



Making financial markets work for the poor

How low can we go?

A discussion note on whether life microinsurance schemes offer value at low claims ratios

Author

Nigel Bowman, Bowman Consulting

Acknowledgements

This paper would not have been written had it not been for the generous funding of FinMark Trust and a number of individuals who have provided valuable input as the concepts have been repeatedly discussed and refined over the last few years.

I would in particular like to thank Doubell Chamberlain (Cenfri) for planting the initial ideas and guiding their development through many early discussions and Jeremy Leach (Bankable Frontier Associates) for his later insights and encouragement to complete the paper. I would also like to thank Dr. Daniel Clarke (World Bank) for providing guidance in applying utility theory.

Health warning:

This discussion note is a working draft and should be read in that context. It is being distributed in this form to elicit comment with the purpose of generating further debate on the subject of improving value of microinsurance schemes for clients. . All comments are welcome and should be directed to the author (bowmanconsulting@webafrica.org.za).

1. Introduction

Microinsurance is seen as a mechanism through which low-income consumers can manage their risks, reduce their vulnerability and improve their welfare. The guaranteed benefit provided by insurance also allows for the development of critical services, which may otherwise not have been available to the community. For example, health service developments where service providers become willing to invest in improving facilities once insurance makes it possible for a larger proportion of the population to access the services¹. While this is theoretically the case, there are many challenges resulting in questions on whether microinsurance can deliver on this value proposition in practice. While extending coverage by insurance products was the initial focus of microinsurance stakeholders, much emphasis is now being placed on ensuring that clients are aware of their cover and are able to use it in times of need. The value experience depends on factors relating to both the client side (awareness, literacy, etc.) and the provider side (product design, sales process, disclosure, the availability of adjacent benefits such as credit, etc.).

Claims ratios have been used as one of the measures to consider the value proposition of microinsurance at the product, company and industry level. It is, however, not clear what the appropriate benchmarks are for claims ratios at different stages of industry and country development. For example if an insurance industry is in the early stages of development for its retail offering with limited distribution infrastructure, overhead and distribution costs are likely to consume a larger proportion of premiums paid, leaving a smaller proportion available to pay claims. This may result in claims ratios that are below the level that would be considered as offering value. At the same time, it may be unreasonable to expect higher claims ratios at this particular stage of industry development and the insurers may not be collecting excess profits from this engagement.

Finding an appropriate balance to facilitate growth and value is a challenge and gives rise to the following key considerations.

Are lower claims ratios acceptable under such circumstances as a necessary first step to develop the market? How should regulators engage with the value performance of its industry to incentivize better value delivery over time? What are acceptable levels of claims ratios to pursue? Is it possible to compare the efficiency and value offered by the insurance mechanism to that of credit as an alternative risk management mechanism? Or other risk management mechanisms for that matter, both formal and informal?

This is not only a question of relevance to regulators. Low claims ratios risk short-term gains at the cost of the development of a long-term sustainable and profitable industry. Research on the global experience suggests that microinsurance programs have struggled to achieve scale to date (Thom et al., Forthcoming) and shows that compulsion or auto-enrolment is the most effective route to achieving scale. Ultimately voluntary sales of microinsurance remain very constrained and it is still necessary to “make a market” for microinsurance (Bester et al., 2008). In order to “make a market”²,

¹ See Protecting the Poor, A Microinsurance Compendium, Volume 2 (Churchill and Matul) for a description of how some health microinsurance schemes have had a positive impact on the development of health services and infrastructure.

² Product suppliers frequently make use of loyalty programs in an attempt to “make a market” where users of a product or service are able to obtain low levels of insurance at no additional cost to themselves. This approach is becoming common amongst mobile network operators (e.g. Tigo in Ghana).

it is argued that some level of active sales may be required but more importantly for this analysis, demonstrating value is critical. Low-income consumers are at best unfamiliar with formal insurers and at worst distrustful of such providers due to their poor perceived performance when it comes to paying claims. Paying claims, and paying them quickly, will be critical in overcoming these barriers.

The value question is, therefore, relevant for both regulators and industry players. This note seeks to explore the concept of value to serve as a basis for discussion amongst industry stakeholders on the long-term, sustainable development of the microinsurance market.

This note considers a method of measuring the value of life microinsurance with a view to answer the question of whether microinsurance products that have low claims ratios necessarily mean that their consumers are receiving poor value. It also considers whether there is a level of claims ratio below which consumers should not consider microinsurance as a viable risk coping mechanism because the value it offers is too low. To simplify the analysis, the note takes a narrow view when answering these questions by focusing only on the risk coping mechanism provided by micro loans in the cases where microinsurance is compared with an alternative coping mechanism.

As a further simplification, the analysis presented here focuses only on life insurance. There are three reasons for this focus. Firstly, life products still dominate the microinsurance product landscape³. Secondly, despite their dominance, life products receive relatively little attention in terms of their impact and the value they provide to consumers (the exception being MILK's client math studies⁴ which only consider households in which a risk event has occurred and therefore does not take account of the cost of insurance in the form of the claims ratio). Thirdly, many of the microinsurance products that have low claims ratios are life microinsurance products, specifically credit life and funeral products.

Before one can start considering value, the concept of value must be defined. Section 2 considers the definition of value. Section 3 introduces the methodology used to measure value, provides an example to illustrate its use and then considers the levels of claims ratios at which life microinsurance offers value. Section 4 closes the discussion by drawing some conclusions from the analysis of value.

2. What is value?

According to the MILK Project's⁵ Client Math methodology for measuring client value, there are three components to the value that consumers receive from microinsurance, which include the financial value of benefits paid, positive behavioural changes (e.g. agricultural insurance can encourage riskier farming activities that provide higher potential yields) and access to product-related services that benefit the consumer. This paper restricts its focus to financial value only. This is not a judgment on the other aspects of value but a necessary simplification as starting point to this

³ For example, 71% of lives covered in Latin America and the Caribbean were covered for Life excluding Credit Life (source: The Landscape of Microinsurance in Latin America and the Caribbean: a Briefing Note), while in Africa the same percentage is 76% (source: The Landscape of Microinsurance in Africa briefing note).

⁴ See MILK Brief #9: What is "Client Math"?, available on the Microinsurance Centre's website (<http://www.microinsurancecentre.org/milk-project.html>).

⁵ The Microinsurance Learning and Knowledge (MILK) Project is a three year initiative of the Microinsurance Centre that has been designed to help answer the questions of whether low income families benefit from microinsurance and if there is a business case for microinsurance. More information can be found at <http://www.microinsurancecentre.org/milk-project.html>

discussion. While not the focus of this note, it is recognized that consumers can and do derive significant value from the non-financial benefits of microinsurance.

Terminology used in this note

Certain terms used in this note have been assigned specific meanings that may not be consistent with their everyday, generic meanings. This box describes the specific meanings assigned to these terms.

The **value** or **financial value** of a risk coping mechanism refers to the impact on welfare of that coping mechanism as measured by the utility that an individual derives from making use of the coping mechanism. For example, the statement “microinsurance has **value**” should be taken to mean that microinsurance improves the individual’s welfare as measured by utility..

The **cost of insurance** refers to the insurance premium. The analysis in this note uses the claims ratio to determine the **cost of insurance**. This comes from the definition of a claims ratio: $claims\ ratio = claims / premiums$, which can be rearranged as $premiums = claims / claims\ ratio$. Thus, a lower claims ratio implies a higher **cost of insurance** and vice versa.

Microinsurance is said to be **expensive** if the claims ratio for a microinsurance product is low. “**Expensive**” is therefore not a reference to the absolute cost of microinsurance, although the absolute cost increases as the claims ratio reduces.

Affordability refers to the willingness of consumers to pay for a particular risk coping mechanism. For example, this note would say that a microinsurance product is **unaffordable** if most reasonably risk averse individuals would not consider it a practical risk coping mechanism due to its cost.

The financial value of microinsurance can be viewed at three different levels, as illustrated in Figure 1:

1. *Absolute value*. A microinsurance product offers *absolute value* if consumers are financially better off consuming the product than not. *Absolute value* is the “bare minimum” value that microinsurance should provide. For example, are consumers better off having no life cover if it is extremely expensive (i.e. claims ratios are very low, say 10%)?
2. *Relative value*. A microinsurance product offers *relative value* if consumers are financially better off consuming the product than employing alternative mechanisms to cope with a risk. For example, are consumers better off purchasing expensive life cover than taking a loan that charges 3% interest per month to finance the costs related with a death? *Relative value* is a higher form of value than *absolute value*, unless of course no available coping mechanisms offer *absolute value*. For the purpose of this note, we focus on credit as an alternative risk management mechanism because it is a fairly common coping mechanism and its financial impact can easily be quantified.
3. *Best possible value*. A microinsurance product offers *best possible value* if consumers are obtaining the maximum benefit possible from the product on a basis that is financially sustainable for the providers. This implies an optimum balance between benefits paid to consumers, shareholders and other stakeholders in the value chain (i.e. all stakeholders receive a fair and sustainable share of the revenue). What the optimal balance should be may differ by stage of development. Initial entrants are likely to incur higher costs and

require higher profits as reward for the risks taken to invest in building a market. Profit levels are likely to reduce as the market matures. *Best possible value* represents the highest form of value.

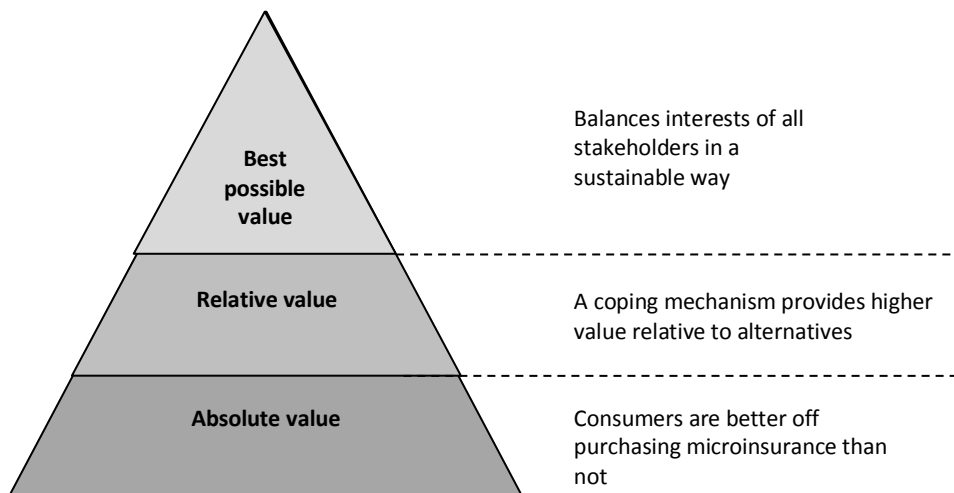


Figure 1: an illustration of the different levels of financial value.

This note focuses on *absolute value* and *relative value*. The issue of *best possible value* will require further consideration. It could also be argued that, at the early stages of market development *relative* and *absolute value* are the first concern whereas *best possible value* becomes more important in the more advanced stages of development.

3. Measuring financial value

3.1. Explanation of the method

A fundamental feature of insurance is that it transfers the risk of an uncertain event (death in the case of life microinsurance) from one party (the consumers) to another (the insurer). There is value in this risk transfer even if the insured event does not actually occur. Expected utility theory provides a framework that can be used to assess the value (utility) under uncertain wealth outcomes, such as when households are exposed to the risk of death.

Let W be the current wealth of an individual, the financial impact of the loss that occurs on the death of an individual be L and the probability of death over the period being considered be q . Then the two possible outcomes for this individual's wealth at the end of the period if insurance is not purchased are W with a probability of $1 - q$ (there is no impact on wealth if the individual survives the period) and $W - L$ with probability of q (wealth is reduced by the financial impact of the loss if the individual dies during the period)⁶.

If the same individual was to purchase life cover for the period with a sum assured of S at a cost of P for the period under consideration, then the two possible wealth outcomes become $W - P$ (for no death) and $W - L - P + S$ (in the case of death).

⁶ Both income and consumption have been ignored in the model. The implicit assumption being made is that income equals consumption over the period being considered.

Similarly, if the same individual was to finance the impact of the loss on death by a micro loan with capital amount C and total amount of loan repayments of R , the two possible wealth outcomes are W (for no death) and $W - L - R + C$ (in the case of death). The time value of money has been ignored in all scenarios for simplicity. So R is simply the sum of loan repayments.

If we were now to define a utility function $u(w)$ as the utility of an individual with wealth of w , the expected utility at the end of the period under consideration for the scenario where the individual has no insurance and does not use a micro loan to finance the cost of death is

$$(1 - q) \times u(W) + q \times u(W - L)$$

The expected utility for the insurance and micro loan scenarios can be calculated in a similar way and are given in Table 1 below together with a summary of the possible wealth outcomes for the three scenarios.

	Survival to end of period (e.g. year)	Death during period (e.g. year)	Expected utility
No insurance or micro loan	W	$W - L$	$(1 - q) \times u(W) + q \times u(W - L)$
Insurance	$W - P$	$W - L - P + S$	$(1 - q) \times u(W - P) + q \times u(W - L - P + S)$
Micro loan	W	$W - L - R + C$	$(1 - q) \times u(W) + q \times u(W - L - R + C)$
Probability	$1 - q$	q	

Table 1: possible wealth outcomes and the expected utility under each risk coping scenario.

For a given utility function, one can calculate the expected utility of an individual that has insurance and compare that against the expected utility if he or she did not have insurance or use a micro loan to consider whether insurance provides *absolute value* or not. Similarly, insurance provides *relative value* if the expected utility with insurance exceeds that when a micro loan is used instead.

3.2. An illustrative example

A parameterized utility function is required to derive results and draw comparisons between different risk coping mechanisms. The set of power utility functions, $u(w) = w^{1-\gamma} / (1-\gamma)$, is the most used function in literature⁷ on economic risk and financial decisions and is thus used in this note. Most people make decisions at γ ranges from 0.5 to 2⁸, which represents the degree of relative risk aversion, with a higher value representing a higher degree of relative risk aversion. This form of utility function displays two types of behavior that should be noted:

- Decreasing absolute risk aversion (DARA): This is when people are willing to take larger absolute risks as their wealth increases. This means that consumers of life microinsurance will be less inclined to purchase a fixed amount of life microinsurance cover as their wealth increases.

⁷ Eeckhoudt, L., Gollier, C. and Schlesinger, H. 2005. Economic and Financial Decisions under Risk.

⁸ As advised by Dr Daniel Clarke in private correspondence.

- Constant relative risk aversion (CRRA): This is when the willingness of people to accept risks that represents a constant proportion of their wealth (e.g. a stake of 10% of their wealth) remains level over wealth.

Consider the following example as an illustration of the methodology outlined in the previous section. An individual has starting wealth of $W = 10,000$, their probability of death during the coming year is $q = 1\%$ and the financial loss on their death is $L = 10,000$. Table 2 below shows the calculation of expected utility under three approaches to coping with the risk of death:

- Approach 1: no insurance or micro loan.
- Approach 2: insurance was purchased with a sum assured of $S = 10,000$. The annual premium⁹ for this example is then 200 ¹⁰ for a claims ratio of 50%.
- Approach 3: a microloan was used where the value of the loan is $C = 10,000$ and the loan is repayable in 12 monthly instalments at a monthly interest rate of 3%.

The results are shown for three different insurance claim ratios. The degree of relative risk aversion assumed is $\gamma = 0.5$.

Claims ratio	Approach 1: no insurance or micro loan	Approach 2: insurance was purchased	Approach 3: micro loan was used
30%	$0.99 \times u(10,000) + 0.01 \times u(10,000 - 10,000) = 198.00$	$0.99 \times u(10,000 - 333) + 0.01 \times u(10,000 - 10,000 - 333 + 10,000) = 196.64$	$0.99 \times u(10,000) + 0.01 \times u(10,000 - 10,000 - 12 \times 1,005 + 10,000) = 197.09$
50%		$0.99 \times u(10,000 - 200) + 0.01 \times u(10,000 - 10,000 - 200 + 10,000) = 197.99$	
70%		198.57	

Table 2: expected utility for no insurance or micro loan versus insurance versus a micro loan for three different claims ratios

The expected utility for approach 1 (no insurance or micro loan) is independent of the claims ratio because the claims ratio determines the cost of insurance, which has no impact under approach 1. The same applies to approach 3 (use of a micro loan). The expected utility under approach 2 increases as the claims ratio increases because a higher claims ratio implies a lower cost of insurance (i.e. a lower premium). Also note that when the loss on death is fully insured (i.e. the sum assured equals the financial impact of the loss), the expected utility calculation reduces to $u(W - P)$ ¹¹. Under this condition wealth and therefore utility are certain because the risk is fully insured.

Absolute value. It can be seen in Table 2 that the “no insurance or micro loan” approach produces higher expected utility at claims ratios of 30% and 50%, while “insurance” produces higher expected utility at a claims ratio of 70%. Thus, there exists a claims ratio between 50% and 70% where insurance begins offering *absolute value*.

⁹ “Premium” in this note refers to the gross premium or office premium (i.e. the risk premium plus loadings for expenses such as distribution and administration and for profit).

¹⁰ $10,000 \times 1\% \div 50\% = 200$

¹¹ If the sum assured equals the financial value of the loss, then $S = L$ and the expected utility for insurance becomes $(1 - q) \times u(W - P) + q \times u(W - L - P + S) = (1 - q) \times u(W - P) + q \times u(W - P) = u(W - P)$.

Relative value. The “micro loan” approach produces higher expected utility than insurance at a 30% claims ratio, but lower expected utility at 50% and 70% claims ratios. Thus, there exists a claims ratio between 30% and 50% above which insurance begins offering *relative value* when compared to the use of a micro loan. Note that expected utility is always lower under approach 3 (micro loan) than under approach 1 (no insurance or micro loan) because of the additional cost of the interest payable on the loan¹².

The above example considers value (in the form of utility) given a single level of starting wealth, a single value for the financial impact of death, a single level of relative risk aversion and a single loan interest rate. But how does the claims ratio at which microinsurance begins providing *absolute value* and *relative value* change as each of these factors change? The following section explores these questions with a view to determine the level of claims ratio at which microinsurance no longer provides *absolute value* or *relative value*.

3.3. An analysis of absolute and relative value

This section continues using the utility function and other assumptions made in the previous section.

3.3.1. Absolute value.

Figure 2 shows how the claims ratio at which microinsurance provides *absolute value* varies over wealth for two different levels of relative risk aversion ($\gamma = 0.9$ and $\gamma = 0.5$, representing a more risk averse and a less risk averse scenario respectively). The financial impact of a death is assumed to be 10,000 for all wealth levels. All claims ratios above the curve offer *absolute value*, while those below the curve do not. For example, at wealth of 20,000 a 60% claims ratio does not offer absolute value, an 80% claims ratio offers *absolute value* for more risk averse individuals but not for those who are less risk averse, while a claims ratio of just below 100% offers *absolute value* at the levels of risk aversion considered.

¹² This can be seen by comparing the formulae in Table 1 for expected utility for “no insurance or micro loan” (approach 1) against that for “micro loan” (approach 3). Wealth under approach 3 differs from that under approach 1 by $-R + C$, which is the only difference between the two formulae. Since the loan interest rate is positive, R will always exceed C and the expected utility under approach 3 will always be lower than under approach 1.

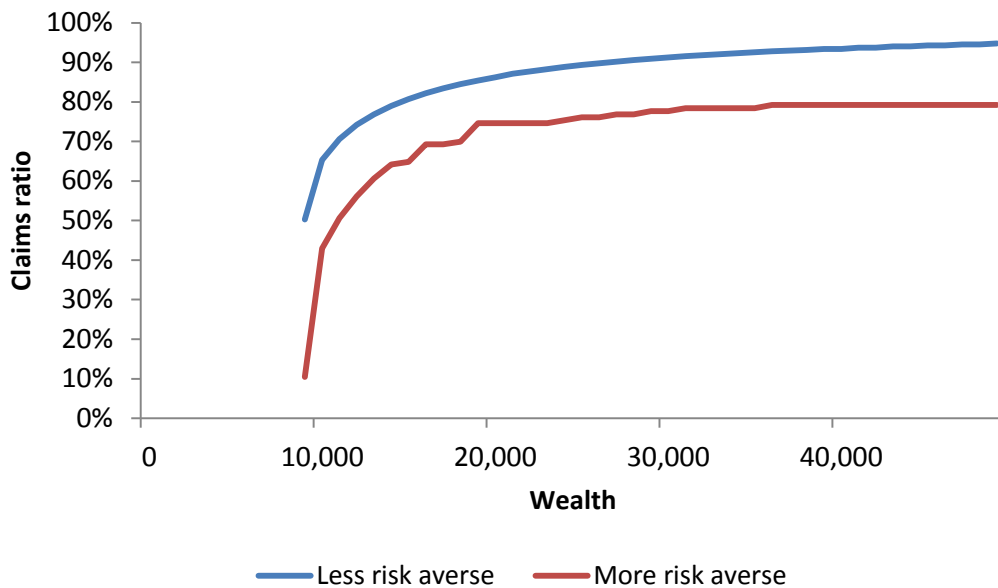


Figure 2: level of claims ratio at which microinsurance provides absolute value.

The following observations can be made:

- The claims ratio at which microinsurance begins to offer *absolute value* increases with wealth. The increase in claims ratio is very steep when the financial impact of the loss on death (assumed to be 10,000 for this analysis) is close to the level of wealth. This implies that lower claims ratios are more acceptable when the financial impact of death is close to the level of wealth (i.e. if death were to significantly deplete or remove wealth).
- The more risk averse individuals are, the lower the claims ratio at which microinsurance begins offering *absolute value*.
- Claims ratios as low as 10% can offer *absolute value*, but only in the extreme cases where the financial impact of death wipes out all wealth for individuals that fall into the more risk averse category. More generally speaking, it appears that claims ratios lower than approximately 40% do not provide *absolute value*.

The two curves in Figure 2 do not extend to wealth levels below 10,000. This is because the level of wealth in the event of a death becomes negative (the assumed financial impact of a death is 10,000) and the utility function used, $u(w) = w^{1-\gamma} / (1-\gamma)$, is only defined for $w \geq 0$. Thus, the extreme poor are not formally covered by the analysis in this note. However, directional results can be inferred from the characteristics of utility curves¹³. For instance, insurance will provide *absolute value* at lower claims ratios as wealth reduces, assuming all other factors remain constant (e.g. level of risk aversion), which is true for levels of wealth below 10,000.

3.3.2. Relative value

The discussion above considers *absolute value*, but how does the value of life microinsurance compare relative to that provided by alternative risk coping mechanisms and in particular a micro loan? Figure 3 below shows how the claims ratio at which microinsurance begins to offer value relative to a micro loan varies depending on wealth. The “more risk averse” and “less risk averse”

¹³ Using the fact that utility curves are increasing in wealth at a reducing rate.

scenarios are again considered. A monthly interest rate of 3% was assumed for the loan. Claims ratios above the curve indicate that microinsurance offers better value, while claims ratios below the curve indicate that a micro loan offers better value.

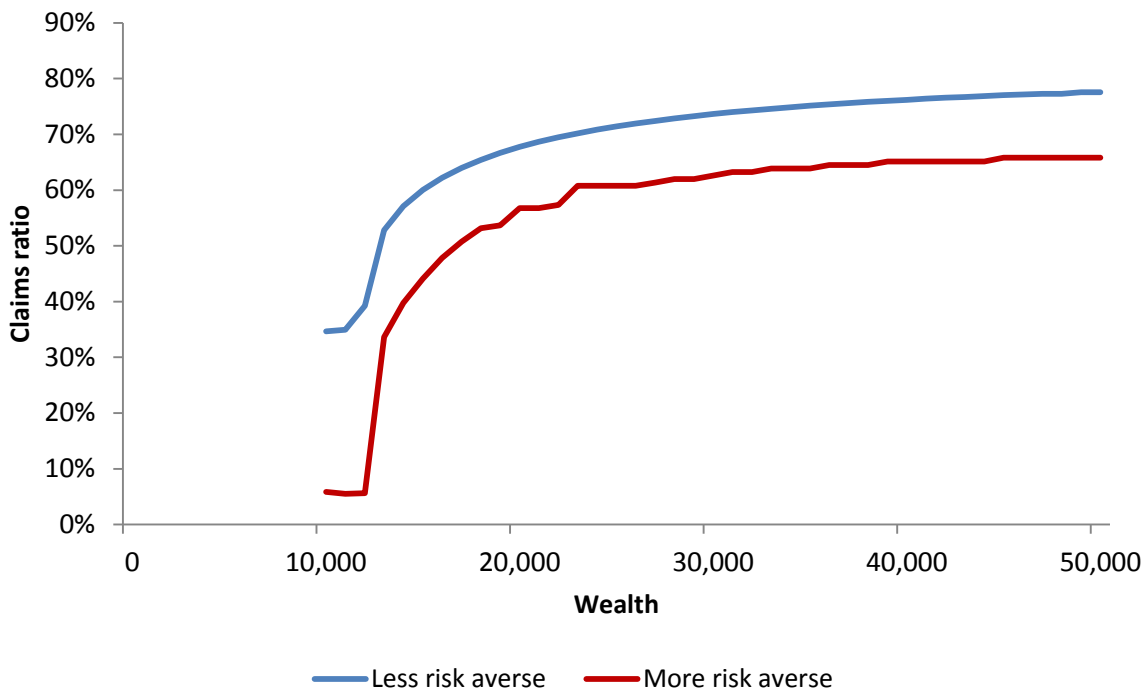


Figure 3: level of claims ratio at which microinsurance provides value relative to a micro loan.

The following observations can be made with respect to *relative value*:

- The shapes of the curves are identical to those observed in the *absolute value* analysis meaning that microinsurance only offers relative value at low claims ratios when the financial impact on death is close to the level of wealth.
- The curves are lower than those observed in the *absolute value* analysis at all levels of wealth. This is caused by the interest cost when a micro loan is used as the risk coping mechanism¹⁴.
- Insurance begins providing *relative value* at lower claims ratios when risk aversion increases. This is true across all levels of wealth.
- Generally speaking, it appears that claims ratios lower than approximately 35% do not provide *relative value* when comparing life microinsurance against micro loans with an interest rate of 3% per monthly.

Higher loan interest rates increase the relative value of life microinsurance as a coping mechanism. The above analysis of *relative value* considered a micro loan that is repayable over 12 months at a monthly interest rate of 3%. In reality, families in financial difficulty are frequently forced to turn to more expensive forms of credit in times of crisis. Figure 4 shows that an increase in the interest rate

¹⁴ The reason for this can be observed in Table 1. The expected utility for the “no insurance or micro loan” approach is $(1 - q) \times u(W) + q \times u(W - L)$, while the expected utility for the “micro loan” approach is $(1 - q) \times u(W) + q \times u(W - L - R + C)$. These two equations are identical except for the $-R + C$ change in wealth if a death occurs for the “micro loan” approach. R always exceeds C when the interest rate is positive and therefore $u(W - L - R + C) < u(W - L)$.

on a micro loan from 3% to 10% per month has a material impact on the *relative value* of life microinsurance. Broadly speaking, the claims ratio at which microinsurance begins to offer *relative value* is more than 20% lower for a micro loan with 10% interest per month than one with 3% interest when the financial impact on death is low compared to the level of wealth (this can be observed at the higher levels of wealth in Figure 4 below). The increase in interest rate has a higher impact as the level of wealth reduces. At a general level, it appears that life microinsurance will not offer *relative value* at claims ratios below approximately 20% when micro loans with interest rates of 10% per month are available. Figure 4 compares this directly against the 35% cut-off claims ratio when loan interest rates of 3% are charged.

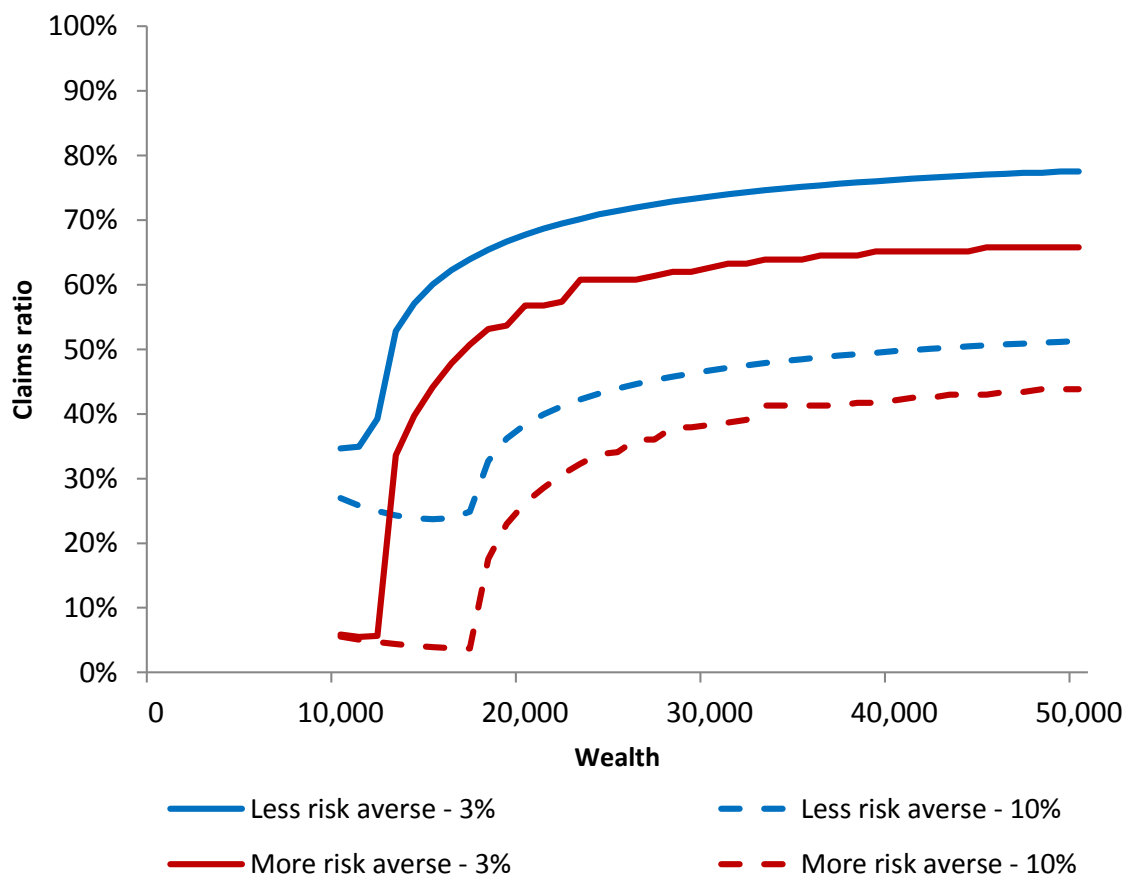


Figure 4: the impact on relative value of increasing the loan interest rate from 3% to 10% per month

3.4. Additional considerations affecting relative value

The attraction of a risk coping mechanism such as insurance or a micro loan does not depend solely on the financial value analysis conducted above. There are a number of additional factors that should be taken into account when assessing relative value such as access and the ability of consumers to use either insurance or micro loans as viable coping mechanisms:

1. Monthly credit repayments are materially higher than the corresponding monthly insurance premiums. Using the assumptions made previously, the annual cost of microinsurance cover of 10,000 at a 50% claims ratio is 200 or 17 per month. This can be compared to a micro loan repayment of 1,005 per month (at a monthly interest rate of 3%) if the same amount (i.e. 10,000) is borrowed. Under these assumptions microinsurance is thus viewed as more affordable to a much larger segment of the poor than the micro loan.

2. Micro loan interest rates tend to increase as the wealth of consumers decreases. Thus, the poor will typically pay more for credit than the wealthy¹⁵. A higher cost of credit will reduce its *relative value* as illustrated in Figure 4.
3. Access to credit may be directly impacted by a death. For example, if the deceased was a breadwinner, the household's ability to repay a micro loan could be severely reduced or removed altogether and credit providers would be unlikely to make a micro loan available to the household.
4. Consumers who lack adequate collateral are frequently forced to turn to alternative sources of credit in the informal market where monthly interest rates can be as high as 30% (or 360% per annum). Higher interest rates reduce the *relative value* of micro loans.

All the above additional factors require consideration when comparing insurance and micro loans as risk coping mechanisms and serve to increase the attraction of insurance.

3.5. The impact of affordability

As pointed out in the first additional factor considered in the previous section, different coping mechanisms will have very different costs (e.g. 17 per month for microinsurance versus 1,005 for an equivalent micro loan). Such a large cost differential implies that a materially larger segment of the poor will be able to afford microinsurance as opposed to micro loans and is worth analyzing further.

For the purpose of this affordability analysis it is useful to view affordability as being absolute, meaning that an individual can either afford, for example, an annual premium of 200 or they cannot. In practice affordability is not absolute. One individual may feel he or she can afford the 200 annual premium, while another individual in identical financial circumstances may feel it is unaffordable. The affordability decision depends on the level of utility an individual expects to derive from paying the 200 premium. However, there should be a level of wealth at which the majority of a population would consider the 200 premium to be unaffordable. In utility theory this would be the level of wealth at which all reasonably risk averse individuals would find the premium unaffordable¹⁶.

This analysis defines the *affordability threshold* as the minimum level of wealth at which the cost of a particular risk coping mechanism would be regarded as affordable by a reasonably risk averse individual. The greater the cost of the coping mechanism, the higher the affordability threshold will be. Using the example above, the affordability threshold for the micro loan will be substantially higher than the affordability threshold for microinsurance.

How is the affordability threshold determined?

Intuitively, affordability depends on income rather than wealth. It is realistic to expect that most reasonably risk averse individuals will not be prepared to spend more than a specific percentage of their household income on any coping mechanism. For the purposes of this note, the maximum percentage of monthly household income that an individual would be prepared to spend on insurance as a coping mechanism has been set at 5%. This is an arbitrary level of affordability that

¹⁵ Mortality similarly increases as wealth reduces, causing insurance to increase in cost. However, the increase in mortality will be lower than the equivalent increase in the cost of credit as a result of higher interest rates.

¹⁶ There will probably always be some extremely risk averse individuals who would find a particularly high premium affordable, but this analysis is not interested in the extremes.

has been chosen to illustrate the affordability threshold argument (and is reasonable, at least in the author's opinion).

In order to move from the percentage of monthly household income that the cost of insurance should not exceed to the affordability threshold (defined in terms of wealth), income must be expressed as a function of wealth. This has been done by applying a linear regression model on a limited set of wealth and income data that were obtained from financial diaries recorded during 2004 in South Africa by the University of Cape Town¹⁷. The assumed linear relationship between income and wealth can then be used to determine the affordability threshold for a given insurance premium (i.e. the level of wealth at which, for example, a monthly insurance premium of 17 would be considered unaffordable because it exceeds 5% of monthly household income).

The affordability threshold can then be overlaid on the graphs in the above analysis to illustrate the ranges of wealth at which microinsurance can be considered a practical coping mechanism.

3.5.1. Affordability and absolute value

The claims ratio at which microinsurance begins offering *absolute value* depends on an individual's level of risk aversion, as shown by the two curves in Figure 2, which represent two different levels of risk aversion. The lower an individual's level of risk aversion, the higher the claims ratio at which insurance offers *absolute value*. The higher the claims ratio, the lower the insurance premium¹⁸ and therefore the lower the affordability threshold (i.e. insurance is affordable at lower levels of wealth). It therefore makes sense to base the affordability threshold on the less risk averse scenario so that it will apply to a larger segment of the population.

The affordability threshold can be viewed as that level of wealth below which it is not practical to purchase microinsurance because the cost becomes prohibitive to the majority of the population. The value of microinsurance becomes irrelevant in practice for wealth levels below this affordability threshold.

Where does the affordability threshold lie?

Figure 5 below (the curves shown are identical to those in Figure 2) shows that given the assumptions made in this note, microinsurance is affordable at all levels of wealth for individuals from the "less risk averse" scenario. However, for the "more risk averse" individuals it can be shown that the affordability threshold is exceeded when wealth falls below 10,000.

As an example, consider an individual from the "more risk averse" scenario. The "more risk averse" curve in Figure 5 shows that such an individual with current wealth of 10,000 and potential financial impact on death of 10,000 would receive *absolute value* from a microinsurance offering with a claims rate of 10%. Given these circumstances, however, the affordability threshold would rule out such an offering. Given a claims ratio of 10%, the monthly insurance premium is 80. Based on the assumed linear relationship between wealth and income, monthly income is estimated to be 1,252. Therefore the premium is 6.4% of monthly income, which is above the 5% affordability threshold

¹⁷ Further detail on the financial diaries data can be obtained from www.financialdiaries.com.

¹⁸ Since this analysis assumes the probability of a claim (i.e. the mortality rate) is constant, a higher claims ratio means lower loadings for distribution, administration and profit resulting in a lower premium.

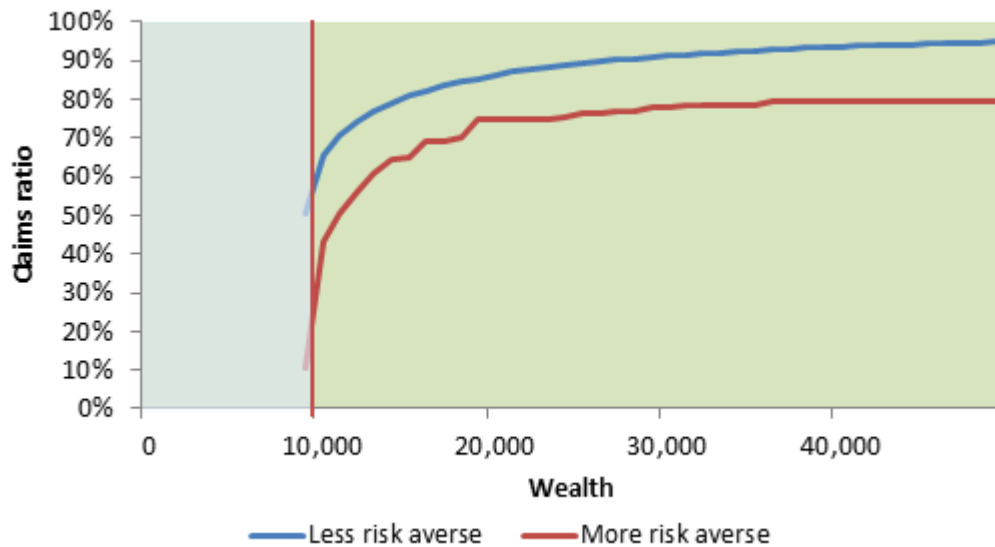


Figure 5: level of claims ratio at which microinsurance provides absolute value, overlaid with an affordability threshold for “more risk averse” individuals.

Introducing an affordability threshold has a material impact on the minimum claims ratio at which microinsurance offers *absolute value*. For individuals from the more risk averse category, applying an affordability threshold increases the minimum claims ratio required for *absolute value* from 10% to 43%. Given these assumptions, it again appears as though claims ratios below approximately 40% do not offer *absolute value*.

3.5.2. Affordability and relative value

An affordability threshold can be calculated for a micro loan using the approach found in the previous section. For a micro loan with a 3% per month interest rate, the monthly repayment is estimated at 1,005. Given that the micro loan may not exceed 5% of monthly household income the affordability threshold can be estimated as 190,000. This implies that the cost of a micro loan would be considered prohibitive at all wealth levels that have been considered in this analysis.

Note that this conclusion depends heavily on the assumed linear relationship between wealth and income. For example, the assumed relationship implies that the monthly household income at wealth of 50,000 is 3,200. The monthly loan repayment of 1,005 would therefore make up 31% of the monthly household income at this level of wealth, which would be considered unaffordable.

The affordability threshold for loans with higher interest rates is even higher than 190,000. The conclusion is therefore that a micro loan is not a practical risk coping mechanism for low income families in the scenario where a monthly loan repayment in excess of 5% of household income is considered unaffordable.

However, the international threshold for credit is generally accepted as 30% of monthly household income rather than the 5% used above. Using the 30% cut-off, the affordability threshold for a micro loan becomes approximately 53,000. This implies that a micro loan would remain unaffordable at all wealth levels that have been considered in this analysis.

3.6. Assessment of the method

Expected utility theory provides a robust method that can be used to assess the *absolute value* of microinsurance and its value relative to alternative coping mechanisms where their cost and the cost of a death can be quantified. However, there are a number of areas in the method used that warrant further discussion.

- It is worth reiterating that this note does not take account of other potential benefits of microinsurance (e.g. positive behavioral changes). Only financial value has been considered.
- The results obtained depend on the form of utility function chosen and the assumed degree of relative risk aversion. As pointed out in **Section 3.2**, the power utility function that was used in this note is widely used by economists and the note considers typical degrees of relative risk aversion. The results obtained should therefore reflect typical choices made by a large segment of the population.
- **Section 3.3.1** noted that negative levels of wealth have been excluded from this analysis. However, decreasing absolute risk aversion (the family of utility curves assumed for this analysis) implies that risk averse individuals should be prepared to spend more on insurance as wealth reduces. In practice, there may be scenarios where claims ratios lower than those shown in this note provide financial value. In particular, this could be the case where the cost of a death exceeds the level of wealth.
- The affordability threshold introduced in **Section 3.5** is based on an assumed linear relationship between income and wealth. This relationship requires more scrutiny.
- The analysis in this note made no attempt to quantify the actual cost of a death, but rather assumed the cost to be fixed at 10,000. The actual cost includes once-off costs such as funeral expenses and on-going costs such as the loss of income from a breadwinner. This simplification does not change the conclusions as it is the size of the financial loss on death relative to wealth that is important.

4. Conclusions

How low can the claims ratio of a life microinsurance program fall before it ceases to provide financial value to consumers?

The answer is unfortunately not that straight forward and depends on a number of factors such as an individual's level of risk aversion, the size of the financial loss on death relative to the family's level of wealth and what alternative risk coping mechanisms microinsurance is being compared against.

Families should not insure risks that do not have a major impact on the family finances. The claims ratio at which microinsurance offers *absolute value* increases rapidly as the size of the financial impact on death reduces relative to wealth. This holds true for reasonable levels of risk aversion and can be seen in **Figure 2**. Once the financial impact (10,000) on death reduces to between 50% and 30% of wealth (or between 20,000 and 30,000), microinsurance begins to offer absolute value only from claims ratios of 75% and above. At the current stage of microinsurance development in many countries it is unlikely that there are life microinsurance schemes that are sustainable at claims ratios much above 75%. This leaves too little margin to cover distribution and administrative costs and still make a reasonable contribution to profit. Thus microinsurance does not offer *absolute value*

when the financial loss on death is “small” relative to wealth, which leads to the conclusion that families should not insure risks that do not have a major impact on household wealth.

Generally speaking, claims ratios above 40% offer absolute value for large risks. Microinsurance tends to begin to offer *absolute value* from claims ratios of 40% and above when the financial impact of a death is significant relative to wealth (roughly 50% and above). This holds true for all reasonable levels of risk aversion.

Claims ratios as low as 10% can offer absolute value, but only in extreme cases. **Figure 2** shows that a claims ratio of 10% can offer *absolute value*, but only for individuals who fall in the more risk averse category and only if the financial impact on death is close to the household’s level of wealth. If these two conditions do not hold, then very low claims ratios certainly do not offer *absolute value*. This is a potentially controversial conclusion that requires debate and should not be construed as the author advocating for lower claims ratios.

Affordability and access considerations increase the relative attraction of microinsurance. The analysis highlighted a number of practical factors relating to affordability and access which work to further increase the attraction of microinsurance when considered against a micro loan as an alternative risk coping mechanism.

Microinsurance compares favorably against a micro loan. Life microinsurance begins to offer value relative to a micro loan at very low claims ratios when the financial impact of a death is large relative to wealth, particularly for more risk averse individuals. Life microinsurance still offers better value relative to a micro loan at claims ratios between 60% and 80% at higher levels of wealth (depending on the level of risk aversion). Higher interest rates on loans increase the *relative value* of microinsurance substantially (as shown in Figure 4 above). Therefore micro loans should only be regarded as a better risk coping mechanism than microinsurance if the following three conditions hold:

- the financial impact of the risk being mitigated is low relative to wealth (less than approximately 50% of wealth);
- if the interest rate on the loan is low (in the order of 3% per month);
- and claims ratios are below roughly 60%.

Micro loans will typically be unaffordable at those wealth levels where microinsurance is most valuable. The introduction of the affordability threshold concept shows that micro loans only become feasible risk coping mechanisms when the loss they are used to finance is low relative to wealth. Although it must be noted again that this observation is based on a rough and ready assumed linear relationship between income and wealth. It also depends on the loan repayment term. A repayment term greater than the assumed 12 months will make the micro loan more affordable. However, the magnitude of the difference in affordability is so large that this conclusion is unlikely to change materially if different reasonable assumptions are made. Considering both affordability and *relative value*, micro loans become even less attractive as a risk coping mechanism particularly when the financial impact of a death is substantial relative to wealth.

In summary, the results of this analysis supports life microinsurance products as effective and affordable risk coping mechanisms particularly where the financial impact of a death is substantial

relative to wealth. This holds true down to fairly low claims ratios, but the industry will be hard pressed to argue for claims ratios lower than 30% to 40%. This should become the minimum standard of financial value for life microinsurance products. Furthermore, it can be concluded that life microinsurance has a better potential welfare outcome than credit when the financial impact of a death is large relative to wealth, unless claims ratios are very low.

5. References

Bester, H.; Chamberlain, D.; Hougaard, C. 2008. Making a market for microinsurance: the success and failure of different channels of delivery. (Cape Town, South Africa), at: www.cenfri.org

Thom, M.; Gray, J.; Müller, Z.; Leach, J. Forthcoming. Thinking Big: Drivers of Scale. (Cape Town, South Africa).