Trade-off between Different Aspects of Outreach and Optimum Rates of Interest for Microcredit

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Abstract

The aims or goals of microcredit are the same worldwide: to offer credit on affordable terms to the poor and to mitigate their poverty by creating opportunities for investment. However, there are widely divergent views on how to estimate the results of poverty alleviation efforts. One of these differences stems from opinions regarding interest rates for microcredit; there are those who favor high interest rate and those that oppose them. A key point of contention revolves around the concept of outreach. High rates proponents assess the results of poverty alleviation efforts by observing "breadth" of outreach, that is, how many poor people have been reached. Thus, they favor high rates so that more lenders will enter the market and more profit-led investors are willing to provide their money to the lenders. On the other hand, opponents of high rates say that reducing "cost" for the poor is a priority, and these costs include interest rates.

There is a trade-off between "breadth" and "cost" when it comes to interest rates: while raising rates increases the reach of credit, the interest cost imposes a heavier burden on the poor. This study treats the number of clients as a proxy for "breadth"; net profit (business profit minus interest charged) as a proxy for "cost." It takes their mathematical product as the social value of net gain. We then construct a framework of optimum interest rates that maximize this social value. Using this framework, we explain the mechanism that triggered microcredit repayment crises in developing countries at the end of 2000s, and point to future issues for microfinance in the developed world.

Keywords: microcredit, outreach, social value, repayment crises

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I. INTRODUCTION

Microcredit has emerged as a means of enabling the poor to obtain micro loans that were earlier impossible because they lack the collateral or economic viability. Although microcredit is mostly seen in developing countries, there are also a few instances observed in developed countries. The aim of microcredit is to offer opportunities for the poor to borrow small amount on affordable terms and help them mitigate their poverty by making use of these opportunities themselves. However, opinion is divided among researchers on how the outcomes of poverty alleviation should be estimated.

Some believe that high rates of interest will help micro-financiers (MFIs) cover their operational costs and thus ease their entry into the markets, and would also help raise more loan from capital markets. Such views are based on the notion of "breadth" of outreach, in which the outcome of poverty alleviation efforts is assessed by seeing how many poor clients have gained access to credit (Helms & Reille, 2004; Armendáriz & Morduch, 2010). Meanwhile, those in the opposite camp believe high rates of microcredit interest hurt the most vulnerable sections of society, as it leaves them with little money in borrowers' hand to better their lives after repaying the loans and could, in some cases, even leave them worse off. Opposition to high interest rates comes from concerns regarding both "depth", where the outcome of poverty mitigation is expected to equal how much the most socially vulnerable sections are better off; and "cost", where the outcome is reckoned in terms of the net gains after repayment (Hudom, 2007; Dale, 2012; Sinclair, 2012). When raising interest rates helps more people gain access to credit, there is an increase in welfare. Thus, the final outcome would depend on the relative strengths of these two effects of raising interest rates.

In our study, we first construct a framework of optimal rates of interest that maximize the outcomes of poverty alleviation efforts. We then try to analyze the causes of repayment crises from 2008 to 2009 in developing countries, where, as we will show, the outreach leaned toward "breadth" and the main issue was an excess supply of loans. Next, we anatomize the case of insufficient credit in developed countries such as New Zealand, where the outreach concept was biased toward "depth" and "cost."

The rest of the paper is organized as follows. Section II provides a relatively long literature review of the different definitions of outreach in microcredit to provide a baseline of the framework of optimal interest rates that we will construct in section III. Based on this framework, we analyze issues in microcredit in both developing and developed countries in section IV. Section V concludes the paper.

II. LITERATURE REVIEW

2.1 Different concepts of outreach and the trade-offs among them

2.1.1 Schreiner's six aspects of outreach

Although now the term Outreach is used to mean "range of aid recipients," at first, it just meant "extending welfare hands." We use a more broad interpretation of the term to briefly explain six aspects of outreach—worth, cost, depth, breadth, length and scope—following Schreiner (2002), whose work provides probably the most comprehensive literature on the meaning of outreach.

First, "worth" refers to the overall benefits to clients. In a broad sense, such benefits include making tools of money management accessible to the poor. However, in the narrowest sense, it refers to clients' increased business profits earned by investing money borrowed from MFIs.

The aspect of "cost," following Schreiner (2002), consists of two elements; first, price costs such as direct payments of interest and charges; second, transaction costs including both indirect costs such as travel expenses and opportunity costs. Unlike other aspects, lowering these costs results in higher appraisal of the outreach.

Therefore, by combining these two aspects above, we can arrive at the "net gain" of clients, which is equal to "worth" minus "cost," representing a rise in the economic welfare of the poor, or in other words, the social value created by microcredit.

"Depth" is an indicator of whether credit opportunities have reached appropriate targets, as reflected in higher scores for poorest segments of the population, remote regions, and females.

According to Schreiner (2002), "breadth," a frequently used aspect of "outreach" in a narrow sense, simply means the number of clients reached by MFIs.

"Length" refers to timelines of credit, maturities, and the number of installments and their intervals. If the term is used to mean the length of time for which services are offered, one must

consider the financial sustainability of MFIs.

Lastly, the aspect of "scope" alludes to the number of services MFIs offer; its score would be higher if micro savings and micro insurance were added, or if individual lending was available in addition to group lending.[1]

2.1.2 Trade-offs between different aspects of outreach

As mentioned earlier, there are trade-offs among different aspects of outreach.

For example, Hermes et al. (2011) demonstrate that MFIs with a mission to target the poorest sections of the population and females are not cost effective. If such cost deterioration prevents a sufficient lowering of interest rates on loans, it can be regarded as a trade-off between "depth" and "cost." Meanwhile, to increase the number of clients, MFIs may be inclined to lend to wealthier poor who may find it easier to pay higher rates of interest. In such a case, it can be regarded as a trade-off between "depth" and "breadth."

In cases of multiple trade-offs, improving financial sustainability to extend "scope" and secure the "length" of service may increase "cost" and decrease "depth"; for example. Embarkation upon banking services is a case in point.

Lastly, if we assume an upward sloping supply curve for loans, marginal cost would increase with an increase in the product amount. This implies interest rates would rise with an increase in the loan amount, that is, an increasing "cost" caused by an expanding "breadth". Now if "worth" is fixed, this would mean a fall in the "net profit" of borrowers. The following sections will expand on this type of trade-off.

2.2 Outreach of "breadth" –Case for high interest rates

2.2.1 Cost structure of microloan interest

Most arguments that say microcredit's interest rates are high focus on the peculiar cost structure of MFIs. We now delve into the literature on this topic.

Helms & Reille (2004) identify three types of costs that MFIs should cover: (1) capital cost of raising money for lending, (2) loss-compensation cost, and (3) operational expenses. Here, operational expenses include expenditures for identifying and screening clients, processing loan

[1] Schreiner (2002), pp.592-596.

applications, loan payments, collecting funds, and continued management of non-repayments.

Armendáriz & Morduch (2010), who authored a well-known standard textbook on microfinance, and support high rates of interest, add (4) the source of MFI profits as a component of the costs listed by Helms & Reille (2004). However, in their view, the capital costs of raising money are the most important.[2]

2.2.2 MFIs' high operational costs

Helms & Reille (2004) oppose a cap on rates of microcredit interest and any institution that keep the rates low through subsidies. Their reasons are as follows:

First, they point out that MFIs' operational costs tend to be higher than those of commercial banks, because MFIs, which cannot rely on either collateral or credit scoring processed by a computer, engage in face-to-face transactions in small lots and must reckon with higher supply costs than banks. They point to two demerits of the celling from the standpoint of client benefit. One is a possibility that the "breadth" aspect of outreach may become compromised through both a withdrawal of MFIs who find it impossible to cover their costs, and the entry of commercial banks in a microfinance market that has become unprofitable. The other revolves around the "cost" aspect of outreach; MFIs staying and coping with a rates cap will have to charge new fees or introduce a credit insurance to cover their high costs. This means the effective rates of interest will not fall, making it difficult for clients to calculate the cost of their loans.

They also give three reasons for why a subsidy policy will not succeed: (1) an actual poor client is never served because a subsidized project is likely to be a political gimmick; (2) rates of repayment tend to decline as a subsidized interest is apt to be misunderstood as a grant; and (3) once subsidized, these costs will not be covered in the future, which means a continued dependence on subsidies, which likely to become a fiscal problem. In particularly, they argue, historically largely subsidized state-owned banks have borne huge fiscal losses, weeded out players with financially sustainable rates, and excluded of competition that has hindered the evolution of the financial sector.

Therefore, they recommend the following; first, promote competition and innovation increase

[2] Cull, Demirguc-Kunt, & Morduch (2009) also take a similar stance on interest rates of MFIs. Incidentally, they also point out that "It is the operating costs, rather than capital costs or loan-loss provisions, which drive the differences in total costs between different kinds of microfinance institutions (p.183)".

productivity; reduce operational costs, and thus realize lower rates of interest; second, use a combination of consumer education and protection to protect the poor, without placing any restrictions on interest rates.[3]

2.2.3 Capital costs and commercial money

Like Helms & Reille (2004), Armendáriz & Morduch (2010) too point to MFIs tending to have high operational costs. However, they focus the role of higher rates to cover the higher capital costs involved in raising money from profit-led investors in developed countries, and then improve "breadth." In this spirit, they support Banco Compartamos in Mexico whose effective interest rate was reportedly more than 100%.[4]

They echo other similar opinions on high rates. For example, Michael Chu, the founder of ACCION, has said microfinance providers cannot meet the worldwide demand for financial service without private, profit-oriented capital."[5] Funk (2007) has estimated that US$30 billion per year is required to reach the world's underprivileged effectively. Besides bank loans, he says, capital markets could play a critical role in reaching more than 100 million poor customers.[6]

These views, like those of Helms & Reille (2004), justify high interest rates for advancing "breadth," which implies a narrow definition of outreach.

2.3 Case against high rates of interest

2.3.1 Fair interest rate

Hudom (2007) put forth a concept of "fair interest rate," and detailed four approaches to explain it. First is the deontological approach. "In religious, Marxist, and Keynesian understanding, high interest rates are looked upon as either intrinsically unjust and or potentially harmful," he says. However, he agrees with the view that limiting interest rates may threaten the financial sustainability of MFIs.[7]

The second approach is the consequentialist one. According to it, whether interest rates of MFIs are fair or not can be judged by whether the wellbeing of the clients has improved or not. Hudom

[3] See Helms & Reille (2004), pp.14-15.
[4] Okamoto (2015) also explains why Compartamos Bank's rates are so high and their legitimacy.
[5] See Armendáriz & Morduch (2010), p.240.
[6] Ibid, p.241
[7] We refer Hudom (2007), pp3-4.

(2007) criticizes this approach by claiming, "If one follows a definition of fairness focusing only on the impact of the loan on its clients in comparison with the previous situation, the 10% margin will be fair even if it only leaves a small profit margin to the borrower."[8] This is clearly referring to the "cost" aspect of outreach and clients' net profit as "profit margin to the borrower." We come to this point in a later section.

The third approach focuses on "demand for credit", which is the view supported by almost supporters of high interest rates. It holds that borrowers must have the ability to repay loans with substantially high interest rates and that high rates of repayment and the presence of repeat users indicates the fairness of credit. In addition, they stress that "access to finance is more important than its price."[9] In contrast, Hudom (2007) holds that "As in the trade case, the distribution of the benefits may well be unequal. The poor may also lack the bargaining power to influence the price or approach another lender."[10]

The last approach or perspective is the "procedural one," in which Hudom (2007) recommends use of credit scoring by MFIs to assess the characteristics of their borrowers. In this regard, however, it seems problematic not to consider the cost aspect of MFIs' interest rates that is inclined to be higher than those of commercial banks for the reasons mentioned above.

2.3.2 The case of developed countries

We now look at the developed world. Here we find that the statement that "access to finance is more important than its price" is not applicable. One of the main reasons for this revolves around the use of microcredit. In many developed countries, microcredit is offered not for productive use by poor clients, but to rebuild their consumer lives compromised by high rates of interest charged by loan sharks or to reduce such debt burdens.

High rates of interests by MFIs should, therefore, be out of question in the developed world. The only aspect of outreach that is relevant is "cost," good or bad; the "breadth" aspect is secondary, matter as we point out in section IV.

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[8] See ibid, p.4.
[9] Cull, Demirguc-Kunt & Morduch (2009), p.171. We can find the same sentiments in Helms & Reille (2004), pp.3-4 and in many other works supporting high interest rates.
[10] See Hudom (2007), p.5.

2.3.3 Net profit in the hands of borrowers

Based on a practical evaluation of MFIs, Sinclair (2012) casts doubts on the effectiveness of poverty alleviation efforts. Notwithstanding the lack of any economic or statistical verification, one of his critical assertions could be seen as another interpretation of the "cost" aspect of outreach.[11]

The premise of microcredit is that a poor client without any capital can get a loan from an MFI to begin a micro enterprise and earn profits, which he can then use to repay his loan. The most important part of profits in relation to poverty alleviation is retained earnings after repayment. Yet, the poor client must spend his profits on living costs for food, clothing, housing, and other expenses to maintain the health of a family member, a child's education, and so on. Whether the life of the beneficiary's is better or worse off depends wholly on the size of this "net profit." A higher rate of interest obviously entails a smaller net profit. Sinclair (2012) says that "interest rates [are] so high [that] no reasonable entrepreneur could make any genuine profit and repay the loan; [there is] massive inefficiency and zero evidence of any widespread impact on poverty."[12]

2.3.4 Summary of the case against high rates

We can summarize Sinclair's assertion as follows; interest rates of microcredit as "cost" are so high in comparison with business revenue or "worth" that poor clients cannot retain enough net profit to improve their wellbeing or alleviate their poverty. Thus, it should be possible to improve the wellbeing of the poor if microcredit's rates of interest are low enough, which is also a fundamental perspective of microfinance in the developed world.

Hudom (2007) expresses similar views when he says, "some public action will be necessary not only to broaden access to credit but also to encourage to charge interest rates that do not exceed certain limits."[13] It is clear that his words "broaden access to credit" corresponds to the "breadth" aspect of outreach, and "interest rates that do not exceed certain limit" to the "cost" aspect. However, it is not easy to answer what is this "certain limit" or how can we define the level if we interpret these terms using his "procedural approach". Nevertheless, it becomes easy if we translate them in line with his objections to the "consequentialist approach." That is, he hopes to

[11] Sinclair (2012), pp.104-105, p.152
[12] Ibid, pp.65-66.
[13] Hudom (2007), p.7

encourage "net profit" by keeping the interest rate or "cost" level sufficiently low in comparison with "worth."

Now, let us formulate the perspective of the opponents of high interest rates by defining the business profit of a borrower y_b as "worth," principal and interest to repay k as "cost," and net profit G_b as "net gains." We can define a simple relationship, as given below:

$$G_b = y_b - k \quad (2\text{–}1)$$

Equation (2–1) tells us that if y_b is fixed, raising interest rates must decrease G_b because of an increasing k. Even if y_b is not constant, there is a relationship between rising interest rates and the growth of profits: the higher the rate, the lower the growth of net profit.

2.4 Section summary

The statement by the supporters of high rates that "access to finance is more important than its price" ignores by how much the wellbeing of the poor has increased because their point of interest is whether business profit y_b exceeds "cost" k or not. As long as the cost does not exceed business profits, raising interest rates can be justified on grounds of expanding "breadth." On the contrary, the crucial point of the opponents is how much net profit G_b remains by reducing interest rates. In this scenario, "cost" is critical, while "breadth" is secondary.

III. GROUND MODEL FOR OPTIMAL INTEREST RATES

3.1 What is an optimal rate of interest?

Each "breadth" and "cost" aspect of outreach, between which there is a precise trade-off, is just one facet of microfinance's mission: poverty reduction. Basically, we need to estimate the effects or impacts of all aspects of outreach, including "breadth" and "cost."

Schreiner (2002), as mentioned in section II, where we referred to the different aspects of outreach, puts forth three methods to assess the social value of net gains that BancoSol, one of the largest MFIs in Latin America, has brought to their customers, combining six aspects of outreach: worth, cost, depth, breadth, length, and scope. One of the formulas is used is as follows:[14]

[14] He mentions this formulation "may have better theoretical support". In addition, it appears that each of six each aspects is most clearly reflected in other formulae.

$$Social\ value\ of\ net\ gains = \sum_{t=1}^{T} \sum_{s=1}^{S_t} \sum_{n=1}^{N_{ts}} \delta^t (0.9 / \rho)(w_{tsn} - c_{tsn}). \quad (3\text{–}1)$$

For simplicity, he limits "scope: S" to group lending, and indicates "depth: D" as an average 0.9 in first parenthesis, where ρ is a discount factor. The social value of net gains is calculated by summing up the net gains ("worth: w_{tsn}" minus "cost: c_{tsn}") of each customer "N_{ts}" served in each year "from 1 to T."

When we introduce a "trade-off" into this formula, we notice a functional relationship between the number of N_{ts} and cost c_{tsn}, the other factors being constant. Both variables should be increasing functions of interest rates. Raising the rate would increase the number of clients in each year by both expanding (1) the number of MFIs who find it easier to cover operational expenditures, and (2) the amount of money from profit-seeking investors. On the other hand, raising the interest rate directly ties in with the rise in clients' repayment costs. With regard to the social value of net gains, from (3–1) we see that raising the interest rate is a positive factor as to number of clients or the "breadth" aspect of outreach; it is a negative factor in terms of clients' "cost" aspect of outreach.

According to conventional wisdom, an optimal interest rate is one that maximizes the social value of net gains (or overall effect of poverty reduction), other aspects being constant.

For further simplicity, we treat "net gain" as "net profit" per customer, as shown in (2–1). Then we describe the social value of net gain as "the product" of net profit per client multiplied by the number of clients at a certain level of interest rate, with other aspects of outreach being constant despite a change in the rate. In addition, we assume that the number of clients served will increase in proportion to a rise in the interest rate. Therefore, the social value of "net profit" increases rapidly at first, gradually slows down, and finally turns downward. Thus, the overall effect is that represented by an inverse U-shaped curve. If the aim is maximization of the overall social value, interest rates corresponding to the top of the curve would be a potential target (See Figure 1).

3.2 A ground model for an optimal rate of interest

Therefore, we propose a ground model for an optimal interest rate. We assume there is no risk to borrowers' business profits. We define θ as the additional rise in interest rates and l as the

increased number of clients for each 1 percent rate increase. Thus, $l\theta$ indicates the expanded "breadth" ($\theta > 0$). We redefine (2–1) as borrowers' net profit when $\theta = 0$. Converting the subscript b (meaning a general borrower) to s (implying a safe borrower), we can express net profit when $\theta > 0$ as given in (3–2):

$$G_s - \theta = y_s - k - \theta \quad (3\text{–}2)$$

At a certain level of interest rate increase, we can represent the social value of "net profit" or overall poverty reduction W as:

$$W = (G_s - \theta) \times l\theta = lG_s\theta - l\theta^2 \quad (3\text{–}3)$$

If we define the optimum interest rate rise maximizing W as θ^*, we can calculate it as below:

$$dW / d\theta = lG_s - 2l\theta = 0,$$

Thus, $\theta^* = G_s / 2 = (y_s - k)/2$ (3–4)

The social value of net profit realized by an optimal rise of the interest rate is as given in this next equation:

$$W(\theta^*) = G_s^2 l / 4 = (y_s - k)^2 l / 4 \quad (3\text{–}5)$$

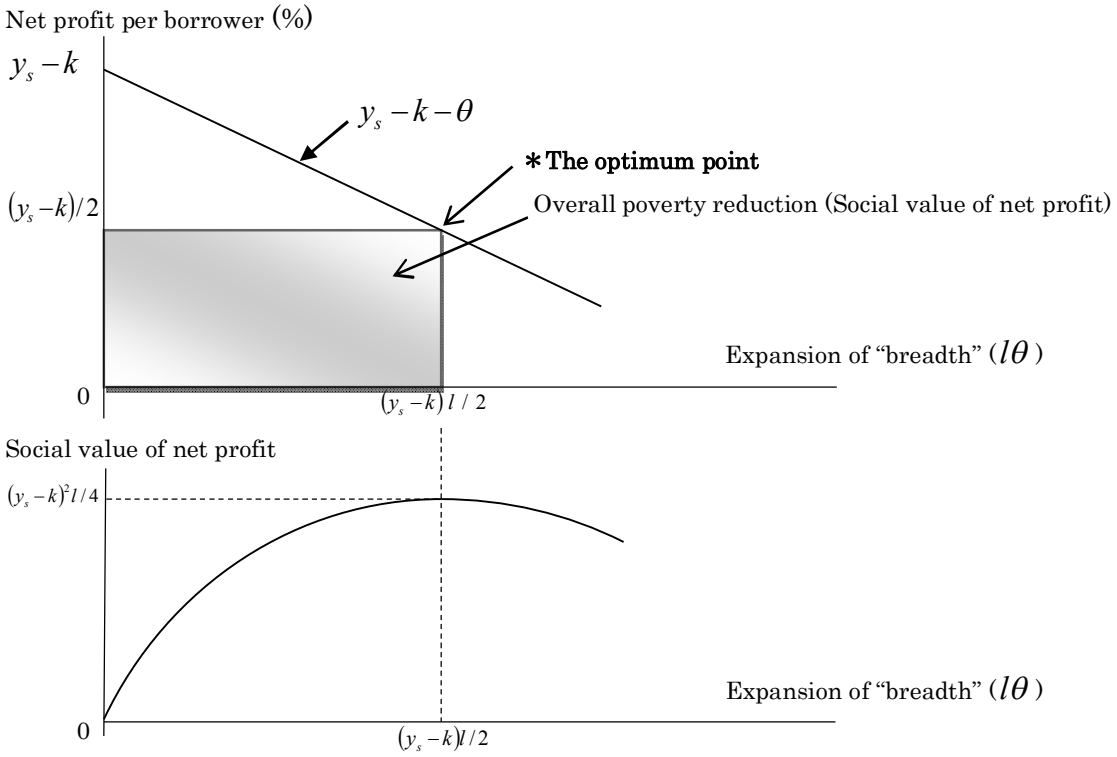

Figure 1 Ground Model for Optimum Interest Rate

In the upper part of Figure 1, the vertical axis indicates net profit per borrower, and the horizontal axis, the expanded "breadth," or more clients. The downward-sloping line traces the combination of net profit and client numbers at each level of the raised interest rate. Thus, the area of the rectangle represents the social value of net profit. On the lower part, while the vertical axis represents the social value of net profit, the horizontal axis is just the same as in the upper part, and of identical scale.

Raising the interest rate initially enlarges the social value as the horizontal effect exceeds the vertical one. However, the marginal growth rate of value decreases and it turns negative after a certain level of interest rate is reached. The turning point corresponds to the optimal interest rate, as indicated in (3–4), where maximum social value is realized.

The implications of the model are as follows: First, while we can justify supporting raising interest rates until it helps realize the largest social value of net profit, we cannot rationalize raising it above the optimum point even if the borrower is able to repay when net profit per borrower remains zero or slightly more. Meanwhile, adherence to a zero percent rate of interest or a rate that is much lower than the optimal point would be a barrier to the maximization of social value, even as a few fortunate customers enjoy the largest net profit. In the next section, we apply this model to explain the microcredit case.

IV. DEVELOPING VS. DEVELOPED COUNTRIES

4.1 Excess supply of credit at high interest rates in developing nations

According to Chen (2010), the microcredit debt crises in Bosnia-Herzegovina, Nicaragua, Morocco, and Pakistan from 2008 to 2009 typically broke after several years of rapid market growth fueled by ample commercial funds from developed countries (85% in the case of Morocco). He points to three causes of the crises: (1) multiple borrowing linked to intense competition among MFIs, (2) overstretched MFI systems and controls, and (3) erosion of MFI credit discipline. The intense competition made it easy for customers to repay one institution using credit from another institution, and the efficiencies of group lending or incentives based on a loyalty to one MFI were lost because of ease of borrowing from other MFIs. Although staff expansion corresponded to this rapid growth, they had not been trained enough to screen and monitor their greater number of

clients reliably. This meant fewer group meetings and simplified customer evaluations. In brief, markets had expanded at the expense of loan discipline.[15]

As Chen (2010) noted: "In the first decade of this century, the focus was on expanding access to services. As a result, millions of clients gained access to microcredit, thanks to high-growth institutions fueled by abundant funds. In the next decade, the focus was on sustainable growth."[16]

In terms of "sustainable growth," we must take note of one point, which is related to the central argument of supporters of high interest rates. High rates of repayment are proof that loans are affordable. The term "repayment crises" refers to the macro level where MFI borrowers in developing nations lost the ability to repay their loans. This supports the argument of high-rate supporters that poor borrowers must have lost their capacity to repay.

Why does this happen? Applying our model presented above, we show that (4–1) a situation where a poor borrower without own capital can repay his loan, assuming there is no refunding:

$$y_s - k - \theta \geq 0 \quad (4\text{–}1)$$

That is, the loan is affordable when net profit is more than zero. In contrast, it becomes unaffordable when

$$y_s - k - \theta < 0 \quad (4\text{–}2)$$

In this case, the repayment amount exceeds the borrower's business profit. We can attribute the reasons for this to all three variables on the left-hand side. Business profit y_s is likely to fall when the market share per borrower reduces because of intense business competition which the lending offensive launched by MFIs stimulates. The principal contained with k, if refunding is possible, increases as a portion of the interest paid to the previous creditor increases at each additional round of funding. Regarding the higher interest rate θ, we cannot exclude the possibility it already exceeds the optimal. As a precondition of crises, excess supply of commercial money from profit-led investors induces a combination of more clients and a smaller amount of net profit than that at the optimal level. Besides, an expanded principal should raise the amount to be repaid and thus reduce the net profit of borrowers at a certain level of interest. The downward-sloping line now becomes steeper.

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[15] Chen (2010), pp.7-11

[16] He proposes several solutions. For example, "MFIs should balance their growth objective with the need to improve the quality of client service." For this purpose, he points to roles of external audits, ratings, portfolio testing, credit information bureaus, and financial access mapping (Chen, 2010, pp.13-15). Of course, there is no reason to believe that these institutions are equipped and utilized sufficiently in the case of microcredit.

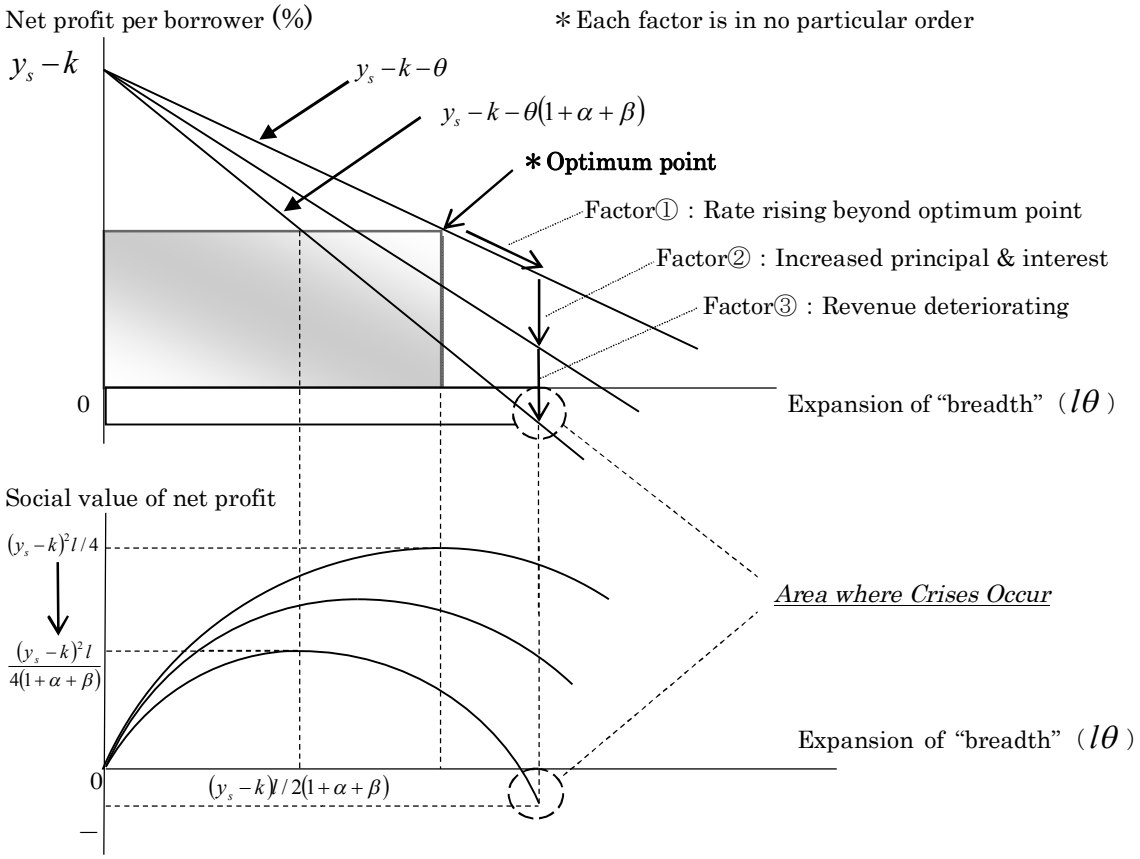

Figure 2　An Explanation for Repayment Crises

Thus, we must revise equations (3–2) to (3–5) above. By defining ρ as the additional amount to repay, and assuming ρ is proportional to θ for simplicity, we can express net profit per borrower as

$$G_s - \theta - \rho = G_s - \theta - \alpha\theta = G_s - (1+\alpha)\theta \quad (4\text{–}3)$$

Using a similar calculation as in section III, we arrive at a revised optimal interest rate increase as given below:

$$\theta^{*\prime} = G_s / 2(1+\alpha) = (y_s - k) / 2(1+\alpha) \quad (4\text{–}4)$$

Then, the social value of net profit with a revised optimal rise in the rate is as given here:

$$W'(\theta^{*\prime}) = G_s^2 l / 4(1+\alpha) = (y_s - k)^2 l / 4(1+\alpha) \quad (4\text{–}5)$$

Comparing (3–4) and (3–5), the optimal rate falls because $\alpha > 0$, and consequently, the maximization of social value falls. Next, we additionally consider declining business profit from y_s. If we assume such profit declines are proportional to θ, we must revise net profit as:

$$G_s - \theta - \alpha\theta - \beta\theta = G_s - (1+\alpha+\beta)\theta \quad (4\text{–}6)$$

The optimal interest rate and, subsequently, the social value of net profit also changes, as given in equations (4–7) and (4–8).

$$\theta^{*''} = G_s / 2(1+\alpha+\beta) = (y_s - k)/2(1+\alpha+\beta) \quad (4\text{–}7)\ 0$$

$$W''(\theta^{*''}) = G_s^2 l / 4(1+\alpha+\beta) = (y_s - k)^2 l / 4(1+\alpha+\beta) \quad (4\text{–}8)$$

We see that these values are even lower than those obtained from (4–4) and (4–5). Simultaneously, a borrower's net profit easily becomes negative. If the net profit goes below the horizontal axis as in (4–2), we have a repayment crisis (see Figure 2).

A crisis is not only problematic because it causes chaos in the macro economy, but it is also a sign of a *mission drift* if it is connected to an excess supply of credit that makes borrowers' net profits go below zero.[17] Now we can redefine "sustainable growth" as growth that is in keeping with borrowers' net profit above zero, even if not at an optimum level.

4.2 The challenge in a developed country: Under-supply of microcredit

Even though on a far smaller scale than in developing countries, we now look at examples of active microcredit projects in the developed world. This paper examines the Nga Tangata Microfinance (NTM) scheme in New Zealand.

Dale (2012) states "there are some important differences between developing countries and developed countries. In the case of the former, the role of microfinance is to support or establish micro-entrepreneurial enterprises. In addition, the lack of collateral is a more widespread problem and therefore moral hazard is a more important concern. In the case of no interest loan scheme (NILS) in developed countries, the role of microfinance is to provide a path to engagement with mainstream lenders through access to financial literacy and affordable credit for asset building."[18] She also says that the NILS loans emphasize "safe" and "fair" as well as "affordable" as loan characteristics.[19] It was a benevolent institution in Australia; the Good Shepherd Sisters, that initially started the interest-free loans program with women in domestic violence situation. NTM is the NILS provider accredited by Good Shepherd; however, it is mainly funded by Kiwibank, which is New Zealand's own bank capitalized by a state-owned enterprise, New

[17] The term "mission drift" is used for financial sustainability; an MFI shifts its main clients from the poorest people to the less poor, when the amount of loan per borrower becomes bigger in general (for example, see Armendáriz, Szafarz, 2010). In other words, it is a trade-off between "depth" and "length" or "breadth."
[18] Dale (2012), p.311
[19] Ibid. p.304, for example

Zealand Post Limited.[20]

NTM uses inherent devices in NILS, which is uncommon in developing countries.[21] To protect against adverse selection, budget advisers (BAs), assess clients' compatibilities with loan products, and if approved, introduce them to the loan commission. After payment, they not only follow up on the repayment but also assist with improving the borrowers' financial literacy.[22] NTM has further established methods to secure repayments: paying directly to providers of the goods and encouraging the use of automatic payments from the borrower's income, to minimize the borrower's discretion.[23]

Dale and Sabi (2017) have evaluated NTM from its start in 2011 to 2016. During this period, NTM added a new low (not free) interest rate product, called the debt relief loan scheme (DRLS),[24] for which they also assessed the efficiency. The assessment was based on large-scale questionnaire surveys of their customers, BAs, and others, in which they expressed their satisfaction with the results, confirming that they corresponded to the aims of the schemes. However, NTM's projects are not above criticism.

The largest discontent of BAs and financial mentors who deal directly with borrowers is that it is necessary to lift the upper limit of DRLS from NZ$3000 to NZ$5000.[25] There are calls to, "increase the resources available including funding and staff," and opinions such as, "It is important to build NTM capacity in terms of the number and size of loans, as well as ensuring long term sustainability," and "…NTM needs to make a stronger connection with the business sector."[26]

Since the reforms of the 1980s, income inequality has been expanding in New Zealand; issues related with poverty, especially child poverty, have become serious. An estimated 0.3 million children have fallen into poverty in a population of 4.7 million (Dale, 2014). Meanwhile, Dale and Sabi (2017) found that "from February 2011 to November 2016, NTM loans are estimated to have saved their 187 clients over $800,000 in credit costs and charges."[27]

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[20] Ibid. p.306
[21] Products offered by NTM are of only individual lending type.
[22] Ibid. p.308
[23] Ibid. pp.309-310
[24] Its expected role is to provide relief from the debt burden caused by high interest rates by refunding former loans with loans carrying far lower rates of interest (DRLS).
[25] Dale and Sabi (2017), p.7
[26] Ibid. p.31
[27] Ibid. p.38

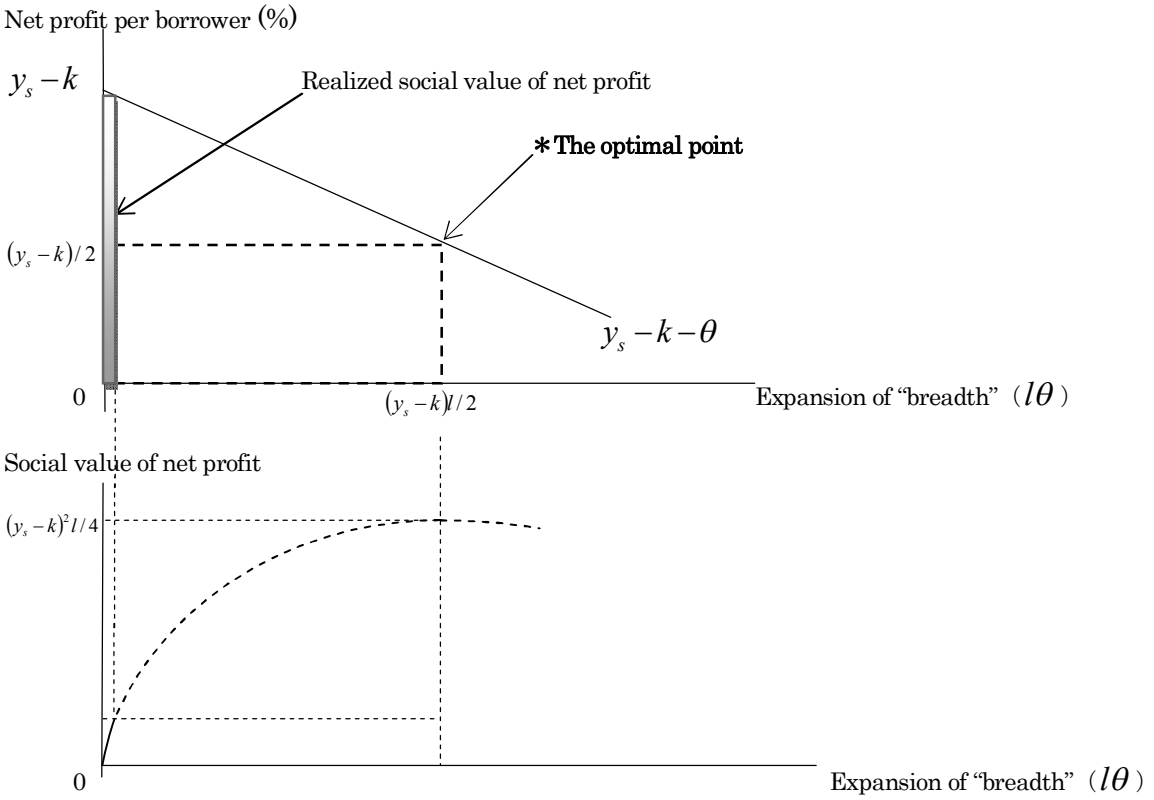

Figure 3　An Issue Observed in a Developed Country

Although we cannot simply compare both NILS and DRLS with microcredit projects in developing countries because of the difference between consumer loans and business ones, as pointed out by Dale (2012), there is no intrinsic functional difference, as a pecuniary source of relief from poverty, between earnings remaining after repayment in the hands of NTM clients and net profit of borrowers in developing countries. Although free or lowest-interest rates loans are the best tools to reduce poverty, the "breadth" aspect of outreach poses the gravest challenge to NTM, as is evident from the discontent seen in the questionnaire answers. Thus, we ought to recognize it as the opposite of the problem in developing countries cases where the narrow sense of outreach of NTM largely falls short of the optimal, even though it never crosses the horizontal axis (See Figure 3).

V. CONCLUSION

We have examined the issues surrounding microcredit in both developing and developed countries from the perspective of social value of net profit, or in other word, from the two

points of view of the "cost" aspect of outreach and the "breadth" aspect of outreach. Lastly, we would like to talk of the political implications of the points detailed above.

In the case of developing countries, especially in nations facing repayment crises, borrowers' net profits $G_s(=y_s-k)$ have potentially declined to near zero. Thus, the required increase in the interest rate θ ought to be negative. Our analysis shows that one-sided expansion or growth is not necessarily a right course. Rather, the goal should be to realize an optimal level of interest rates and the corresponding outreach in a narrow sense ought to be more desirable.

If the main reason for a rate of interest higher than the optimal level is increased capital costs involved in raising funds from profit-led investors, the most appropriate policy is to control the money inflow to an optimum level, which may be different in each nation. If the chief reason of high interest rate is high operational expenses of MFIs, the most suitable policy is to encourage cost reduction by promoting market competition and restricting money inflow to avoid a mere lending competition. If low or zero net profit results in low business profit y_s of borrowers, one promising approach may be to establish and promote social businesses to increase their profit-making opportunities, for which we can refer to the examples in Bangladesh where the Grameen Phone started.

However, it may not be appropriate to talk of an optimum interest rate in the case of developed countries, where retained earnings by borrowers after repayment may be less than the net profit of micro enterprisers in developing countries. Accordingly, as Roberts (2013) suggests, we expect non-profit MFIs to decrease the effective rates of interest through qualitative competition. In the developed world, it may be more worthwhile to examine policies to promote non-profit MFIs rather than introduce commercial money.

It is further challenge for us to ascertain which policy would be better suited to each country in the developed world estimating variables in equation (3–2) and the increased number of clients for each 1 percent rate increase in each case.

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