Microfinance and Famine: The Irish Loan Funds during the Great Famine

Aidan Hollis
Department of Economics
University of Calgary
2500 University Dr. NW
Calgary, AB
T2N 1N4, Canada

ahollis@ucalgary.ca
voice: 403-220-5861
fax: 403-282-5262

Arthur Sweetman
School of Policy Studies
Queen's University
Kingston, ON
K7L 3N6, Canada

sweetman@qsilver.queensu.ca
voice: 613-533-3114
fax: 613-533-2135

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Abstract

What happens to microfinance organizations when faced with massive external shocks such as famines? Using a unique and extensive data set, we analyze the impact of the Great Irish Famine of the 1840s on the Irish loan funds. The funds were a large and important microfinance institution operating throughout Ireland. We find that the pre-Famine capital ratio of each fund was a strong predictor of survival of the fund through the famine. Among available local demographic variables, the most significant is the rate of female literacy, which was strongly correlated with the probability of fund survival.

1. Introduction

What happens to microfinance organizations when faced with massive external shocks such as famines and wars? Sustainability is one of the central problems in modern microfinance, not least because many microfinance institutions are located in countries that are susceptible to huge swings in the economic climate. Despite this, we know of no studies that have documented the outcomes of famine and other very large external shocks on the sustainability of microfinance organizations. This study examines the effect of a devastating famine on one historical institution – the Irish loan funds – to see what we can learn about how a microfinance organization can be successful and sustainable even through the worst episodes of famine. We find, using an extensive and unique data set, that pre-Famine efficiency and capital ratios were critical for institutional survival; more surprisingly, we also find that local female literacy is strongly correlated with fund survival, even accounting for other demographic and famine-related variables.

Johnson and Rogaly (1997), Buckley (1997), Conning (1999) and Morduch (1999 sect. 4) and others have argued that sustainability is a key problem in microfinance. However, there has been very little analysis of microfinance during times of severe macroeconomic fluctuations. One exception is Patten, Rosengard and Johnston's (2001) fascinating study of the BRI bank in Indonesia during the period of the East Asian crisis. They show that the microbanking units of BRI performed better than other parts of the bank, possibly owing to the design of the lending structure. However, the East Asian crisis involved a drought and a banking crisis, not a severe famine.

A related major issue arising in microfinance is the trade-off between "outreach" (which means lending to the very poor) and sustainability (see, e.g., Conning, 1999; Paxton, 2002). The managers of the Irish funds, of course, had to face exactly this problem at its most acute during the Famine. Should they continue to lend to labourers who would in all likelihood be unable to repay? Should they impose extra fines on borrowers who were late in repaying? Should they seek to enforce repayment from impoverished borrowers or their co-signatories through the courts, resulting in evictions? Loan funds that strictly enforced loan requirements during the Famine may have been

more likely to survive it; but they may also have been of less benefit or of greater harm to the starving poor of Ireland during the crisis. We do not, in these circumstances, make any judgment about whether outreach or sustainability is the more important goal; we can only show what seems to have been important for sustainability.

Although today Ireland is a wealthy country, in the 1800s it was an impoverished hinterland to Europe, plagued by frequent famines. Despite local poverty, the (then) British government kept good records, and the activities and finances of the Irish loan funds are therefore extensively documented. The funds' history can be traced from the early 1700s until the 1960s. At their peak just before the "Great Famine" in the late 1840s, some 300 independent loan funds were making small loans to the Irish poor. Approximately 20% of households were borrowers from the loan funds annually, making this one of the most successful microfinance institutions anywhere. The average loan size was approximately equal to the per capita income of the poorer two thirds of the population. The Famine, caused by repeated failure of the staple potato crop, had a devastating impact on the people of the Ireland, and the loan funds. Excess mortality from the famine has been estimated at around 13%, and emigration at another 12%, leading to a sudden decline of approximately one quarter of the population. Not surprisingly, many of the loan funds closed; somewhat more surprisingly, about half managed to stay open. We focus in this paper on discovering what fund and demographic characteristics led to fund survival.

We provide below a brief review of the problems related to sustainability of microfinance organizations and then discuss the Irish loan funds and the famine. In section 5, we discuss the effect of the famine on the loan funds, and in section 6 present data and an econometric analysis of what factors were important in loan fund survival.

2. Microfinance, Sustainability, and Crisis

Access to capital is for the poor a critical obstacle to escaping poverty, and this is particularly true in developing countries. This demand for capital is not met by traditional banks, whose cost structure and culture typically prevents them from dealing with the poor. In response, microfinance organizations have arisen indigenously in some places, or

have been set up by NGOs in other places, and have had remarkable success in making small loans to very poor people, and being repaid. The extraordinary effectiveness of several modern institutions, highlighted by the Grameen Bank in Bangladesh, has led to a convergence of interest from international institutions such as the World Bank, the UNDP, government sponsored international aid agencies, and NGOs.

While these organizations have demonstrated convincingly that poor people are creditworthy, the high costs of administering small debts, especially with high-frequency small-installment repayment plans, mean that sustainability without continuing external subsidies is a critical problem for microfinance organizations (Morduch 1999). The problem of high costs of administration becomes worse the more the organization is focused on making loans to the very poor. However, while there has been some research on the problem of sustainability during "normal" economic conditions, what has not been much examined is what factors are important for survival of microfinance organizations during abnormal conditions.

Research on economic crises – how to respond to them, and what policies will help to limit their severity – has been recognized as a particularly important area for research in the development literature in recent years. The November 2001 IADB/IFPRI conference on Crises and Disasters summarized by Skoufias (2003) is a good example of the direction of current research. While much research on crises examines effects on child welfare, nutrition, and other social issues, an important direction for research is how crisis directly affects the institutions which are important for welfare both during and after the crisis, an approach taken by Patten, Rosengard and Johnston (2001). Indeed, design of institutions to be robust to serious economic and social crises is one of the features which enable countries to emerge successfully from a crisis, since if institutions are destroyed along with physical infrastructure, then the process of rebuilding society and the economy must take much longer than if the institutions remain.

3. The Loan Funds before the Famine

We provide a short characterization of the loan funds here, as we have already described them extensively elsewhere (Hollis and Sweetman, 2001). The funds had evolved out of

an initiative by Irish author and nationalist Jonathan Swift during the early 1700s to provide small sums of capital to the poor of Dublin. Early successes imitating Swift's model led to an explosion of independent charitably funded organizations for lending to the poor during the first part of the 1800s. These organizations began experimenting with accepting deposits, and fell under the regulation of the newly created "Loan Fund Board" in 1837. By 1843, there were around 300 loan funds scattered through the entire island operating under the Board. There was very considerable variety between the funds, and between the areas in which they operated, which allows us to perform some statistical tests.

The typical fund made 1649 loans in 1843, averaging around £3 each. (As a measure of scale, Mokyr (1985, pp. 10-11) estimates the per capita income of the poorer 67% of the population as £4.3.) Loans were required by law to be no more than £10, and to have a 20 week term, with weekly repayments. Borrowers paid an annualized interest rate of about 8.8%, which might be augmented by fines if repayments were late. Loan funds were funded by "capital free of interest" – which included donations, retained earnings, and interest-free loans – and deposits, on which interest was paid. Funds had an official, volunteer, manager, but their daily affairs were mostly controlled by paid clerks. Many of the managers were religious ministers in this period, and the funds were seen as a form of assisting the poor.

Loans were used for a wide variety of purposes – buying consumption goods in bulk, rent, stocking of small stores, farm animals, tools, and so on. Borrowers were drawn from the lower-income strata of Irish society – agricultural laborers, small-scale farmers (who owned their own land), and tradesmen dominated the occupations of borrowers, and these were among the classes most severely affected by the Famine. About 20% of borrowers appear to have been women.

4. The Great Famine

The Great Famine of the 1840s in Ireland was one of the most severe famines in modern history, comparable in its severity to famines in China (1950s), Ethiopia (1980s), and Biafra (1960s). Ireland in the early part of the nineteenth century was regarded as one of

the most impoverished parts of Europe (Mokyr, 1985, 6). This poverty was caused by – or at least reflected in – many parts of the economy. Absentee landlords spent earnings from their Irish properties in London. The industrial revolution in England, and to a lesser extent in Ulster, had precipitated the collapse of Ireland's traditional cottage industries of spinning, weaving and other small-scale production during the 1830s. At the same time Ireland had tremendous population growth through the first half of the century. This led to an economy on the edge of catastrophe, with vast numbers of impoverished landless laborers; even artisans and farmers were relatively poor compared to other West European countries. The German traveler Kohl commented in 1844 that "until one has seen the west of Ireland he has no idea that human beings can live in a state of greater misery than in the fertile environs of Dublin."[1]

Ireland was famous for its potato dependency, which provided a plentiful if monotonous source of food most years. The average adult laborer in most regions of Ireland is estimated to have consumed over 12lb of potatoes per day, implying a daily intake of over 3,800 calories (Bourke, 1968, 76). The nutritional status of the Irish poor appears to have been relatively good thanks to the potato, but since potatoes could neither be stored for more than a year nor transported at reasonable cost, crop failure in a year was disastrous. Occasional problems with the potato crop led repeatedly to local food shortages.

Despite Ireland's relative poverty, the British government (following the union of Britain and Ireland in 1800) implemented a distinct, and rather harsh, welfare system for Ireland in 1838. The Irish Poor Law had two very important provisions which restricted the ability of the system to care for the poor during a widespread crisis: first, relief was administered exclusively through workhouses, which became vectors for opportunistic diseases such as typhoid to spread; and second, there was no legal right to relief, so that when a workhouse was full, supplicants were simply turned away. These two provisions severely limited the potential of the Poor Law to provide relief, and led to the complete collapse of the system during the Famine.

[1] Cited in Mokyr (1985) p. 6.

Thus, as of 1845, Ireland was on the edge of a precipice: the people were impoverished, with very little capital accumulation, and the poor had no savings to buy food if their staple crop failed; the staple crop was grown all over the island and dominated the diet of the poor (especially of the very poor); and the system of relief was totally inadequate to handle any major crisis.

The crisis began in 1845, when the potato blight *Phytophthora infestans* destroyed about one third of the crop. The following year three quarters of the harvest was lost. While yields were about average in 1847, little had been planted because of the scarcity of seed potatoes. Yields fell again in 1848 to about two thirds (Kennedy *et al* 1999, 69). For laborers who had planted and lost their crop in 1845 and 1846, the situation was desperate. They had no crop of their own, food prices were very high, and they typically had no savings to purchase food in any case. At the height of the Famine in 1847, some 50% of the population required relief, but the workhouse system under the Poor Law had been designed to provide for at most 1% of the population (Kinealy, 1995, 25).

The combination of poverty, inadequate relief measures, and a total dependence on the potato by millions of people led to mass starvation, particularly in the west of Ireland. Boyle and Ó Gráda (1986) estimate total excess deaths at 511,000 males for average annual pop of 3,716,000, and 474,000 females out of the average annual population of 3,839,000. This implies excess mortality of some 13.75% for men and 12.34% for women, or about 13% overall. They also find, not surprisingly that the very young and the elderly were most vulnerable and had the highest rates of mortality. The rate of excess mortality places the Irish Famine at the top of the league tables of the most deadly famines by proportion of the population killed. Along with the excess mortality, emigration was extremely high, at around 12% during the famine period. Those who died were probably mostly from the poorest classes, while those who emigrated were somewhat better off on average.[2] From the perspective of the loan funds, neither starving nor dead laborers, nor emigrants, were likely to repay loans, so the situation of the loan

[2] Ó Gráda (1994, p. 177) cites the complaint of a nationalist: "All the best of out people are flying to America, leaving behind them an inconceivable legion of idleness, filthiness and beggary to drag the whole nation into the gulph of Pauperism."

funds was extremely bleak. The repeated failure of the potato crop meant that Ireland's economy was not really stabilized until the early 1850s, as many famine-induced changes, including a permanent reduction in the yield and acreage of potatoes, took some years. It is for this reason that our measure of whether a loan fund survived the famine is whether it was still actively operating in 1851.

5. Effects of the Famine on the Funds

The loan funds reached their apex at an unlucky time, for they had no sooner grown into a substantial institution than Ireland was struck low by the "the fearful famine afflicting the country, which has disorganized the whole ramifications of society."[3] The famine most directly affected the class of individuals who borrowed from the loan funds, leading to considerable overdues and bad debts. Loan funds contracted their operations, partly out of fear of making bad loans, partly because their clientele was so diminished, and partly because many deposits were withdrawn to finance consumption or emigration. Extant records for loan funds from the time of the Famine reveal the dismal situation of defaulting borrowers: the account books note after the borrowers have stopped repaying their loans "paupers" or in some cases "all dead".[4]

Account books from a fund under the aegis of the "Reproductive Loan Fund Institution"[5] in the town of Newport, Co. Mayo, show the extremely difficult circumstances faced by the loan funds during this period: in October 1845 it recorded 6 overdues out of 484 current loans, but by October 1847, there were 205 overdues out of 241 loans. In a final tally the fund, which seems not to have accepted deposits, found that it had lost £276 out of its capital of £1000.[6] This outcome seems positive in light of the fact that during the Famine over 80 percent of households in the region – essentially *all* of the borrowers – were on government food rations. Some funds managed well despite

[3] Ninth Annual Report of the Central Loan Fund Board, 1847, p. 5.
[4] See for example Public Record Office of Northern Ireland D1248/LF/5B Tandragee Estate Loan Fund List of Arrears for 1847 and 1848.
[5] The Reproductive Loan Fund Institution managed about 100 loan funds which are not included in our data set. All of them were closed during the Famine. See Hollis and Sweetman (2001) for more on this institution.
[6] Public Record Office (Kew), Mayo Inspection Analysis Book, T-91-183, Ledger 4036.

the extremely adverse conditions. For example, 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." [7]

Funds operating under the Loan Fund Board recorded over £10,000 of losses to depositors (or about 2.5%) during the Famine, which tarnished their reputation as depositary institutions.[8] A large number of (mostly smaller and weaker) funds closed by 1853, but the remaining ones quickly became healthy again and were soon making more loans than before. Though the system was seriously damaged by the Great Famine, it is remarkable that it suffered such relatively light losses given the enormity of the event. This suggests that the institutional form is quite robust and is informative for modern microfinance. In particular, it seems likely that had the loan funds been a single unified institution, the entire system would have collapsed under the weight of bad loans during the famine; but given the independence of each fund (as in the BRI microfinance units of Indonesia), relatively healthy funds were insulated from sicker ones, and this allowed them to continue operating.

6. Sustainability and the Loan Funds

Data

In this section, we analyze empirically the effects of the famine on fund survival. The data used in this study are drawn from two principal sources. First, there is data on the loan funds themselves, taken from the annual reports of the Central Loan Fund Board to Parliament. These reports list summary financial statistics from each of the registered loan funds. The most useful statistics from these reports are summarized at the top of Table 1.

The first listed statistic is "Fund Survive" which is a binary variable, either 1 if the fund was active in 1843 – 1845 and in 1851; and 0 if the fund was active in the earlier period but not in 1851. As the table shows, only 43% of funds survived the famine. The

[7] Eleventh Report of the Loan Fund Board, (P.P. 1849, XXIII), p. 16.

[8] Thirty-second annual report of the Loan Fund Board, (P.P. 1870, XVII), Appendix A, No. 3.

Capital Ratio is "capital free of interest" divided by total deposits plus capital, and is measured at 1845, the first year it was available.[9] The other fund statistics are taken from the year 1843, since that safely predated the famine.[10] The average fund lent only £6728, though there is immense variation in scale, as seen from the minimum and maximum. Before the famine, some 41% of funds had a religious minister listed as their manager, and "Manager a Minister" is a 1 if true and zero otherwise. The expense to loans ratio lists the fund expenses – mainly salaries and other non-interest costs – divided by the Total Annual Loans. The average loan size in 1843 is £3.3 at those funds still operating in 1845.

The lower part of Table 1 shows demographic data drawn from the 1841 and 1851 censuses, by barony, for the baronies in which there was a fund operating in 1843 and 1845. Baronies were the smallest geographic areas separated out in the census, and baronies had an average population of about 25,000. The first variable is population change between the 1841 and 1851 censuses, which averaged –21% in those baronies, approximately the same as for the total country. The variable "Famine Roads Jobs" shows the proportion of the male population employed on Roads by the government in 1847. This figure is intended to proxy the severity of the famine.[11] "Wealth per capita" is the Poor Law Valuation for each barony as listed in the 1851 census, but divided by the 1841 population. (There was no comparable valuation for 1841.) Fourth class housing shows the proportion of families living in the worst types of housing in 1841. Fourth class houses were mainly one-room cabins, often shared with livestock. Population density shows simply the number of persons in 1841 divided by the number of acres. Male and female literacy show the proportion of men and women who could both read and write. Judging from our experience in reviewing account books of the loan funds, the

[9] Capital free of interest consisted of retained profits, donations, and interest free loans to the fund, and is the best available measure of capital.
[10] The results are essentially unchanged if we use data from the year 1845.
[11] Data on this is taken from Correspondence relating to The Measures adopted for the Relief of the Distress in Ireland Board of Works Series. Commissioners of Public Works to the Lord Treasury, Appendix (C), Return showing the Daily Average Number of persons Employed on Roads during the Week ending 7 November 1846. BPP 1847[764]1

proportion of loan fund borrowers who could read and write was much lower than the proportion listed in the census, which is not surprising since loan fund borrowers were typically drawn from less-skilled occupations. “Agricultural Work” shows the proportion of families who obtained most of their income from agriculture in each barony in 1841, and “Females in Cloth” shows the number of women who earned some of their income from the cloth industry.

Regression Results

Table 2 shows raw correlation coefficients for some of the key variables with all the other variables. The large number of starred coefficients indicates that there is broad correlation between many of the variables. However, since so many variables are correlated, it is difficult to sort out what is causing what, so that we need to use multivariate regression to tease out the relationships.

We used probit regressions to test for what characteristics were important for fund survival. The dependent variable, fund survival, was regressed against several fund and demographic characteristics. Results are presented in Table 3. The presented coefficients have been transformed for easier interpretation: each indicates the derivative (slope) of the probability function evaluated at the mean with respect to each continuous independent variable, and the discrete change for dummy variables. Thus the coefficient listed for capital ratio in column 1 indicates that if the capital ratio increased from 0 to 1, the probability of fund survival would increase by about 45%. Since some of the funds are in the same baronies, robust and clustered standard errors were employed, to eliminate the assumption of independence between observations in the same baronies. The related *z*-statistics are reported in the tables.

Column 1 of Table 3 shows the relationship between fund survival and a number of independent variables for the full data set. Column 2 performs the same regression restricting the regression to those baronies which had suffered a population loss. The reason for doing this is the difficulty of interpreting the severity of the famine for the ten funds in baronies without any population loss. The results are, for the most part, robust to this restriction. The third column restricts the analysis only to those baronies with greater than average population loss. Again, the results are generally robust. Column 4

uses the same data restriction as column 2 but drops dummies for the provinces and literacy to try to see whether other demographic variables will be seen to be important. Not surprisingly, the other demographic variables which are correlated with literacy – 4th class housing, wealth per capita, and population density – become statistically significant.

Table 4 uses the full dataset, but drops out each province in each regression to test for robustness of results. As is clear, not even one of the variables is significant at 10% or better in all of the regressions, though some are close. A few results immediately stand out. First, the pre-famine capital ratio is very important in predicting survival. A small increase in capital has a large impact on the probability of survival. This is an important result: capital adequacy is important for microfinance institutions.

The effect of scale ("total annual loans") is not clear. In the regressions which drop provinces, it is statistically significant in only one case. The implication is that scale is not terribly important. In contrast, the average loan size appears to have been negatively related to fund survival. Apparently making smaller loans was a hallmark of better-run funds, or possibly smaller loans were less risky when the economy collapsed during the famine.

Having a religious minister for a manager was strongly and consistently negatively related to fund survival. The calculated coefficient implies that a fund managed by a minister was 15% - 20% more likely not to survive the famine than other funds, conditioning on other fund and barony characteristics. Why might this have been the case? Possibly such managers were less effective; but possibly they were simply more humanitarian. The famine would have required fund managers who wished to preserve value in the fund to prosecute starving borrowers and cosignatories. Using the courts to enforce repayment could have achieved better repayment for the loan funds, but it might also have had the effect of severely penalizing borrowers who borrowed before the severity of the potato blight became known. This issue exactly parallels the modern debate described by Morduch (2000) between those in the microfinance movement who stress financial sustainability and those who seek to maximize social impacts.

One of the striking results is that the population change variable is statistically insignificant. Recall from Table 2 that there is a statistically significant relationship

between fund survival and population change when other variables are not included. However, once we control for pre-famine fund and barony characteristics, population change has little impact. This is surprising since population change is not highly correlated with barony characteristics, and it would seem reasonable that if the famine struck somewhat randomly, then the impact of population change on the funds would be noticeable. The implication is that to the extent that it is desirable to help microfinance organizations survive through severe shocks, what is important is to strengthen the underlying demographic and institutional characteristics.

The pre-famine demographic characteristics we could use concerned very rough measures of wealth, occupation, and literacy. The wealth measures – 4^{th} class housing, wealth per capita, and population density – are all statistically insignificant. The occupational characteristics were the proportion of women who obtained some income from the cloth industry, and the proportion of families earning income primarily from agriculture. Both point weakly to a positive correlation, but the level of statistical significance across the regressions is not encouraging.

The principal result from the demographic characteristics is that pre-famine female literacy is strongly correlated to fund survival. This result is consistent across all regressions. The range of the coefficients indicates that a 1% increase in female literacy in a barony would lead to around a 5% increase in the probability of fund survival. Since male literacy is highly correlated with female literacy, as shown in Table 2, including both tends to weaken the literacy effect. Including only female literacy increases the statistical significance and coefficient size of female literacy. Male literacy is only significant when female literacy is excluded, and in that case, while statistically significant, it has a positive but much smaller effect on fund survival than female literacy.

This striking and unexpected result can be interpreted in three ways. First, female literacy may simply be a good indicator for the development of social institutions that would have allowed for fund survival. Perhaps, for example, baronies with higher rates of female literacy were also baronies with higher rates of social development; conditioning on the total population decrease, more socially developed baronies might have been more successful in retaining their institutions. A second interpretation could be that female

literacy was indeed a cause of fund of survival. Perhaps women who could read and write were better borrowers, or somehow sustained the funds. A third view is that the observed empirical relationship is due to some mix of these – that female literacy was important in itself and it was correlated with other unobserved barony characteristics.

The second interpretation should not be dismissed out of hand. As shown by Hollis (2002), it appears that at the time of the Famine, women constituted approximately 20-25% of all borrowers. Greater female literacy would likely have led to higher rates of female participation, and could have increased the profitability of funds. However, few borrowers – either male or female – were literate, so it seems unlikely that a small increase in female literacy, given the proportion of female borrowers, could have such a large impact on fund survival.[12]

Female literacy could also indirectly impact fund survival. Literate women are more likely to participate in public life and in the market economy. Investment in female education has been shown to reduce maternal, infant and child mortality, to improve nutritional status and to lower rates of morbidity. (See, for example, Schultz 2002.) In addition, female literacy has been found to be one of the most important determinants of the effects of growth on income poverty (Thomas, 1997; World Bank, 2001; Datt and Ravallion, 2002). So it is possible that having a greater proportion of literate women could affect local institutions in important ways.

The first interpretation implies that higher female literacy and higher fund survival are somehow the joint outcome of unobserved baronial characteristics. For example, if some baronies supported local institutions such as schools and loan funds, then the observed outcome could be generated. (Of course, in such a situation, we would also expect to see a similar effect from male literacy.) Unfortunately, without more data, it is not possible to distinguish whether higher female literacy caused higher fund survival rates, or whether they were both endogenous outcomes of some other

[12] Based on evidence from two funds at Tandragee Estate (Co. Armagh) and Baltimore (Co. Cork), the rates of female and male default during the Famine were comparable, however, evidence from other funds shows an increased proportion of female borrowers during the famine. (Hollis, 2002)

institutional process. In any case, this lends yet more support to the importance of literacy – and especially female literacy – in developing countries.

7. Conclusions

This paper has examined the effect of the Great Irish "Potato" Famine of the 1840s on the Irish loan fund system. Pre-famine capital ratios, managerial occupation, and female literacy were found to be the key predictors of loan fund survival through the famine. One key implication for contemporary microfinance institutions is that maintaining a strong capital ratio appears to be particularly important to increase institutional robustness. Interestingly, this conclusion corresponds exactly with Conning's (1999) findings, that "sustainable" microfinance institutions (as measured by various indices of dependence on outside subsidies) tend to be less "leveraged" (i.e., they have higher capital/debt ratios).

A second interesting result is that the severity of the famine in a district appears to have been less important in determining the sustainability of the funds than the social conditions and state of the fund prior to the famine. Thus the capital ratio, size of the loan fund, managerial occupation, and local literacy levels, are all found to be significant predictors of fund survival through the famine, while the best available measure of local famine severity – population change – is not. This suggests that strong institutions can survive even very severe crises.

Most surprisingly, microfinance institutions can also be expected to perform better in locations with higher female literacy. While this tells us little about microfinance institutions, it does suggest that female literacy may be of particular importance in the protection and support of social institutions – a benefit to be added to the long list of reasons "why governments should invest more to educate girls" (Schultz 2002).

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Table 1 Summary Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Fund Survive	203	.43	.50	0.00	1.00
Capital Ratio	203	.13	.20	0.00	1.00
Total Annual Loans (000)	203	6.73	7.33	0.18	65.77
Manager a Minister	203	.41	.49	0.00	1.00
Expense/Loans Ratio	203	.01	.00	.00	.03
Ave. Loan Size	203	3.29	1.02	.74	7.06
Population Change	203	-.21	.11	-.40	.33
Famine Roads Jobs	201	.02	.04	0.00	.29
Wealth per capita	203	1.41	.52	.40	4.22
4th Class Housing	203	.32	.12	.00	.77
Population Density	203	1.68	6.74	.17	62.95
Male Literacy	203	.33	.07	.12	.59
Female Literacy	203	.16	.06	.04	.45
Agricultural Work	203	.67	.13	.15	.85
Females in Cloth	203	.14	.09	.02	.36

Table 2 Correlation Coefficients between selected variables.

	Fund Survive	Population Change	Female Literacy
Fund Survive	1.0000	0.1618*	0.2802*
Capital Ratio	0.1618*	1.0000	0.0622
Total Annual Loans (000)	0.1245*	-0.0820	0.2955*
Manager a Minister	-0.1779*	-0.1677*	-0.0406
Expense/Loans Ratio	-0.0548	0.1696*	0.1533*
Ave. Loan Size	0.0370	-0.1483*	0.1867*
Population Change	0.1643*	0.0934	0.5684*
Famine Roads Jobs	-0.0956	0.0294	-0.2568*
Wealth per capita	0.1135	-0.0648	0.5791*
4th Class Housing	-0.1947*	-0.0861	-0.6430*
Population Density	0.1209*	0.0615	0.5321*
Male Literacy	0.2506*	0.0679	0.8555*
Female Literacy	0.2802*	0.0622	1.0000
Agricultural Work	-0.1658*	-0.1452*	-0.6912*
Females in Cloth	-0.0480	-0.1318*	-0.3212*

* indicates significant at 10% level

Table 3 Probit regressions on fund survival

	(1) All Observations	(2) Observations with Pop. Loss	(3) Obs. with Pop. Loss >20%	(4) Observations with Pop. Loss
Capital Ratio	0.456	0.498	0.371	0.432
	(2.19)**	(2.44)**	(1.54)	(2.14)**
Total Annual Loans (000's)	0.0005	0.025	0.034	0.024
	(0.62)	(2.19)**	(2.09)**	(2.36)**
Manager a Minister	-0.180	-0.174	-0.168	-0.142
	(2.49)**	(2.31)**	(1.83)*	(1.96)**
Expense/Loans Ratio	-18.915	-12.680	-13.314	-8.508
	(1.94)*	(1.33)	(1.07)	(0.88)
Ave. Loan Size	-0.041	-0.084	-0.084	-0.087
	(0.97)	(1.83)*	(1.48)	(2.06)**
Pop. Change	0.709	0.009	0.330	-0.383
	(1.22)	(0.01)	(0.26)	(0.61)
4th Class Housing	-0.593	-0.679	-0.504	-0.722
	(1.26)	(1.37)	(0.92)	(1.74)*
Male Literacy	-0.183	-0.461	0.167	
	(0.16)	(0.38)	(0.11)	
Female Literacy	4.518	4.272	6.423	
	(2.59)***	(2.36)**	(2.61)***	
Famine Roads Jobs	-0.237	0.153	0.446	
	(0.25)	(0.17)	(0.44)	
Wealth per cap.	-0.082	0.030	-0.160	0.158
	(0.81)	(0.30)	(1.03)	(1.72)*
Females in Cloth	2.403	2.680	2.222	0.562
	(2.49)**	(2.64)***	(1.89)*	(1.02)
Pop. Density	-0.010	-0.463	-0.413	-0.673
	(1.29)	(1.30)	(0.94)	(2.11)**
Agr. Work	1.284	1.037	-0.081	-0.077
	(2.22)**	(1.55)	(0.07)	(0.14)
Connaught	-0.262	-0.259	-0.138	
	(1.76)*	(1.75)*	(0.77)	
Leinster	-0.083	-0.102	-0.064	
	(0.62)	(0.70)	(0.37)	
Ulster	-0.421	-0.384	-0.346	
	(2.54)**	(2.14)**	(1.69)*	
Observations	201	191	134	191

Change in probabilities (derivatives if continuous), not coefficients, presented. Absolute value of *z*-statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 4 Probit regressions dropping one province at a time

	(1)	(2)	(3)	(4)
	No Leinster	No Munster	No Ulster	No Connaught
Capital Ratio	0.722	0.250	0.594	0.438
	(2.77)***	(1.04)	(2.60)***	(2.08)**
Total Annual Loans (000's)	-0.010	0.002	0.056	0.000
	(1.02)	(0.31)	(2.89)***	(0.04)
Manager a Minister	-0.165	-0.161	-0.147	-0.213
	(1.89)*	(1.93)*	(1.52)	(2.85)***
Expense/Loans Ratio	-26.375	-16.893	-12.247	-13.410
	(1.80)*	(1.61)	(1.12)	(1.29)
Ave. Loan Size	-0.135	-0.008	-0.101	-0.017
	(2.20)**	(0.20)	(1.70)*	(0.40)
Population Change	1.683	0.559	-0.425	0.474
	(2.02)**	(0.91)	(0.56)	(0.77)
4th Class Housing	-0.484	-1.158	-0.569	-0.403
	(1.04)	(1.82)*	(1.09)	(0.83)
Male Literacy	-0.249	-1.797	1.733	-0.665
	(0.13)	(1.26)	(1.19)	(0.54)
Female Literacy	6.745	3.860	3.446	4.480
	(1.53)	(2.20)**	(1.76)*	(2.59)***
Famine Roads Jobs	0.977	-2.075	0.158	-0.264
	(1.09)	(1.52)	(0.18)	(0.21)
Wealth per capita	-0.273	-0.039	-0.003	-0.089
	(1.52)	(0.39)	(0.02)	(0.87)
Females in Cloth	1.665	0.393	0.114	0.512
	(2.06)**	(0.56)	(0.10)	(0.76)
Population Density	-0.007	-0.008	0.008	-0.004
	(0.54)	(0.97)	(0.45)	(0.53)
Agricultural Work	1.921	1.288	1.357	1.203
	(1.60)	(2.16)**	(1.81)*	(2.04)**
Observations	125	153	143	182

Change in probabilities (derivatives if continuous), not coefficients, presented. Absolute value of z-statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. All observations are used, so the results are comparable to Column 1 of Table 3.