

Lending to Lemons: Landschafts-Credit in 18th Century Prussia

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Abstract:

The following paper describes the emergence of cooperative mortgage credit associations, called ‘Landschaften’ in 18th century Prussia. Landschaften facilitated the refinancing of loans for Prussian estates by issuing covered bonds (Pfandbriefe) that were jointly backed by their members. They relied on a cooperative structure, joint liability, and local administration to overcome asymmetric information problems related to lending. Their emergence serves as an example for financial innovation in historical mortgage markets.

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1. Introduction

The 2007/08 financial crisis, which was preceded by a large housing bubble, has ignited interest in mortgage-backed securities and their regulation. It has also forced American banks to search for alternate ways to finance mortgages and reduce their dependence on the asset-backed securities market. Before this background, the introduction of covered bonds has been debated in the US. Covered bonds are secured directly by a pool of collateral, typically consisting of mortgages or public sector debt. They remain on the balance sheets of the issuing banks, as opposed to the off-balance sheet transactions for unsecured mortgage-backed securities. Covered bonds often receive the highest credit ratings, as they are backed by the collateral pool and the issuers' credit-worthiness (Packer, Stever and Upper, 2007). They are often seen as an investment alternative to government securities, and for the US mortgage market they might present a way to replace the federal guarantees in the housing market. A bill to introduce covered bond legislation was proposed in the US in 2010 (HR 4884 and HR 5823), but it narrowly failed to be included in the 2010 Dodd-Frank financial overhaul law.² A similar bill was reintroduced in 2011 (HR 940), recommended by the House Financial Services Committee, and is currently awaiting a House vote. Despite the lack of a cohesive covered bond framework, individual banks have made foray into introducing covered bonds in the US market, for example Washington Mutual and Bank of America.

Prior to the 1990s, covered bonds – called Pfandbriefe in German – could only be found in Germany and Denmark, and to a lesser extent in Austria and Switzerland (Packer, Stever, Upper, 2007). In the 1990s, covered bonds gained popularity with the introduction of covered bond bills in most of Europe. By 2010, the size of the European covered bond market had grown to 2.5 trillion Euros, with the German market taking up about one third.³ While covered bonds are popular in Europe, especially Germany, and have remained stable investment options throughout the recent crisis, few economists know about their origins and why they proved to be such successful and safe financial

² For current news coverage on the legislation, compare for example “An Effort to Adapt a European-Style Tool to US Mortgages” *The New York Times*, November 3rd, 2010.

³ European Covered Bond Council, www.ecbc.hypo.org.

instruments.⁴ This paper sheds light on the origins of the German Pfandbrief, which serves as template for covered bonds today.

Pfandbriefe were created by the Prussian Landschaften, cooperative mortgage associations of noble estates that facilitated the refinancing of loans to their members. They were launched by King Frederick II (Frederick the Great) in 1770, in order to support the Prussian landed gentry – often referred to as the Junkers – following the Seven Years War (1756-63). Landschaften were public institutions that did not have a profit motive and except for reserve funds did not hold their own capital.

The first of these Landschaften was the ‘Silesian Landschaft’ founded in 1770. Within quick succession other provinces followed suit. By 1790, five Landschaften had been created in different regions of Prussia: the Kur-und Neumärkische Ritterschaftliche Kreditinstitut (1777), the Landschaft of Pomerania (1781), the Landschaft of West-Prussia in Marienwerder (1787), and the Landschaft of East Prussia in Königsberg (1788) (Hecht, 1908, p. 10). These five ‘old’ Landschaften form the basis of this study. However, throughout the 19th century the Landschafts-concept spread to other German regions.⁵ While the old Landschaften were closed down at the end of WW II, others were folded into modern Pfandbrief-issuing banks and some smaller institutions exist to this day.

From today’s perspective, the study of Landschaften is relevant for several reasons:

First, as mentioned above, Landschaften provide the first institutional example of how safe bonds could be based on land (Frederiksen, 1894). They are the only mortgage lending institutions prior to the emergence of private mortgage banks in the mid-19th century. While mortgage credit had been an important element in European finance since the Middle Ages, previous attempts at issuing mortgage-backed debt, including John

⁴ The German Pfandbrief-market is the largest individual bond market in Europe (Mastroeni, 2001).

⁵ Other examples of Landschaften established outside of Prussia were the Ritterschaftliches Kreditinstitut des Fürstentums Lüneburg in Celle (1766/1790), the Hamburgische Landschaft (1782), the Landschaft of Schleswig-Holstein (1811), Mecklenburg (1818 and 1840), Posen (1822), Würtemberg (1825), Calenberg, Grubenhagen and Hildesheim (1825), Bremen und Verden (1826), and the Hannoversche Landes Kreditanstalt (1840) (Frederiksen, 1894).

Law's 'système', had failed.⁶ Landschaften and their creation of the Pfandbriefe therefore present an example for successful innovation in financial markets.

Second, Landschaften constitute a non-bank financial institution taking on the role of a delegated monitor.⁷ In this function, they enrich the understanding of German financial history, which has predominantly been focused on the success of the large universal-style credit banks.⁸ Landschaften, as non-bank financial intermediaries were successful in recapitalizing the impoverished Prussian estates and they provided credit and liquidity.

Third, by connecting the landholding Junker class to the financial market in Berlin, Landschaften enabled Junkers to expand the amount of leverage taken on against their estates, solidifying their economic dominance.⁹ Pfandbriefe also constituted an attractive investment choice for capital holders. However, as Landschaften were extended to include farmers and non-noble landholders in the mid 19th century, they expanded credit access and eased the transition from serfdom to peasant proprietorship (Frederiksen, 1894). Landschaften thus played an important role in the economic, political, and social development of Prussia and later the German Reich.¹⁰

In the following, this paper describes the common operational features of the Landschaften and demonstrates how they served as financial intermediaries. I will argue that the stability and relative success of the Landschaften can be traced back to their specific institutional design, which helped overcome adverse selection, moral hazard, and auditing and enforcement problems related to lending. I will also briefly outline their role and function for the Prussian economy. The paper is organized as follows: Section 2 describes the economic conditions in Prussia at the time of the creation of the Landschaften. Section 3 discusses the features of the Landschaften and introduces a stylized model of credit intermediation. Section 4 provides empirical evidence of their performance. Section 5 concludes.

⁶ Compare Hofman, Postel-Vinay and Rosenthal (2009).

⁷ Compare Stiglitz (1990).

⁸ For a review of recent developments in research focusing on German financial history compare for example Burhop (2006), Guinnane (2002) and Fohlin (2007).

⁹ For a more recent discussion, refer to Schiller (2003) and Hess (1990).

¹⁰ Compare Gerschenkron (1946) for a discussion of the role of the Prussian Junker class for German economics and political development.

2. Economic Conditions in Prussia and the Creation of the Landschaften

Prior to 1848 Prussia was a monarchy, ruled by the king and supported by the landed aristocracy, the Junkers, and the bureaucracy. Prussian society was organized in a feudal class system and the representatives of these classes, especially the Junkers, controlled local affairs through manorial courts and police powers. The Junkers also organized economic activity and while they are often portrayed as showing little interest in furthering industry, they were obviously concerned with the status of agriculture and their estates (Schiller, 2003; Hess, 1990).

At the end of the Seven Years War in 1763, Prussia emerged as a regional power. However, economic conditions were bleak. The war had disrupted trade and economic activity, and especially the areas east of the river Elbe had suffered from enemy occupation and having been the site of military operations. Farms were neglected and landowners, farmers and peasants were short on horses, cattle, sheep, fodder and seed (Henderson, 1962). To restore agricultural production, landowners and farmers were in need of long-term credits at affordable rates.

Before the war, landowners had relied on private credit intermediaries who offered a loan at about 6% interest plus ½ to 1% commission. Loans were usually granted up to half of the last sale price of the estate and would often be secured by an entry into the cadastral register of the estate (Mauer, p. 19). The foundation for the formal use of land as collateral for loans had already been laid with the 1722 bankruptcy law, which stipulated the publication of the cadastral register (Jessen, p. 36). Revisions of the mortgage laws in 1748 and 1750 established a ranking for debt, which secured debt registered in first position a privileged status (Weyermann, p. 64).

However, during the Seven Years War, the credit limit of 50% of the estate's last sale price had been raised, contributing to the high indebtedness of the manors (Mauer, p. 20). Defaults were rising and from the lender's perspective, verifying the security of a loan

and ensuring its repayment was cumbersome, and it entailed high information and transaction costs.¹¹

A study of the Kur- and Neumark in 1771 reveals that the average level of indebtedness of the estates was 53% of their value, but about 15% of estates were indebted over 100%, and some as high as 200% (Pr. Br. Rep 23B, Neumärkische Stände, Nr. 635). In addition, mortgage rates for the safest mortgage loans had climbed to 10% and the commission had widened to 2-3%, substantially increasing the cost of credit (Frederiksen, 1894). The agricultural credit crisis coincided with the financial depression and general credit crunch in the crisis of 1763. At the end of the war, speculative trading activities that had been profitable in wartime came under pressure, leading to bank failures, especially of the bank house De Neufville. The financial crisis was transmitted through bills of exchange from Amsterdam via Hamburg to Berlin. In Berlin, Friedrich II had tried to halt the crisis through the refusal of Wechselstrenge (holder in due course) and bailouts. However, both measures only heightened the risk perception of foreign creditors and worsened the credit crunch (Schnabel and Shin, 2004). In 1765, Friedrich II passed a three-year general moratorium on all outstanding debts – principal and interest payments – but this was insufficient to restore the estates and it did not relieve the overall shortage of capital. At the end of the moratorium in 1768, many estates went into foreclosure. According to contemporary sources, liquidations of estates in which less than half of the outstanding debt could be recovered led to a complete collapse of agricultural credit (Weyermann, p. 66). Land as collateral no longer sufficed to attract individual loans and creditors shied away from all rural investments.

Landschaften were created in this credit vacuum. The design of the Landschaften goes back to a proposal made by a Berlin merchant named Diederich Ernst Bühring in 1767. Bühring had spent the early years of his career in Amsterdam, gaining experience with trading bills of exchange that were used to finance economic activities in the Dutch colonies. Growing up in Bremen, he was also acquainted with Bremer ‘Handfeste-Urkunden’, bearer bonds that were backed with a claim on real estate belonging to the debtor (Jessen, p. 40-41). Bühring’s plan combined his ideas of these various financial

¹¹ Borhardt (1961) shows that the lack of credit in Germany was in fact not a problem of supply but rather of insufficient matching between creditors and debtors.

instruments and stipulated the creation of a general mortgage institute for Prussia, the ‘General Landschaftskasse,’ that would hypothecate all of Prussia’s noble estates. This Landschaftskasse would issue bearer bonds at 4% and would guarantee the convertibility and punctual payment of interest rates. Estate holders would elect to be part of this mortgage bank and would pay 4.5 or 5% interest on their loans. The interest rate differential would be used for administrative funds and to assemble a reserve fund for emergencies.¹²

The plan was presented to king Friedrich II in February of 1767 who forwarded it to his minister of finance, Etat-Minister von Hagen. Von Hagen rejected the plan in March of 1767. In 1768, Johann Heinrich Casimir von Carmer – the new finance minister and minister of justice – proposed a Landschaft for all of Prussia, but stipulated that all noble estates would be mandatory members of this new organization. The Landschaft would issue covered bonds up to half the value of all estates and guarantee the interest payments as well as the principal, backing the Pfandbriefe with the joint liability of all member estates. Furthermore, Pfandbriefe should circulate as quasi-money to alleviate the general shortage of credit.

It remains ambiguous whether Bühring’s plan served as the template for von Carmer’s proposal. However, since Bühring’s ideas laid out the key details he is often referred to as the conceptual father of the Landschaften (Jessen, p. 38). In 1777, after the first two Landschaften had already been established by the crown, Bühring was officially credited with the original concept of the Landschaftskassen (Jessen, p. 44).

Based on von Carmer’s ideas king Friedrich II passed a cabinet order to found the first of the Landschaften, the Silesian Landschaft in August of 1769. In the summer of 1770 the statutes of the Silesian Landschaft were ratified by the general assembly of the Silesian feudal class, and in December of 1770 the first Pfandbriefe were issued (Jessen, p. 47).

The creation of the Silesian Landschaft took up important elements of Bühring’s as well as Carmer’s original plans, but also differed in some key aspects. As von Carmer had suggested, the noble estates of Silesia were combined in a mandatory credit association and would jointly back all Pfandbriefe issued by the Landschaft. The key concept of the

¹² Compare Bühring’s Plan, cited in Maurer (1907, p. 190-95).

Pfandbrief however went back to Böhring's original plan, with the Landschaft guaranteeing the interest payments as well as limited convertibility. Lenders could therefore rely on the Landschaft rather than on individual borrowers for their payments. They would purchase standardized Pfandbriefe rather than negotiating private loans, and benefit from reduced transaction costs and an emerging secondary market. The key features of the Landschafts-credit for landholders were that it was long-term and affordable, so landholders were insured against low and variable returns. In addition, loans could not be called-in by the lender. This provided additional stability and security for the debtors.

(Insert Figure 1 here.)

An example of a Pfandbrief issued by the Silesian Landschaft on June 24th, 1774, and listing all the key features of this bond, can be seen in Figure 1. The picture shows a privileged Pfandbrief over 30 Reichstaler Courant, at 14 Reichstaler per mark fine silver. It is made out for the estate named 'Jaschkowitz' in the district of Toste in Upper Silesia, and it is backed by all combined estates in Upper Silesia. Interest was payable in cash in Cosel or Breslau and the receipts of the bi-annual interest payments were stamped on the Pfandbrief. Interest payments were carried out through 1923 (noted on the back) and in 1929 this Pfandbrief was stamped worthless and exchanged for a new gold Pfandbrief.

3. The Design of the Landschaften and their Lending Mechanisms

This section details the design of the Landschaften and proposes a stylized model of financial intermediation to illustrate their role in the credit market. It also outlines the special organizational features that Landschaften relied on to overcome the asymmetric information problems related to lending.

3.1 The Design of the Landschaften

The design of the Landschaften anchored their function as intermediaries between lenders and borrowers. To obtain a loan, a landholder and member of the Landschaft would place a request with the Landschaft. Then the local assessor, who was also a member of the Landschaft, would estimate the value of the estate and determine a credit limit that was either based on the net profit of the estate (Grundsteuerreinertrag) or its last sale price. After the credit was granted, the Pfandbriefe were handed to the estate holder the following Christmas or Johanni (Saint John the Baptist, June 24th). Estate holders could present these bonds to the Landschaft and ask to be paid in cash after a period of six months. Alternatively estate holders could sell the bonds directly in the open market. Bonds were initially issued at 4% and borrowers had to commit to paying bi-annual interest payments in cash to the Landschaft, plus an added ½-1% for administrative purposes.¹³

(Insert Figure 2 here.)

To raise funds, the Landschaft sold Pfandbriefe to creditors, especially urban merchant bankers that were seeking investment opportunities. Pfandbriefe carried interest payments of 4.5% or 5% and were first sold at their nominal value. With rising popularity their initial sale prices demanded a premium of ¼ to ½% and it became easier for landholders to sell them directly to investors rather than cashing them in with the Landschaft. Figure 2 describes the transaction, assuming that the Landschaft was presented with the Pfandbrief, Figure 3 describes how borrowers could sell their Pfandbriefe directly. In both cases the Landschaft remained responsible for coupon payments to the lender and the borrower made regular interest payments (twice a year) to the Landschaft.

(Insert Figure 3 here.)

¹³ The 4% interest rate was adjusted later to 3.5%, then raised again. Over their lifespan, most Landschaften created different issues of bonds, all priced between 3.5% and 5%.

3.2 A stylized Model of Lending Intermediated by the Landschaften

Following Gehrig (1993) and Demsetz (1968) I introduce a simple model of credit intermediation to illustrate the functioning of the Landschaften and their role for historical credit markets. The model is summarized in Figure 4. Assume that in a non-intermediated financial market, such as the capital market in Prussia before the Seven Years War, a continuum of borrowers (D) and lenders (S) meet at the unregulated equilibrium E, trading credit contracts at interest rate r and quantity Q . A financial shock, like the war, now disturbs this market, making it harder for lenders to receive repayment on their loans. Lenders start calling back loans, raising interest rates and restricting available credit. This puts pressure on borrowers, especially on those already experiencing financial strain. The credit market begins to resemble a lemons market – as described by Akerlof (1970) – where at rising rates only the high risk borrowers that are in immediate need for credit remain in the market. With shrinking supply, the market may completely collapse (compare the intersection of D and S'' in Figure 4). The idea that the credit collapse in the crisis goes back to a Lemon's problem and cannot solely be explained by the overall tightness of credit can also be seen in the fact that after the creation of the Landschaften, some lenders relied on the Landschaft to carry out the estate's assessment, but would then negotiate a private credit contract in place of the Landschaft's loan (Ucke, 1888). Moreover, the credit market was liquid before the war and recovered quickly after the creation of the Landschaften.

The introduction of the Landschaften and their issuing and selling of the Pfandbriefe introduces an artificial demand (D') and supply (S') that revives the market (up to the credit limit set by the total value of the estates). Borrowers can now receive loans in the form of Pfandbriefe from the Landschaft at interest rate r'' , while lenders can offer credit via their purchase of Pfandbriefe and receive a virtually guaranteed rate of r' on their loans. The difference between r'' and r' is used to cover the administrative costs of the Landschaft. While the intermediated equilibrium $E'E''$ remains inferior to the unrestricted pre-crisis equilibrium E it vastly improves on the crisis outcome and succeeds in re-instating the market.

(Insert Figure 4 here.)

The model predicts that in the intermediated market interest rates available for borrowers and lenders should straddle the old equilibrium interest rate. Lending volume should rise compared to the crisis outcome, but fall short of the old equilibrium outcome.

The following section now turns to the institutional features that the *Landschaften* incorporated to address the information asymmetry problems related to lending and to operate as effective credit providers.

3.3 Adverse Selection

Adverse selection is an *ex ante* informational problem which captures that under certain conditions only borrowers that are a poor credit risk will be attracted into a market.¹⁴ In response, lenders will not be willing to supply capital to this pool of ‘lemons’. To mitigate adverse selection, the old *Landschaften*, except for the Kur- und Neumarkt, automatically included all noble estates situated within the geographic expanse of the *Landschaft*.¹⁵ While this did not change the destitute economic situation of the estates, it gave all estates equal credit access at fixed interest rates and thus improved the pool of potential borrowers. Since all estates that were part of the *Landschaft* were also included in the joint liability, landowners had an incentive to rely on the *Landschaft* for credit, increasing participation and again improving the borrower pool.

Corresponding to the compulsory membership, all members of the *Landschaften* held a ‘right to credit’. Therefore, key to prevent adverse selection was the determination of the credit limit. The assessment of the member estates prior to granting a loan followed two different mechanisms. Starting from the last sale price of the estate, the landholder could obtain a loan up to one quarter, one third or one half of this price, depending on when the sale had taken place. Alternatively, the net profit of the estate was assessed by a tax commissioner, and the estate holder could then obtain a loan of 15-20 times the assessed

¹⁴ This ‘lemons’ problem was first described by Akerlof (1970).

¹⁵ *Landschaften* built on the history of earlier financial functions of Prussian feudal organizations, which had provided banking services to its members. However, most of these old credit banks had been shut down by a decree of the king in 1717. Only the ‘Kreditwerk der Churmärkischen Landschaft’ had survived as the last of these old credit banks. It functioned as the credit institute for the Prussian upper class and remained in operation until 1820, issuing bonds that were traded on the exchanges of Berlin and Vienna (Jessen, p. 48).

amount (Altrock, p. 25). To ensure a conservative assessment, the assessor could even be held personally liable for losses in the case of a too generous assessment (Weyermann, 1910).

Pfandbriefe were entered into the cadastral register of the estates and took precedence over all other outstanding debt, holding the preferred first debtor position. In cases where existing debt could not be extinguished prior to the Landschafts loan, the amount of capitalized debt was subtracted from the maximum loan value. But often landholders could exchange Pfandbriefe for existing debt up to the credit limit (Altrock, pp. 60/61). Pfandbriefe were also used to service standing obligations such as rent payments or payments resulting from inheritance or estate settlements (Ritterschaftliche Haupt Direktion, Rep 23A Kurmärkische Stände).

3.4 Moral Hazard

Moral hazard constitutes an interim problem in the lending process in which borrowers that have received funds engage in risky behavior, for example choosing a more risky investment project. Moral hazard can be avoided through improved incentives and monitoring. Moral hazard is also reduced when borrowers have to put up significant collateral. Without microdata on individual loans, it is hard to verify to what extent moral hazard presented a problem for the Landschaften. Generally, funds are described as being put to productive use, such as purchases of new agricultural machinery or construction or renovation of houses and barns on the estates.

Some indication for moral hazard, however, might be the purchase of new land, which was fuelled by the Landschaft and set off a speculative boom in real estate. Estate holders could take out Pfandbriefe for an existing estate and use the proceeds to buy more land, which could then again be assessed and used as collateral for new loans. Changes in ownership of estates were frequent between 1780 and 1806 and the noble estates were consolidated in the 1780s and 1790s (Mauer, p. 21). In 1789 the King passed a law for Silesia that limited the extent at which new estates could be purchased with Pfandbriefe. However, this law was difficult to enforce and was abolished again in 1791. While the Landschaften failed to set up an effective mechanism to prevent land speculation, the practice appeared to have attracted less followers over time.

The key mechanism for *Landschaften* to address moral hazard was collateral and the principle of joint unlimited liability. Issuing the *Pfandbrief*, two legal obligations were incurred (Mauer, p. 3-4). First, the owner of the *Pfandbrief* held a claim against the estate to which the *Pfandbrief* was tied. This claim was a charge against the land on which the estate was situated, not against any private property or assets of the owner, but in ensured that each borrower brought in adequate collateral. Second, the *Pfandbrief* constituted a claim against the *Landschaft*, meaning that the *Pfandbrief* was backed by all liquid assets of the *Landschaft* as well as all land of the member estates of the *Landschaft*, whether they had borrowed money or not.

The joint liability feature resembled group-lending contracts used in modern microfinance groups and the design of the credit cooperatives founded in the mid-19th century by Friedrich Raiffeisen and Hermann Schulze-Delitzsch.¹⁶ Even though the joint liability was never called on in practice, it appeared to be an important signal, at least in the early years of the *Landschaften*' existence. It also increased the incentive for neighbors to monitor each other (Hagedorn, p. 58). Since *Landschaften* were relatively large institutions, local monitoring was not always easy. But all members of the *Landschaft* belonged to the same social class, making the group fairly homogeneous and conscious of social stigma. Moreover, *Landschaften* built on the existing political and social order, continuing and often replacing the organization of the 'Stände', which had historically ensured representation of the nobles. This reinforced the relationship between the *Landschaft* and the pre-existing social structure. *Landschaften* were also subdivided in smaller regional groups for administrative purposes. For example the *Landschaft* for East Prussia was split into three administrative regions (Angerburg, Königsberg and Mohrunen), each of which again was divided into 3-5 districts.¹⁷ These smaller administrative units reinforced monitoring. One advantage of the *Landschaften* over private lenders laid in the fact that all monitoring was now relegated to this institutional structure within a central authority. To help with auditing and enforcement,

¹⁶ A detailed discussion of the Raiffeisen credit cooperatives can be found in Guinnane (2001, 2002).

¹⁷ The Prussian administrative units of 'Department' and 'Kreis' are frequently translated as administrative district and county, respectively. Eddie (2008) argues that the terms administrative region for Department and district for Kreis are more accurate representations. Also, the *Landschafts* Departments and Kreise do not exactly follow the administrative units.

Landschaften relied heavily on local expertise and used local officers to inspect the estates and set the maximum loan amount.¹⁸

3.5 Auditing and Enforcement

Regarding their institutional structure, Landschaften were self-governed with elected officials coming from the membership. Landschaften were managed by the General-Landschaftsdirektion, headed by the Generallandschaftsdirektor (general director), elected for six years. Next to the director worked a corporate counsel, which also had judicial powers to be able to carry out foreclosure. In addition, three Generallandschaftsräte with complete voting rights were part of the Landschaftsdirektion. These had to be estate holders in the Landschaft and be fully employed in agriculture. In contrast to the director and the counsel, which were employed by the Landschaft, all other positions were honorary. By relying on voluntary labor, Landschaften kept costs to a minimum.

The Landschaftsdirektion was equivalent to a board of directors and carried out the important decision-making and the day-to-day operations of the Landschaft. Members of the directorship were elected by a supervisory board, called Landschaftsausschuss, that was designed to be representative of the membership of the Landschaft. It included 20-25 members, and met at least once a year to supervise the Landschaftsdirektion (Jessen, p. 119). Over time Landschaften supplemented the Landschaftsdirektion with additional tax and accounting committees that assisted with assessing the estates and supervising financial matters.

To strengthen their enforcement mechanism and provide a tool to address defaulting estate holders, Landschaften had the right to foreclose on estates that were in arrear with their payments. The foreclosure process provided a credible threat and even if not frequently, was employed on a regular basis. Due to the relatively conservative loan amount of half the tax value of the estate, Landschaften were usually able to cover the amount of the outstanding loan with the sale price.

¹⁸ Landschaften also refrained from valuing life stock early on, as it was found that livestock was too variable and estate owners would ‘borrow’ life stock for the time of the assessment (Frederiksen, 1894).

3.6 Additional Measures

Landschaften reduced transaction costs as they pooled loans and created a standardized debt instrument. They could realize economies of scale and scope by including up to 2,500 borrowers and reaching deeper into the pool of creditors.¹⁹ As the Pfandbriefe were standardized, this also offered creditors an emerging secondary market that increased liquidity. Pfandbriefe of the Prussian Landschaften were quoted on the Berlin Bourse and were available to a wide audience of lenders.

Additional mechanisms, which boosted the stability of the Landschaften, were the accumulation of reserve funds, and over time, the introduction of amortization schedules. In addition to the land provided as collateral for the Pfandbriefe, Landschaften built reserve funds that were to be used to cover unexpected operating costs or irregular losses. Reserve funds were never used as a source of loan funds, but they represented a form of forced saving that added a level of security to the Pfandbriefe. The capital accumulated by the Landschaften resulted from the interest differential paid by the borrowers, as well as capital injected by the crown. For the Silesian Landschaft, for example, King Friedrich II extended a loan of 200,000 Talers at 2% interest (Frederiksen, 1894). However, not all Landschaften received this form of direct assistance. Moreover, the Landschaften seemed not to depend on these loans for their day-to-day operations. Over time, all Landschaften built sizable reserve funds, however, these assets were only used for emergencies and not to issue credit.

Landschaften varied in the extent to which the borrowers had to amortize their existing debt. While the Landschaften paid out the principal of the loans on demand, originally, the individual borrowers were only obliged to make regular interest payments to the Landschaft and the 'old' Landschaften did not carry provisions how the existing debt should be retired. Only over time did Landschaften introduce obligatory amortization schedules (Frederiksen, 1894). Between 1770 and 1777 borrowers could opt to retire their debt through bond payments as well as cash payments to the Landschaft. In 1777 the by-laws of the Silesian Landschaft stipulated that debts could only be extinguished with Pfandbriefe of the corresponding interest schedules. Only after 1785 cash payments were

¹⁹ By the early 20th Century, the East Prussian Landschaft even included over 15,000 estates that had issued Pfandbriefe.

permitted again. The lack of amortization was seen as a structural weakness of the Landschaften and in the design of the subsequent Landschaften, for example Posen in 1818, provisions to pay off the debt were included from the start (Mauer, p. 168). For the 'old' Landschaften, however, estate holders resisted the amortization, especially during the agrarian crisis of the 1820s. But as economic conditions improved, the West and the East Prussian Landschaft began creating amortization funds to extinguish some of the existing Pfandbriefe. In 1832, the East Prussian Landschaft even raised the interest payments for the estate holders by 1/6% (Mauer, p. 169). But in practice, these funds were nothing but expanded reserve funds for the Landschaft as they were never used to relieve the estates of their debt. Mandatory amortization by the estate holders was only introduced in the 1920s. (Jessen, p. 78).

4. Empirical evidence

In the following section I present empirical evidence that is consistent with the presentation of the credit market model and highlights the importance of the institutional features of the Landschaften.

This evidence remains descriptive since data are scarce and often inconsistent. Nevertheless it shows that overall the Landschaften were successful in providing credit to the Prussian nobility. Contemporaries describe the Landschaften as averting liquidations of Junker estates and stabilizing economic conditions. For example, Friedrich II claims in his memoirs that the Silesian Landschaft saved 400 of the best families of the province from ruin (Frederiksen, 1894). In fact, Landschaften lowered the cost of credit for agricultural estates from about 8% before the Seven Years War to below 5%, and Pfandbriefe circulated widely soon after their issue. While in Silesia, interest rates in 1770 had been 6, 8 and 10%, rates averaged 4.66% in 1777 and 4% in 1787 (Jessen, p. 67). Homer and Sylla (p. 258) show that interest rates in Prussia throughout the 19th century were consistently lower than in neighboring regions.

Pfandbriefe were deemed extremely safe investment choices, often at par with government securities. They also increased the value of the estates that could be used as

collateral and brought a stabilization and eventual rise in the price of land. In 1770 the value of all noble estates in Silesia was estimated to be 60 million Reichstaler, of which 22 million were registered debts. Already by 1790, the value of the estates had doubled and Pfandbriefe valued at 15 million Reichstaler were circulating (Jessen, p.68).

(Insert Figure 5 here.)

The number of estates that borrowed through the Landschafts-system (Figure 5) rose steeply, especially from the mid 19th century onward. With it also the total amount of Pfandbriefe increased (Figure 6), emphasizing their popularity in financial markets. Pfandbriefe were also popular investment choices abroad, to the degree that the government worried about interest payments that were paid to foreigners and tried to curb foreign sales (Franz, p. 26).

(Insert Figure 6 here.)

The steep rise in the number of estates for the Landschaft of East Prussia and the amount of Pfandbriefe issued corresponded to the changes in regulations of the Landschaften. Over time, they expanded to include smaller estates and farms. In 1808 the East Prussian Landschaft decided to include non-noble estates that belonged to the Köllmer, a group of free farmers. Beginning in 1849, the East Prussian Landschaft included all estates of a minimum tax value of 1500 marks (Altrock, p. 108). The effect of the Landschaften for these smaller farms however remained limited and large estates took more advantage of the Landschafts-credit than smaller ones. In the second half of the 19th century the system of Landschaften solidified and expanded. Many Landschaften added additional financial services in the form of Darlehnskassen (savings and loan associations) and insurance companies (mostly fire and life insurance). In 1860 for example the East Prussian Landschaft added the Landschaftliche Darlehnskasse. Also, similar to the central organizations of the Raiffeisen credit cooperatives, the Central-Landschaft for the Prussian States was founded in 1873.²⁰ This central organization was a cooperation of twelve regional Landschaften. The Central-Landschaft issued unified Central-Pfandbriefe, which were thought to be more appealing to a wider group of buyers, however since the individual Landschaften still issued their own Pfandbriefe alongside

²⁰ Compare Guinnane (1997) on the Raiffeisen centrals.

the Central-Pfandbriefe, the Central-Landschaft's success remained below expectations (Jessen, p. 92).

In practice, Landschaften issued two different kinds of Pfandbriefe. First, Capitalsbriefe (capital bonds), which constituted 90% of the total share of all Pfandbriefe and second Realisationsbriefe (realized bonds, 10% of the total). Realisationsbriefe could be exchanged on demand at the Landschaft into Prussian Taler. They were issued in denominations of 20-100 Talers, while Capitalsbriefe were denominated up to 10,000 Talers. For Capitalsbriefe, there was a six-months exchange period after which the Pfandbriefe could be cashed in (Jessen, p. 72). The Landschaft thus needed to hold reserves in the amount of all issued Realisationsbriefe, initially made available by the crown. At an exchange rate of 14 Talers to a mark of fine silver, Pfandbriefe were directly tied to the monetary base, but backed by land rather than specie. Often borrowers could pay obligations directly with the acquired Pfandbriefe, without cashing them in at the Landschaft.

Zöllner writes in his "Letters about Silesia" in 1793, describing the function of the Pfandbriefe as quasi-money:

"Und im Grunde war es für die Provinz so gut, as wenn 14 Millionen Taler bares Geld in dieselbe gekommen wäre, weil diese Summe in Pfandbriefen vorhanden war, deren man sich zu allen Zahlungen eben so sicher und mit noch grösserer Bequemlichkeit als der Klingenden Münze bedienen konnte" (Zöllner, p. 399)

Translation: "In effect, it was as if 14 million Taler in cash had entered the province, as this sum was available in Pfandbriefe, which could be used for all payments with the same security and even greater convenience as coins."

(Insert Figure 7 here.)

Figure 7 shows the development of Pfandbrief yields for the five old Landschaften in comparison with the 4% Prussian sovereign bond. These yields reflect the major economic and political events of Prussia at the time, but their peacetime overall stability

also speaks to the success of the Landschaften. Frequently the Pfandbriefe traded at par with or above the Prussian state bonds.

All Landschaften initially issued 4% Pfandbriefe, which were converted to 3.5% in the 1830s. From the 1830s forward, Landschaften issued a broader selection of Pfandbriefe with varying interest rates (3.5% - 5%) to compete with changing conditions in the credit markets.

The yields of the Silesian Landschaft remained below 4% from the outset and were stable until the beginning of the Napoleonic Wars, when the yields of all Landschaften spike. The Wars halted agricultural productivity in Prussia. They also burdened East Prussia with approximately 260 million marks in wartime costs (Altrock, p. 110). In response, Landschafts members were granted extensions on their interest payments between 1807 and 1818 (Ristau, 1992). Also, after 1807, the Silesian Landschaft and the East Prussian Landschaft incorporated territories of the Prussian State as member estates. This allowed Prussia to request Pfandbriefe backed by these territories and thus raise funds to pay off war debts. Thus the Silesian Landschaft, as well as the East Prussian, was actively used to expand the government budget and the fiscal debt with the Landschaft was not amortized until 1900. However, other Landschaften refused to accept State territories into their domain, thus assuring their independence from the Prussian State (Jessen, p. 74).

The years 1807-1815, were also years of agricultural reform for Prussia. Following the proposals by Karl August von Hardenberg and Heinrich Friedrich Karl Freiherr von Stein the old feudal system was abolished and farmers were liberated (Jessen, p. 84). As part of the reforms, noble estate holders were compensated for the loss of agricultural labor with part of the land that had belonged to farmers. The effect of these reforms on the value of the estates and thus the value of the Pfandbriefe was unclear at first. The loss of workers reduced the productivity of the estates, but the additional land again could be used as collateral for the issue of new Pfandbriefe (Mauer, p. 52).

The Pfandbrief yields for all five Landschaften recovered with the end of the War and, with the exception of spikes for East and West Prussia in the early 1820s, remained stable until the 1848 revolution. Beginning the in 1840s, the Landschaften also struggled to attract capital due to the rising need for credit in industry, especially railroads and mining

(Altrock, p. 113). Frequent Pfandbrief conversions also lowered their popularity in the 1860s. However, prices steadily recovered again after the German unification of 1871, trading close to par in the 1880s and 1890s.

(Insert Figure 8 here.)

The movements of the yields are also mirrored in the outstanding interest arrears, which *Landschaften* accumulated over time (Shown in Figure 8). Arrears are generally low for the period after the 1830s, speaking to the *Landschaftens'* stability and their overall successful monitoring of loans. Arrears spike, especially for the *Landschaft* of East Prussia, for the years before 1815, related to the suspension of payments during the War. They rise again, predominantly for East and West Prussia during the early 1820s, mirroring the yield movement. The poor performance in the 1820s was driven by the agricultural crisis that affected the estates (Ucke, 1888).

(Insert Figure 9 here.)

With rising interest arrears, *Landschaften* did make use of their right to take estates with nonperforming loans into receivership and ultimately foreclose estates to recover the outstanding loan amounts. Systematic data on estates in receivership and foreclosures are lacking, but for 1829 for example, the Acta of the *Königliche Oberpräsident* of Prussia list 30 estates in receivership in East Prussia and 32 estates in receivership in West Prussia (XX.HA Hist. Sta. Königsberg). Data on West Prussia for the period after 1870 (shown in Figure 9) shows that *Landschaften* did make use of this enforcement mechanism and that the takeover of the estates was by no means and empty threat.

5. Conclusion

Landschaften were public non-profit institutions that by issuing covered bonds, formalized the mortgage market in Prussia, beginning in the second half of the 18th century. They were effective in providing credit to Prussian noble estates and by demonstrating how bonds could be safely backed with land served as an early predecessor for credit cooperatives as well as private mortgage banks. They also proved

extremely durable, establishing an asset class of mortgage-backed securities that remained popular to this day.

Landschaften assumed an important financial intermediary function connecting the landholding but cash-poor Junker class with credit sources in Berlin. Landschaften reduced transaction costs for lenders and borrowers and relied on joint liability, local monitoring and forced membership to avoid problems of moral hazard and adverse selection. They also cooperated with the crown, with some Landschaften even mortgaging crown lands and thus directly supporting government finances. Through the Landschaften, Junkers could easily take on large amounts of debt that were available long-term at comparatively cheap rates. The creation of a standardized debt instrument also enabled a growing secondary market, which increased the liquidity of mortgage loans. Since Pfandbriefe were issued in various denominations they also circulated as cash equivalent and helped expand the monetary base.

Then as now, the stability of the Pfandbriefe was anchored in their one to one correspondence to an underlying asset, which was guaranteed by the institution of the Landschaften. The historical example highlights successful financial innovation.

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Figure 2: Borrowing Intermediated by the Landschaft – Version 1

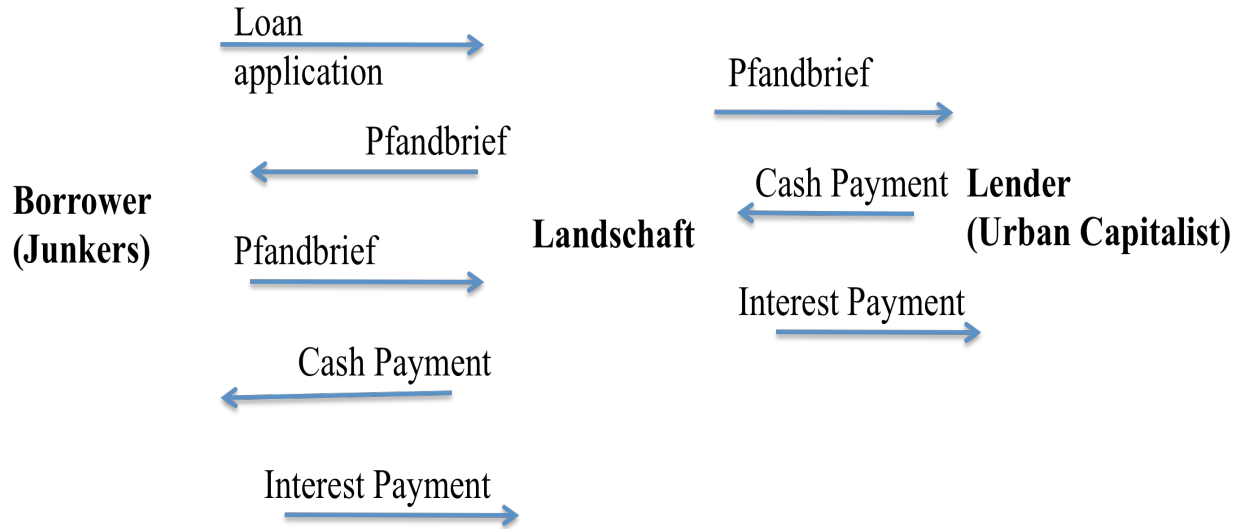


Figure 3: Borrowing Intermediated by the Landschaft – Version 2

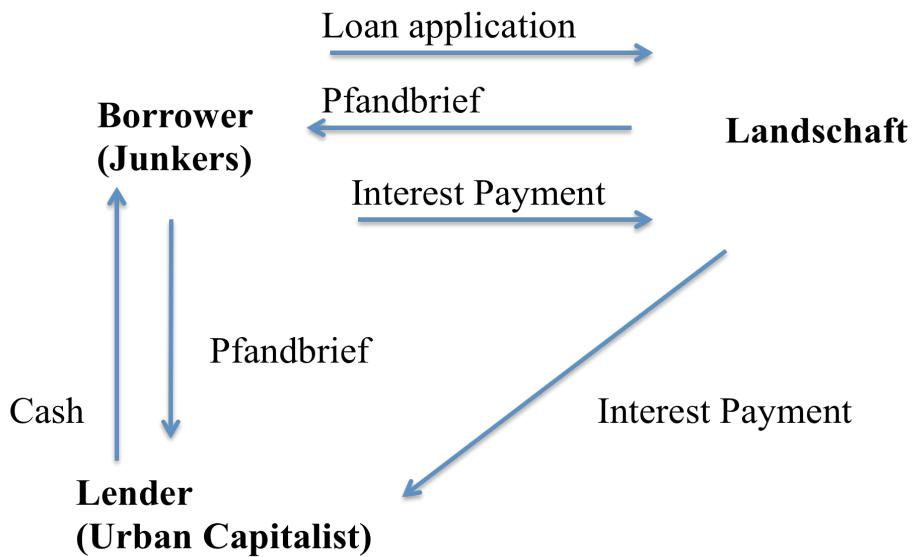


Figure 4: A Stylized Model of Credit Intermediation

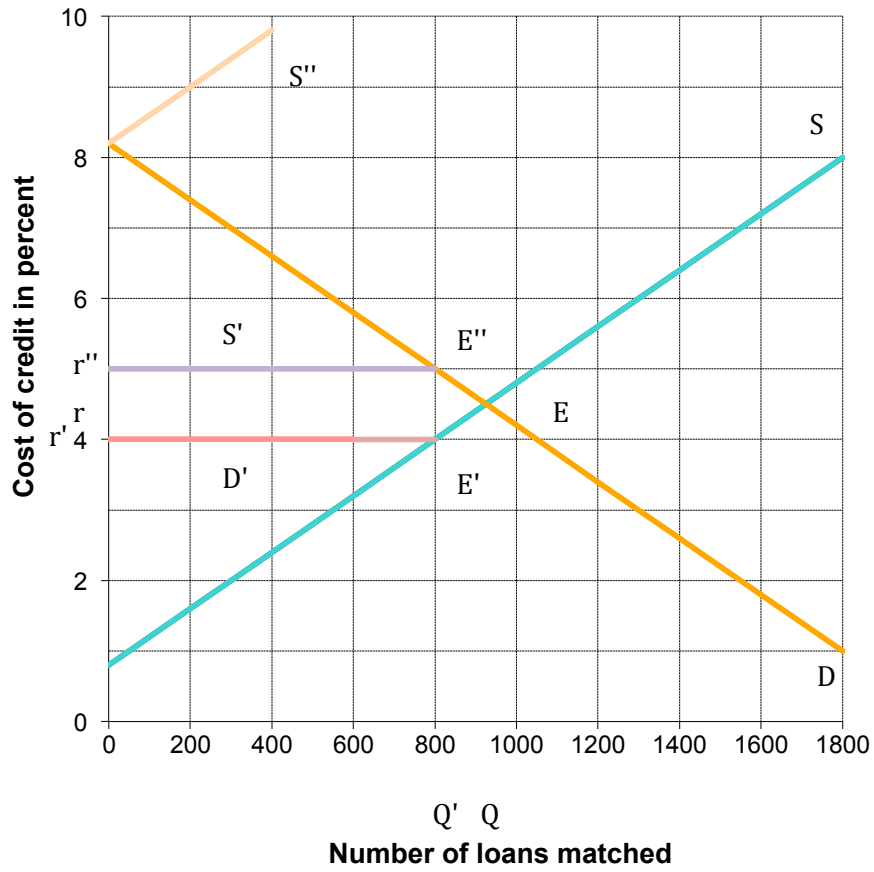
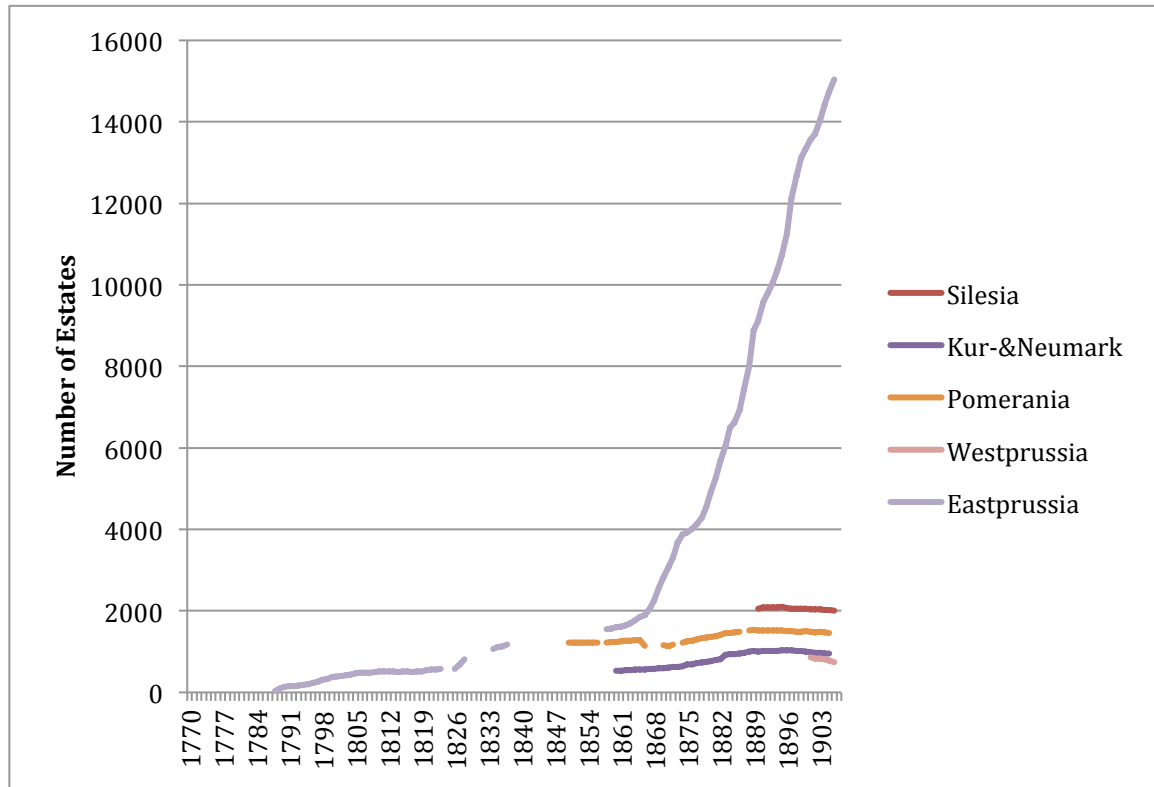
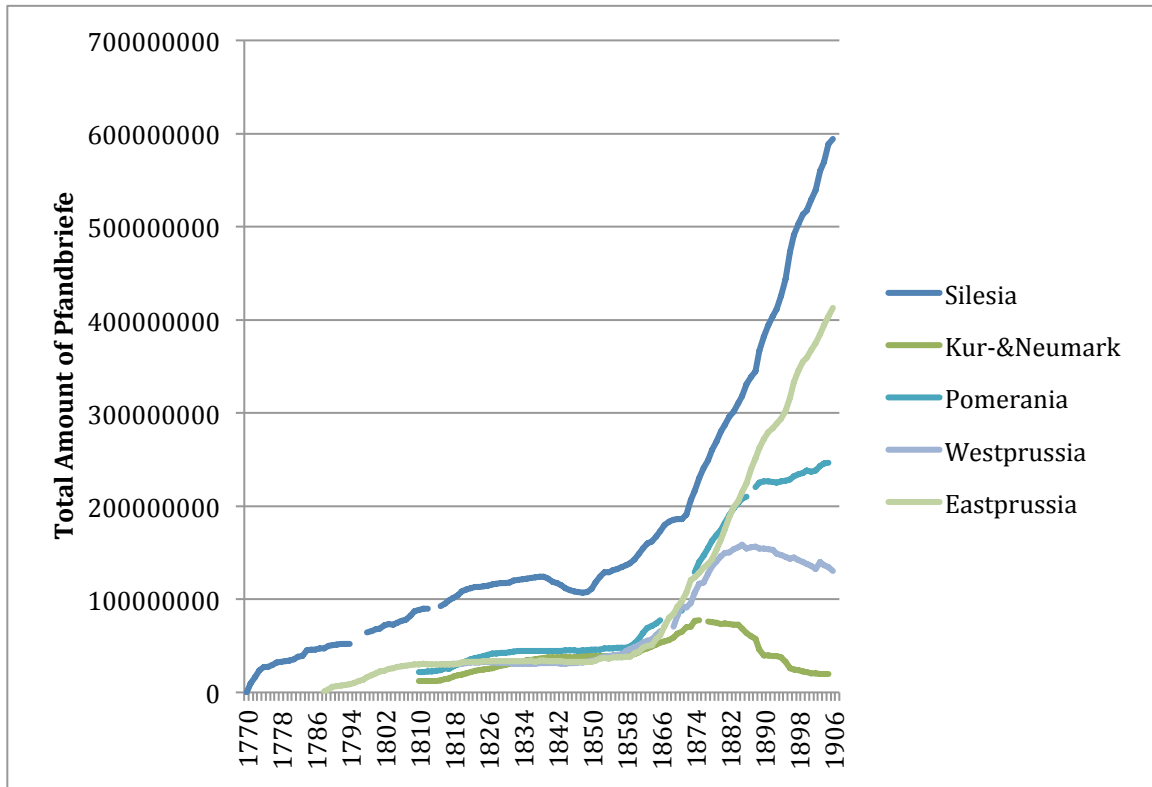


Figure 5 – Number of Estates that Issued Pfandbriefe



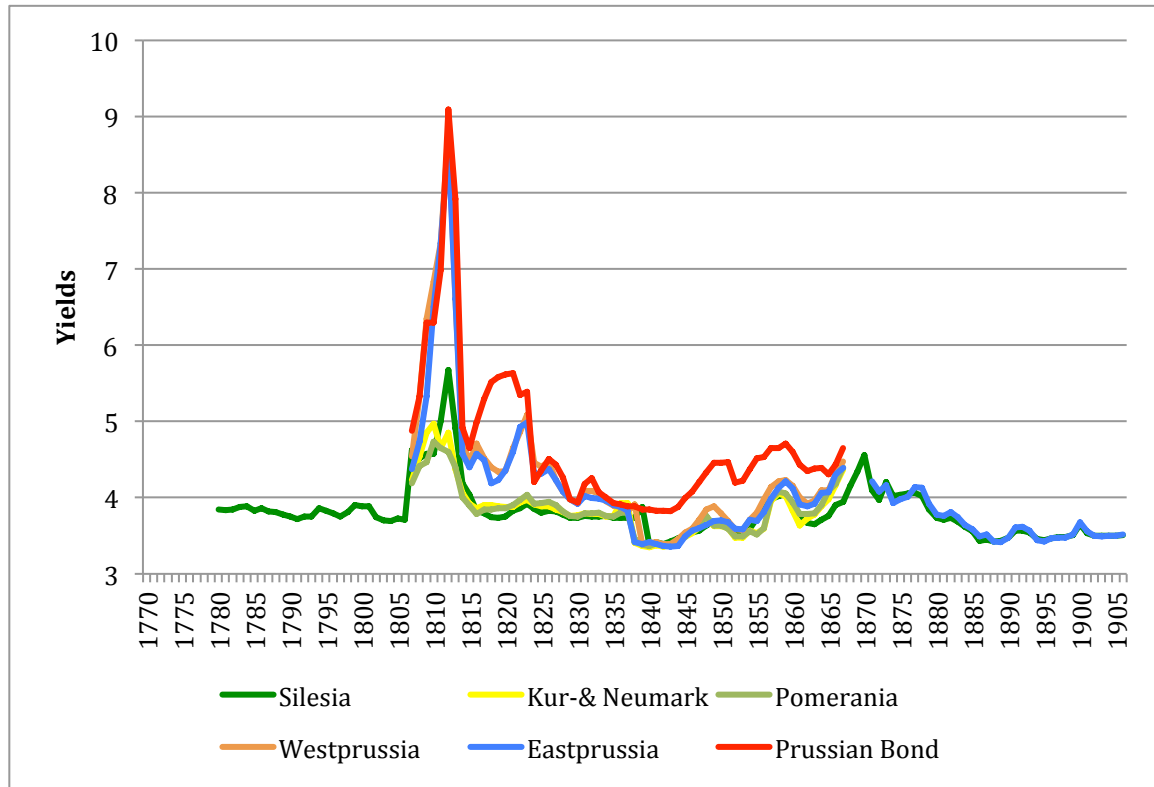
Source: Hecht (1908), Kur- und Neumärkisches Landschaftliches Kreditinstitut: Tableau der mit Pfandbriefen belegten Domänen (1817), Brämer (1867).

Figure 6: Amount of Pfandbriefe Outstanding (in Mark)



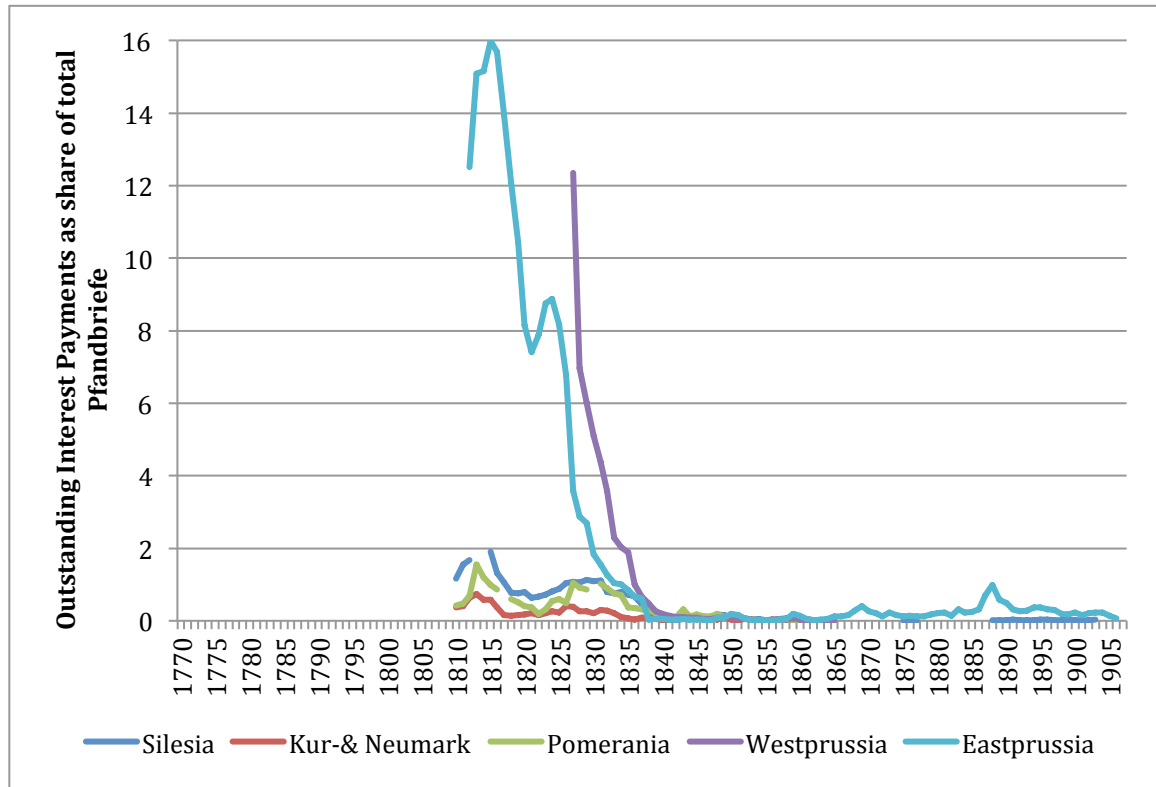
Source: Hecht (1908), 125 Jahre Ostpreussische Landschaft (1913)

Figure 7: Maximum Yields of Pfandbriefe for the Five Old Landschaften



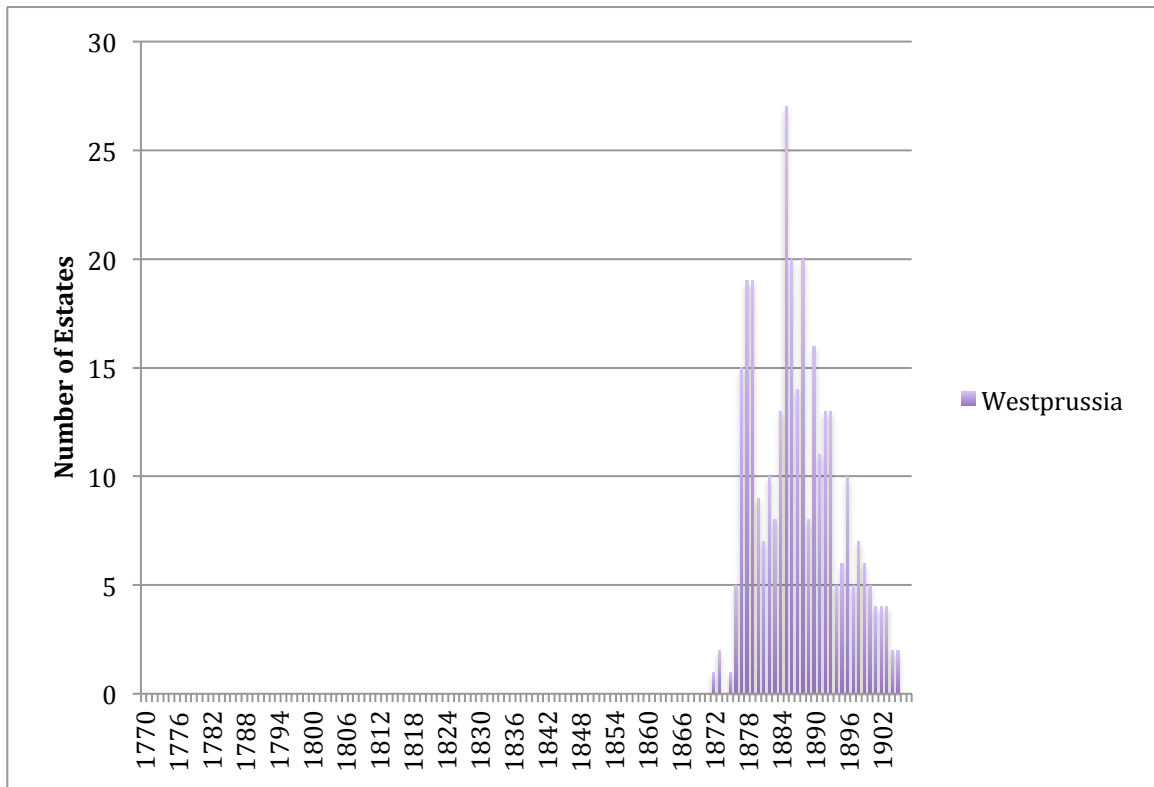
Source: Hecht (1908), Meitzen (1868)

Figure 8: Interest Payments in Arrears as Share of the Total Pfandbrief Volume



Source: Hecht (1908)

Figure 9: Number of Estates in Receivership in West Prussia (Data only available after 1870)



Source: Hecht (1908)