Department of Economics
and
Institute for Policy Analysis
University of Toronto
150 St. George Street
Toronto, Ontario M5S 1A1
Canada

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THE EVOLUTION OF A MICROCREDIT INSTITUTION: THE IRISH LOAN FUNDS, 1720 - 1920

by

Aidan Hollis
Institute for Policy Analysis, University of Toronto

and

Arthur Sweetman
Department of Economics, University of Victoria

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Department of Economics
University of Toronto

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Author's e-mail: hollis@epas.utoronto.ca

Abstract

We introduce the Irish loan funds, a set of independent but regulated microcredit societies, which in the mid-nineteenth century were lending to 20% of Irish households. Their institutional evolution is traced from the eighteenth to the twentieth centuries. This system was remarkably successful at transferring capital to the "industrious poor" on a large scale over a long period. We argue that its structure conferred many advantages on the funds, enabling them to mitigate informational problems and allowing sufficient flexibility for the institution to survive even the Great Famine. Empirical analysis confirms their sensitivity to external economic factors and their role in promoting diversification.

INTRODUCTION[1]

In the mid-nineteenth century hundreds of loan fund societies were making small loans to as many as 20% of Irish households. These community-based institutions originated in the early 1700s, but mushroomed in the 1830s after Parliament took legislative action to encourage them as part of an effort to stimulate privately funded poverty relief. Many of the funds survived the Great Famine and some continued to operate into the twentieth century. This institution offers both a new perspective on capital formation in the Irish economy and a well-documented case study of the development of an institution designed to lend small sums to the poor. We hope that this will enrich the historical context of current work on microcredit-providing institutions which have recently experienced a surge of popularity. Economic analysis of microcredit institutions has mainly focused on problems of asymmetric information, moral hazard and enforcement in credit markets for the poor.[2] Private moneylenders have good information on potential borrowers and persuasive methods of enforcing repayment, but are limited in their scope as financial intermediaries because the same market failure problems render them unable to borrow. In contrast, banks which can attract deposits find it difficult to lend safely to borrowers without collateral. Our study analyses the development by the loan funds of mechanisms to mitigate such informational and enforcement problems, and their evolution in a changing environment.

Most commonly found in countries with less developed financial service industries, microcredit institutions now operate all over the world and are believed to lend to over 10 million families globally. Following the success of the Grameen Bank in Bangladesh, many development organizations, including the World Bank, are sponsoring similar schemes.[3] While many microcredit institutions arise endogenously to serve needs in local communities, recent evaluations by, for example, Dale Adams and J.D. von Pischke

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[2] See for example Stiglitz (1990), Varian (1990), Besley, Coate and Loury (1993), Besley (1993), Udry (1994), and Hoff, Braverman and Stiglitz (1993).

[3] See Wahid (1993).

(1992), and A. Srinivasan (1994) have cast doubt on the effectiveness of external initiatives, which tend to collapse within a few years. Avishay Braverman and J. Luis Guasch (1993) suggest that poorly designed incentive systems, which often take inadequate account of social and cultural factors, are at the root of many failures of government interventions into rural credit markets. As a result, sustainability has become the "main objective in institutional development".[4] For evidence on this, we can turn to historical institutions whose evolution can be traced, such as the Irish loan funds. Our study stresses the necessity of supervision and the value of a decentralized structure, and it suggests a positive role for charitable donations. Two other recent studies have provided some evidence from historical institutions. Abhijit Banerjee, Tim Besley and Tim Guinnane (1994), referring to German credit cooperatives of the nineteenth century, observe that each of the many independent cooperatives could optimally evolve to suit its idiosyncratic environment and argue that peer monitoring was an essential element in the success of the cooperatives. Guinnane (1994) examines the Irish credit cooperative system of the early twentieth century and concludes that poor management and stiff competition from a well-entrenched banking system were responsible for its lack of success. Both studies, in contrast to the current one, lack data on the financial operations of the cooperatives.

New insight into a previously neglected segment of the Irish economy is provided by the loan funds. In contrast to the joint-stock and savings banks, which have been widely criticized for their failure to lend domestically, the loan funds recycled all their deposits within Ireland, transferring capital between classes rather than between countries. This suggests that traditional notions of the rural Irish as unenterprising and financially unsophisticated should be viewed with caution, and corresponds with recent research showing non-bank "vibrant rural credit systems" in other parts of Europe.[5] Loan fund clients were mainly agricultural laborers, small-scale farmers, craftsmen and tradesmen. Significantly, around 25% of borrowers were women. We show that according to its own goals of poverty relief through transferring investment capital to Ireland's industrious poor, the loan fund system was surprisingly successful on a large scale.

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[4] Bechtel and Zander (1994) p. 25.

[5] On Ireland, see O Grada (1994) p. 142 and Vaughan (1994) p.86. On Europe, see Rosenthal (1994), p.288.

These independent and diverse local funds were regulated in 1838, and from that point onward were required to file annual reports with a central board. Several official inquiries and around twenty pieces of legislation also exist, so that there is a rich institutional history to accompany a large data set. A remarkable picture of the growth and decline of this *transition institution* emerges as it operates under various legislative regimes, survives the Great Famine, and is gradually displaced with the development of the banking system.

THE ORIGIN AND DEVELOPMENT OF THE LOAN FUND SYSTEM

The Early Origins of the Loan Funds

Early proponents of Irish loan funds generally attributed their origin to Dean Jonathan Swift, who gave £500 in the 1720s to be lent out to "poor artizans of Dublin" in loans of under £10 each. In the 1740s or 1750s, the Dublin Musical Society began to make loans "upon the same system as Dean Swift" and it was incorporated for this purpose in 1756, "whereby several thousand families were relieved in the space of a few years." As the social benefits of loan funds were recognized, parliament propagated a new act in 1778 allowing the Musical Society to appoint persons in other towns "to receive contributions, and to lend out such sum or sums of money interest free" to "indigent and industrious manufacturers." The Act described the motivation for this form of charity:

> industrious tradesmen ... are often incapable of earning to themselves a livelihood for want of money to buy materials and other necessaries for carrying on their respective trades; whereby several of that useful class of men have perished, and their families reduced to beggary and become a burthen to the publick.[6]

Supporting small enterprises and concurrently reducing the public burden of caring for the poor were recurrent themes for fund proponents.

In 1822 a London based relief committee gave £55,000 to establish the Irish Reproductive Loan Fund Institution. This financed 100 new funds which made small loans to the "industrious poor." The London committee introduced two important innovations. First, in order to prevent the individual funds from degenerating to the standards of the notorious gombeenmen, mealmongers, and moneylenders, the managers of the funds were strictly prohibited from obtaining "any salary, allowance, profit or benefit whatsoever." However, clerks were permitted to receive some remuneration. Second, the funds were

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[6] An Act for incorporating the Charitable Musical Society for Lending out Money Interest free to indigent and Industrious Tradesmen, 17th-18th George III, chap. XII.

allowed to charge interest on their loans, cushioning them against defaults, and enabling growth if interest exceeded defaults and expenses. This also ensured a more efficient use of money since only those whose expected return from the loan exceeded the interest rate would wish to borrow. These rules formed the basis for an Act of Parliament in 1823 regulating all loan funds in Ireland, an instance of how "organizations incrementally alter the institutional structure" (Douglass North, 1990, p. 73).[7] The funds created by the Reproductive Institution did not last very long, however, since the London committee was not active in monitoring or regulating their activities, and they suffered a steady decline from inattention and corruption over the next 25 years. In 1848, all lending was stopped and the remaining capital given to various other charities.

Growth of the Loan Fund System and Reform of Legislation

The 1823 legislation allowing funds to charge interest stimulated the founding of a number of other loan funds, some of them charitably constituted, some profit-oriented. For example, in Tyrrell's Pass, Co. Westmeath, a loan fund was started in 1824 with a gift of £26, which the donor lent out in 20-week loans of a maximum £3. By 1834, other contributions had increased the capital to £141. It started accepting interest-bearing deposits, and within six months had attracted over £800.[8] This charity, like many others at the time, had thus transformed itself into an unregulated bank. A lack of regulation led to a variety of questionable practices at these institutions. Some "charitable" loan funds were operating like moneylenders, charging illegal rates of interest and paying very large salaries. Depositors in some funds were robbed by dishonest managers and clerks who had emigrated with their deposits. The improper practices at institutions which were competing with banks led to renewed government interest in the loan funds.

Legislation in 1836 and 1838 was crucial for the funds' success and established what became their enduring structure. A central authority, the Loan Fund Board, was established to regulate and monitor the many loan funds which were springing up.[9] While

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[7] A Bill for the Amendment of the laws respecting Charitable Loan Societies in Ireland, 4 Geo. IV, cap. 32.

[8] Tyrrell's Pass, Official Papers, 1844/18, National Archives, Dublin

[9] Loan funds connected with the Irish Reproductive Loan Fund Institution were exempted from this supervision in 1838 (1 & 2 Vic., c. 78), presumably because they were supposed to be supervised by the London committee. Also, A Bill to Amend the Laws relating to Loan Societies in Ireland, 6 Will.IV, 1836.

each fund remained independent and had substantial latitude in it operations, bounds were set and enforced (with a vigor that varied over the years) by the Board. Information on all registered loan funds was collected and published in annual reports which constitute our principal data source. Considerable powers were given to the Board: it could make "General Rules", reduce the amount of salaries, and wind up the affairs of funds. This movement to third party enforcement by an active and specialized monitoring agency in Ireland was a major innovation that increased depositor confidence, particularly in smaller funds. One of its most important functions was to reduce the opportunity for fraud and rent-seeking by unscrupulous clerks.

The Board reduced operating costs by providing a franchise-like framework, including standardized rules, a simple accounting system, and even stationery. Managers were also released from personal liability for loan fund liabilities, unless voluntarily given. As noted by Karla Hoff and Joseph Stiglitz (1993, p. 49) there is an externality in local organization. Individuals who bear the costs, in money or time, of initiating a fund provide a form of social capital. Inasmuch as these costs can be reduced welfare is increased.

The Acts formalized the innovation of accepting deposits, limiting the interest paid to 6%. This was extremely important since it allowed rapid growth and transformed the funds from charities into quasi-banks.[10] The maximum legal loan size was set at £10, and borrowers were restricted to one loan at a time.[11] Several important advantages, compared to banks, were legislated for registered loan funds. They were freed from having to pay stamp duty, a tax required for contracts to be legally enforceable. This cost reduction was crucial given the numerous small loan contracts they were making. For example, the annualized cost of a three-month bank loan of £5 (if available) would typically have been: interest 6%, commission 6%, stamp duty 2% and an additional charge of 1% for the person who drew the Bill.[12] Further, the Acts freed funds from "being subject or liable on account [of the interest], to any of the forfeitures or penalties imposed

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[10] Deposits under £50 could be withdrawn with two weeks' notice; sums under £100 required one month's notice; and sums over £100 required two months' notice. [Fifth Annual Report of the Loan Fund Board, p.35].

[11] That the maximum loan size remained unchanged at £10 from the time of Dean Swift into the twentieth century is vivid testimony to power of round numbers and to Douglass North's contention that institutions are strongly path dependent.

[12] Fourth Annual Report of the Loan Fund Board, p.84.

by any Act or Acts relating to usury." Funds were also entitled to recover loans from defaulters by a simple complaint to the Justice of the Peace.[13] This effectively made them preferred creditors over, for example, merchants, landlords and moneylenders, since warrants executed by the Justice of the Peace were always quicker than the proceedings of the Quarter Sessions. Given the state of the banking system of the day, these privileges, by reducing transactions costs and default risk, allowed the loan funds to operate in a market that would otherwise not have existed.

Finally, the Acts required that one half of accounting profits each year be given to local charity. This legislation thus substantially extended the loan funds' role in reducing the public burden of poverty. Remaining profits could be held by the loan fund as a capital base to protect depositors. That the funds were charitable organizations is likely crucial to the legislative changes discussed above. As Samuel Popkin (1979, p. 259ff.) argues, not-for-profit organizations possess the credibility to generate cooperative action. The public perception of fairness and their trust in the funds not to exploit legal advantages rested, in part, on the funds' nonprofit status. Charitable funds could also be limited in their scope of operation which reduced competition with, and opposition from, the banking establishment.

It is important to understand why the loan funds received this legislative support in the 1830s. With rapid industrialization and high rural unemployment in England, the 1830s was a period of intense legislative activity directed at alleviating poverty and placating the poor. This extended to Ireland, where a commission to inquire into the condition of the poor, and the institutions established for their relief, was appointed in 1833. One of the recommendations in the commissioners' third and final report in 1836 was that a "loan fund ... be established in every district".[14] Westminster introduced the Irish Poor Law in 1838 (the British New Poor Law had been passed in 1834). Any interpretation of the loan funds' dramatic increase in activity and legislative support must incorporate this concurrent activity. Since the burden to the government of regulating and operating the fund system was small relative to the potential costs of the Poor Law, it was actively encouraged by the government.

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[13] 6 Will. IV., p.5.

[14] Nicholls, 1856, p. 142.

Three types of fund supporters bear special mention. Altruistic individuals who were willing to provide time and money because of their ideology supported numerous funds.[15] Many local funds' initiation relied upon close ties with a local parish (either Catholic or Church of Ireland). In 1843, for example, 132 of the 300 unpaid managers were clergymen. Indirect beneficiaries may also have been important in supporting the legislation; they were probably motivated by an expected relief from poor taxes and other positive externalities that might accrue from a reduction in poverty. There were also direct beneficiaries: borrowers, depositors, and clerks.

During the late 1830s and early 1840s the loan fund system enjoyed tremendous success, and by 1843 some 300 funds (including the Dublin Charitable Musical Loan Society) were making almost 500,000 loans annually to the "industrious poor." In 1843 the government enacted legislation which reduced the maximum allowable interest rate payable to depositors from 6% to 5%, and the maximum effective annualized rate payable by borrowers from 13.6% to 8.8%.[16] This meant that the margin was reduced from over 7.6% to only 3.8%. Additionally, funds were required to reserve at least 10% of their net profits "to form a fund for the security of debenture holders." Parliamentary records surrounding this legislation are unrevealing, and we can only speculate as to the reasons for the rate decrease. One possibility is that the government was concerned that usurious interest rates were being charged to borrowers. Pawnbrokers and banks, however, commonly charged more than 9% for small loans, and this explanation would in any case not explain the decrease in the maximum deposit interest rate.[17] We suspect that the funds' unexpected success aroused fear on the part of the joint stock banks which were facing a formidable competitor for deposits. The decrease in permissible interest rates was strongly opposed by the Board and by most funds.[18] Many funds protested vigorously that they

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[15] See North 1984, p. 258 for more on this.

[16] A Bill to Consolidate and Amend the Laws for the Regulation of Charitable Loan Societies in Ireland, 6&7 Vic. c. 91. The section of the Act restricting interest was later misread by the Board, which in 1845 encouraged funds to issue twenty-week loans repayable at the rate of 4s. per month for each pound lent, at a discount of 7.5d in the pound (an interest rate of 14.9%). A few loan funds proceeded to take advantage of this apparent misreading, which was not corrected for over 50 years.

[17] See, for example, the Report of the Select Committee on Pawnbroking, 1837.

[18] See, for example, Thomas Hincks, "Letter to the Governor-General of Ireland." 1843, NLI.

could not continue to lend "unless they derive a heavy income from fines and other impositions that are incompatible with the object for which they are established."[19] Nevertheless, appeals for the interest rate reduction to be rescinded were unavailing. A political decision not to allow banks to be weakened was apparently made, although the funds retained the advantages required to perform their poverty relief function.

Legislative neglect, in part we suspect attributable to pressure from banking interests, marked the years after 1843. Although there was a major inquiry into improper practices in 1896, the structure of the loan fund system remained essentially untouched after 1843, and was basically the same in 1915. The neglect occurred despite repeated attempts by the Board to have aspects of the legislation amended. In 1915 the few remaining funds were put under the auspices of the Department of Agriculture and annual reports are unavailable after 1918. A few funds survived into the mid-twentieth century.

Competing Financial Institutions

When the Dublin Musical Society began to lend, the only banks in Ireland were private and limited in the scope of their operations. Not until the early 1820s was there serious reform of banking legislation and then in 1825, the opening of the first joint-stock banks. These new banks spread quickly, and by 1845 all towns in Ireland with a population over 5000 were served by one or more bank branches. The joint-stock banks seem to have been ill-equipped in the 1830s and '40s to do the kind of lending performed by the loan funds, and were only marginally involved in the loan funds' lending market until the 1860s. As a result, the banks "performed the useful function of converting deposits, largely from rural areas, to loans in the towns and cities."[20] The savings banks also collected deposits, but invested all their assets in government stock.[21] Thus the banks acted as a one-way conduit for savings from the impoverished, low-capital rural parts of Ireland to the wealthier cities or indeed out of Ireland altogether. The Irish banks' transfer of capital abroad has led historians to conclude that investment opportunities in Ireland were simply not there: "if banks were to make a profit and sufficient possibilities of making advances did not present themselves, bankers could earn an adequate return only by investing a high proportion of their assets in government stocks."[22] The fact that many

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[19] Seventh Annual Report of the Loan Fund Board, p.25.

[20] O Grada (1994), p. 141.

[21] Barrow, p. 193.

loan funds borrowed from banks to finance their lending suggests instead that a different monitoring and repayment technology were required.[23]

There were some attempts by banks to enter the market for small-scale loans. The Agricultural and Commercial Bank had a broader base of equity holders than the other banks and claimed to be "the poor man's bank" since it offered loans under £10.[24] This bank opened its first branch in 1834, spread rapidly, and was insolvent within two years.[25] Its founder was undiscouraged and set up the Provident Bank in 1837 in Dublin. In the second half of 1837, the Provident Bank had a circulation of £6000, much of which seems to have been circulated through four loan funds, although it also made some "loans of under £10 to tradesmen, farmers and others."[26] However, by 1839 this venture had also failed. The instability of these banks should be taken into consideration when judging the performance of the loan funds: the only two commercial banks which had a special emphasis on small loans failed within two years, while many of the loan funds lasted for decades. By the 1860s, however, the other banks had spread wider and had well-established branches, and began making more and more small loans in competition with the loan funds.

Given the absence of banks from the market for lending to the poorer classes of Ireland, pawnbrokers, moneylenders and landlords were the principal sources of non-family financing for the poor, aside from the loan funds. Pawnbrokers mainly lent amounts much smaller than the loan fund minimum of £1. Most towns seem to have had at least one moneylender, though many moneylenders were principally involved in other activities as traders or farmers. Upon visiting the Loan Fund at Mullinahone, in Tipperary, the loan fund board inspector found that in this village of 1200, there were two funds and five

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[22] Cullen (1987), p. 129.

[23] See, e.g. Letterkenny Report (1939). p. 19; Fourth Annual Report of the Loan Fund Board, p.35.

[24] Barrow, p. 118.

[25] Barrow, p.149.

[26] Barrow, p. 158. The circulation of the loan funds in 1838 were Carlow, £2662; Athy, £2961; Mullingar, unknown; and Strabane, unknown. Thus these four funds could well have accounted for almost the entire currency circulation of the Provident Bank.

moneylenders.[27] The relationship between loan funds and moneylenders was a matter of debate: some felt that the formation of loan funds had displaced moneylenders while others believed that the system of weekly repayments required by the loan funds had actually *stimulated* the trade of moneylenders and pawnshops.[28] It is difficult to get a sense of the normal interest rate charged by moneylenders; probably it varied across time, district and individual, but seems to have ranged between 25% and 100%.[29]

THE ECONOMICS OF IRISH MICROCREDIT IN NINETEENTH-CENTURY IRELAND

Donations and Deposits

Most loan funds were initiated by donations, or interest-free loans, that served as a sort of risk capital which allowed the funds to operate in a market where the risks were not well known and potentially high. Charitable organizations were one source. For example, the Letterkenny loan fund was the beneficiary of a £57 grant from the Letterkenny Ladies Association and a £300 interest-free loan from the Society for Bettering the Condition of the Poor of Ireland.[30] Seed money was sometimes provided by landlords. Such start-up money may have been motivated by altruism, by the hope of obtaining community respect or by a desire to reduce the incidence of local poverty. Reports from various funds are reminiscent of the 1778 legislation in describing how borrowers had "been raised from poverty and despair to comparative comfort and confidence, and *saved from being a charge on the Poor Rate or Mendicity Institution*"[our italics].[31] Evidently, loans were perceived to be an inexpensive mode of poverty relief with potential long term benefits. Landlords also had an interest in encouraging the funds since in some places tenants could borrow to pay their rent. Funds were legislatively advantaged in obtaining repayment so that "the county constabulary are indirectly made the means by which the landlord recovers his rent."[32] Some funds were almost certainly started as pure money-making operations with rents extracted in the form of salaries.

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[27] Fourth Annual Report, pp. 28-30. One of the funds was wound up subsequent to this inspection.

[28] Kennedy (1847), pp. 207, 226.

[29] See Kennedy (1847)

[30] Second Annual Report of the Letterkenny Loan Fund Society, 1939. NLI.

[31] Third Annual Report of the Loan Fund Board, p.17.

[32] Kennedy (1847), p. 222.

We estimate initial gifts and interest-free loans to have been in aggregate around £30,000, constituting an on-going subsidy to the operations of the loan funds worth perhaps £900 per annum (assuming an interest rate of 3%). This subsidy was much less than the annual donations by the loan funds to other charitable activities, so that the loan funds were net givers to charity rather than net receivers. Nevertheless, they could not have started up without this money.

Domestically, the loan funds faced competition from both joint-stock banks and savings banks (and from the mattress) for deposits. Key to attracting deposits are risk, yield, and convenience. In 1843 the average fund had deposits of around £1200 from 20 individuals for an average deposit of £60.[33] In addition to wealthier depositors, it seems that loan funds were successful in drawing out new sources of savings. One witness before the 1855 Select Committee recollected that "an old lady smuggled in a sum of money which she said she did not wish her husband to know she possessed."[34] Some loan funds encouraged small deposits in order to act as a savings bank for the poor. The number of depositors in 1843 was just over 5000, or about one in 1500 persons. The occupations of depositors is not available before 1891, at which time the majority of depositors were listed as farmers, professional men, shopkeepers and women.

Deposits were subject to two principal types of risk: defective or dishonest management, and a severe negative shock correlated across borrowers. Dishonesty of the manager or clerk can be seen in a principal-agent context, with the usual problems of asymmetric information and moral hazard. As local institutions, funds were able to mitigate these problems. Depositors' personal knowledge of the managers, clerks, and their extended families could increase confidence in the fund. While the community-based nature of the funds limited asset diversification and restricted the set of potential managers, it provided a check on corruption and may have increased the institution's credibility. Nevertheless, it was sometimes difficult for depositors to assess the solvency of a fund.

The creation of the Loan Fund Board by the Act of 1836 was a significant step forward in protecting depositors, since the Board required funds to have appropriate rules and inspected funds to ensure proper practices. The Board communicated good practices

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[33] In comparison, the average opening balance at the Provincial Bank's Parsonstown branch during its first year was £250. (O Grada, 1989, p.152.)

[34] Report from the Select Committee on Loan Fund Societies (1855), p.52.

across funds. For example, some managers tried to make the funds more "altruistic" by not imposing fines, or by charging below the maximum rate of interest, a practice which the Board discouraged as being detrimental to the interests of both depositors (financially) and borrowers (morally). In other funds, depositors were abused by corrupt managers. As charitable institutions with no residual claimant, the loan funds were vulnerable to being "hi-jacked" by rent-seeking managers and clerks. The Board had an important role in preventing funds from becoming either too altruistic or too profit-oriented. As evidence, we contrast the longevity of the loan fund system under the Board with the unregulated, uninspected funds of the Reproductive Institution discussed above, which had disappeared within 25 years despite their larger initial capital. The very different trajectories of two otherwise similar institutions suggests that the Board was an essential component in the growth of the loan fund system in Ireland.

The structure of loan fund assets tended to achieve a high level of diversification given that they were constrained to lend only in their immediate vicinity. First, the average fund had a portfolio in the early 1840s of over 600 loans, with no loan constituting more than 1% of assets. To the extent that individual borrower risks were uncorrelated, this provided excellent diversification. Second, the weekly repayment system was unsuitable for financing crops. Thus the loan funds were to some extent insulated from the vagaries of crop yields, although as we show in time series analysis below, the amount lent was sensitive to agricultural output. However, the concentration of assets in a neighborhood made the loan funds vulnerable to local depressions. This contrasted with the banks, which were diversified geographically and across types of asset. For example, especially before 1850, U.K. government bonds formed a large proportion of bank assets. *Ex post*, it appears that the national banks posed lower risks than the loan funds. However, this may not have been apparent to depositors at the time. Many depositors seem to have falsely believed that regulation of the loan funds by an agency of the government implied financial support by the government, though it is unclear how widespread this fallacy was. In addition, a local loan fund was a fairly transparent intermediary, in the sense that an informed depositor could gauge the value of its portfolio of local loans. In contrast, a bank is relatively opaque since its assets cannot be readily identified. For an ordinary saver without a great deal of financial sophistication, but with a personal knowledge of the loan fund manager, the fund may have appeared safer than a bank.

Proximity is also important for attracting deposits. Here the loan funds had an advantage since, in 1842, funds operated in over 250 towns or villages, while bank

branches were in only 84. Indeed, several counties had but one town with a bank. The rapid decline of the loan funds during the Famine eliminated their numerical superiority, but they continued to have a wide presence, and some funds outside of major towns faced limited competition from banks. However, the banks grew to be increasingly dominant through the second half of the century, as shown in Figure 3a.

The loan funds' strongest drawing card was that they paid higher interest than banks. Throughout the nineteenth century, deposits at banks yielded between zero and two percent. The loan funds paid 6% until 1843 and 5% thereafter. High interest rates caused "oversubscription" at some funds. Thus the Board lamented in 1841 that "many persons, to secure five or six per cent. for their money, force it on [Loan Fund] Societies."[35] The interest rate premium offered by funds was an important factor for depositors. However, the "charitable" aspect of the loan funds may also have been important in attracting deposits. The loan funds in this, as in other respects, were hybrid institutions, neither purely charitable nor purely commercial.

Lending

In 1843 the loan funds issued almost 500,000 loans, implying over 300,000 borrowers, or about 4% of the nation's population.[36] If we assume an average family size of five and at most one loan per family, the loan funds were lending to around 20% of Irish families. On the same basis, in some counties, 30% to 40% of households were receiving loans. The average loan fund made 1650 loans (21 min., 19558 max.[37]) ranging from £1 to £10 in 1843. Defaults were low enough that after bad debts and expenses, profits ranged from -£132 to £832, with an average of £51, as shown in Figure 2e. Funds which were well managed were able to sustain low rates of default for a long time. For example, the Ballyjamesduff (Co. Cavan) loan fund had bad debts of only £313 over 80 years, during which time it had lent almost £1 million. The Moyne (Co. Wicklow) fund lost only £17 over 75 years.[38]

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[35] Third Annual Report of the Loan Fund Board, p.20.

[36] We assume here that about half of all loans were rolled over.

[37] Two enormous funds in Belfast and Cork skew the statistics. Without them the average is 1541 (max. 7655).

[38] Report on Agricultural Credit (1914), p. 104.

Figure 2b illustrates the substantial variation across funds in interest income. While the mode is at the maximum rate, the bulk of the distribution is below this, probably because many fund managers wished to assist borrowers. About 30% of the funds report interest income implying rates above the legal maximum; it is possible that some of these were taking advantage of the higher rates available for loans repaid monthly, (see footnote 15), or renewing loans before they had been fully repaid.

Since the loan funds paid a higher rate of interest than banks, in order to be competitive lenders they needed to earn more on their assets, and/or have lower costs. Funds used several mechanisms to help overcome adverse selection of borrowers. First, as the trustees of the Callan fund noted in 1841, loan funds "avoided much of the evil consequences which naturally resulted from the ordinary banking system; first, from a knowledge of the parties...."[39] All the managers and staff of the loan funds were local, and were thus relatively well-informed about borrower characteristics. In contrast, bank managers were highly mobile and typically came from outside the community. For example, the Provincial Bank recruited its managers almost exclusively from Scotland.[40]

Second, some loan funds benefited from monitoring by depositors, as in the credit cooperatives analyzed by Banerjee, Besley and Guinnane (1994). In the early years certain funds required that all borrowers be recommended by a depositor. Some, to encourage carefulness in recommendations, published statistics identifying the defaults on loans recommended by each depositor.[41] Such monitoring would be efficient if the depositors had access to some information about borrowers at lower cost than the fund. This would most frequently have been the case when the borrower was a tenant and the depositor his landlord or property manager, but could have operated through any commercial or personal relationship. In that case, the depositor would already have the information and the only cost would be of communicating it.

Third, every borrower was required to have two co-signatories or "bailsmen" who were jointly liable for repayment. In this way, the funds benefited from peer monitoring. Sometimes borrowers would stand as security for each other, as in the group borrowing scheme of the Grameen Bank. As Stiglitz (1990) shows, the co-signatory has an incentive

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[39] Third Annual Report of the Loan Fund Board, p. 19.

[40] O Grada (1994), p.139.

[41] Second Annual Report of the Letterkenny Loan Fund Society, 1939. NLI.

to monitor the actions of the borrower; it is also an effective screening mechanism, since only borrowers with good reputations are likely to find co-signatories. However, peer monitoring is costly to the monitor.

Loan funds also had some significant advantages in enforcing repayment. They were able to obtain repayment through a simple appeal to a Justice of the Peace, as described above. Such direct enforcement meant that borrowers knew that failure to repay would lead, with certainty, to their assets being sold to pay the debt. The structure of loan repayments also assisted in monitoring borrowers. Loans were discounted and the principle repaid in 20 weekly installments of 1s per pound, (although some funds also allowed monthly repayments).[42] Borrowers in financial difficulties came quickly to the attention of the fund, which could take timely action to minimize losses, and those who did ultimately default were likely to have repaid some of the principle. Punctuality was enforced by a system of fines for late payments. The fine for being one day late was normally 1d or 2d per pound on the face value of the loan (0.4% - 0.8%). There was substantial heterogeneity in the use of fines across funds, as shown in Figure 2c. Fines were almost half as large as interest at some funds, implying effective average interest rates between 12% and 20%, while for the system as a whole, they generated around 20% of total income. Fines penalized borrowers with less steady cash flows and thus created an *ex post* separation of borrower types.

Finally, as local charitable institutions, the loan funds were the beneficiaries of community sanctions against defaulters that no bank external to the community could hope for. Failure to repay a bank might not entail the same moral censure as failure to repay the loan fund which would result in a reduction in the funding of local charitable services. Strong community effects on reducing moral hazard are well documented; see for example Hoff and Stiglitz (1993, p. 43) and essays 5 through 10 in the collection edited by Hoff, Braverman and Stiglitz (1993). A substantial portion of annual profits went to local charities, increasing local services and reducing the public burden of poverty relief. Local infirmaries and schools were the charities of choice, although all kinds of projects were sponsored. The loan fund at Tyrrell's Pass (Co. Westmeath) boasted that as "collateral operations" in 1841, it:

(1) acted as a savings bank;

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[42] This system simplified calculations since the British pound was divided into 20 shillings or 240 pence so that £1 = 20s = 240d.

(2) supported an infants' school of 120 students;

(3) established a platting school;

(4) employed a Scottish agriculturist to train local farmers;

(5) furnished new seed varieties to farmers and sold fertilizers at "Dublin price";

(6) "worked the machinery of a Ladies' Society for the improvement of the female peasantry" (with 417 female peasants assisted in 1840);

(7) laid in stores of coal and meal to sell at cost during times of scarcity;

(8) employed an average of 82 distressed laborers per day on public works in 1840; and

(9) exercised "an extensive moral influence by the encouragement of habits of temperance."[43]

Tyrrell's Pass was larger than average and spent £900 on these unusually extensive charitable operations. The actual distribution of donations over profits is shown in Figure 2f; the average donation was £37. In 1843, 54% of the funds reported making no donations; of the funds in this group that operated in adjacent years, 28% and 24% made donations in the previous and following one respectively. Despite negative profits 3% of funds report donations and 15% report donations larger than positive profits. The 50% rule of the 1838 Act seems not to have been active unless some uncommon definition of profits was employed.

To be efficient in making a large number of small loans, funds were obliged to minimize their transactions costs. First, as indicated above, loan funds were freed from having to pay stamp duty. Second, loan funds were able to minimize overhead costs because of their limited range of services. Some funds only operated one or two days a week. Many funds, taking advantage of their charitable nature, obtained free accommodation in public buildings. Streamlined procedures for making and repaying loans were also important; since all loans had the same maturity schedule, repayment could thus be noted by a mark in the loan fund ledger, which simplified the accounting so as to require fewer and less skilled clerks. Figure 2d indicates the distribution of expenses divided by the amount circulated. The average administrative cost per loan was only 1.3% of its face value.

Management

[43] Third Annual Report of the Loan Fund Board, pp. 22-23.

Fund managers might derive some social reward, but this was likely to be accompanied by a good deal of hard work, and many funds found it difficult to recruit volunteers. The Secretary of the Board in 1857 lamented the fact that managers could not be remunerated in any way, and observed that abuses of the system were inevitable since managers had "trouble without recompense, negligence without liability."[44] This difficulty was echoed in the beginning of the twentieth century by the experience of the Irish credit cooperatives. A 1931 analysis of the failed Irish credit cooperative system opined that "The conclusion seems unavoidable that Ireland has not produced a large class of persons capable of and willing to run a local credit society with success."[45] Since the loan funds were able to hire a clerk to manage the business on a daily basis, they were perhaps less reliant than the credit cooperatives on volunteer labor, but "the want of adequate supervision" by volunteer managers was called "the monster evil of the System," a criticism which was repeated regularly.[46] The loan funds' reliance on depositors was a response to this problem, since depositors had the correct incentives to monitor fund activities.

DID THE LOAN FUNDS ACHIEVE THEIR GOALS?

It is important to try to assess whether the funds did indeed reduce poverty. Relevant issues are (1) whether it was in fact the poor who borrowed, and (2) whether they borrowed to finance investment or consumption. The loan funds seem to have been successful on both counts, although there were persistent criticisms of the institution, especially in regard to its failure to eliminate corruption on the part of clerks and managers.

While it is unlikely that the very poorest persons would have been able to borrow, 70% of the rural population consisted of the families of laborers, smallholders with less than five acres, poor artisans and tradesmen.[47] It appears to have been mainly this group which borrowed from the loan funds, as we see in Table 1a which shows the occupations of borrowers from loan funds in Ballycastle, Co. Antrim and Castletown Delvin, Co.

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[44] Madden, 1857, Vol. 4, p.6.

[45] Cited in Guinnane (1994), p. 55.

[46] Madden, 1857, Vol. 3, p.26.

[47] Cullen, 1987, p.111.

Meath.[48] The large number of laborers, smallholders, weavers and dealers represented shows clearly that the funds had a significant proportion of poor clients from a broad cross-section of occupational groups. Of particular significance, 27% of borrowers at Ballycastle were women, almost all spinsters and widows. At least one loan fund served only women and a small number of funds had women managers. Data from other funds after 1870 shows a similar proportion of female borrowers. This is strong evidence for the importance of female participation in the Irish economy, and suggests that the loan funds were particularly successful at reaching this important segment of the poor population.

The evidence shows that loan funds mainly financed investment of fixed assets and inventories. Many funds made it a condition of borrowing that the loan finance a "reproductive" project that would enable the borrower to meet the scheduled repayments. Suitable projects might, for example, be the purchase of a dairy cow, whose milk could be sold, or of implements for a craftsman, or of stock for a dealer. Reports filed by the Ballycastle and Castletown Delvin funds, shown in Table 1b, provide a sample of the lending practice. In line with the goals of the system, "reproductive" loans are dominant -- most are financing investment rather than consumption.[49] Nevertheless, in both funds a substantial proportion is used for paying rent and buying food in bulk. Naturally, the purposes of loans varied with location. For example, the Wicklow loan fund lent out a considerable sum to pay for hay, horses and materials for carts to help meet the "demand for conveyances for Sulphur Pyrites from the mines to the shipping ports."[50] In some towns, the investments financed by the loan fund were at the center of the town's economic life: one loan fund boasted in 1849 that "the town of Newtownstewart and its trade depend chiefly, at present, upon the circulation of money given by the Loan Fund."[51]

The average loan was about £4 in the late 1830s and 1840s, though the mean varied from £2.1 to £5.2 across counties. To put this into perspective, Joel Mokyr estimates the per capita wage income of the poorest 66% of the Irish population around 1840 as

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[48] The occupations listed are similar to those at other funds in Mayo and Sligo (Ryan, 1838, pp. 54-55).

[49] Another loan fund in Armagh which had made 5,860 loans by 1846 showed that 13% had been to pay for rent. (Kennedy (1847), p. 217)

[50] Third Annual Report of the Loan Fund Board, p. 21.

[51] Eleventh Annual Report of the Loan Fund Board, p. 21.

£2.40.[52] (For the entire population, Mokyr estimates income per capita at around £10.) £4 would have been sufficient to purchase several farming implements, a couple of lambs, or a small quantity of stock for a shop. Some borrowers would, in the absence of loan funds, have obtained credit elsewhere. However, given the much higher rate of interest charged by moneylenders, it appears that there was rationing of small-scale credit, a result which is unsurprising given the inactivity of banks. Thus the loan funds increased the volume of lending and decreased the interest rate.

Despite their rural clientele, the loan funds tended not to finance crops but instead promoted economic diversity. This was important, since according to the estimates of the 1845 Devon Commission, the minimum farm size required to sustain a family of five was between 6.25 and 10.5 acres, so that small-holders typically had to supplement their income as laborers on other farms and/or in some other way, such as selling eggs and cheese, or keeping a pig.[53] Loans were a vehicle for financing such non-crop activities, and they were thus instrumental not only in increasing household income, but in developing diversity in rural production and introducing borrowers to the formal financial system. Our finding, described below, that the loan funds tended to be more active in counties with greater rural manufacturing, accords with the contention that the funds supported diversification.

The loan fund system received three major official reviews in 1855, 1896, and 1914, in which the records indicate considerable ambivalence about their value to society. This ambivalence is evident in the testimony before the Devon Commission in 1845, in which many witnesses claimed that the loan funds were "injurious to the farming class," who borrowed for unproductive reasons such as paying rent. The poor "do not know how to calculate, and they are apt to waste the money." One witness observed that "every person ... who has borrowed from the loan fund has been ruined." Nevertheless, the same witnesses agreed that "Previous to the establishment of loan funds, needy persons had recourse to usurers, whose usual rate was twenty-five per-cent on even short periods," so it is not clear what alternative is proposed. The general tone of these negative comments is that the poor need to be protected from their own propensity to borrow foolishly. Other

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[52] This figure is abstracted from data kindly provided by Joel Mokyr.

[53] Mokyr, 1983, p.175.

witnesses had a more positive view, arguing that the funds provided great benefits to "very poor tenants; holding about three acres of ground...; living in bog districts."[54]

An extraordinary feature of the loan funds' history is their apparent reversal in fortunes in the 1880s and early '90s. As we see in Figure 3b, coincident with a significant decline in outside interest rates at this time, the number and circulation of loan funds increased rapidly. This increase, however, cannot be viewed positively since it was largely attributable to a number of funds in Ulster which were seriously in breach of the spirit and rules of the system. The 1896 inquiry found that they had "ingrafted on the Charitable Loan Fund System, many of the worst features of 'Gombeenism,' and relying on the facilities in regard to recovery of debts afforded by the Loan Fund Act of 1843, have issued loans with a recklessness that would soon have reduced a private money lender to insolvency."[55] The inquiry found that, in some districts, between 60% and 90% of all households were borrowing from the loan funds and that many households had been continuously indebted for many years.[56] Many of the loan funds had strayed far from their charitable origins, with control having "passed into the hands of men who are merely money lenders."[57] One family had managed to install its members as paid clerks in a number of funds and together their salaries were over £700.[58] Nevertheless, this inquiry concluded that "although ... out of the 104 existing Societies, there are perhaps not more than twelve or fourteen Societies worked fairly well in compliance with the Rules, we are satisfied that generally the good more than counterbalances the evil."[59] This inquiry led to some reforms in the system. As a result of the inquiry, the offending loan funds were closed and the practice of renewing loans eliminated, and the loan funds afterwards continued to decline as other sources of credit became available.

This unsavory chapter in the funds' history should not be seen as characteristic of them, but as an opportunistic exploitation of the system. The incentive to abuse the loan

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[54] Kennedy (1847), pp. 222-229.

[55] Report of the Committee (1897), p. 12.

[56] Report of the Committee (1897), pp. 14-22.

[57] 1897, p. 12.

[58] Reports of the Castletown Delvin and Mullingar Loan Funds (1854).

[59] 1897, p. 27.

funds was in part dependent on the differential between the funds' maximum permissible deposit rate and the outside interest rate. As seen in Figure 3b, the opportunity to make large profits from the loan funds occurred in the 1880s and 1890s because this differential increased substantially owing to a decline in the outside interest rate. When egregious abuses of the system came to light, the government intervened. The failure of the Board to prevent the blatant rent-seeking and abuse of this period suggests that its supervision may have been equally defective at other times.

The Report of the Departmental Committee on Agricultural Credit in 1914 concluded that "the first thirty years' operations of the Irish Loan Fund system were productive of many grave abuses, due to defective legislation, to lack of competent inspection, to grave neglect of duty by the local Committees, to fraudulent acts on the part of officials of Societies, to illegal exactions from borrowers in the shape of fines, etc., and the absence of proper control and supervision by the central body."[60] The committee noted that the previous irregularities and abuses had been eliminated and that some funds were "doing a fair amount of good."[61] Nevertheless, they recommended that the remaining loan fund societies be closed and their capital transferred to credit cooperatives. Their recommendation was not accepted and the funds continued to operate, with the strongest ones lasting into the 1940s.

CROSS SECTIONAL ANALYSIS

Geographic patterns of loan fund activity are illustrated in Figure 1 which shows fund incidence and the number of loans per hundred inhabitants by county. Funds were less prevalent in the most developed areas, such as Dublin, where the banks were well represented, and the least developed areas, such as the West coast. In addition, according to our analysis above, we expect that the loan funds would have some comparative advantages operating in relatively rural areas where their informational advantages would be largest. We also expect that, given the structure of their loans, espoused goals and the advantages of diversification, they would finance cottage industries and traders preferentially over agriculture. In order to explore these hypotheses, we performed a regression across the 32 counties using census data. See the appendix for information on the data used.

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[60] 1914, pp. 87-88.

[61] 1914, p. 94.

Table 2a column (3) presents a regression of the amount circulated (i.e. the face value of loans) per capita by county on the measures found in the 1841 census. Figure 2a illustrates the distribution of the amount circulated. It is clear from the regression that more rural counties, and those with higher fractions of workers primarily involved in manufacturing, tended to have higher circulation, which supports the above hypotheses. Rural, small manufacturers (artisans, tradesmen, miners, etc.) seem to have been important clients of the loan funds, either as borrowers or depositors. In contrast, families who derived some income from the cloth trade seem not to have used the funds as much.[62] Tests on the number of depositors and assets per county presented in (1) and (2) of Table 2a yielded similar results.

Cross-sectional regressions of some of the operating parameters are presented in (4) and (5) of Table 2a. Regression 5 measures how efficiently assets were used, and is unaffected by the industrial mix, suggesting that, on the margin, the distribution of fund activity reflected the opportunities for lending in different industries. Slightly lower gross profits in more urbanized counties may indicate a lower cost of establishing funds in cities. Regression 4 indicates that fines were lower in more urban counties, as would be expected if travel and/or time costs were important. This makes it interesting that fines were also a smaller share of gross profits in counties with a higher fraction of agricultural workers. The coefficients are economically large given that the average level is 0.20. It is possible that farmers, if poorer, were more careful to repay on time. Additionally, funds in those counties with larger agricultural sectors may have preferentially implemented monthly repayment schemes.

Bank and fund incidence by county is contrasted in Table 2b. Using the only bank data available, we compared loan fund and bank incidence across counties in 1842 and 1843. Loan fund incidence appears to be largely idiosyncratic, whereas that of the banks appears more responsive to measurable economic factors, particularly manufacturing activity.[63] In a SUR framework, testing revealed that the urban coefficient was signifi-

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[62] The cloth industry seems to have been more successful in obtaining financing from banks. See Gill, pp. 315-6 for more on bank finance of the linen industry.

[63] The reason for the low explanatory power for loan fund incidence here is that while size-weighted measures of fund activity are correlated with our industrial measures, the pure counts are not because a large number of small funds seem to exist for reasons not correlated with the economic variables available to us.

cantly different between banks and the funds at the 7% and 10% levels for 1842 and 1843 respectively.[64]

LONGITUDINAL ANALYSIS

Summary measures of fund activity over time can be seen in Figure 3. Figure 3a presents the number of loan funds under the Central Board, Reproductive funds and bank branches. One might infer from 3a that, following a burst of fund starts, this stock simply declined over time, but this is misleading, since new funds were started in most years in every decade of the century. Ireland's population was sharply declining in this period, so we chart financial statistics per capita in constant 1900 pounds in Figures 3b, c and d. We identify three turning points in the development of the loan funds after 1840.

An initial reduction in the number of funds occurred in 1843 when legislation reduced the interest rates that the funds could charge and offer, and the margin between the two. Figure 3b graphs the differential between 3% British consol yields and the maximum fund interest rate. Figure 3c graphs real profits and donations per capita. Profits were reduced by half following the rate changes, from just under £0.002 per capita to just under £0.001. Donations to other charities were dramatically reduced, from about £0.0013 per capita to £0.0003. Surprisingly, however, the volume of lending, shown in Figure 3b, rose slightly. Fund activities were sensitive to the external interest rate, so this legislation should have been effective in curbing the ability of the loan funds to compete with banks in the long term. One of the main impacts of the rate reduction was an abrupt decrease in fund initiation. Unfortunately, we are unable to assess the impact of this interest rate ceiling on the long term performance of the system, since it was so seriously affected by the Great Famine in the succeeding years.

From 1845 to 1848, Irish potato crops were reduced to a fraction of their previous volume, causing massive excess mortality and emigration. During these few years, of a population of 8 million, around 1 million died and 1 million emigrated. The widespread devastation of the Famine was particularly hard on the loan funds' clients. Fearing a high rate of default, many depositors, particularly those at smaller funds, withdrew their

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[64] A Lagrange-Multiplier test [Breusch and Pagan, 1980] was also used to see if the residuals of the bank and fund regressions were correlated. While such a test relies on large sample properties, it might have power enough to reject the null that the errors are independent if they are very highly correlated. The null was not rejected (Chi^2 statistics of 0.25 [p=.61] and .003 [p=.96] for 1842 and '43 respectively). This reinforces the idea that the banks and funds were responding to neither the same observed nor unobserved economic factors in choosing their locations.

money. Thus, as seen in Figure 3a, by 1851 the number of funds fell to 123, 40% of the peak number. The average amount circulated per fund also dropped dramatically from a peak of £6197 in 1845 to £2438 in 1847. Some of the medium- and large-sized funds were hardly affected by the Famine. The Killaloe Fund in Co. Clare boasted that in 1848, it "had not a single demand made on us for the withdrawal of money...; on the contrary, parties having drawn their money from out Savings' Joint Stock Banks, were anxious to lodge it with us on security of the Society's debentures."[65]

Funds that survived returned to normal operation relatively quickly. As seen in Figure 3b, by 1851 the amount circulated had recovered partially and the mean amount circulated per fund was larger than prior to the famine. Profits for the system as a whole, shown in Figure 3c, also returned to pre-Famine levels. Donations, however, took substantially longer to increase. Assets, and assets free of interest (including donations, retained earnings and deposits free of interest that could be withdrawn) are presented in Figure 3d. The assets of the system never recovered from the Great Famine and, despite cyclical upturns, they slowly declined. Following the famine, funds tended to retain earnings to build up a reserve to protect depositors. That the Board began to require funds to report retained earnings at this point indicates its importance.

Given the severity of the famine and the fact that fund assets were comprised only of unsecured loans to the poor, the survival of so many loan funds through the Famine is testimony to the tenacity of the institution. The unit nature of the system may have been a significant advantage during this great calamity. The short-lived Agricultural Bank was the most similar to the loan funds in its borrowing clientele, but poor lending decisions at many branches brought down the entire institution during a period of relative stability. The loan funds were, on the whole, probably less well run than the Agricultural Bank, yet many survived even the Great Famine since distress at one fund did not propagate through the system. Because of their independence, a Darwinian selection process operated and those loan funds which were best run, or least affected by adversity, were able to survive.

A third, and more gradual, decline in the amount circulated occurred between 1851 and the mid-1880s, and after 1896 (Figure 3b). In this period the funds faced mounting competition as the banking industry expanded, as shown in Figure 3a, though the funds also had to compete for deposits with the post office savings banks (from the 1860s) and rural credit cooperatives (from the 1890s). This competition was exacerbated

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[65] Eleventh Annual Report of the Loan Fund Board, p. 16.

by a declining rural population. In addition, because of inflation and increasing personal income the legislated maximum loan size became more binding. The banks also became more aggressive in their lending, as average personal incomes increased and more individuals acquired credit histories through loan fund borrowing.

Times series analysis

In order to determine the relationship of loan fund activity to economic variables over time we present in Table 3 a regression using annual data covering the period 1850 to 1914. The dependent variable is the total amount of fund lending ("circulation") per capita in 1890 pounds. This best captures the level of fund activity. Regressors include the annual values of crops and livestock. These agricultural series determine the length of our analysis. Also used as a regressor is the average annual yield on 3% British consols. This can be seen as an indicator of the opportunity cost of capital. The inquiry of 1896 caused a major structural change in the operations of the funds which we allow for in our modeling.

Since the system had constant maximum interest rates over the period, it could be argued that the legislated interest rates were a fundamental determinant of fund activity. In the larger picture of competing institutions this is, however, not credible. Had there been political support, legislation to change the interest rate could have occurred. We do not, therefore, believe that any of our explanatory variables are determinants of the long-run decline in fund activity. Rather, their ability to describe short run movements around a trend is of interest.

An autoregressive distributed lag model of the form $y_t = \alpha + \sum_{i=1}^{p} \beta_i y_{t-i} + \sum_{j=0}^{q} \gamma_j x_{t-j} + \delta T + u_t$ where $u_t \sim IID(0, \sigma^2)$ and T may be a vector of time trends, was used as the base from which to test down to the final model; all variables are in logs.[66] Four variations of the final specification are presented in Table 3. (1) is the

[66] In practice we never tested for p larger than 3 or q larger than 4, and we did not test down on the trend variables. The Akaike and Schwarz criteria were used in model selection. As a precursor to modeling the time series relationship, the possibility that the agricultural variables might have a unit root was tested. In both Dickey-Fuller and Phillips-Perron tests, the hypothesis of a unit root was rejected, but both series were found to have significant trends. Because these series and amount circulated had trends, a trend is included in the model, with an allowance for a structural change in 1896. Quadratic trend terms (not shown) were also tested, but they did not affect the coefficients of interest substantially.

most encompassing, allowing for each of the variables of interest and its lag. The trend and intercepts are allowed to change before and after the inquiry of 1896 and dummy variables are used for the inquiry and the years following it. These structural breaks are reduced in (2) and (3) as first the trend is consolidated and then the year-specific dummies are removed. The coefficients of interest are relatively robust to these changes. Finally, in (4) the insignificant lags on crops and the yield are removed, and yield is crossed with a dummy variable that is 1 prior to 1896, and 0 in 1896 and following. In effect the interest rate is not allowed to operate following the inquiry. The resultant coefficients are very similar to those in (1), except that the standard errors are smaller when the lags are dropped.

Agricultural fluctuations have large impacts on the amount circulated by the funds, as expected in this largely agrarian economy. In interpreting the coefficients, which are elasticities, care must be taken since it is not clear whether the effects work through demand or supply. The amount circulated increases in years when crops are good, possibly because there is an anticipated ability to repay or because of the increased costs of the harvest. An increase in the value of livestock is associated with a sizable rise in the amount circulated, but its lag has a negative coefficient. It is possible that when livestock purchases were above average one year, fewer purchases were required the next, suggesting a savings role for livestock.

The interest rate has the expected negative effect on loan fund circulation. The causality here is clearer, since the yield on government bonds represents the yield on alternative investments. Thus (at least some) depositors were sensitive to the rate of return offered and were "rational." One *caveat* regarding interest rate movements is indicated in Figure 3b. The yield differential increased dramatically in the early 1880s, and so did the amount circulated, but the 1896 inquiry had a dramatic impact on circulation while interest rates decreased only slowly. The role of the outside interest rate was apparently reduced following the inquiry as deposits shrank compared to fund capital.

CONCLUSIONS

The success of the Irish loan fund system is important evidence that the Irish middle and lower classes had a much greater degree of involvement in the formal financial sector than has been previously assumed. Since banks were unable or unwilling to lend to smallholders and laborers, the funds responded to the need for a local savings and lending intermediary. During the early 1840s, the loan funds appear often to have been the principal institutional source of credit in the districts in which they operated outside of the

larger towns. The loan funds were sensitive to their economic environment. Conditioning for the degree of county urbanization, funds were more active in counties with higher rates of manufacturing employment. They were nevertheless heavily dependent on the agricultural economy, with substantial increases in activity in years with good harvests. Fund activity was also sensitive to the outside interest rate, suggesting that depositors were not only altruistic.

The rapid growth of this institution is important evidence for the value of "alternative" credit institutions when the economy is being monetized, and agency and monitoring problems cannot satisfactorily be dealt with by commercial banks or private moneylenders. Although the loan fund system developed initially without government intervention, the promulgation of appropriate legislation to reduce costs and ensure supervision appears to have been essential for significant growth. The fact that the government did not provide capital or loans to the funds was an equally important feature of the system, since to mobilize deposits they were therefore required to maintain portfolio quality. While we cannot argue that the loan funds solved the problem of rural undercapitalization, we observe that the distribution of capital is important, particularly when the economy is so poor that many are on the brink of starvation. The scale of the loan funds in the 1840s and 1850s was large enough that they would have made a significant difference to poverty relief.

We have argued that the loan funds were better able than the banks to mitigate problems of asymmetric information. However, it should be noted that their charitable status conferred cost advantages: they paid no stamp duty, they had a small amount of donated capital and they benefited from volunteer labor by managers. Was this sufficient to explain their success? There are two counterfactuals to consider: (1) Had the banks had similar cost reductions, would they have lent to the poor? and (2) Had the funds not had these advantages, could they still have operated? We believe that the cost advantages were probably essential to the funds, being worth in total around 3-4% on their lending operations. With respect to the second counterfactual, we simply observe that the banks' cost of funds -- the rate they paid on deposits -- was about 4% lower than the loan funds. So they already had a cost advantage.

The structure of the loan fund system may be of interest in the current analysis of microcredit institutions. Some characteristics worth noting from its institutional form include its charitable nature, which was likely an important factor on several counts including the initiation of the system and lowering the default rate. The loan funds' local

affiliation helped to overcome problems of asymmetric information, partly since they had local management, and partly since depositors had stronger incentives to monitor fund operations. The financial independence of each fund may also have been important in enabling the institution to survive the very large shock of the Great Famine. An important extension to this research is the analysis of the determinants of fund success and failure during the long history of the system, particularly during the Great Famine and through other economic fluctuations. We are in the process of building a large panel of data on the loan funds through this period of great economic turbulence which we hope will be a valuable source of information on the sustainability of microcredit institutions.

APPENDIX - DATA DESCRIPTION

Annual reports of the Central Board, beginning in 1838, are our principal data source. From 1838 to 1849 the format of the report grew to include an increasing number of variables. Occasional values are missing, especially in the early years and for smaller funds. By 1841 it seems that all of the funds were known to the board and that reporting was more regularized, although the notes to most reports list funds that did not make the deadline for publication. Financial duress was frequently cited as the cause. As a result, we expect that the figures underreport funds with higher rates of default and higher costs. This bias is unlikely to be very severe, since all funds were required to report and failure to do so would lead to a visit from an inspector and then an order to cease operations. We aggregated fund data to the county level for the cross-sectional regression, so there are 32 observations.

The independent variables, *AGR*iculture, *OTHER*, and *MANU*facturing indicate the fraction of families in the county whose main source of income was the indicated industry. The *Urban* variable is the fraction of the county's population living in towns larger than 2000. The *Cloth* variable indicates the fraction of households obtaining any fraction of their income from the cloth industry. (These data were kindly provided by Joel Mokyr, who abstracted them from the Reports of the Commissioners Appointed to Take the Census of Ireland for the Year 1841.) A substantial fraction of workers, from 13% to 46%, with an average of 22%, were primarily involved in manufacturing. The manufacturing was *not* heavily concentrated in more urbanized counties; the correlation is 0.24 and insignificantly different from zero. The variables on the loan funds are from 1843 because we believe that data to be more reliable than data for earlier years.

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Table 1a
Borrower Occupations

Ballycastle 1838-40		**Castletown Delvin 1841**			
	# Borrowers		# Borrowers	Total Loans(£)	Avg. Loans(£)
Farmers	604	Farmers < 5 acres			
Labourers	354	and labourers	283	1179	4.2
Weavers	127	Dealers or huxters	556	982	1.8
Shoemakers	64	Farmers > 5 acres	160	834	5.2
Dealers	33	Tradesmen	61	338	5.5
Blacksmiths	28	Weavers or spinners	49	165	3.4
Tailors	23	Other	133	626	4.7
Fishermen	22				
Stonemasons	19				
Carpenters	17				
Teachers	10				
Other men	136				
Total	**1407**				
Spinsters	392				
Widows	163				
Married Women	30				
Total	**555**		**1042**	**4124**	**3.9**

TABLE 1B
STATED PURPOSE OF LOAN

	Ballycastle 1840		Castletown Delvin 1840	
Purpose	Number	Amount £	Number	Amount £
Pigs, Cows Goats	486	2902	293	1137
Provisions	670	1853	160	635
Shop goods	321	1635	143	764
Rent	346	1818	28	123
Oats,Straw,Hay			142	690
Yarn	196	860	61	191
Wool,Flax	218	588		
Horses	62	374	34	104
Leather	59	238	36	173
Seed	82	425	9	30
Clothes, Furniture	9	24	26	143
Timber	26	134		
Farm Implements	3	9	14	80
Iron	27	87		
Poultry			13	67
House or land	8	50		
Debts	11	33		
Fishing Tackle	7	25		
Handicraft Tools	1	4		
Total	**2532**	**10959**	**933**	**4072**

Sources: Ballycastle: Third Annual Report of the Loan Fund Board, p.12; Castletown Delvin: Reports of the Castletown Delvin and Mullingar Loan Funds, 1854, p 6. The occupations are as stated by borrowers.

TABLE 2A
LOAN FUND CHARACTERISTICS ACROSS COUNTIES, 1843

	(1) assets /pop	(2) # dep / pop	(3) amt circ / pop	(4) fines / gross pft	(5) gross pft / assets
Agr.	-0.33***	-0.48***	-1.17**	-0.68***	-0.07
	(.109)	(.148)	(.474)	(.231)	(.073)
Other	-0.34	-0.38	-1.04	-0.23	0.10
	(.224)	(.306)	(.979)	(.479)	(.151)
Urban	-0.15**	-0.24**	-0.66**	-0.34**	-0.09**
	(.065)	(.089)	(.286)	(.139)	(.044)
Cloth	-0.24**	-0.38**	-0.84*	-0.64***	-0.13*
	(.106)	(.144)	(.461)	(.225)	(.071)
Const.	0.38***	0.53***	1.35***	0.84***	0.21***
	(.108)	(.147)	(.472)	(.230)	(.072)
R^2	.28	.31	.22	.38	.31
N	32	32	32	32	32

TABLE 2B
BANK AND LOAN FUND INCIDENCE BY COUNTY

	(1) Loan Funds / pop	(2) Bank Branches(1842) / pop	(3) Bank Branches(1843) / pop
Agr.	-0.09	-0.12***	-0.13***
	(.086)	(.037)	(.037)
Other	-0.06	-0.26***	-0.22***
	(.177)	(.076)	(.076)
Urban	-0.09*	0.02	0.004
	(.052)	(.022)	(.022)
Cloth	-0.13	-0.041	-0.05
	(.083)	(.036)	(.036)
Const.	0.14*	0.13***	0.14***
	(.086)	(.037)	(.037)
R^2	.15	.51	.47
N	32	32	32

Notes: One, two and three asterisks represent significance at the 10, 5 and 1 percent levels respectively.

Sources: County variables were abstracted from the 1841 Census of Ireland and kindly provided by Joel Mokyr. For bank branches, Barrow (1975), pp. 215-219.

TABLE 3
TIME SERIES OF THE AMOUNT CIRCULATED 1850-1914

	(1)	(2)	(3)	(4)
lag(Amt Circ)	.68***	.79***	.74***	.69***
	(.094)	(.082)	(.074)	(.063)
Crops	.15*	.20**	.24***	.15**
	(.085)	(.085)	(.084)	(.065)
lag(Crops)	.01	.04	.07	--
	(.081)	(.084)	(.089)	
Livestock	.49***	.44***	.44***	.46***
	(.098)	(.099)	(.105)	(.093)
lag(LS)	-.20*	-.33***	-.29***	-.17*
	(.117)	(.106)	(.111)	(.104)
Yield	-1.32**	-.96*	-1.05*	--
	(.542)	(.538)	(.553)	
lag(Yield)	.06	.66	.73	--
	(.589)	(.545)	(.555)	
Yield(pre96)	--	--	--	-1.38***
				(.379)
Trend	--	-.0003	-.001	-.01**
		(.003)	(.003)	(.004)
Trend5095	-.01*	--	--	--
	(.005)			
Trend9614	.02**	--	--	--
	(.009)			
Yr97 dum	-.19	-.28**	--	--
	(.123)	(.122)		
Yr96 dum	.25*	.09*	--	--
	(.141)	(.125)		
constant	22.57**	2.50	3.71	23.78**
	(10.76)	(6.25)	(6.61)	(8.99)
post dummy	-57.01	-.23***	-.27***	-1.61***
	(25.26)	(.070)	(.060)	(.377)
R2	.96	.95	.95	.95
Durbin h	.67	-.12	.84	-.34
B-G	5.59	2.61	2.00	1.66
p-value	.232	.625	.735	.798
N	64	64	64	64

Notes: Logs have been taken of all of the X variables; the trends are in years. B-G (p-value) is a Breusch-Godfrey test for autocorrelation in the residuals. The statistic presented tests four lags; other lengths (not shown) were also examined. Jarque-Bera tests did not reject normality. Breusch-Pagan-Godfrey tests did not reject homoskedasticity for equations 1 and 2. The tests did reject for equations 3 and 4 where the allowances for the 1896 reforms are removed; while the coefficients of interest are robust to this, the preferred specification is 1. One, 2 and 3 asterisks represent significance at the 10, 5 and 1 percent levels respectively.

Sources: Agricultural data is taken from Turner (1996), p. 108. Interest rate yields are from Homer and Sylla (1991). Population estimates are from Mitchell (1992) p.77ff. All monetary values are deflated to 1890 pounds using the average price of Bread in Dublin, from Mitchell (1988), p. 771. While this is obviously not an ideal index, we have some confidence in it since it moves fairly closely with the UK consumer price index presented in Mitchell (1992, p. 846ff); the latter index is not used because of a break in the series in 1871.

FIGURE 1
LOAN FUND ACTIVITY PER COUNTY IN 1843

County	Loans per hundred inhabitants	Loan funds per county
Ulster		
Donegal	7.2	12
Londonderry	3.4	4
Antrim	8.0	7
Down	2.2	6
Armagh	8.2	6
Monaghan	9.4	14
Cavan	10.1	12
Fermanagh	6.5	8
Tyrone	9.6	19
Leinster		
Carlow	9.0	7
Dublin	1.7	8
Kildare	5.3	4
Kilkenny	6.7	15
Kings	10.8	8
Longford	10.1	9
Louth	4.1	5
Meath	6.7	7
Queens	12.7	7
Westmeath	7.6	10
Wexford	9.2	12
Wicklow	11.6	11
Connaught		
Galway	2.7	10
Leitrim	6.0	7
Mayo	0.9	2
Roscommon	3.5	8
Sligo	5.6	7
Munster		
Clare	1.7	5
Cork	7.7	36
Kerry	0	0
Limerick	1.7	4
Waterford	7.6	8