

God and risk: The role of religion in early twentieth century Dutch rural cooperative banking*

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Abstract

What is the relationship between religion and risk-taking in banking? The Netherlands' new cooperative movement of the turn of the twentieth century was instigated by religious groups – Roman Catholics, orthodox Calvinists and liberal Protestants. Using quantitative analysis combined with archival business histories, this paper investigates how religion mattered for the banks' risks in the build-up to, during, and immediately following the 1920s financial crisis. It finds that the level of risk may have been influenced by the relative size of banks' affiliated religious denominations within their local market. Financial analysis suggests that banks serving small religious groups were less willing, despite being more able, to take on risks than those serving larger minorities. Evidence from two case studies is consistent with the use of a theory of club goods as an explanation for this finding. Strict membership criteria and the use of personal guarantors in loan agreements acted as strong screening and monitoring devices at banks for minorities, regardless of their denomination.

Keywords: bank risk, cooperative banking, historical microfinance, religious business, club goods, the Netherlands, interwar financial history, rural history

JEL classification: G01, G21, N24, N84, P13, Z12

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Then he which had received the one talent came and said, Lord, I knew thee that thou art an hard man, reaping where thou hast not sown, and gathering where thou hast not strawed: And I was afraid, and went and hid thy talent in the earth: lo, [there] thou hast [that is] thine. His lord answered and said unto him, [Thou] wicked and slothful servant, thou knewest that I reap where I sowed not, and gather where I have not strawed: Thou oughtest therefore to have put my money to the exchangers, and [then] at my coming I should have received mine own with usury.

The Parable of the Talents, Matthew 25:14-30 (Authorised King James Version)

1 Introduction

Existing histories of finance tend to privilege the supply of financial services over their demand. This has resulted in historians scouring the past for institutions that look and feel like particular types of modern bank. Although the economic and social identity of the customers of financial intermediaries has changed quite radically, histories that look at how society itself shapes the strategy and structure of such intermediaries are rare. This study is one such history. It looks at how the socioreligious demand for financial services within a segregated rural society shaped the financial institutions that served it. This new approach to banking history provides a complementary perspective on a type of business widely recognised to be an important facilitator of growth and prosperity.

Banking textbooks traditionally define four sources of risk that affect banks' balance sheets: (1) credit risks; (2) liquidity risks; (3) interest rate risks; and (4) market risks (Kohn 2004, Freixas & Rochet 2008, Hull 2010). The first are due to uncertainties regarding business outcomes and the value of collateral. The second are caused by differences in the marketability of claims issued and claims held. The third result from the variability of interest rates combined with differences in the maturity of banks' assets. Finally, the fourth is the risk that the value of banks' portfolio of marketable assets or liabilities will decrease due to (exogenously determined) market conditions. A bank's exposure to these four types of risk is determined by a host of different factors, including their customer profile, bankers' expectations of future economic performance, the level of interbank competition, banking regulations, but also bankers' willingness to take on risks – their level of risk aversion.

This paper investigates in what way the religious attitudes of bankers and their customers – and the sociopolitical institutions which they belong to – affect all four types of bank risk. It examines a class of overtly religious banks that operated in a religiously mixed country during an historical period in which religion played an important role in that country's economy and society. Specifically, this paper investigates how religion affected bank managers' risk-taking behaviour at cooperatively-owned rural

banks operating in the Kingdom of the Netherlands in the early twentieth century. In answering this question, this paper also helps to identify why rural cooperative banks survived the Dutch financial crisis of the early 1920s in a better condition than most other types of bank. This paper does not, however, attempt to determine the optimal level of risk-taking in banking; its more modest goal is to provide a first empirical assessment of the religion-risk relationship in banking in what may be considered a “natural experiment”.

Early twentieth century Dutch rural banking markets provide unique histories with which to investigate the effect of religion on risk for two reasons: (1) different religious groups operated in the Netherlands during the period under investigation, each with different involvement in business and enterprise; and (2) the performance of Dutch cooperative banks during the agricultural depression of the 1920s differed across the sector. The Dutch case permits the isolation of religious factors from other region-specific, economic, factors that should affect crisis-period performance of banks of all denominations operating in that same market, regardless of religious affiliation or minority position.

The question addressed by this paper is important for four reasons: (1) Rabobank, today the largest bank operating in the Netherlands and the safest bank in the world not owned by a government,¹ is the direct descendant of the early twentieth century rural, religious, cooperative banking movement; (2) histories of Dutch cooperative businesses are always about a single organisation or geographic area, and are largely absent of conclusions regarding the generality of their findings and wider economic and historical importance; (3) the business history writing of Dutch cooperative banks lacks economic analysis of its overt religiosity, a subject which is viewed as an embarrassing historical curiosity; and (4) there is an absence of historical work on the economic consequences of religion at a microeconomic business level of analysis, and hence the underlying causal processes of recent macroeconomic studies in this field are little understood.

Studies of the determinants of risk in banking are numerous. To the author’s knowledge, however, economic studies of risk-taking and religion in banking are not. This is because religiously-motivated financial institutions are not the norm today, at least not in the developed world. But this was not always the case: 18 percent of the Dutch population had a savings account with religiously-motivated rural banks in 1919,² with the amount they saved totalling 260 million guilders, or 1.4 billion euros in today’s money,³ over four percent of all Dutch bank-held assets at the time (Van Zanden 1997).

¹‘World’s 50 safest banks 2009’, *Global Finance Magazine*, <http://www.gfmag.com/tools/best-banks/2341-worlds-50-safest-banks-2009.html>. Accessed August 2010.

²Own calculation using the annual reports of the three principal cooperative networks combined with the 1920 census (see Appendix A for details)

³ Inflation-adjusted using the International Institute of Social History’s Value of the Guilder calculator

This study addresses its religion-risk question in two stages. Stage one is a quantitative assessment of risk using bank-level balance sheet data concerning the entire population of network-affiliated independent rural cooperative banks operating in the Netherlands in the early 1920s – 1,144 banks in all. It measures the impact of socioreligious, institutional and geographic factors on banks' leverage and savings ratios, measures of bank risk. This methodology does not reveal what happens *inside* the firm, however. Instead it provides a “first sieve” for risk determinants, necessary in generating specific historical hypotheses for stage two. Stage two of this study, then, uses a different kind of evidence – that which is more familiar to business historians – to look inside specific firms and find out how the measured effects work. It takes a comparative history approach to enable general conclusions to be drawn about the Dutch case, conclusions beyond those which can be made from idiosyncratic case studies.

One possible interpretation of the New Testament parable quoted at the start of this paper is that Christians should look after assets (talents) entrusted to their care, feel compelled to take calculated risks with them to benefit themselves and others by investing them usefully for a return, in the service of their god (Hultgren 2002). The results of the present enquiry suggest that the practical adherence to this parable differed greatly across the cooperative banking sector. The quantitative enquiry finds that banks servicing religious minority groups – especially Catholic ones – operated less risky portfolios, unwilling to increase their leverage to levels typical of banks serving religious majorities, despite being technically more able to do so in certain respects. The comparative case studies are consistent with these findings and show how minority groups made use of superior screening, monitoring and enforcement technologies derived from repeated interaction combined with strong within-group societal norms. The result is not that religion affected risk directly through a single special “religion characteristic” such as Weber’s (1930 [2003]) Protestant work ethic, but is instead that religion affected risk through a mixture of different information- and enforcement-affecting qualities of religious group formation. This paper points to a Buchanan (1965) theory of club goods to explain the different risk-taking behaviour of religious minority groups, regardless of actual denomination.

This paper proceeds as follows. Section 2 reviews the literature underpinning this paper’s research questions. Section 3 then provides the necessary historical context with which to understand the structure and performance of the Dutch cooperative banking sector. Section 4 sets out the testable implications for the religion-risk relationship and describes the quantitative (cliometric) and qualitative (comparative case studies) empirical strategy employed in more detail. Section 5 is a quantitative assessment of

(available at <http://www.iisg.nl/hpw/calculate.php>).

the determinants of risk in the entire cooperative banking sector over the period of the 1920s crisis. Section 6 is then the presentation of the religion-risk question using business history archival sources. Finally, Section 7 concludes.

2 Microfinance, norms, and religious clubs

The motivation for the present study of bank risk is found in Bernanke (1983) and Calomiris & Mason (2003), among others, who emphasise how the risk-taking behaviour of bankers affects economic and financial stability. Empirical studies have looked at the relationship between bank risk-taking in owner- versus manager-controlled banks (Saunders et al. 1990), the relationship between competition, deposit insurance and risk-taking (Keeley 1990, Boyd & De Nicolò 2005), and that between bank governance structures, banking regulation and risk-taking (Laeven & Levine 2009). Economic studies of risk-taking and religion in banking are few. The only works to date that look at this question (implicitly) are studies of Islamic banking, examples of which are found in Iqbal & Llewellyn (2002) and a recent critical study of which is Khan (2010). In addition to the above, this paper relates most directly to the literature on microfinance institutions, especially historical ones. Also relevant are the literatures on the economics of religion, on club goods, on trust and norms, and on the *verzuiling*, the religious segregation of Dutch business and society. Each is discussed in turn, focussing on how they are useful for understanding the present study of Dutch cooperative banks, and on how the present study contributes to these works.

Microfinance business has received much recent attention from both policymakers and academics, especially following the successes of the Grameen Bank (Yunus & Jolis 2003). The existing study of microfinance institutions focusses on the methods used in this sector to make small-scale banking work (or fail to work), despite (or because of) disadvantages regarding scale and scope. The principal factors emphasised as influencing microfinance success are screening, peer monitoring and social sanctions (especially Stiglitz 1990, Banerjee et al. 1994, Besley & Coate 1995, Ghatak & Guinnane 1999, Ahlin & Townsend 2007). However, the literature largely fails to examine institutional arrangements other than those relating to joint liability loan contracts, formal or otherwise. The Dutch case of early rural microfinance provides a natural experimental setting in which the efficacy of different ideas on their functioning – in addition to alternative explanations – can be explored.

Most appropriate historical comparisons for the present context are those which look at the (late) adoption and adaptation (and often failure) of German-designed credit cooperatives in countries other than Germany. Guinnane (1994) argues that the principal

reason why Raiffeisen institutions did not work in Ireland were the differences in social sanctions available in group lending; Irish peers seemed reluctant to force their neighbours to repay loans. Guinnane & Henriksen (1998) look at the failure of Danish cooperatives around the same time, and argue they were unsuccessful due to strong competition from incumbent savings banks. Van Molle (2002) recounts how Belgium's *spaar- en leengilden* took far more deposits than they could usefully lend out, and instead participated in risky non-agricultural business ventures within Belgium's Catholic community, ultimately with disastrous consequences.

Unlike the Irish, Danish and Belgian cases, Italy's attempt to introduce Raiffeisen cooperatives was highly successful. Galassi (1996) puts their success down to three factors: (1) effective *ex ante* screening of members' type; (2) internal monitoring of customers in order to reduce moral hazard problems; and (3) the ability to operate with lower overheads than competitors. Galassi speculates that the most important of these three is the first, which he posits were achieved through cultural and social variables; *casse rurali* had stringent membership selection criteria that resulted in a customer base with similar characteristics, including attitudes towards risk. For example, the Cassa Rurale di Treviglio (near Milan) demanded that members 'shall be good Christians, [...]; shall neither drink to excess, nor abuse their family members; shall not swear or curse; [...]' (Galassi 1996, p.22).

Economic enquiry into the consequences of religion has a long history and has seen a recent revival. Weber (1930 [2003]) argues that it was the peculiar "work ethic", or norms, associated with the Protestant interpretation of the Christian faith that led to industrialisation, growth and development. This thesis has long been the subject of criticism (especially Tawney 1926, Samuelsson 1961, Cantoni 2009). But Weber-inspired economic enquiry is not doomed. Denominational differences have been linked with macroeconomic outcomes through causal chains other than a work ethic (e.g. La Porta et al. 1997, Guiso et al. 2004, Ekelund et al. 2006, Becker & Woessmann 2009, Arruñada 2010). However, the work of Ostrom (especially 1990, 2003) shows that the concept of norms remains useful to understand economic behaviour. Using controlled laboratory experiments, Ostrom describes how a great number of alternative strategies are observed within any given population, from full cooperation to free riding. Whilst a more standard Williamson (1993) approach to explaining economic interaction sees trust only in the revelation of an economic actor's innate risk type (good or bad) through the flow of information in repeated interaction, Ostrom adds a "trust variable" that lies with the beholder and can depend on economic actors' (exogenously-determined) social norms.

A second strand in the economics of religion literature links religion and religiosity with microeconomic rather than macroeconomic performance (Iannaccone 1998). Particularly

interesting is Renneboog & Spaenjers (2009), who examine religious attitudes towards financial decision-making in contemporary the Netherlands and finds that religious households: (1) care more about saving; (2) are more risk averse; and (3) consider themselves more trusting. However, the identity of the causal chain that links religion and economic outcomes is difficult to ascertain from survey-based enquiry alone. Attempts have been made to instead identify this causal link using empirically-testable models. A particularly successful approach has been to model congregations as mutual-benefit organisations ‘dedicated to the collective production of worship services, religious instruction, social activities, and other quasi-public “club goods”’ (Iannaccone 1998, p. 1482). Club goods have already been used with great effect to explain public utilities, international organisations, military alliances, and even gated communities (Sandler & Tschirhart 1997, Manzi & Smith-Bowers 2005). Buchanan (1965), who originally coined the term, describes club goods as differing from pure public goods in that they are excludable (it is possible to prevent access to non-paying consumers), and differing from pure private goods in that they are non-rivalrous (consumption by one consumer does not prevent simultaneous consumption by others). In the context of religious groups, positive externalities associated with (mass) religious participation increase all members’ utility (i.e. non-rivalrous), whilst high-cost behavioural standards facilitate screening and monitoring and minimise free-riding (i.e. excludable). Zaleski & Zech (1994) posit that an optimal congregation size may exist, beyond which monitoring costs prove too high, thus many small religious clubs (denominations/sects) can exist side-by-side. Differences in club size may be explained by differences in the externalities of religious worship. Berman (2000) employs a club good model to explain the purpose of costly religious rituals. He argues that Ultra-Orthodox Jews choose high-cost religious worship over work because the externalities of worship (mutual insurance) outweigh any disincentives (prohibitions that tax real wages).

Perhaps the closest work in business history that implicitly uses this idea is Hansen & Hansen (2008), who argue that interwar business bankruptcies were lower in areas with higher churchgoing population in the US because of improved “social capital”. Putnam (2000, p.19) defines social capital in terms of ‘social networks and the norms of reciprocity that arise from them’. However, social capital is used here in a somewhat vaguer still Coleman (1990) sense as “everything else” that is important in economic interaction. The most closely aligned work in economic history more generally is that of Greif (e.g. 1993), who uses game-theoretical models to show how groups of eleventh-century traders belonging to tight-knit social groups were able to successfully employ overseas agents without recourse to a legal system. The historical evidence used suggests that repeated interaction combined with social punishment – easily enforceable thanks to

a common culture within their pan-Maghreb minority community – were sufficient to ensure successful economic interaction over long distances.

The use of concepts like trust and social capital, although increasingly prominent in the social sciences, is arguably unnecessary and creates confusion rather than clarity in thinking (Guinnane 2005). What is it about social networks that is important? Greif does not rely on a social capital in his work; he is instead able to more precisely specify what is happening in terms of more specific economic terminology. The same should be true of other scholarship, and in this current work. The combined use of transaction cost economics with Ostrom's norms in a club good setting remains largely absent from extant histories of business, which have all too readily hopped on the social capital bandwagon without a second thought for more precise economic language. In the context of the questions posed by the present study, a breakdown of the role of religion as a non-rivalrous but excludable good or service, the size and shape of which may be determined exogenously by societal norms, and the successful sustained enforcement of which is ensured through repeated interaction with screening and monitoring and social punishment, although not new to the literature, is nevertheless a novel application.

The Netherlands has had a mixed religious make-up since at least the Reformation. By the late nineteenth century, Dutch citizens identified themselves strongly with a particular religious denomination, the primary of which were the liberal *hervormde* (Dutch Reformed) or the orthodox *gereformeerde* (literally “re-reformed”) forms of Calvinism, and Roman Catholicism. Dutch enterprise and society became highly segregated along religious lines; the different Christian denominations – in addition to socialist and neutral or secular groups – developed sophisticated parallel economies. Each had its own schools, political parties, newspapers, trade unions, scientific societies, music bands, sports clubs, youth organisations, hospitals, charities, and banks. This phenomenon, known as the *verzuiling* (pillarisation), reached its zenith in the interwar period, but persists even to this day.

The *verzuiling* phenomenon was first analysed scientifically by Kruijt (e.g. 1974) and by Lijphart (especially 1975). Kruijt distinguishes *zuilen* (pillars) from social classes or castes because they: (1) included a non-religious *levensbeschouwing* (way of life); and (2) formed in a society that was otherwise ethnically homogenous. Meanwhile, Lijphart argues that *zuilen* came about as the consequence of a political compromise made by the country's social elites to divide power between themselves. Stuurman (1983), argues that the *verzuiling* was part of a wider political struggle for minority rights, particularly those of the Catholics. He posits that the two necessary conditions for the phenomenon to work successfully were: (1) the presence of multiple religious denominations living side-by-side; and (2) a high level of economic prosperity. Recent revisions are found in

De Rooy (1995), who uses different historical cases to argue that religiously separate identities were for most Dutch citizens more important in daily life than either economic or political concerns, and Luykx (1996), who argues that the phenomenon was Catholic-led, but that it was a form of social control by Catholic elites over the working classes rather than a reaction to any discrimination against this group.

Whatever the cause of the *verzuiling*, measuring its tangible economic consequences for business organisation and performance is an important endeavor in itself, and one that is a subject of Arnoldus (2002) and Davids (2006). The latter looks at the day-to-day decision-making process of Dutch Protestant business leaders in the nineteenth century, but fails to do a similar analysis for Catholic or other business leaders. Arnoldus, on the other hand, makes direct comparisons on succession strategies, firm financing and marketing relations between liberal and orthodox Protestant and Jewish businesses. She argues that the importance of (familial) social networks for arranging these business attributes was greatest for firms aligned to minority groups, but that, overall, firms' embeddedness within their regional economy and the location of their market were most important for maintaining stable business networks.

The effects of the *verzuiling* on rural finance have yet to be studied systematically. A reading of Jonker (1988*a,b*) suggest that many rural cooperative banks the Catholic south were established by religious leaders for religious rather than an economic reasons. Parts of Sluiterman et al. (1998) look at the impact of the *verzuiling* on the original choice to have multiple rather than a single central cooperative clearinghouse, but do not investigate decision-making at the level of local cooperative banks. Amateur business histories have been authored on cooperatives operating in specific localities in which religious segregation was particularly prominent (see especially Rouwenhorst et al. 1998 and Vercauteren et al. 2004). Additionally, Brusse has authored a number of academic histories of religiously-split rural areas (e.g. 2002, 2008) which also cover the histories of different banks in these areas. However, all these studies fail to ask the religion-risk question explicitly, fail to frame their narrative as an economic inquiry, and do not relate their findings to the *verzuiling* literature more broadly. Few wider conclusions can be drawn from these studies regarding the effect of religion on cooperative banking in the Netherlands as a whole, nor on the wider economic question regarding the effect of religion on risk-taking behaviour in general.

3 Boerenleenbanken in historical context

Data concerning the Dutch market for small-scale rural savings in the early twentieth century offer relatively unique opportunities for the study of religion and risk in banking due to the country's social, political and economic segregation based on religious affiliation. The Dutch case is also interesting in that a financial crisis occurred during the period under analysis in this paper, a crisis in which different types of bank had different survival chances, but in which cooperatively-owned rural banks performed well overall. This section provides the historical context necessary to understand the structure and performance of the Dutch rural cooperative banks. It discusses their origins and nature, exposes (differences in) their key institutional attributes and business objectives, and outlines their performance during the 1920s crisis period.

3.1 Emergence, proliferation and institutional attributes

Small independent cooperative banks sprang up all over rural areas of the Netherlands from the late 1890s (Jonker 1997). As was the case in Belgium, Denmark, Italy and Ireland – among others – the type of institution introduced to the Dutch countryside was inspired by the German Raiffeisen model first initiated some thirty years earlier in Rhenish Prussia by the mayor of Heddesdorf (now in Neuwied), Friedrich Wilhelm Raiffeisen. There are three explanations for their emergence in the Netherlands presented in the existing literature on the sector: (1) as a means of extending and consolidating the influence of (confessional) sociopolitical organisations across Dutch society (Jonker 1988*b*); (2) to meet untapped market demand for financial services from the unbanked and underbanked (Sluyterman et al. 1998); and (3) as an organisational response to agricultural depression and technological change (Bieleman 2008). These explanations are not mutually exclusive, however, and the exact reason likely differed by region.

Whatever the reason for their emergence, the geographic penetration of these banks – which in Dutch were called *boerenleenbanken* or farmers' borrowing and/or lending banks – was almost universal by the end of the Great War, a war in which the Netherlands maintained political neutrality throughout and in which Dutch farmers benefited greatly from trading with both belligerents (De Jong 2005). Figure 1 depicts the locations of all clearinghouse-affiliated cooperative rural microfinance institutions operating in the country between 1904 and 1919. Locational growth in the sector was saturated by 1919, with 1,145 banks operating in approximately 70 percent of *gemeenten* (municipalities) nationwide.⁴

⁴By comparing the Dutch government's official register of savings banks for 1919 with the annual reports of the three central clearinghouses for the same year (see Appendix A for references), the author

Many of the institutional attributes of the Netherlands' Raiffeisen banks mirrored those of their German cousins, which are described in detail in Guinnane (2001). Each bank was independent and theoretically operated in a narrowly-defined local market. Farmers who wished to borrow money from these institutions first had to seek membership and therefore stand liable for any future losses incurred by their peers, in theory up to an unlimited amount. Farmers who wished merely to deposit savings with a *boerenleenbank* were not obliged to join and stand liable. Banks were generally small operations: in 1919, each bank held an average of 194 thousand guilders of savings deposits and made 67 thousand guilders of loans to members.⁵ Banks were managed part-time and gratis by their members and most had limited opening hours. They did not pay dividends to members, depositing any profits – which were tiny anyway – in reserve funds.

Almost all banks belonged to one of three cooperative networks, the headquarters of which acted as their auditing authorities, clearinghouses and lenders-of-last-resort.⁶ These central clearinghouses invested any excess savings lent to them by member banks in safe securities, such as municipal and government bonds, and railway shares. The biggest difference with the German setup was that cooperative networks were not principally regional but instead religious: Protestant Calvinist (either strict *gereformeerd* or the more liberal *hervormd*) or Roman Catholic. Each had different attitudes towards business, with Protestant groups favouring a clear separation between religious and commercial spheres, whilst Catholic groups pushing instead for more active involvement (Rasker 2004). Figure 2 shows how some areas were dominated by a single Christian denomination whilst others were religiously mixed. Many villages had two banks in close proximity to one another in these mixed areas, one for each denomination.

A further difference existed in the legal frameworks that cooperators could choose in order to gain legal personality: (1) the *Wet van 1855*; or (2) the *Wet van 1876*.⁷ The *Wet van 1855* was a general law governing associations (or meetings) of any type, permitted only fully unlimited liability for members and had few corporate governance rules or liability protection mechanisms for members. The *Wet van 1876* was specifically designed to govern organisations under cooperative ownership, imposed stricter rules on corporate governance, and provided members with increased protection in cases of bankruptcy.⁸ Rommes (forthcoming, 2011) argues that the reasons many cooperators

estimates that there were an additional 23 independent non-network affiliated *boerenleenbanken* in 1919.

⁵This is approximately one million and 360 thousand euros in today's money respectively.

⁶These headquarters are often referred to as central banks in the existing literature, but are here referred to as central clearinghouses in order to avoid possible confusion with De Nederlandsche Bank, the Netherlands' *de facto* central bank.

⁷See Appendix A for full legal references.

⁸However, the act permitted cooperators to alter these liability arrangement using their official statutes to suit their specific needs, i.e. there was no strict adherence to the Roman law principle

chose to adopt the older over the newer legislation were: (1) cost; and (2) religion. He calculates that the cost of establishing a *Wet van 1855* association were three fifths of those needed for a *Wet van 1876* cooperative, and expensive legal professionals were not required. However, he notes that soon these cost were soon subsidised by the government. Rommes then argues that Catholic organisations – apparently in fulfilment of a Papal encyclical concerning the ‘rights and duties of capital and labour’ espoused in Leo XIII (1891) – saw *boerenleenbanken* not as organisations to further the financial interests of members *per se*, but rather to provide collective social improvements for the Catholic *zuil* (pillar), and felt that the *Wet van 1855* was the most expedient act for achieving this goal.

Boerenleenbanken were owned and operated by a (sub-)group of their customers. As such, their business objectives differed substantially from other types of financial institution. They made few profits, indeed they were explicitly non-profit making; an official communiqué on the interest rate policy of cooperative banks belonging to the Coöperatieve Centrale Boerenleenbank (CCB-Eindhoven) network makes this point explicitly in 1925.⁹ Instead, these banks’ aim was the ‘improvement of the farming and horticultural sector’ by: (1) ‘making loans available to members’; (2) ‘placing deposits in interest-yielding safe investments’; and (3) ‘the creation of a reserve fund’ to be drawn upon in times of need.¹⁰ These banks were effectively self-help societies which improved their own plight by recycling their depositors’ savings into loans for members.¹¹ The best way in which *boerenleenbanken* could finance their lending business was through attracting deposits, from members and others. This was cheaper than borrowing from external sources, the primary one of which was their central clearinghouse. Clearinghouse loans came with unwanted extra scrutiny by auditors and were supposed to be only temporary in nature. Relying on internal funding was also safer as a cooperative’s members are unlikely to run on a bank which they co-own and for which they are therefore liable, whilst central clearinghouses could more easily call on its loans, for instance if an emergency arises elsewhere in the network. Because *boerenleenbanken* had no (share) capital to speak of, the proportion of loans internally financed through deposits is a measure of balance sheet leverage

Banks were supervised by oversight committees which were also unpaid. In practice, of *numerous clausus*. The ability of cooperators to do this was successfully tested in court in 1908 (Deking Dura 1913).

⁹‘De rentepolitiek bij de plaatselijke banken’, *Maandelijkse Mededelingen van de Coöperatieve Centrale Boerenleenbank*, No. 115, December 1925, p. 1163-1172.

¹⁰This is a translation of Article 1 of the founding statutes of the *boerenleenbank* in Baardwijk, Noord-Brabant (January 1904) and is typical of the sector.

¹¹Some cooperatives had the explicit aim of ‘furthering the interests of God, the family and property’ (Smits 1996, p. 56-57).

however, much of the day-to-day decision making process was in the hands of a (part time) paid cashier, from whose house the bank often operated. Larger loan requests were usually discussed jointly by the directors and supervisors, with the cashier in attendance. Banks were advised that 25 to 30 percent of their deposits could be treated as long-term in nature, and that long-term loans to members should therefore not exceed 30 percent of their investment portfolios.¹² However, many banks apparently exceeded this advice, or alternatively, had little loans business to speak of. Figure 3 depicts the level of liquidity of all banks in 1919, this sector's most stable year immediately prior to the crisis period. Banks located in the south of the country – the vast majority of which were affiliated with the *de facto* Catholic CCB-Eindhoven network – appear to have operated more liquid portfolios overall, suggesting differences in the advice or scrutiny given by the clearinghouse.

3.2 The Dutch financial crisis of the early 1920s

Between 1920 and 1924, and to a lesser degree even up to 1927, the Netherlands experienced a financial crisis that affected hundreds of banks and financial institutions of different types and in various locations. The problems they faced varied in degree of seriousness and manifested themselves as depositor runs, share price crashes, bankruptcies and state interventions. The types of bank affected included large national joint stock public listed banks, smaller provincial banks, national and municipal savings houses and urban and agricultural cooperative banks. The story for each type of bank appears to differ and the picture for many types of bank is understudied and remains opaque. This is especially so for the case of rural cooperatives, which on the whole performed well, and where any serious problems appear to have been successfully solved privately by the two larger central clearinghouses, the Coöperatieve Centrale Raiffeisen Boerenleenbank (CCRB-Utrecht) and the aforementioned CCB-Eindhoven.

The existing literature on the causes of the 1920s financial crisis is dominated by the work of Jonker (e.g. 1991, 1995, 1996), the definitive restatement of which is found in Jonker & Van Zanden (1995) and Van Zanden (1997). It holds that the 1920s crisis was a result of banks' over-exuberance during the Great War and immediate post-war period. Large and sustained declines in aggregate demand and prices in the early 1920s – declines that were largely due to international factors, but arguably aggravated by (expectations of) the Dutch guilder's return to pre-war gold parity – put pressure on business and thus the banking system it used. In short, Dutch banks were over-exposed to sectors of the

¹²This point is made in an article in the official newspaper of the CCRB-Utrecht network: 'Liquiditeit', *De Raiffeisen-Bode*, October 1924, p. 22-23.

economy that suffered greatest at the hands of debt-deflation *à la* Fisher (1933). Figure 4 shows how key rural commodity prices fell over the first half of the decade. It suggests that deflationary pressures may have differed considerably across the country, depending on the type of farming carried out. This may help explain why different parts of the banking sector performed differently during the crisis.¹³

The Dutch state's bank of issue and monetary policy authority was De Nederlandsche Bank (DNB), a privately-owned exchange-listed bank with no formal regulatory powers. It served the purpose of *de facto* lender-of-last-resort through its *disconto* facility, its commercial bill rediscounting business. This facility was unpopular however, its long-term use viewed by bankers as a sign of weakness. Added to this, it did not grant all cooperatives full use, permitting CCRB-Utrecht clearinghouse from 1906 as a 'test', the Coöperatieve Christelijke Centrale Boerenleenbank (CCCB-Alkmaar) in 1909 when it had clarified its legal position and raised sufficient savings deposits (DNB: 14.528), but never permitting CCB-Eindhoven any access in the early twentieth century on the grounds that it did not have sufficient capital reserves (DNB: 14.415) despite reserves being superior to CCCB-Alkmaar, but possibly also because this network had "Catholic overtones" (RabonEd: E85). In his official history of DNB, De Vries (1989) argues that the bank was 'sucked into the abyss of lack of experience' during the crisis period, rescuing some banks but allowing others to fail when it began to worry it had overstretched itself.

The biggest known casualty of the crisis in the rural cooperative sector was the central clearinghouse of the CCCB-Alkmaar network, which was liquidated by DNB in 1924 following bankruptcy. This bank was overtly Catholic in its setup, having been established in 1904 precisely to service Catholic cooperatives located in the diocese of Haarlem, i.e. the provinces of Holland. It likely failed because lack of scale and scope meant it was insufficiently diversified to deal with the deflationary pressures of the early 1920s. However, there is currently little known about this central clearinghouse and its member local banks. Sluyterman et al. (1998), the standard business history of the sector, has a strong survivorship bias and hardly mentions this third clearinghouse. The only study to date of the fate of the CCCB-Alkmaar clearinghouse is Borst (2004), an unpublished master's dissertation. Borst argues that this bank failed due to: (1) bad investments in securities; (2) write-offs following the failure of a banking subsidiary based in Leiden; (3) the failure of an agricultural purchasing cooperative it financed; (4) in-fighting between the management of member local banks; (5) constant managerial staff changes; and (6) possible competitive pressures.

¹³This is a point that has thus far not been made in the literature on the Dutch crisis, but has been shown to be important explanation for differences in the performance of rural banks in the US in the 1920s in Alston et al. (1994).

Other than the failure of CCCB-Alkmaar, no other difficulties in the rural cooperative sector show up in DNB (2000), an historical database of banks operating in the Netherlands compiled by the Dutch central bank. The list excludes events at local *boerenleenbanken*, however, likely because the sector was judged to be too small (and unimportant) to compile statistics for, and (absolute) failure of these banks is anyway difficult to detect; even if such data had been compiled, potential (large) losses at any individual local *boerenleenbank* would have been masked by (covert) rescues by the two surviving clearinghouses, e.g. by extending existing loans beyond their planned maturity. This last point is alluded to in a 1925 communiqué to members of the CCRB-Utrecht network, which warns the managers of local banks that recent inspections had identified six (new) issues that were putting banks at risk: (1) unverifiable or risky lending; (2) the granting of loans without a guarantee, or with insufficient guarantee; (3) speculations with foreign currency or securities; (4) participation in large business ventures, which have the effect of aligning the interest of the bank too closely to that of the venture; (5) the unnecessary purchase of property by banks; and (6) unnecessary delays in assessing and writing off bad loans.¹⁴ The empirical analysis of this paper is part of a first attempt to identify the features of the rural cooperative banking sector that caused these problems, using cliometric analysis as a first filter, and then using comparative business histories to study (changes in) the decision-making process *inside* the firm.

4 Testable implications and empirical strategy

This section outlines the differences between the four types of risk that banks face. It then combines the literature review and historical context of the previous sections to form a number of testable working hypotheses on the possible relationship between religion and these different types of bank risk. Finally, this section outlines the quantitative and qualitative methods used in the analysis that follows.

(1) A bank's credit risks are due to uncertainties regarding business outcomes. Also known as default risks, they describe the ability of borrowers to repay debt. The riskiness of a loan is affected by the existence and quality of collateral, compensating balances and endorsements (e.g. personal guarantees). Credit market characteristics, including information sharing between banks and bankruptcy procedures, are also important determinants (Freixas & Rochet 2008). As Raiffeisen banks were unlimited liability cooperatives, all members were financially responsible in the event of failure and hence membership criteria may also be an important consideration.

(2) A bank's liquidity risks are due to differences in the marketability of claims issued

¹⁴Redactioneel Gedeelte: De Centrale Bank' *De Raiffeisen-Bode*, No. 11, May 1925, p.73-74.

and claims held. They describe the ability of a bank to meet (unexpected) withdrawal demand. Simply holding cash is an expensive unattractive way to meet the liquidity needs of depositors. The degree to which the cashiers and managers of *boerenleenbanken* had immediate access to sufficient cash whilst also generating necessary returns is an important avenue of enquiry.

(3) Interest rate risks are the risks that fluctuations in interest rates adversely affect the value of banks' assets and liabilities. Kohn (2004) described two ways in which banks can avoid such risks: (1) by matching the maturity of assets with the maturity of that funding; and (2) by matching the commitment or repricing period of loans. Exploring the exact terms of loans and deposit accounts offered by different cooperatives helps to build a better picture of possible exposure to this risk type.

(4) Market risks refer to the risks that the value of banks' portfolios of assets and/or liabilities will decrease due to market risk factors, such as prevailing interest rates and commodity prices. Freixas & Rochet (2008) discuss how portfolio theory is used to characterise a bank manager's investment strategy as a compositional choice between asset classes with different levels of expected risk and return. Regulation aside, the standard model they summarise holds that the most important determinant of the relative proportions of different portfolio constituents is the level of risk aversion.

Given the material presented in the previous sections, what are the specific expectations on the nature, size and direction of the religion-risk (aversion) relationship in the Dutch case? A club good theory explanation would suggest that overtly religious banks, whilst being technically more able to take on risks thanks to their improved ability to monitor and enforce, would be unwilling to do so because their membership consists of individuals with closely aligned risk (aversion) characteristics thanks to improved screening and similar social norms. Hence, the size of a religious community that the bank serves should be positively associated with risk; banks servicing small minority groups operated low risk portfolios, whilst those belonging to larger minorities – or indeed the majority religion – would be more risky in their decision-making.

In summary then, the working hypothesis is that banks servicing religious minorities are exposed to fewer risks as: (1) the size of their congregation is such that religious norms and social sanctions – more specifically the fact that interaction is repeated and religious segregation makes group-exit difficult – reduce the cost of screening and monitoring below that of the socioreligious standards of behaviour incurred by them for participation; (2) the local community can afford to operate their own exclusive bank, in spite of any costs this incurs from a lack of scale and scope; and (3) they have strict membership criteria – used to differentiate their banks from those of the religious majority – that facilitate group formation by risk type, and they use insider monitors who are informationally well

equipped to enforce repayment.

Given the literature inspired by Weber and the discussion of the Dutch *verzuiling*, one alternative hypothesis is that differences in risk-taking behaviour existed between banks associated with different denominations. Given the economic geographies of the regions studied, a second alternative hypothesis is that any differences in banks' risk-taking behaviour is almost entirely governed by differences in their customers' economic activities. For this second alternative hypothesis, religious matters are relegated to a lower division of importance.

The cliometric assessment of Section 5 cannot directly answer the religion-risk question as the sources and method used do not reveal anything about what happens *inside* the firm, only their outwardly-observable (institutional) characteristics. The intuition behind some of the estimated effects is therefore better understood only after a closer examination of the business histories of the banks involved. Instead this section helps to more precisely specify the guiding hypothesis.

Controlled replicable laboratory experiments are impossible to carry out in historical research. The alternative, used in Section 6, is the comparative method, or natural experimentation. This approach consists of comparing 'different systems that are similar in many aspects but that differ with respect to the factors whose influence one wishes to study' (Diamond & Robinson 2010, p.2). Two parallel comparisons are made using qualitative data concerning the day-to-day operations of banks serving two distinct geographic regions, the rural *environs* of the city of The Hague on the west coast and the town of Waalwijk in the Rhine river delta in the south of the country. In addition to the fact that good business records still exist for the banks serving these regions, they are chosen because they differed by agricultural specialisation, but were similar in being inhabited by a mixture of different Christian denominations. This way, the influence of these other factors versus religious ones can be gauged.

More specifically, Section 6 makes two sets of comparisons simultaneously to ascertain the link between religion and risk: (1) between Protestant and Catholic banks operating in the same geographic area (either that surrounding The Hague *or* that surrounding Waalwijk); and (2) between Protestant and Protestant (or Catholic and Catholic) banks operating in different geographic areas (that surrounding The Hague *with* that surrounding Waalwijk). Comparing banks within the same region minimises the possibility that the outcomes depend on other factors as all banks are exposed to similar factors within that region. Subsequently, comparing banks operating in the different regions minimises the possibility that the true explanatory factors are merely correlates of the measured factors.

5 Quantitative assessment of bank risk

The exposition thus far exposes unanswered questions, namely: (1) whether a relationship between religion and risk (aversion) exists in the first place, or whether observed patterns are due to other correlated factors; (2) if a relationship exists, which way the effect works and why; and (3) again if a relationship exists, whether it is an important one versus other determinants of risk. The present section takes a cliometric approach to answering these questions. It combines balance sheet data pertaining to all clearinghouse-affiliated rural cooperative banks operating in the Netherlands, with socioeconomic and geographic census data pertaining to the areas in which they operated, all for the first half of the 1920s. Appendix A outlines the data sources used. Appendix E contains the tables and figures referred to in the discussion below.

The aim of the regression models discussed here are to measure banks' willingness and ability to take on risks. More specifically, their aims are to measure the determinants of: (1) banks' leverage ratio, a measure of bank risk defined as the proportion of all deposits (short- and long-term) that is lent out to members across a financial year; and (2) banks' savings ratio, a measure of depositors' withdrawal behaviour defined as the proportion of new deposits (short- and long-term) withdrawn from banks across a financial year. As explained in Section 3.1, leverage as defined here is an appropriate measure for cooperatively-owned farmers' banks given their ownership structure. The ratio functions as an indicator of their *willingness* to take on risks; the higher a bank's leverage ratio is, the more it has chosen to rely on outside financing and thus the more it is exposed to bank risks. The second measure of risk – the savings ratio – measures a something different: banks' *ability* to take on risks. As explained in Section 3.1, the core aim of cooperative farmers' banks was to expand their loans portfolio in the cheapest possible way: through new savings deposits. Small values of the savings ratio indicate high portions of savings are be used to internally finance banks' loan books. The higher the value of a bank's savings ratio, the more depositors are withdrawing their savings, thus limiting the bank's ability to internally finance their loans book. Values of the savings ratio above 100 percent indicate that groups of depositors are withdrawing money faster than others are depositing new savings, thus forcing banks to finance loans either from any remaining retained deposits from previous years, or by borrowing externally.

The full list of explanatory variables used in all regressions is found in Table 1, which also provides detailed definitions and any economic intuition for their inclusion. Variables are classified into five groups: (1) the dependent variables; (2) religious factors; (3) bank-specific attributes; (4) the economic geography of banks' markets; and, finally, (5) network- and year-specific effects. Table 2 reports summary statistics for all variables

used in the regression analysis, including a breakdown of the dependent variable for the four years of the panel. Among other things, it shows how the dispersion of the two dependent variables increased significantly over the early 1920s, reflecting the balance sheet impact of the crisis. Figures 5 and 6 use kernel density estimation to illustrate that statistically significantly different distributions in 1923 are observed for both dependent variables, the height of the crisis period. In all cases, the distribution is complex and non-standard; it is censored at zero (a bank cannot have a leverage or savings ratio below zero), and it has long upper tails (there is a sizable group banks that are “extremely leveraged” or suffer massive withdrawals by depositors). Separate summary statistics for the three cooperative clearinghouse networks are reported in Table 3. They show that banks belonging to the CCCB-Alkmaar network in particular had significantly higher mean values for the two dependent variables, suggesting that they were more willing but less able to take on risks.

The results of four regressions are discussed in this paper. Results of the two principal regressions are reported in Tables 4 and 6. Tobit specifications are used in order to take account of the zero censor in these two regressions; OLS specifications would yield biased estimates in this case. Distribution-independent bootstrapped P-values and 95 percent confidence intervals are reported in all cases to aid with interpretation; some explanatory variables are not normally distributed and hence standard test statistics would be biased. In addition to the more usual frequentist approach to hypothesis testing, this analysis takes a simple Lindley-Bayesian approach as described in Press (2003) by looking more explicitly at measured effects’ size and position in relation to the confidence intervals. This provides a better understanding of “economic significance” and relative importance, or as Ziliak & McCloskey (2008) put it, of “oomph”. Two additional regressions are run in which the dependent variables take the form of a binary variable, equal to one if (and only if) a bank’s leverage or savings ratios lie in the top ten percent of the distribution. These additional regressions, reported in Tables 5 and 7, are used to determine whether banks in the long upper tail has peculiar properties versus the rest of the sample.

What follows is a discussion of each of the variables in the regressions and the accompanying economic intuition. Turning first to the regression models reported in Tables 4 and 5, the analysis of banks’ leverage ratios. The first three variables concern this paper’s working hypothesis, that banks’ religiosity affects their risk-taking behaviour. The first variable (*overtly Christian*) is a dummy variable that captures the effect of banks advertising themselves openly as Christian to (potential) customers using their corporate (statutory) names. Some thirty banks in all advertised themselves in this way. They can be considered more strictly confessionalised than the rest of the population in terms of business practices, but also in their desire to exclude customers with dissimilar

characteristics. The estimated marginal effect is statistically significant at the five percent level, and may be considered economically significant in that it is large and most of the possible outcomes are negative; the effect is negative for all of the 95 percent confidence interval. This suggests that overtly Christian institutions may have been less leveraged than their “less Christian” cooperative counterparts.

The second variable (*minority bank*) takes the value of one if (and only if) a bank is aligned to a (*de facto* or *de jure*) Catholic-leaning central clearinghouse and the local population is predominantly Protestant, or visa versa. The intuition for its inclusion follows from: (1) the Ostrom framework, where the use of heuristic norms in homogeneous societal groups can result in stable cooperative group formation; and (2) ideas in club good theory where small religious groups benefit from being able to monitor one another more easily, reducing moral hazard problems more generally. The estimated marginal effect is small, it lies well outside reasonable bounds of statistical significance and the confidence intervals span zero; it is not economically significant. The third religious factor variable (*size of minority in area*) is an interaction term which measures the size of the religious group aligned to a bank if it is a minority bank, e.g. the size of the Protestant minority for a Protestant bank located in a Catholic-majority area. This variable is included to consider the idea of club good theory’s optimum congregation size; to account for the increased possibility of free riding behaviour by cooperative members in large congregations, or alternatively put, to account for peer monitoring costs or the efficacy of the excludability constraint. The coefficient is not “frequentist-significant”, the p-value being just over the ten percent cutoff. However, it may be considered economically significant in that the confidence intervals suggest that it is positive for most possible outcomes. This implies that banks servicing larger religious communities were willing to take on more risky portfolios. An increase in the size of a religious minority by one percent from the mean increases a minority-affiliated bank’s level of leverage (i.e. increases its exposure to risk) by 0.10 percent. This effect is not present in the upper tail of the distribution (see Table 5), i.e. the size of the religious minority does not affect the likelihood that a bank is extremely leveraged.

The second set of variables, reported in the second panel of Table 4 under the heading ‘bank-specific attributes’, concern more conventional determinants of bank leverage. An increase in the proportion of bank assets that are immediately callable (*liquidity*) by one percent from the mean results in a decrease in a bank’s level of leverage by 0.53 percent. The direction of this effect is as would be expected; banks that hold more assets in callable categories are likely lending out less to members. The monetary value of banks’ total assets (*assets*) is positively associated with leverage, and is statistically and economically significant. This suggests that larger banks were willing to take on more risks. The

size of the principal-agent problem (*depositor-to-member ratio*) does not seem to affect banks' leverage. Banks that are older (*bank's age*) appear to have been less leveraged, suggesting a lifecycle hypothesis-type explanation. Recently-established banks did not have a significantly higher likelihood of being extremely leveraged, however (see Table 5). The distance between a bank and its central clearinghouse (*dist. to clearinghouse*) greatly affects leverage; an additional kilometre increases the value of the leverage ratio by 0.11 percent. This distance can be interpreted as the cost to a local bank of central clearinghouse oversight over their activities (information costs), or alternatively as the cost to a local bank of borrowing from its clearinghouse (transaction costs). Whether a bank derives legal personality from the *Wet van 1855* or the *Wet van 1876* (captured by *legal choice*) appears to have a large negative effect on the leverage ratio in the expected direction; the *Wet van 1855* offers less protection in case of bankruptcy and hence banks are less leveraged (see discussion in Section 3). The marginal effect is large and negative for most of the 95 percent confidence interval, and lies inside conventional bounds of statistical significance.

The third set of variables, reported in the third panel of Table 4 under the heading 'economic geography of market', concern the principal alternative hypothesis, that banks' risks are determined mostly by the economic activity of their customers. Of the four factors included, two are discussed (*horticulture* and *owner-exploited*). The proportion of land that is used for horticulture affects banks' leverage positions in a positive direction and is statistically and economically significant; an increase in the portion of land used for horticulture by one percent increases banks' leverage by 0.17 percent.¹⁵ The direction of the effect is as could be expected, given that horticulture is a capital-intensive form of farming. The proportion of farms that are owner-exploited (as opposed to rented) does influence the likelihood of a bank being extremely leveraged (see Table 5, but only by a small amount).

Finally, the network-, and year-specific effects capture any differences in risk between the three networks, and also any changes to systemic risk present in specific years. Banks belonging to the CCB-Eindhoven network (*CCB-Eind*) were economically significantly more leveraged than banks belonging to the CCRB-Utrecht network; although the effect is not statistically significant at conventional levels, if it did occur, then it would dwarf most other factors. The positive sign of the marginal effect is to be expected as CCB-Eindhoven banks did not have access to DNB's discount facility, whilst CCRB-Utrecht banks, the base category with which the network dummy variables are compared, did

¹⁵Data for this refer to the regions in which banks operate, not the activities of customers themselves necessarily. To avoid the "ecological fallacy" (Gregory & Paul 2007), no geography-determined assumption is made on the economic activities of banks' customers, only regarding their potential market.

(see discussion in Section 3). However, other network-correlated causal factors may be involved that cannot be measured using this cliometric approach, such as bank policy, cashier training, or inspection directives. Banks belonging to the CCCB-Alkmaar network (*CCCB-Alk*) are significantly more leveraged than banks in the other two networks. This too is as expected, for it is the central clearinghouse of this network that ultimately failed, in 1924, due to mismanagement. The entire cooperative banking sector appears to have been significantly more leveraged in 1923, which is in the middle of the crisis period, when agricultural prices reached their all-time low (see Figure 4). The interaction terms suggest that CCB-Eindhoven banks were particularly leveraged in 1925 whilst CCCB-Alkmaar banks were particularly leveraged in 1921. The historical reason for this is unclear.

Turning briefly to the regression reported in Tables 6 and 7, the regressions of banks' savings ratios, the key results to note are: (1) overly Christian banks did not experience significantly different savings ratios over the crisis period; (2) although only "borderline significant" in a Lindley-Bayesian sense, banks for minority groups experienced higher levels of deposit retention, i.e. fewer new deposits were immediately withdrawn by customers; (3) cooperatives with more corporate governance protection but more liability limitation experienced (statistically and economically) significantly higher saving ratios, i.e. fewer savings were withdrawn from banks with completely unlimited liability constructs; (4) the economic geography of banks' target markets was not important; and (5) bank size in terms of assets is an important and minority status is not an important determinant of the savings ratio of banks in the upper tail of the distribution, i.e. for those that were losing deposits much faster than they could attract them. Overall, then, the most interesting result for the working hypothesis of this paper is that the ability of banks affiliated to religious minorities to take on risks may have been higher than those for majorities. This is consistent with the theory summarised in the previous section, that banks for minorities were more able to use screening, monitoring and enforcement technologies and hence more able to take on risks. In combination with the results of the previous regressions, this implies that banks for minority groups were not willing to take on risks, despite being able to do so. This implies that they acted in a more risk averse fashion.

This section commenced by specifying three religion-risk (aversion) questions. Each is addressed in light of the quantitative analysis. (1) A relationship between religion and banks' risk does appear to exist, specifically in relation to banks that were established for minority denominations. (2) The religious factors appear to have had an overall risk-reducing effect.¹⁶ Overtly Christian banks were less risky, and banks that were

¹⁶Whether banks were taking optimal risks – whether this is “good” or “bad” for long-run bank performance – is beyond the scope of this paper. As discussed in the introduction, however, the rural

established for religious rather than economic reasons (so-called minority banks) were less risky if the size of their affiliated congregation is small. This is despite the fact that they were able to take on more risks had they so desired. This suggests a club good-style explanation to group formation – mutual insurance combined with self-selection by risk type, perhaps in which signalling combined with peer monitoring and easily-enforcible social sanctions prevented free riding behaviour. This theoretical interpretation of the results is only speculative at this stage, however, as this cliometric approach concerns only banks’ outwardly-observable characteristics and not their inside working, the subject of the next section. (3) Conventional factors, such as banks’ liquidity and distance to clearinghouse, do influence bank risk, and in theoretically expected directions. This is an encouraging result that strongly suggests that the regression results are not arbitrary. The results suggest that the most important risk-affecting factor is a bank’s choice of clearinghouse network. Indeed, this choice may be considered more important than religion *per se*, although it may too be influenced by members’ religious affiliation; each network is *de facto* affiliated with another religious *zuil* (pillar), and, as discussed in Section 3, there is a suggestion in some quartres of possible segregationist discrimination against Catholic-affiliated networks. Overall, however, the network effect is therefore very difficult to disentangle from a “specific denomination effect”, and hence evidence for a Weber-style explanation for this is inconclusive. Although a bank’s risks are affected by the fundamentals of its customers, each network provided guidance on the way customers were chosen and pursued in bankruptcy, and hence the choice of network can be considered to be partly endogenous to these fundamentals. Disentangling this factor requires the (qualitative) comparative approach of the next section.

6 Qualitative assessment of bank risk

This section compares the findings of case studies in two distinct regions of the Netherlands, one on the west coast and one in the south of the country. The banks of interest are: (1) two banks in Loosduinen and two in Rijswijk, both rural satellite towns of in The Hague; and (2) one bank in Baardwijk and one in Capelle, both satellites of Waalwijk. Appendix C describes the two study regions which these banks service. Appendix D constitutes detailed microstudies of the banks operating in these regions.

Comparing the Loosduinen with the Rijswijk cooperatives suggests that minority religious groups, both Catholic and Protestant, were particularly militant in securing a separate and separated religious identity for their bank. The evidence presented in

cooperative sector outperformed the rest of the Dutch bank sector during the 1920s crisis, especially versus urban cooperatives.

the appendices suggests that potential costs relating to the lack of scale and scope that resulted from this segregation were possibly compensated for by the information and enforcement benefits of a religiously homogeneous banking institution. Strict joining requirements at the banks for Catholic minority groups suggest that they intended to use these as an exclusion device, a method of ensuring homogeneity between their customers. The cases highlight differences in lending technologies used by banks with otherwise very similar customers. Banks for Protestant minority groups appear to have been stricter in their lending requirements, making no use of mortgages or loans without a guarantee, insisting instead on the use of personal guarantors.

The history of the Baardwijk and Capelle cooperatives tell a similar story, but with some interesting differences. In this case, both religious denominations lived in religiously homogenous communities, spitting distance from one another. Capelle was a minority outpost of Protestantism in an otherwise Catholic area. The Baardwijk cooperative never attempted to accommodate the Protestants living next door in Capelle, who waited a further fifteen years for a bank to arrive in their village. As the type of farming carried out in both towns was virtually identical, and the access to alternative financial services similar, this suggest that: (1) there was initially little economic demand for a *boerenleenbank* in either place, but that the Catholic political drive for bank creation was stronger than that of Protestant groups; and/or (2) there was significant untapped demand in Capelle, but an absence of Protestant political will to create an institution that would meet this demand.

The Baardwijk bank was managed with heavy influence from Catholic-only social and agricultural organisations, but its market was sufficiently large and diversified for this to not significantly influence risk exposure or bank performance in an adverse way. But over the crisis period, when customers were most under stress, this bank was forced to borrow considerably from outside sources to accommodate credit demand, suggesting that it failed to hold onto or expand depositors' savings but continued lending as before. The Capelle bank, which was relatively free from socioreligious influence, was managed in a similar way to that in Baardwijk, but was more thorough with its screening of loan applications, i.e. more risk averse. Its credit risk was lower as a result, and it did not have to increase dependence on external sources during the crisis.

Comparing The Hague's cooperatives with those of the Waalwijk area shows how, regardless of location, Catholic-leaning banks limited membership by requiring members to also join local farming associations, whilst neutral ones did not do so explicitly. Instead, neutral banks "mopped up" everyone who was left in the market after the Catholics had siphoned off their group, and hence were left with Protestants; i.e. neutral banks were *de facto* Protestant. Although lending requirements were in many respects similar

in all cases, The Hague's cooperatives in particular show how managers adapted their credit policy to the specific business activities of their customers, to their local economic geography. All cases demonstrate the use of peer monitors – in the form of named personal guarantors – in loan contracts, in addition to the unlimited liability of banks' members. Differences in banks' legal structure – which influenced liability limitation and corporate governance, among other things – appears to have made little difference in their business structure or their day-to-day banking practices and processes (their business conduct).

Although all banks' financial positions worsened during the crisis period, there is little evidence their business conduct changed in reaction to it. This lack of adaptation was not a major obstacle to their long-run performance, however. Comparing the performance of banks for minority religious groups in Capelle and Rijswijk with banks for the majority religious denominations in Baardwijk and Loosduinen does suggest that the stresses of the crisis appear to have affected banks with similar customers in different ways, that banks for minorities under stress were unwilling or unable to take on any additional risks. The failure and disappearance of the CCCB-Alkmaar bank did cause problems for member banks, such as those in Loosduinen, but the damage was only short-lived.

In summary, the qualitative evidence is largely consistent with the quantitative analysis of the previous section. Banks for religious minorities differed from those for majority groups, regardless of their denominational affiliation or the economic activities of their customers. They were less willing to extend credit using technologies other than personal guarantors and took greater care to screen and monitor their customers, among other things. A different pattern emerges when looking at group norms and group exclusion: Catholics appear to have taken the lead – e.g. with more stringent membership requirements – and Protestants followed only afterwards. But the net result was much the same: a self-enforced segregated market in which the rural banking sector's structure followed directly from its market's socioreligious organisation. It was this organisation that influenced banks' risk-taking behaviour, not the religious denomination *per se*.

7 Conclusion

This paper commences with a quote from a New Testament parable, one interpretation of which suggests a possible relationship between religion and risk-taking in banking: good Christians should not be overly risk averse, but should instead be willing to take calculated risks. Not to do so is a waste of talent. The evidence presented in this paper suggests that religion got in the way of this parable in the Netherlands of the early twentieth century. Economic confessionalisation (the *verzuiling*) led to institutional duplication in religiously-mixed parts of the country. Managers of banks established for sociopolitical

rather than economic reasons – so-called “minority banks” established to service regions’ religious minorities, either Catholic or Protestant – were unwilling to take on the same levels of risk compared with banks in religiously homogeneous areas. Instead minority banks operated a tight ship, making use of the informational and enforcement advantages of the small size of their flock. They buried their talents in the ground, could think only of security and had to rule out risk.

More specifically, this paper finds evidence that: (1) the level of exposure to risk of banks for religious minorities is partly correlated with the size of the religious community it serviced, with minority banks less willing to take on risks, despite potentially being more able to do so; (2) minority banks were much less willing to take on mortgages or loans backed merely with an individual’s credit history, preferring instead personal sureties; (3) membership criteria were used to differentiate the market into sub-groups with similar (religious) characteristics, facilitating screening and monitoring; (4) banks for majority groups were more willing than banks for minority groups to adapt their lending policy to their local customer base, changing their credit policy to meet local needs; (5) whilst majority banks did not alter their business conduct over the period of the 1920s deflation, minority banks became more risk averse in their operations; and (6) the corporate legal form used by banks mattered little “on the ground” – structural and procedural differences between banks using different legal codes were minimal – but overall risk exposure of those banks using the more sophisticated corporate form was nevertheless lower.

In relation to the literatures discussed by this paper, it finds in particular that: (1) a club good-style theory of group formation combined with within-group social norms on business interaction best explains the Dutch case, and that Weber-style theories linking a particular denomination with a particular attitude towards business are less useful; (2) Catholics in particular were more committed to economic confessionalisation, but Protestants in the end were also forced into confessional segregation as Catholics left previously religiously-heterogeneous institutions to form their own; and (3) although there were a number of different popular loan technologies used in the Dutch case, the role of the “inside monitor” in a loan contract in particular appeared to be important, over and above the joint-liability of cooperative organisations as a whole.

On the size and importance of the religion-effect, the regression analysis of banks’ balance leverage and savings ratios – measured of banks’ willingness and ability to take on risks – suggests that religion is important, but that other risk-affecting factors are equally if not more so. Theed comparative case studies reveal a multitude of differences between banks for minority and majority groups in the way they extend credit to members and make decisions more generally. Although not governed by religious attitudes directly,

these differences were nevertheless a consequence of religion, or more precisely of Dutch society's voluntary religious segregation. The Dutch case suggests that religion and risk are not related directly, but that risk is affected by the industrial structure of the banking system, which in turn is a consequence of religious preferences.

A wider point that this paper illustrates is that quantitative evidence is not always sufficient to understand the mechanisms by which estimated effects work, as it does not always reveal what happens *inside* the firm. It shows instead how cliometric methods can be useful to business historians in generating guiding hypotheses in research projects where the literature provides many alternative possible relationships of interest, which can be further investigated using business histories. And, finally, it illustrates how qualitative case studies used in a comparative way can help reduce the risk that findings are merely idiosyncratic in nature.

Appendices

A Primary sources

Where referenced according to the in-house archival referencing systems, or using a description in the absence of such a system, reports, correspondence and meeting minutes of the different central and local cooperative banks and the Dutch state, available at:

- De Nederlandsche Bank in Amsterdam (DNB);
- Rabobank Nederland in Utrecht (RaboNed);
- Rabobank Haaglanden in The Hague (RaboHaag);
- Rabobank Langstraat in Capelle (RaboLang); and
- Directie van Handel en Nijverheid held at the Nationaal Archief in The Hague (NA).

Annual reports for 1918 to 1925 for the following central clearinghouses, viewed at RaboNed:

- Coöperatieve Centrale Boerenleenbank, Eindhoven (CCB-Eindhoven); and
- Coöperatieve Centrale Raiffeisen Boerenleenbank, Utrecht (CCRB-Utrecht).

Annual reports for the 1918 period 1923, viewed at the Nederlandsch Economisch-Historisch Archief at the International Institute of Social History in Amsterdam:

- Coöperatieve Centrale Christelijke Boerenleenbank, Alkmaar (CCCB-Alkmaar).

In-house newspapers published by the two main central clearinghouses (CCB-Eindhoven and CCRB-Utrecht), available at <http://rabobank-tijdschriften.pictura-dp.nl/>:

- *Maandelijkse Mededelingen van de Coöperatieve Centrale Boerenleenbank*; and
- *De Raiffeisen-Bode*

A general register of names of all savings banks operating in the Netherlands in 1919 published in Centraal Bureau voor de Statistiek (1921), ‘Statistiek der Spaar-en Leenbanken in Nederland over het jaar 1918/1919’, Bijdragen tot de statistiek van Nederland, No. 318.

Data from the *Volkstelling* (census) conducted in the Netherlands in December 1920, published by the Centraal Bureau voor de Statistiek in The Hague in 1924, available at <http://www.volkstellingen.nl/>:

- Economisch-geografische indeeling van Nederland (Economic geographical organisational division of the Netherlands);
- Onderscheiding naar bedrijfsklassen, bedrijfspgroepen en beroepen in de economisch-geografische deelen van het Rijk met vermelding van de positie in het beroep en van het geslacht (Division of labour by business class and job type in all economic-geographical organisational divisions of the Kingdom, by job seniority and by gender); and
- Aandeel van elk der voornaamste kerkelijke gezindten in het totaal der bevolking van iedere gemeente (Proportion of population affiliated to each of the main religions resident in every municipality).

Agricultural survey data from the tables 'Indeeling der gronden' in Directie van den Landbouw (1920), 'Verslag over den landbouw in Nederland over 1919', Verslagen en Mededeelingen van de Directie van den Landbouw, No. 3.

Monthly agricultural price data from the Centraal Bureau voor de Statistiek's *Maandstatistiek* bulletin, various volumes spanning the period 1920-1925.

Geographic Information Systems (GIS) data:

- TOP250namen dataset of place names and their geographic coordinates taken from a map of the Netherlands at the scale of 1:250,000 provided by the Dutch Kadaster (land registry) in Apeldoorn; and
- NLKAART GIS shape file of a political map depicting the borders of every Dutch *gemeente* (municipality) at the time of the 1920 census, provided by Onno Boonstra of the Radboud Universiteit Nijmegen.

Legislation governing cooperative organisations, available at the Koninklijke Bibliotheek in The Hague:

- *Wet van den 22sten April 1855, tot regeling en beperking der uitoefening van het recht van vereeniging en vergadering* (Staatsblad 1855, No. 32), including legal changes resulting from *Wet van den 14den September 1866, houdende uitbreiding van art. 14 der wet van 22 April 1855 tot wederkeerige verzekerings- of waarborgmaatschappijen* (Staatsblad 1866, No. 123); and
- *Wet van den 17den November 1876, tot regeling der coöperatieve vereenigingen* (Staatsblad 1876, No. 227).

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C Economic and social geography

This short appendix outlines the economic and social geographies of the two study regions used in the comparative business histories discussed of Section 6 and Appendix D. This discussion is used to identify which differences in the histories of the study banks are due to the economic activities of their customers and which are due to other factors. The principal source used is Directie van de Landbouw (1923), a contemporary government agricultural survey of the Netherlands. In summary, whilst farming around The Hague was predominantly horticultural, that carried out in the Waalwijk area was mixed.

C.1 The Hague and the Westland

The area around the metropolitan centre of The Hague (Den Haag), the Netherlands' seat of government and residence of the Royal family (but not the country's capital), remained predominantly rural up until after the Second World War. The villages of Loosduinen, Wateringen, Rijswijk, Voorburg, Voorschoten and Wassenaar are today just suburbs of

The Hague, but in the period under investigation were separated from the city by large tracts of agricultural land. The two villages of special interest, for which significant records concerning rural cooperative banks have been preserved, are Loosduinen and Rijswijk. Both were mixed religiously: Loosduinen (population 8,500 in 1920) was 35 percent liberal Protestant, 15 percent orthodox Calvinist and 35 percent Catholic, whilst Rijswijk (population 9,000 in 1920) was 37 percent liberal Protestant, 9 percent orthodox Calvinist and 36 percent Catholic.

Directie van de Landbouw (1923) classified these two villages, located to the southwest and south of The Hague respectively, as being part of two separate but similar agricultural regions: (1) Westland (literally western-land) for Loosduinen; and (2) Delf- en Schieland (named for two waterways) for Rijswijk. A short description of each region follows. (1) By far the most important type of agriculture carried out in this region was horticultural farming (fruit and vegetable production), which took up about one third of all available land. Individual landholdings for horticulture were small; approximately 25 percent of all land in this region was exploited by agricultural businesses of one to five hectares. According to the survey, between 20 and 40 thousand guilders was required to exploit just one hectare of horticultural land.¹⁷ Much of the area was covered by greenhouses, from which cucumbers and grapes were the main crop. Other important produce included cabbages, carrots, new potatoes and strawberries. A major use of non-horticultural land was milk cow herding, the milk of which was either sold fresh to customers in nearby markets such as The Hague or used in butter production, and the waste products of which were used by horticulturists as fertiliser. Cereal production was unimportant. Less than 30 percent of land was owner-exploited. (2) Horticulture was gaining increasing importance in the Delf- and Schieland area, which was a mixture of reclaimed *polders* and river clay soil. Cucumber production was especially important. Milk production was the main business in non-horticultural areas, and cereal production was relatively unimportant. The region was characterised by small- and medium-sized businesses landholdings. Approximately 35 percent of land was owner-exploited.

C.2 Waalwijk and the Langstraat

The area surrounding the town of Waalwijk (population 5,500 in 1920) was known as the Langstraat (literally long street). It lies just south of the Rhine and Meuse river deltas, north of Tilburg, just south of the Bergse Maas (a canal connecting the Meuse river with the Hollandsch Diep to the west), east of Breda and west of Den Bosch. It constitutes a string of villages that stretches along the northern border of the southern province

¹⁷This is approximately 100 to 200 thousand euros in today's money.

of Noord-Brabant. The area used to be synonymous with the Dutch shoe making and leather industries, both of which were still active in the period under investigation. The area was quite sparsely populated and agricultural, and remains so even today. Waalwijk was and still is the largest town in this region. The towns of special interest, for which significant records concerning their cooperative banks still exist, are Baardwijk (and surrounding villages) and Capelle, just seven kilometres apart but with totally different constituencies: Baardwijk (population 1,605 in 1920) was 9 percent liberal Protestant, 1 percent orthodox Calvinist and 89 percent Catholic, whilst Capelle (population 2,500 in 1920) was 87 percent liberal Protestant, 6 percent orthodox Calvinist and 7 percent Catholic. The villages immediately bordering Baardwijk in the *gemeenten* of Besoijen, Sprang and Loon-op-Zand were similar in their religiosity.

Directie van de Landbouw (1923) classifies both villages in the same agricultural region: (1) the Noordwestelijke zeeleigonden (northernwesternly sea clay areas), although some of the neighbouring villages to their south are part of (2) the Meijerij (Bailiwick) area. An important farming type in (1) was large-scale hay production. Other land uses included cereal and sugar beet production, but also milk cow raising; indeed, cooperatively-owned steam-powered milk pasturisation factories were first established here in the 1900s (Vercauteren et al. 2004). Artificial fertiliser was the principal type used by farmers in the region. A significant portion of landholdings were medium- and large-sized, but small landholdings were increasingly important; labourers would rent small landholdings for the production of potatoes and sugar beets. Approximately 28 percent of land was owner-exploited. Land use in (2) was different; in addition to sugar beets, potatoes, milk cows and wheat production were also important. Landholdings here were also significantly smaller: 94 percent were below 20 hectares.

D Comparative case studies

This appendix describes the banks operating in the two case study areas in some detail, focussing in particular on their institutional development, day-to-day management processes and practice, the shape and size of loans taken out at these banks, and the role of religion in all the above. Limited by the available material, its primary focus is on factors that affect credit risk, but other classes of bank risk are also discussed.

D.1 The Loosduinen schism and the Rijswijk duplication

The history of the *boerenleenbanken* in Loosduinen reveal much about the impact of religion on the day-to-day management of a bank located in an area with a Catholic

minority. A *boerenleenbank* was founded at a meeting held on 22 February 1909 in a café in the centre of Loosduinen (RaboHaag: Notulen Algemene Vergaderingen Loosduinen I). Most participants were members of the Loosduinen *warmoezenierspatroonsvereniging* (association for horticultural business owners). They opted for the CCCB-Alkmaar network, despite reservations from the meeting's chairman that this network was smaller than the other two and that its overt Christianity – or, more specifically still, Catholicism – may isolate potential members of other socioreligious groups. Participants also decided that their bank should take the *Wet van 1876* corporate form, and that use should be restricted to members of the *warmoezenierspatroonsvereniging*. From a subsequent meeting held that April it is apparent that a significant number of farmers who initially expressed interest in joining did not do so because they did not qualify for membership to, or refused to join, this association (RaboHaag: Bestuursnotulen Loosduinen I).

Records concerning the first two decades of the bank's existence suggest that customers became a member of the bank only in order that they could borrow money; those who already had a relationship with the bank – i.e. had a savings account – did not become liable members until they needed a loan. In addition to the bank's members, all of whom were liable in case of bankruptcy, most loan agreements also enjoyed the security offered by either one or two named personal guarantors. Named guarantors were much preferred to mortgage contracts, as the value of property was argued to be too difficult to value. Instances where mortgages were refused and instead rearranged as loans with personal guarantees from family members residing in the previously-to-be-mortgaged properties were not infrequent. Most loans were small and did not require directors' approval – they were instead arranged by the cashier directly. Larger loan applications were considered by directors after applicants provided sufficient sureties. A typical requirement of a loan was that borrowing members could not deposit anything into their savings account until it was paid off. For many applicants, the proof of past business activities was sufficient to get a loan by itself; loans to the tune of one quarter of a horticulturist's recorded takings from the sale of his goods at the previous year's *groente veilingen* (vegetable auctions) appear to have been granted frequently, without needing any additional sureties.

Soon after the bank was established, the chairman of the local chapter of the Catholic *volksbond* (workman's league) – who was co-opted to attend management meetings – mentioned that a group of Loosduinen Catholics were privately planning to set up a separate cooperative, exclusively for Catholics. One of the bank's directors worried that Catholics would misuse their religion to justify a lax credit (risk) policy for their bank. In June 1909, a local Catholic priest – who sat in on management meetings in his capacity as the bank's *geestelijke adviseur* (spiritual advisor) – informed directors that he had

persuaded this “splinter group” that the creation of another bank was unnecessary, that the current construction was ‘sufficiently Christian’ in its values. To further appease its Catholic constituency, the bank’s early advertising policy was to attract new customers using the region’s Catholic press only.

The religion question apparently simmered in the background throughout the bank’s early years, eventually coming to blows during the Great War; in October 1916, a letter from the CCCB-Alkmaar clearinghouse informed directors that the Loosduinen chapter of the newly-established Catholic *land- en tuinbouwbond* (horticultural farmers’ association) had applied to set up its own bank, with CCCB-Alkmaar also acting as that bank’s clearinghouse. The new bank had been established by December, and was named Loosduinen II for the purposes of bookkeeping. The creation of this new bank coincided with the mass-defection of members of the *warmoezenierspatroonsvereniging* to the *land- en tuinbouwbond* and the creation of separate Catholic-only *groente veiling* in the town (Vijverberg 2009).

As the position of the CCCB-Alkmaar group became more and more fragile, and following a 1919 clearinghouse circular that urged local banks to wind back their loans business because the clearinghouse could no longer afford to extend credit to banks in need, the original Loosduinen (I) cooperative shed the function of *geestelijke adviseur* and left the CCCB-Alkmaar group in the 1921-1922 financial year, with great protestations from that organisation. After this switch of central clearinghouse, the bank became much less leveraged, moving from levels above 100 percent to levels under 50 percent by the mid 1920s (see Table 1 for definition of leverage in this case). The opening of an explicitly Catholic rival likely reduced the need for that bank’s leaders to appease Catholic customers, permitting them to join the financially more secure neutral (*de facto* Protestant) CCRB-Utrecht group instead. Loosduinen II, meanwhile, stayed a member of the CCCB-Alkmaar network until the bitter end of that organisation’s life, in 1924, and joined the Catholic-leaning CCB-Eindhoven thereafter. Its obstinate decision to stick with CCCB-Alkmaar meant it was forced to shoulder part of the costs of that organisation’s wind-up, costs which Loosduinen’s original bank was largely able to avoid.

The history of the *boerenleenbanken* in the nearby village of Rijswijk shows how a cooperative for Protestants emerged as a direct reaction to one for Catholics. Two banks were established in Rijswijk in 1910. The first was set up in September, serviced the Catholic community and belonged to the Catholic-leaning CCB-Eindhoven group. The second was set up just two months later in November, serviced the Protestant community and belonged to the CCRB-Utrecht group. The main source of the brief discussion that follows is the work of a local historian, Jense (1990), in addition to various annual inspection reports of the two banks conducted by their central clearinghouses (RabonEd:

EI472 and UI559).

The Catholic agricultural bank – the Boerenleenbank te Rijswijk – derived its legal personality from the *Wet van 1855* and was primarily instigated by members of the council of Rijswijk’s Catholic Sunday school, the St Bonifatius Patronaat, and members of the local Catholic farming union, the local Catholic *land- en tuinbouwbond*. These farmers also made up the bank’s management and oversight boards. The bank’s director was a church chaplain. It opened on Thursday evenings between 6PM and 8PM in a rented room in the school, which initially cost the bank 30 guilders per year. It charged new members 10 cents to open a savings account. By 1913 the bank had 100 fully-liable members. Loan agreements mostly enjoyed personal guarantors, who according to inspection reports were usually successfully pursued by curators when loans went sour. Loans sometimes involved financial securities (usually corporate bonds) as loan sureties. This bank functioned as a credit house; it was leveraged at a level above 100 percent throughout the period under analysis, relying on the central clearinghouse for outside finance.

It is likely that the Protestant agricultural bank – the Coöperatieve Boerenleenbank Rijswijk – was established in response to the Catholic one. It was instigated by the Rijswijk branch of the Hollandsche Maatschappij van Landbouw, a *landbouwmaatschappij* (farming association) which was officially neutral but which predominantly catered for Protestant farmers by virtue of the fact that the Catholics had by the 1910s largely left it to form their own organisations. Again, the management of the bank overlapped with that of this *maatschappij*, although members of the bank were not required to join. This bank derived its legal personality from the *Wet van 1876*. The Protestant cooperative was smaller than its Catholic neighbour in terms of membership. It did not extend large quantities of credit to its members, functioning predominantly as a savings house – apart from the 1923 crisis year, it was usually leveraged at a level of only approximately 20 percent. Inspection reports reveal that the bank did not grant any mortgages, nor did it grant credit to members purely on reputation without guarantors. All loans were explicitly to be used for (agricultural) business finance, and were monitored annually to ensure this was indeed the case. After the period of analysis on this paper, this bank was forced to merge for scale reasons with the Protestant cooperative in Voorburg, another satellite town of The Hague to the north-east of Rijswijk.

Given the relative differences in the way the Catholic and Protestant banks were used, and the size of the Catholic bank’s balance sheet relative to that of its Protestant neighbour, and comparing these differences with the proportion of Catholics living in the Rijswijk area, it is likely that Protestants banked with the Catholic bank. Although it is unclear what the interest rates offered by each were at this time, elsewhere rates differed

by as much as one half of one percent, which may have influenced farmers' choice of bank over and above religious community loyalty.

D.2 The same but separate in Baardwijk and Capelle

In the Waalwijk area, the idea of establishing a cooperative 'in aid the area's farmers' was first discussed in late 1903 by the local chapter of the Noord-Brabant Christelijke Boerenbond (provincial Catholic farmers' union) (RaboLang: Notulen NCB Waalwijk). Gerlacus van den Elsen, a Catholic priest from Heeswijk, some 60 kilometres to the east of Waalwijk, and a leading force in the Catholic cooperative movement, attended the next meeting of the *bond* (union), in January 1904. He recommends that the new bank should: (1) be exclusively for local farmers; (2) accept deposits from and make loans to farmers; (3) be managed by a committee of directors and supervised by a separate committee of supervisors; (4) insist members of both these committees be fully liable for the bank's losses, just as all regular members are; (5) require large loan applications to be approved by both committees; and (6) join the CCB-Eindhoven network.

Supervisory and management committees were appointed in April 1904 and later confirmed at the first annual general meeting of the bank's members. Baardwijk's mayor was appointed to the board of directors. Members had to also be a member of the *bond*, and had to sign up to the bank's statutes, which espoused Christianity and the family as its core values. The bank's working area was geographically large for such a bank: Baardwijk, Waalwijk, Besoijen, Sprang and Loon-op-Zand (RaboLang: Statutes Baardwijk). These were all majority Catholic areas; the bank did not extend to Capelle, even though this was geographically closer than some of the villages it did cover. Each participating village received representation on the different committees according to its relative size. Legal personality was derived from the *Wet van 1855* and, on Van den Elsen's advice, the CCB-Eindhoven network was chosen. Most committee meetings in the bank's early history were witnessed by a *geestelijke adviseur*, a local Catholic priest, who started and ended proceedings with a Christian prayer. The exact influence of the priest on proceedings beyond formalities is unclear, however. General meetings for all members were brief and not well attended (RaboLang: Notulen Ledenvergaderingen Baardwijk), and so *de facto* control rested with the small committee of directors and supervisors.

Typical loan requests at the Baardwijk bank were for amounts between 200 and 500 guilders, and had two named guarantors (RaboLang: Notulen Directie Baardwijk). Sometimes physical property was used as collateral, or even livestock, but this was rare. There were some mortgage contracts, which required an official notarial act before consideration. At the combined meetings between directors and supervisors, the cashier,

at whose house these meetings were held, ran through the bank's financial position and then asked for advice on any particular problems, such as a shortfall on the books or a loan application from a member with a poor credit history (RaboLang: Notulen Bestuur en RvT Baardewijk). A number of instances can be found where applications for loans from individuals judged not to be agriculturalists in the strictest sense were rejected; they were advised instead to take their business elsewhere, and especially recommended came the Hanzebank, a Catholic bank for small- and medium-sized enterprises which had a branch in Waalwijk.

The Capelle bank was founded some fifteen years after its neighbour, in 1919. It took its legal personality from the *Wet van 1867* and joined the CCRB-Utrecht network (RaboLang: Register en Statuten Boerenleenbank Capelle). The statutes of this bank state that customers could only join if they were not already a member of another *boerenleenbank* (Article 3), i.e. not a member of Baardewijk's cooperative. They had to reside in, or at least work in, the *gemeenten* of Capelle or Loon-op-Zand. Members were only permitted to borrow from the bank if they were 'careful in nature' and were to use their loan for 'useful purposes'; the use of the loan was to be monitored by the bank (Article 33). Unlike the Catholic banks in the region, the statutes did not insist that the loan must be exclusively used for agricultural finance. Indeed, among the original instigators of this bank was a local doctor (Vercauteren et al. 2004). Non-members were also permitted to deposit savings at the bank, on the agreement of the supervisory committee. If a loan took the form of a mortgage, then the market value of the property had to be at least double the value of the loan (Article 36). If property or securities was to be used as collateral, then agreement had to be sought from the central clearinghouse in Utrecht, as that institution was espoused to have superior valuation expertise.

The bank's statutes make no reference to a god or to Christianity, making this bank *de jure* religiously neutral. But by virtue of the fact that the overwhelming proportion of local residents were Protestant, this bank was *de facto* Protestant; the bank was located in a Protestant enclave inside a largely-Catholic area. There was no direct influence from any overtly Protestant institution, however, much in line with contemporary Dutch Protestant thinking about the separation of spiritual from "worldly matters" (Rasker 2004). By the end of its first year, the bank counted 114 members, most resident in Capelle (100 members), with the rest in Loon-op-Zand. Two cooperative organisations also joined the bank: the local horticulture purchasing society and a housing association. Whilst in theory, supervisors were meant to scrutinise the work of the directors, a clear separation of executive and supervisory responsibilities appears not to have been strictly adhered to at Capelle: the bank's supervisors only met together with its directors and did not meet on their own.

Financial records of the Capelle bank have been well preserved and a detailed picture of how the bank functioned day-to-day is easily constructed (RaboLang: Bankadministratie Capelle). The bank's administration is typical of this time and likely similar at banks of all networks. The cashier held four ledgers, named the *grootboek* I, II, III and the *dagboek*. In the latter, all daily mutations, including withdrawals and deposits, were recorded. At the close of play, new entries from the *dagboek* were copied over to the relevant *grootboek*. *Grootboek* I recorded all savings accounts, *grootboek* II all loans and *grootboek* III all current account mutations. Each page of the books concerned a different customer. The books were professional and updated constantly, despite the bank operating mostly from the cashier's own premises.

A reading of the management meeting minutes of the Capelle bank reveals much about the bank's lending policy and processes (RaboLang: Bestuursnotulen Capelle). Loans were requested for a variety of different things, but especially for the purchase of livestock or as working capital. Some mortgage contracts were also taken out. Big customers of this bank were the *gemeente* (the village's municipal government) and the local *polder* (land-reclamation works). Rates of interest on loans usually ranged between four and five percent. The interest percentage does not appear to have been used as an instrument to differentiate loans by expected level of risk; rather the rate was whatever currently prevailed, i.e. that which the central clearinghouse advised. The instrument used by the bank's managers appears instead to have been the physical loan amount itself; the riskier the customer, the less he was permitted to borrow. Loan sureties were predominantly personal guarantors and often included applicants' family members or even residents of other (far away) villages. Further screening of the quality of personal guarantors was carried out in cases in which they were unknown; loans were sometimes rejected if such investigations yielded unfavourable results. The opening of a current account also required a personal guarantor. Large loan requests, above two thousand guilders, needed approval from supervisory committee members.

Differences between the balance sheet structures of the Baardwijk and Capelle banks are striking. Over the early 1920s, the Baardwijk bank increased its level of balance sheet leverage from the lower end to the upper tail of the distribution, ending the crisis period being overleveraged and very illiquid. Over the same period, the Capelle bank maintained a low level of balance sheet leverage, acting as a bank predominantly for savings rather than loans. It also maintained a very liquid portfolio.

E Tables and figures

List of tables

1	Definitions and descriptions of variables used in regression analysis	46
2	Summary statistics for variables used in regression analysis	48
3	Comparison of mean values for variables used in regression analysis by cooperative network	49
4	Tobit panel regression of banks' leverage ratios, 1919-1925	50
5	Probit panel regression of banks with extremely high leverage ratios, 1919-1925	51
6	Tobit panel regression of banks' savings ratios, 1919-1925	52
7	Probit panel regression of banks with extremely high savings ratios, 1919-1925	53

List of figures

1	Geographic expansion of the rural cooperative banking sector, 1899-1919	54
2	Percentage of census-declared Protestants (all denominations) per gemeente (municipality) in 1920	55
3	Liquidity of rural cooperative banks in 1919, defined as most liquid assets over total assets	56
4	Monthly prices for selected agricultural commodities produced in the Netherlands, indices, 1920-1925	57
5	Epanechnikov kernel density distribution functions of the leverage ratio in relation to the normal distribution, separate plots for each year, 1919-1925	58
6	Epanechnikov kernel density distribution functions of the savings ratio in relation to the normal distribution, separate plots for each year, 1919-1925	59

Table 1: Definitions and descriptions of variables used in regression analysis

Variable	Definition	Reason for inclusion
Dependent variables		
<i>leverage ratio (%)</i>	percentage of deposits lent out to members	measure of a bank's reliance on riskier external financing; an indicator of banks' willingness to take on risks †
<i>savings ratio (%)</i>	percentage of new savings withdrawn from bank over the financial year	measure of depositors' withdrawal behaviour; an indicator of banks' ability to take on risks †
Religious factors		
<i>overtly Christian</i>	dummy = 1 if bank is overtly religious in its founding documents or statutory name	measure of those banks which took religious values very seriously
<i>minority bank</i>	dummy = 1 if bank is (<i>de facto</i>) aligned to the minority religion of the local municipality	measure of a bank's sociopolitical origins †
<i>size of minority in area (%)</i>	proportion of local population aligned religiously to bank, if bank is a minority bank	measure of a bank's sociopolitical origins †
Bank-specific attributes		
<i>liquidity (%)</i>	percentage of assets held in cash or at central clearinghouse for immediate withdrawal	measure of liquidity used by contemporaries †
<i>deposit accounts (no.)</i>	number of deposit accounts	measure of a bank's size †
<i>assets (thousands of guilders)</i>	total assets owned by bank	measure of a bank's size †
<i>bank's age (years)</i>	age of bank	control for potential first-mover advantages †
<i>dist. to clearinghouse (km)</i>	distance to central clearinghouse of bank's network	measure of transaction costs of bank access to clearinghouse deposits and loans †
<i>legal choice</i>	dummy = 1 if bank is established using association law set out in <i>Wet van 1876</i>	the alternative law (<i>Wet van 1855</i>) is cheaper to enact but offers less liability protection †
Economic geography of market		

Continued on next page...

Table 1: Definitions and descriptions of variables used in regression analysis (*continued*)

Variable	Definition	Reason for inclusion
<i>pop. density (per km²)</i>	population density of local municipality	control for farming density
<i>agri. employment (%)</i>	percentage of local labourforce employed in agricultural sector	control for potential market size
<i>horticulture (%)</i>	percentage of local land that is used for horticultural farming	control for capital-intensity of farming
<i>owner-exploited (%)</i>	percentage of local farms that are owner-exploited	control for incentives for investment
Network- and year-specific effects		
<i>CCB-Eind</i>	dummy = 1 if bank belongs to CCB-Eindhoven network	control for network-specific leverage policy relative to the CCRB-Utrecht network †
<i>CCCB-Alk</i>	dummy = 1 if bank belongs to CCCB-Alkmaar network	control for network-specific leverage policy relative to the CCRB-Utrecht network †
<i>year dummies (d19XX)</i>	dummy = 1 if year = 19XX	controls for year-specific systemic risk relative to 1919 †
<i>interaction dummies</i>	network * year interaction dummies	controls for network- year-specific risk relative to 1919 †

Notes: All variables marked with the † symbol are time-variant. All others are time-invariant fixed effects. Variables are calculated using data from the annual reports of the three central cooperative clearinghouses (CCB-Eindhoven, CCCB-Alkmaar and CCRB-Utrecht); the Dutch state's official register of savings banks published in 1919; the 1920 censuses of households and businesses; and the Dutch state's agricultural survey of 1919. See Appendix C for full details.

Table 2: Summary statistics for variables used in regression analysis

Variable	Mean	Std. Dev.	C. V.	Min.	Max.
Dependent variables					
<i>leverage ratio (%)</i>	60.47	84.88	0.71	0	4,113
<i>in 1919</i>	50.64	134.10	0.38	0	4,113
<i>in 1921</i>	55.90	68.65	0.81	0	1,260
<i>in 1923</i>	79.41	61.94	1.28	0	1,089
<i>in 1925</i>	55.94	41.31	1.35	0	471
<i>savings ratio (%)</i>	86.14	41.55	2.07	0	1,058
<i>in 1919</i>	77.24	36.47	2.12	0	662
<i>in 1921</i>	76.01	32.43	2.34	0	539
<i>in 1923</i>	107.40	56.99	1.88	0	1,058
<i>in 1925</i>	83.14	24.80	3.35	0	280
Religious factors					
<i>overtly Christian</i>	0.02	0.15	0.16	0	1
<i>minority bank</i>	0.17	0.38	0.45	0	1
<i>minority in area (%)</i>	4.10	10.80	0.38	0	49.29
Bank-specific attributes					
<i>liquidity (%)</i>	34.44	24.60	1.40	0	100
<i>assets (thousands of guilders)</i>	235.65	222.34	1.06	0	3,336
<i>depositors-to-members (%)</i>	229.60	2513.59	0.09	0	169,500
<i>bank's age (years)</i>	12.98	6.04	2.15	0	28
<i>dist. to clearinghouse (km)</i>	74.37	45.94	1.62	0	203
<i>legal choice</i>	0.42	0.49	0.85	0	1
Economic geography of market					
<i>pop. density (per km²)</i>	357.85	1,242.88	0.29	0.10	14,731.00
<i>agri. employ (%)</i>	35.68	12.62	2.83	1.00	59.00
<i>horticulture (%)</i>	6.06	7.10	0.85	0.46	35.05
<i>owner-exploited (%)</i>	49.32	18.26	2.70	11.16	98.85
Network- and year-specific effects					
<i>CCB-Eind</i>	0.42	0.49	0.84	0	1
<i>CCCB-Alk</i>	0.03	0.17	0.17	0	1

Notes: See Table 1 for description of variables. Panel constructed using data for four years: 1919, 1921, 1923 and 1925. The number of observations for each variable is 4,550. The total number of groups (i.e. number of banks) is 1,144. C. V., the coefficient of variation, is the mean by the standard deviation and is a measure of dispersion.

Table 3: Comparison of mean values for variables used in regression analysis by cooperative network

Variable	CCB-Eindhoven	CCCB-Alkmaar	CCRB-Utrecht
Dependent variables			
<i>leverage ratio (%)</i>	58.17 (58.27)	96.30 (64.38)	60.36 (100.72)
<i>savings ratio (%)</i>	94.20 (44.42)	103.68 (45.64)	81.70 (36.67)
Religious factors			
<i>overtly Christian</i>	0.03 (0.18)	0.33 (0.47)	0.00 (0.04)
<i>minority bank</i>	0.16 (0.36)	0.47 (0.50)	0.16 (0.37)
<i>minority in area (%)</i>	3.79 (10.11)	13.25 (16.01)	3.88 (10.78)
Bank-specific attributes			
<i>liquidity (%)</i>	40.53 (25.34)	18.24 (20.91)	30.71 (23.04)
<i>assets (thousands of guilders)</i>	203.05 (167.39)	185.39 (124.75)	277.80 (259.17)
<i>depositors-to-members (%)</i>	192.21 (89.57)	285.73 (591.15)	246.25 (3,268.86)
<i>bank's age (years)</i>	13.84 (6.39)	13.80 (6.45)	12.30 (5.66)
<i>dist. to clearinghouse (km)</i>	59.69 (38.12)	22.06 (17.77)	88.03 (46.99)
<i>legal choice</i>	0.10 (0.30)	0.82 (0.38)	0.64 (0.48)
Economic geography of market			
<i>pop. density (per km²)</i>	357.06 (1,150.76)	727.68 (1,978.71)	339.54 (1,258.44)
<i>agri. employ (%)</i>	35.39 (12.00)	31.07 (8.43)	36.13 (13.19)
<i>horticulture (%)</i>	6.80 (5.87)	13.23 (11.47)	5.16 (7.38)
<i>owner-exploited (%)</i>	55.28 (16.42)	40.61 (8.31)	45.30 (18.66)
No. of banks	469	45	629

Notes: Standard deviations in parentheses. See Table 1 for description of variables. Panel constructed using data for four years: 1919, 1921, 1923 and 1925. The number of observations for each variable is 4,550. The total number of groups (i.e. number of banks) is 1,144.

Table 4: Tobit panel regression of banks' leverage ratios, 1919-1925

Variable	dy/dx	(P-value)	[95% Conf. Int.]
Religious factors			
<i>overtly Christian</i> †	-6.465	(0.033)	[-12.400 , -0.530]
<i>minority bank</i> †	1.643	(0.527)	[-3.441 , 6.723]
<i>size of minority in area (%)</i>	0.096	(0.153)	[-0.036 , 0.228]
Bank-specific attributes			
<i>liquidity (%)</i>	-0.529	(<0.001)	[-0.636 , -0.422]
<i>assets (thousands of guilders)</i>	0.019	(0.043)	[0.001 , 0.036]
<i>depositors-to-members (%)</i>	-0.000‡	(0.995)	[-0.047 , 0.047]
<i>bank's age (years)</i>	-0.634	(<0.001)	[-0.958 , -0.310]
<i>dist. to clearinghouse (km)</i>	0.108	(<0.001)	[0.049 , 0.167]
<i>legal choice</i> †	-4.641	(0.060)	[-9.475 , 0.193]
Economic geography of market			
<i>pop. density (per km²)</i>	0.001	(0.191)	[-0.001 , 0.003]
<i>agri. employment (%)</i>	0.058	(0.308)	[-0.053 , 0.169]
<i>horticulture (%)</i>	0.171	(0.023)	[0.023 , 0.319]
<i>owner-exploited (%)</i>	-0.077	(0.119)	[-0.174 , 0.019]
Network- and year-specific effects			
<i>CCB-Eind</i> †	4.940	(0.292)	[-4.250 , 14.131]
<i>CCCB-Alk</i> †	13.783	(0.007)	[3.807 , 23.760]
<i>d1921</i> †	-3.988	(0.185)	[-9.880 , 1.905]
<i>d1923</i> †	8.723	(0.056)	[-0.225 , 17.670]
<i>d1925</i> †	-5.916	(0.018)	[-10.809 , -1.023]
<i>CCB-Eind * d1921</i> †	-1.859	(0.638)	[-9.599 , 5.881]
<i>CCB-Eind * d1923</i> †	-0.216	(0.959)	[-8.500 , 8.068]
<i>CCB-Eind * d1925</i> †	13.037	(<0.001)	[6.894 , 19.180]
<i>CCCB-Alk * d1921</i> †	17.236	(0.031)	[1.620 , 32.851]
<i>CCCB-Alk * d1923</i> †	6.750	(0.309)	[-6.251 , 19.752]
Observations (groups)	4,550 (1,144)	Censored observations	29 (left)
St. error of RE estimate	36.405	Variance due to RE	0.205
Log-likelihood	-26160	Wald Chi ²	126842

Notes: See Table 1 for description of variables and Table 2 for summary statistics. Panel constructed using data for four years: 1919, 1921, 1923 and 1925. A tobit model is used because the dependent variable is observed only at or above the interval zero, i.e. the data are censored. An OLS regression would therefore generate biased estimators. The panel regression is unbalanced, as some banks enter or leave from the sample. A random-effects (RE) specification is used as tobit does not permit fixed-effects. Marginal effects of variables on the expected value, conditional on being uncensored (dy/dx), are calculated from the mean. For variables marked with the † symbol, the marginal effect is for a discrete change of the dummy variable from zero to one. The marginal effect of variables denoted with a ‡ symbol are very small in size, with just the sign given in the results. Clustered bootstrap P-value estimates (in brackets) are calculated from 500 replications. These P-values are reported as the conditional distribution of the dependent variable is complicated; bootstrap P-values are distribution-independent. Null hypotheses that effects cannot be rejected at a ten percent level of significance occur with P-values less than or equal to 0.1. Confidence intervals [in square brackets] are the bounds between which the estimated coefficient lies at a 95% level of statistical significance.

Table 5: Probit panel regression of banks with extremely high leverage ratios, 1919-1925

Variable	dy/dx	(P-value)	[95% Conf. Int.]
Religious factors			
<i>overtly Christian</i> †	-0.711	(0.147)	[-1.673 , 0.251]
<i>minority bank</i> †	0.280	(0.274)	[-0.221 , 0.781]
<i>size of minority in area (%)</i>	0.001	(0.873)	[-0.016 , 0.019]
Bank-specific attributes			
<i>liquidity (%)</i>	-0.054	(<0.001)	[-0.065 , -0.042]
<i>assets (thousands of guilders)</i>	0.001	(0.209)	[-0.000‡ , 0.002]
<i>depositors-to-members (%)</i>	-0.000‡	(0.927)	[-0.007 , 0.007]
<i>bank's age (years)</i>	-0.054	(<0.001)	[-0.084 , -0.024]
<i>dist. to clearinghouse (km)</i>	0.009	(<0.001)	[0.005 , 0.013]
<i>legal choice</i> †	-0.327	(0.066)	[-0.675 , 0.022]
Economic geography of market			
<i>pop. density (per km²)</i>	-0.000‡	(0.770)	[-0.000‡ , 0.000‡]
<i>agri. employment (%)</i>	0.002	(0.726)	[-0.010 , 0.015]
<i>horticulture (%)</i>	0.025	(0.002)	[0.009 , 0.040]
<i>owner-exploited (%)</i>	-0.009	(0.053)	[-0.018 , 0.000‡]
Network- and year-specific effects			
<i>CCB-Eind</i> †	0.321	(0.224)	[-0.196 , 0.837]
<i>CCCB-Alk</i> †	1.038	(0.057)	[-0.032 , 2.107]
<i>d1921</i> †	-0.480	(0.006)	[-0.819 , -0.140]
<i>d1923</i> †	0.856	(<0.001)	[0.520 , 1.192]
<i>d1925</i> †	-0.474	(0.023)	[-0.882 , -0.065]
<i>CCB-Eind * d1921</i> †	0.432	(0.163)	[-0.175 , 1.038]
<i>CCB-Eind * d1923</i> †	-0.205	(0.444)	[-0.732 , 0.321]
<i>CCB-Eind * d1925</i> †	0.996	(0.001)	[0.381 , 1.610]
<i>CCCB-Alk * d1921</i> †	1.423	(0.024)	[0.184 , 2.662]
<i>CCCB-Alk * d1923</i> †	-0.204	(0.740)	[-1.411 , 1.002]
Observations (groups)	4,550 (1,144)	Dependent var. = 1	432 obs.
St. error of RE estimate	1.137	Variance due to RE	0.564
Log-likelihood	-903	Wald Chi ²	149.76

Notes: See Table 1 for description of variables and Table 2 for summary statistics. Panel constructed using data for four years: 1919, 1921, 1923 and 1925. A binomial probit model is used where the dependent variable = 1 if the value of the leverage ratio is in the top 10 percent of the distribution (i.e. leverage ratio > 104.98%). The marginal effect of the independent variable should be interpreted as the variable's impact on the likelihood of being highly leveraged. This regression should be read alongside the results in Table 4 in order to understand how the effect of the different variables differs in the upper tail of the distribution. The panel regression is unbalanced, as some banks enter or leave from the sample. A random-effects (RE) specification is used in order to aid in interpretation versus the results in Table 4. Marginal effects of variables on the expected value, conditional on being uncensored (dy/dx), are calculated from the mean. For variables marked with the † symbol, the marginal effect is for a discrete change of the dummy variable from zero to one. The marginal effect of variables denoted with a ‡ symbol are very small in size, with just the sign given in the results. Clustered bootstrap P-value estimates (in brackets) are calculated from 500 replications. Confidence intervals [in square brackets] are the bounds between which the estimated coefficient lies at a 95% level of statistical significance.

Table 6: Tobit panel regression of banks' savings ratios, 1919-1925

Variable	dy/dx	(P-value)	[95% Conf. Int.]
Religious factors			
<i>overtly Christian</i> †	1.107	(0.757)	[-5.908 , 8.122]
<i>minority bank</i> †	-3.909	(0.136)	[-9.044 , 1.226]
<i>size of minority in area (%)</i>	0.066	(0.431)	[-0.098 , 0.229]
Bank-specific attributes			
<i>liquidity (%)</i>	-0.176	(<0.001)	[-0.223 , -0.129]
<i>assets (thousands of guilders)</i>	-0.001	(0.859)	[-0.009 , 0.007]
<i>depositors-to-members (%)</i>	-0.000‡	(0.998)	[-0.008 , 0.008]
<i>bank's age (years)</i>	0.487	(<0.001)	[0.246 , 0.729]
<i>dist. to clearinghouse (km)</i>	-0.043	(0.001)	[-0.070 , -0.017]
<i>legal choice</i> †	4.534	(<0.001)	[1.895 , 7.172]
Economic geography of market			
<i>pop. density (per km²)</i>	0.001	(0.361)	[-0.001 , 0.002]
<i>agri. employment (%)</i>	0.053	(0.234)	[-0.034 , 0.140]
<i>horticulture (%)</i>	-0.044	(0.570)	[-0.196 , 0.108]
<i>owner-exploited (%)</i>	-0.022	(0.508)	[-0.087 , 0.043]
Network- and year-specific effects			
<i>CCB-Eind</i> †	2.220	(0.418)	[-3.151 , 7.592]
<i>CCCB-Alk</i> †	8.141	(0.020)	[1.283 , 14.999]
<i>d1921</i> †	-8.157	(<0.001)	[-10.480 , -5.833]
<i>d1923</i> †	13.207	(<0.001)	[10.018 , 16.396]
<i>d1925</i> †	0.310	(0.685)	[-2.338 , 3.558]
<i>CCB-Eind * d1921</i> †	11.533	(<0.001)	[5.786 , 17.280]
<i>CCB-Eind * d1923</i> †	33.025	(<0.001)	[25.269 , 40.780]
<i>CCB-Eind * d1925</i> †	4.559	(0.075)	[-0.457 , 9.576]
<i>CCCB-Alk * d1921</i> †	10.214	(0.304)	[-9.248 , 29.677]
<i>CCCB-Alk * d1923</i> †	14.210	(0.031)	[1.323 , 27.094]
Observations (groups)	4,510 (1,141)	Censored observations	4 (left)
St. error of RE estimate	36.063	Variance due to RE	0.011
Log-likelihood	-22578	Wald Chi ²	990.83

Notes: See Table 1 for description of variables and Table 2 for summary statistics. A random-effects (RE) specification is used. Clustered bootstrap P-value estimates (in brackets) are calculated from 500 replications. Confidence intervals [in square brackets] are the bounds between which the estimated coefficient lies at a 95% level of statistical significance. For variables marked with the † symbol, the marginal effect is for a discrete change of the dummy variable from zero to one. The marginal effect of variables denoted with a ‡ symbol are very small in size, with just the sign given in the results. See notes under Table 4 for further explanation.

Table 7: Probit panel regression of banks with extremely high savings ratios, 1919-1925

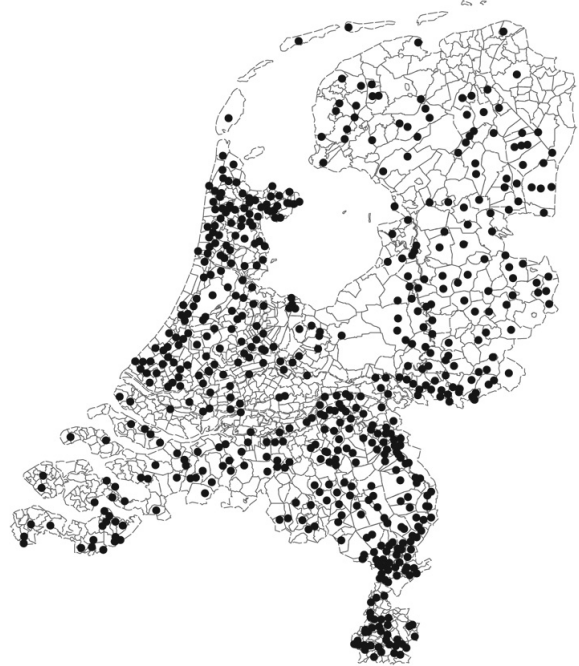
Variable	dy/dx	(P-value)	[95% Conf. Int.]
Religious factors			
<i>overtly Christian</i> †	0.053	(0.772)	[-0.308 , 0.415]
<i>minority bank</i> †	-0.045	(0.776)	[-0.354 , 0.264]
<i>size of minority in area (%)</i>	0.001	(0.880)	[-0.010 , 0.011]
Bank-specific attributes			
<i>liquidity (%)</i>	-0.004	(0.003)	[-0.007 , -0.001]
<i>assets (thousands of guilders)</i>	-0.001	(<0.001)	[-0.001 , -0.001]
<i>depositors-to-members (%)</i>	-0.001	(0.039)	[-0.002 , -0.000‡]
<i>bank's age (years)</i>	0.016	(0.006)	[0.005 , 0.028]
<i>dist. to clearinghouse (km)</i>	-0.002	(0.015)	[-0.003 , -0.000‡]
<i>legal choice</i> †	-0.084	(0.326)	[-0.252 , 0.084]
Economic geography of market			
<i>pop. density (per km²)</i>	0.000‡	(0.345)	[-0.000‡ , 0.000‡]
<i>agri. employment (%)</i>	0.001	(0.564)	[-0.007 , 0.004]
<i>horticulture (%)</i>	-0.004	(0.406)	[-0.013 , 0.005]
<i>owner-exploited (%)</i>	0.000‡	(0.908)	[-0.003 , 0.004]
Network- and year-specific effects			
<i>CCB-Eind</i> †	0.016	(0.916)	[-0.280 , 0.312]
<i>CCCB-Alk</i> †	0.253	(0.397)	[-0.333 , 0.840]
<i>d1921</i> †	-0.377	(0.017)	[-0.688 , -0.066]
<i>d1923</i> †	0.532	(<0.001)	[0.292 , 0.772]
<i>d1925</i> †	-0.303	(0.048)	[-0.603 , -0.003]
<i>CCB-Eind * d1921</i> †	0.597	(0.004)	[0.189 , 1.004]
<i>CCB-Eind * d1923</i> †	1.075	(<0.001)	[0.745 , 1.405]
<i>CCB-Eind * d1925</i> †	0.561	(0.005)	[0.171 , 0.951]
<i>CCCB-Alk * d1921</i> †	0.030	(0.948)	[-0.866 , 0.925]
<i>CCCB-Alk * d1923</i> †	0.670	(0.061)	[-0.031 , 1.372]
Observations (groups)	4,550 (1,144)	Dependent var. = 1	485 obs.
St. error of RE estimate	1.372	Variance due to RE	0.186
Log-likelihood	-1157	Wald Chi ²	462.82

Notes: See Table 1 for description of variables and Table 2 for summary statistics. Panel constructed using data for four years: 1919, 1921, 1923 and 1925. A binomial probit model is used where the dependent variable = 1 if the value of the savings ratio is in the top 10 percent of the distribution (i.e. savings ratio > 122.96%). The marginal effect of the independent variable should be interpreted as the variable's impact on the likelihood of being highly leveraged. This regression should be read alongside the results in Table 6 in order to understand how the effect of the different variables differs in the upper tail of the distribution. See notes under Table 5 for further explanation.

Figure 1: Geographic expansion of the rural cooperative banking sector, 1899-1919

(a) Cooperatives established by 1904

(b) Cooperatives established by 1909



(c) Cooperatives established by 1914

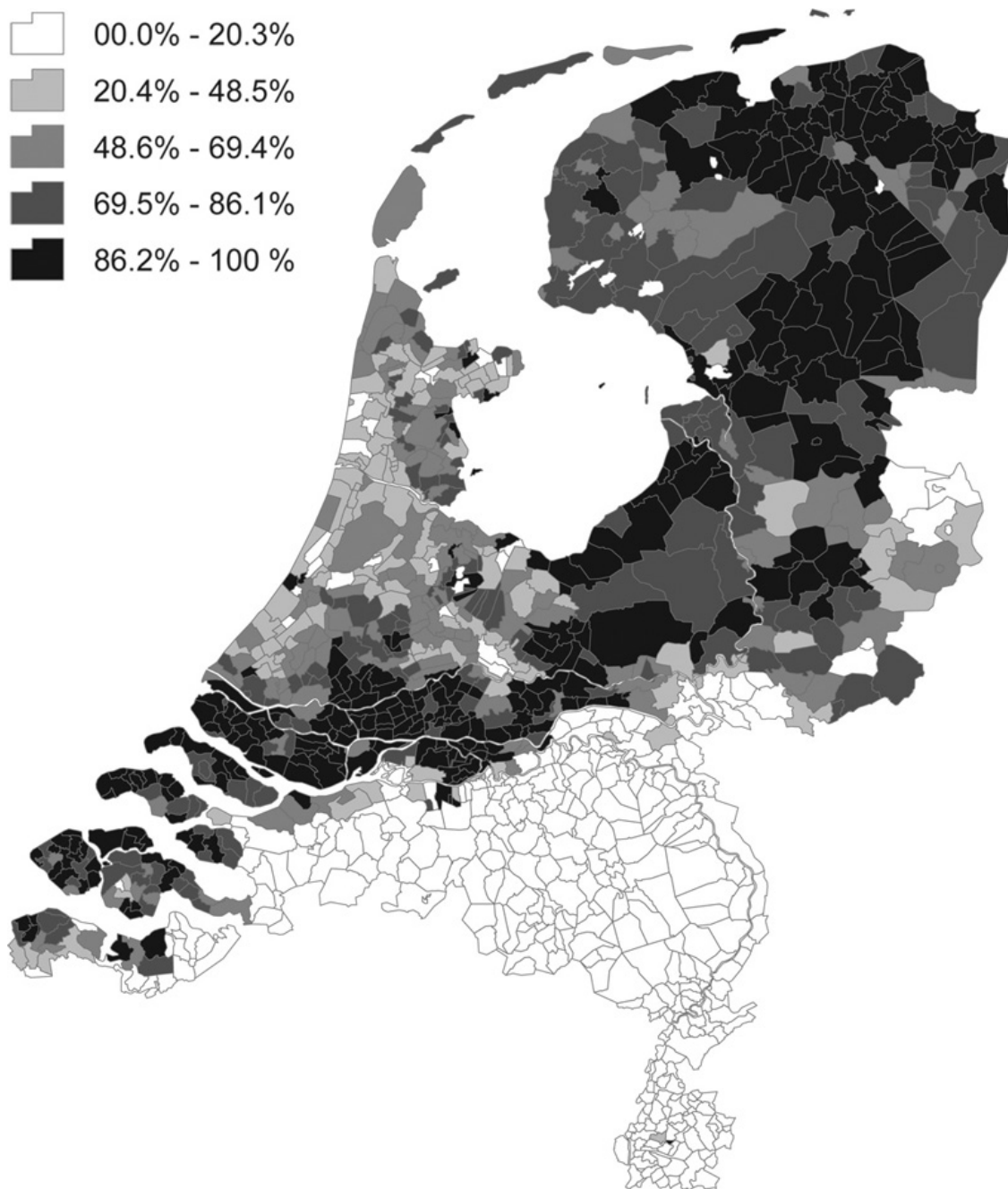
(d) Cooperatives established by 1919



Legend: Black dots depict geographic location of banks.

Source: NL-KAART and the annual reports of the three central clearinghouses. See data appendix for details.

Figure 2: Percentage of census-declared Protestants (all denominations) per gemeente (municipality) in 1920



Note: Percentage of Catholics in any given area is approximately the reverse of the percentage of Protestants, particularly in rural areas where practically no inhabitants declared themselves non-religious.

Source: NL-KAART and the 1920 census. See data appendix for details.

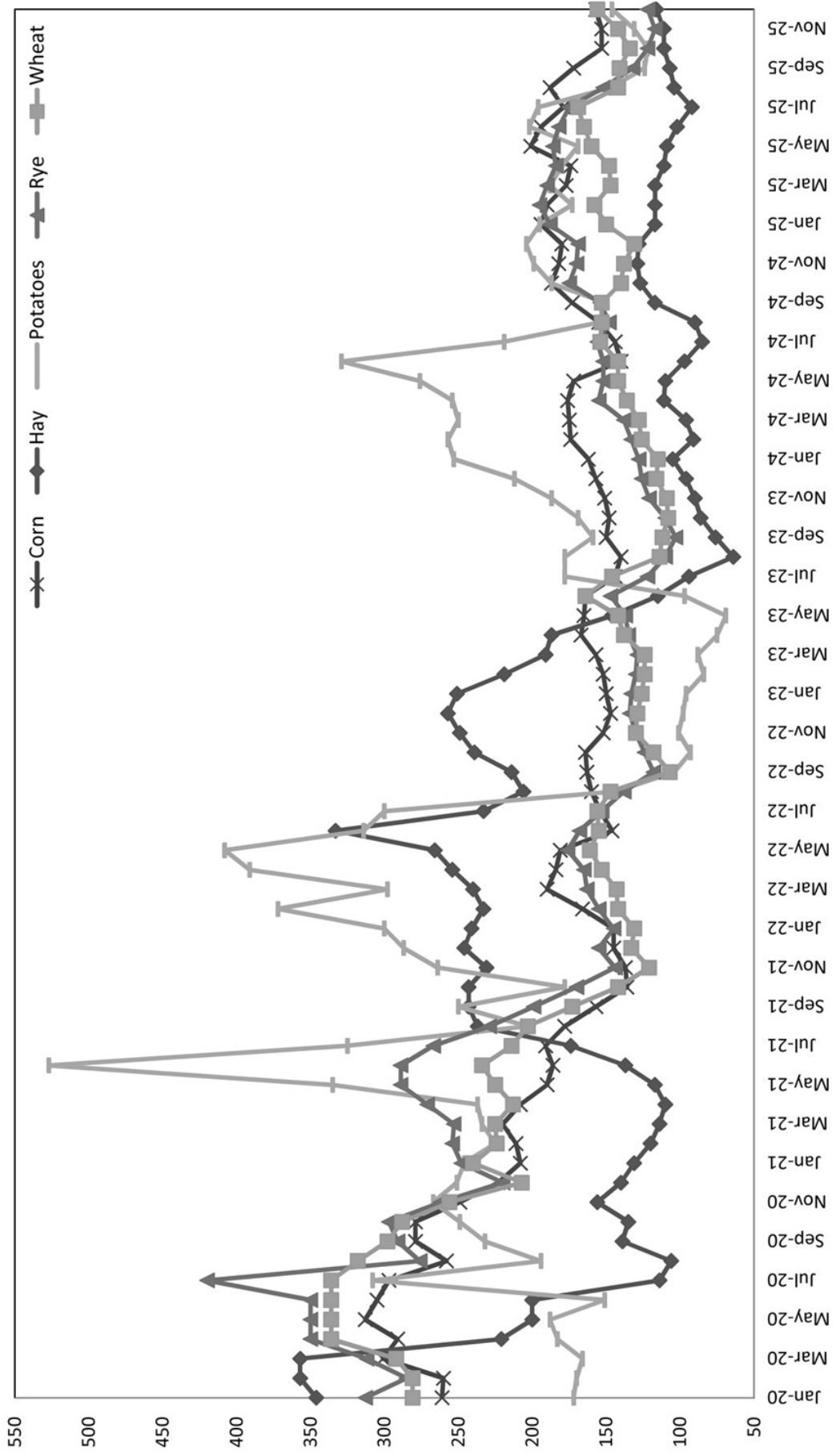
Figure 3: Liquidity of rural cooperative banks in 1919, defined as most liquid assets over total assets



Note: Each point represents a different bank. Each is scaled according to level of liquidity, larger points indicating more liquid banks; scale in legend above.

Source: NL-KAART and the annual reports of the three central clearinghouses. See data appendix for details.

Figure 4: Monthly prices for selected agricultural commodities produced in the Netherlands, indices, 1920-1925



Note: Base period (index=100) is 1900-1910

Source: CBS, 1920-1925. See data appendix for details.

Figure 5: Epanechnikov kernel density distribution functions of the leverage ratio in relation to the normal distribution, separate plots for each year, 1919-1925

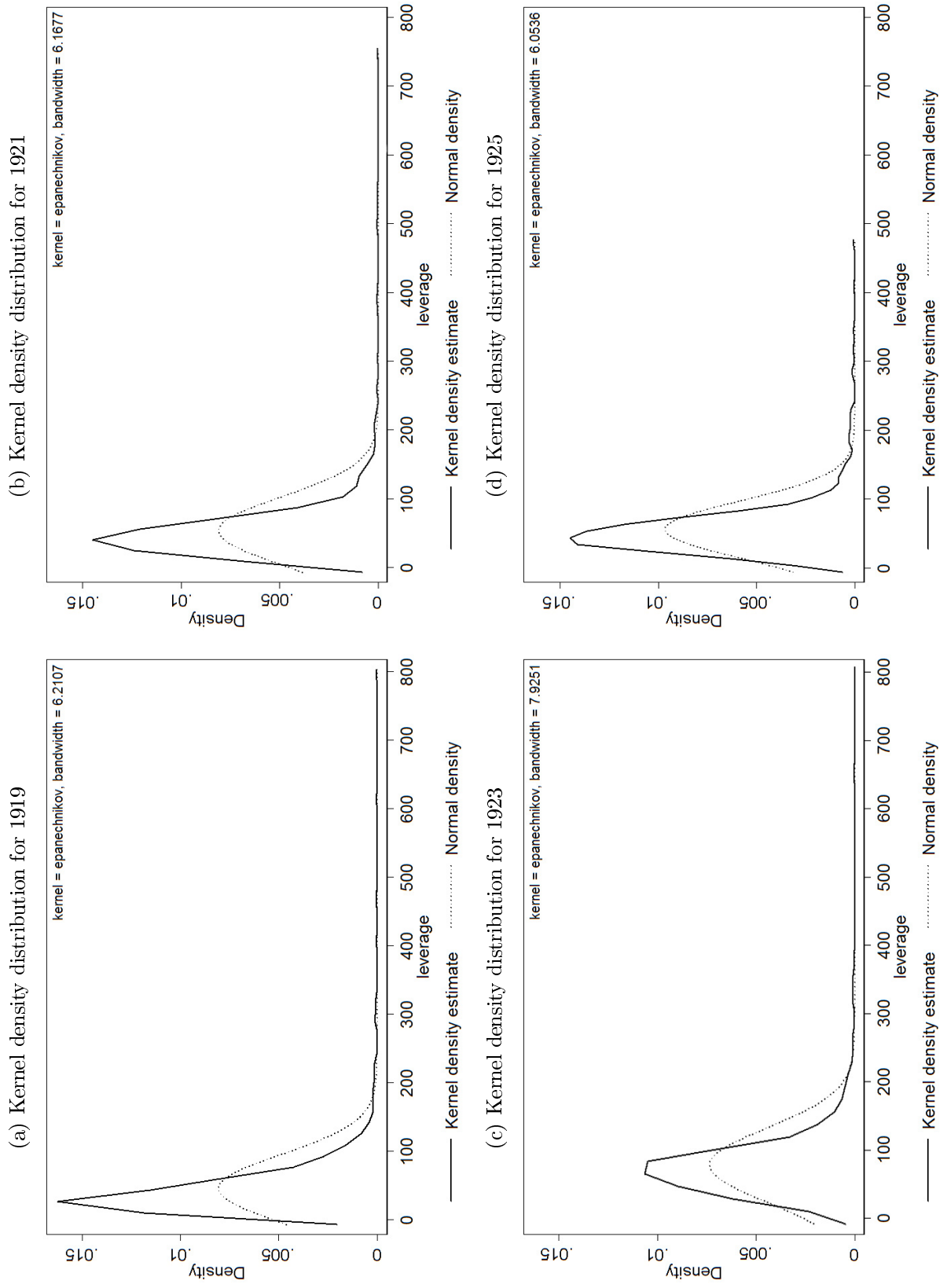


Figure 6: Epanechnikov kernel density distribution functions of the savings ratio in relation to the normal distribution, separate plots for each year, 1919-1925

