.5% interest rate and a similar mortgage and trustee structure to the Amsterdam loan. The lottery structure of the Rotterdam loan was not tied to the value of the properties but instead simply paid a premium of 100% of face value for 10% of the bondholders chosen by lot. Held open for subscription over first several months of 1794, the loans were ultimately undersubscribed and the terms of the loan adjusted accordingly.. The Amsterdam loan collected only 200,000 guilders and the Rotterdam loan collected only 150,000 guilders. The fees of the Amsterdam investment issuers are not known from the surviving documents. The so-called directors of the Rotterdam loan incurred a 1% set up fee and .5% per dividend. The failure of the floatation is sometimes attributed to the turmoil of the Dutch politics at the time, but there is some possibility that the market was skeptical about a security floated by an American consortium as opposed to a Dutch consortium.

In all, 200 bonds were issued by Crommelin in Amsterdam with a face value of \$1,000 guilders. The list of subscribers contains the names of other merchant houses of the day, including bankers. Unlike preceding U.S. Debt negotiatie issued by Crommelin with Greenleaf, here are no surviving certificates and thus they may not exist, although the legal rights of the holders are summarized in the 'Nieuw Nederlandse jaerboeken'.. From the period 1796 through 1811, the Amsterdam Pryscourant quotes bid and ask prices for the two negotiaties on a regular basis. This implies that they were publicly traded.

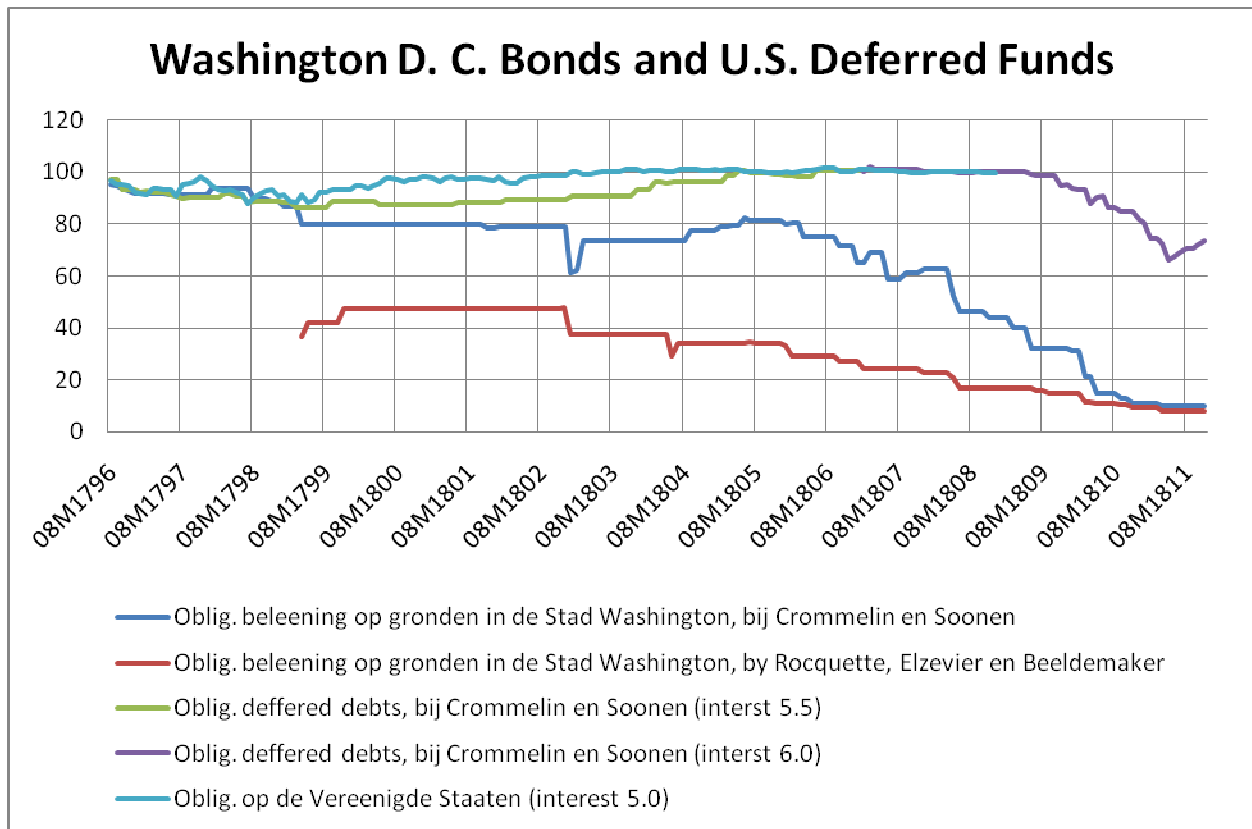


Figure 4

Figure 4 plots prices for the Washington D.C. negotiatives over the period 1796 to 1811. No prices are available after that date. Unfortunately prices do not exist for the years prior to 1796. Immediately following the floatation of the negotiatie in 1794, Greenleaf, Morris and Nicholson experienced liquidity problems. This was almost certainly due to the fact that they had bought a large number of lots in anticipation of financing that did not fully materialize. This left the partners highly levered, and unable to meet obligations to their creditors, included the U.S. government. The terms of Greenleaf's purchase of lots included fulfillment of requirements to improve the land among other things.

The story of the Greenleaf, Nicholson and Morris bankruptcies is a long and fascinating one which will not be recounted here. Essential to our analysis is the step they took on February 20, 1795, (the year following the loans) to launch the North American Land Company. Each partner contributed property to the company, including land in

Washington D.C. as well as other holdings totaling 4,479,317 acres. These properties were held in trust, and shares were issued to the founders. While attempts were evidently made to make a public offering of shares in the North American Land Company in U.S. markets and in the Netherlands, relatively few shares were traded, evidently as a result of shares issued to creditors of the two men.¹¹ Greenleaf sold his shares in 1796 to his partners for \$1,500,000 in notes, although he remained connected with the business of the firm for many years as it wound itself up. He ultimately represented its business interests. In addition, he ultimately represented the business interests of the Dutch claimants to the Washington lots.

The holders of the Dutch negotiatie expected to be shielded from the tribulations of Greenleaf and company by virtue of having title to the properties in trust, and the guarantee of the U.S. securities to cover promised interest payments. The Dutch title to the lots was later challenged due to Greenleaf's conveyance of the titles prior to performance of his obligations to the U.S. government. This led to a protracted legal dispute. Ultimately, over many years, the Dutch investors received proceeds from periodic sales of Washington D.C. lots, some of which Greenleaf apparently managed to engineer to his advantage, despite a fiduciary role.

Greenleaf and Morris and Nicholson's difficulties stemmed fundamentally from their failure to raise sufficient capital to allow them to be patient investors in the development and sale of properties. Like the Holland Land Company, they could not monetize the properties rapidly enough to meet cash obligations. The sales of Washington lots took decades to realize.

Our thesis in this paper is that their problem in large measure stemmed from a sub-optimal security design.

¹¹ Livermore p. 168

IV. Path-Dependent Financial Innovation

In the first part of the paper we detailed the many precedents for the Dutch property negotiatie, particularly the debt-like securities and funds issued in the Amsterdam market in the mid to late 18th century. We showed how the features of the akkers land negotiaties and the Washington D.C. negotiaties could be traced to a particular precedent in the Dutch market. Our hypothesis is that the innovations were path-dependent and relied upon the marketplace's prior acceptance of bond-like instruments. This also precluded offerings of novel securities such as common stock. The debt securities in the Dutch market at the time were characterized by features designed to secure expected future payments, although certain of them also contained "right-skew" payoffs created by lottery features and rights in residual value to portfolios of securities. This framework of innovation is an exemplar of an institutionalist perspective in which frictions and information transactions costs of various types are minimized by reliance on precedent. One corollary is that path-dependent outcomes need not be first-best solutions or optimal in any measurable sense; only that they are improvements on existing technology.

By contrast, an equilibrium perspective asks what problem the new property negotiaties solve. I.e. why is a structured note collateralized by sovereign debt and mortgages the best, stable solution to a particular problem? We use Gorton and Pennachi as a starting point because their theory fits the 18th century setting quite well. First, it applies to a market in which there is a demand for money-like instruments. Second, there are information asymmetries, and resolving them is costly. Third, the entrepreneur has to decide on the method of financing a profitable venture. This applies well to the merchant funding of plantation loans, for example. Plantation owners could issue equity, risky debt or seek to design relatively secure debt with collateral. Gorton and Pennachi predict the last of these options will prevail. The reason for this is that relatively information-insensitive securities will have wide currency in a market in which the cost of valuation research is high. Issuers will find a widespread demand for their notes if they are designed to be traded with little fundamental research required. In

effect, highly collateralized notes underwritten by trustworthy intermediaries become money substitutes. In equilibrium the entrepreneur carves out a near-riskless piece and sells it to a market where it can trade anonymously.

This equilibrium security design seems to fit the case of the commodities trade better than the case of land speculation. The plantation loans generated regular income from the sale of commodities produced each year. By contrast the proceeds from the sale of raw land were highly uncertain. Although the techniques of the plantation loan and related debt instruments were applied to the property negotiatives, and these helped at least for the first few years to create liquidity and investor demand, the debt structure hampered both sets of merchants who resorted to this form of financing.

As discussed above, the Holland Land Company found the debt service burdensome and re-structured their negotiative in 1805 into an instrument with an equity-like component; reducing the face value to be repaid and replacing it with a residual claim. Shortly after issuing their two negotiatives, Greenleaf, Morris and Nicholson also tried to engineer an equity-for-debt swap by creating the North American Land Company. The American consortium of course had some institutional precedent in the 18th century American land companies, and the various infrastructure equity securities trading on the Philadelphia Exchange. These institutional forms might have encouraged the hope that such a rescue was possible. The Holland Land Company investors, on the other hand, were less immediately constrained because their public offering had been fully subscribed. On the other hand, the lack of a market for equities in the Dutch market meant that they had to issue residual certificates as opposed to shares.

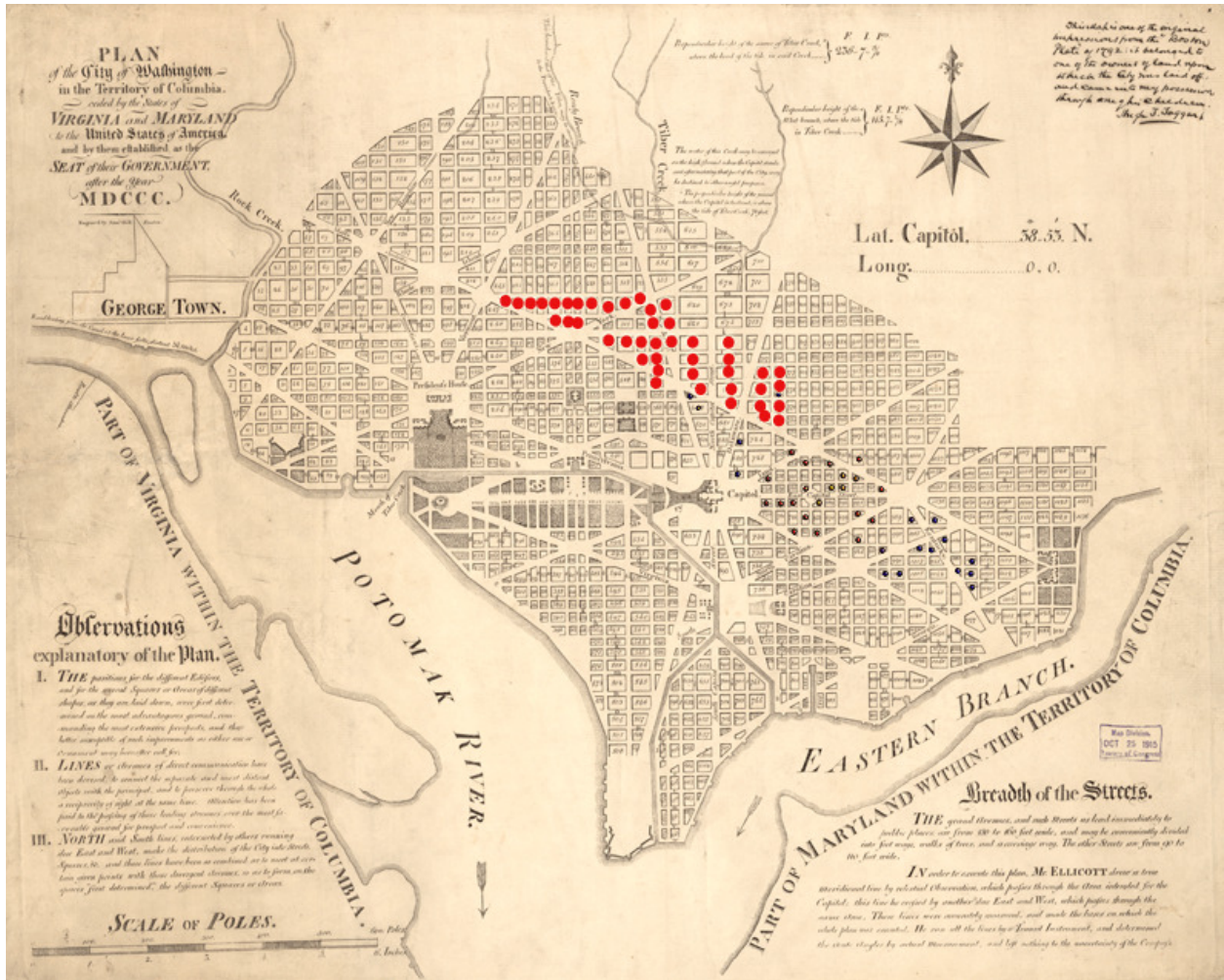
On the one hand, the land company negotiatives in 18th century Netherlands are extraordinary innovations: early and complex structured mortgage notes that demonstrate the remarkable sophistication of the capital markets of the time. On the other hand, the financial engineering required to make a debt instrument fit the needs of an enterprise whose value proposition is based upon patiently developing a market on the Western frontier, or the growth of an entirely new city is perhaps extremely

inefficient. Had these firms been able to issue equity IPO's to a market that accepted them comfortably, the outcome – at least for Greenleaf, Morris and Nicholson, might have been very different.

The economic lessons from this episode are many. The first there is a risk that financing methods based upon successful precedents can be pressed beyond their usefulness and validity. The second is that reactions financial crises that limit the contracting space, either through regulation or through a path-dependent development away from the conditions that caused the crisis, can have negative consequences. The third is that the development of the equity markets through financial history is not something we should take for granted. Despite its deep history, there were important points in time when it equity finance, at least through the public capital markets, was not available.

V. Conclusion

In this paper we use data from a rich period of financial innovation to examine competing theories. The Dutch 18th century public securities markets were essentially equity-less in the wake of the crash of 1720. This gap was filled by debt instruments which evolved to support an innovative merchant tradition that used collateralized securities for financing. We conjecture that the American land negotiatie pushed to capacity of debt to finance projects with long verification periods, but were used anyway with negative results, and led to re-contracting to create what amounted to equity. We show empirical evidence that the demand for this equity, once created was extremely robust. We interpret this as implicit demand for payoff distributions restricted by the path dependent development in the wake of the South Seas Bubble and Dutch Windhandel.



Appendix A: The Crommelin Loan in Amsterdam

Proposals are hereby made for a loan of eight hundred thousands dollars or two million guilders for and on account of James Greenleaf and being for the purposes of the improvement of the city of Washington in the federal district of the United States of America and to be effected at the counting house of _____ in Amsterdam; and for the security of the Lenders thereof Three Thousand House Lots lying in the said City of Washington, and averaging at the least twenty seven feet by one hundred and ten feet or two thousand nine hundred and seventy square feet per lot, to be mortgaged or pledged for the payment of the Principle borrowed. And the amount of _____ Dollars in six percent American Stock or such an amount of six per cent or three per cent American stock and of the stock in the Bank of the United states or of any or either of these stocks, as shall (by employing annually a part of the Principal) give a sufficient revenue for the purpose to be pledged for the payment of interest on the Principal borrowed all shall become due.

The Loan to be made for the term of twelve years, at and after the rate of ____ per Cent pr Annum, but with a provision of the right of discharging the whole or any part of the Principal sum borrowed on the sixth or either of the following years thereafter and of withdrawing of the property pledged, in proportion to the amount of the Principal so discharged. Unquestionable titles for the securing the payment of both Principal and Interest to be ledged with _____ notary Public of Amsterdam and subject to the sole control of _____ as Guardians for Account of the Money Lenders. At the discharge of the Loan, or of any part thereof, there shall be selected by a fair Division, from the lots redeemed a number of lots equal to one tenth of the number of Bonds or Obligations, for one thousand guilders each so discharged, and which lots shall be drawn for by fair ballot among those who receive their payments. The holders of the fortunate obligations on which such lots my fall, to have it as their option to receive or refuse such Lots returning therefor in case of a receipt, One thousand guilders for each lot in receiving clear deeds in fee for such lots.

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