

Executive Summary of the Thesis

The main objective of the present thesis is to investigate the various issues related to microinsurance of health (hereafter MHI). MHI is a financial provision which aims primarily at informal sector. ILO (2010) regarded it as an instrument that improves the risk-management capacity of poor households engaged in informal sector. People working in informal sector are often belong to low-income class as they are deprived of getting higher than survival wage and any type of social security from the employer. Due to their low income these people cannot afford the private insurance available. In this scenario risk-hedging provision in the form of MHI is highly recommended and urgently required. MHI is a financial arrangement to protect the low-income individuals working in the informal sector against the health risk. A typical MHI scheme offers limited coverage at a low premium. MHI scheme is distinct from the health insurance in many ways such as (1) in case of MHI, the size or the extent of insurance coverage is not a choice variable. Individuals are offered a simple contract (package) that includes price, benefits and defines the method of paying premium and settling claims) and on the basis of it all that they decide is whether or not to buy the scheme; (2) premium of MHI scheme is based on community rating and not on individual rating and (3) MHI is generally a group contract/ individual contract initiated or managed by a nodal agency. In order to accomplish the objective, the thesis focuses on mainly three aspects: informal sector households' financial risk coping mechanism with health shocks, financial sustainability of MHI scheme and demand for MHI among informal sector workers. The first and third issues mentioned are addressed empirically whereas the second issue is analysed theoretically. The first three chapters of the present thesis contains introduction, literature review and research objectives respectively.

In chapter-4, we focused on the issue of distress healthcare financing among the informal sector households in West Bengal (a state in India). On the basis of a micro-level field investigation in Purulia district of West Bengal, we initially examined the determinants of out-of-pocket (hence after OOP) average monthly healthcare expenditure of the sample households; and next we investigated the factors influencing incidence of distress healthcare financing of those sample households. Distress healthcare financing is defined as a situation

when a household required to borrow money with interest and/or sell assets/livestock for its healthcare expenditure. In our micro-level study, the households were selected based on a two-stage random sampling method. At the first stage, three blocks (viz. Purulia-I, Purulia-II and Hura) were selected randomly under Purulia Sadar sub-division. Then from each block, two villages were selected randomly and finally eighty households were selected from each village through random sampling procedure. we identified 30 households that did not seek any healthcare at least once during the reference period. We did not consider them in our analysis; so, the sample size of our study was 450. In our study sample the principal working member in most of the households were involved in casual wage employment. The monthly average healthcare expenditure incurred by sample households was around Rs 800 which represent nearly 11.20 per cent of average monthly household income and 35.59 per cent households resorted to distress healthcare financing. To examine the determinants of monthly average OOP healthcare expenditure of sample households, we used an IV (2SLS) regression where logarithm of household's average OOP monthly healthcare expenditure was dependent variable and logarithm of average monthly income of household, incidence of outpatient care, incidence of hospitalisation, size of the vulnerable age group (total number of children aged five or less than five and number of members aged fifty-five or more), healthcare seeking from private provider(including traditional healer), principal earning member's activity status and education of household-head were the explanatory variables. The family income was treated as endogenous regressor and total number of working-members in a household was considered as an instrument for it. The Wu-Hausman test for endogeneity validates the use of IV(2SLS) regression. The results of IV(2SLS) estimation showed that signs of the parameter estimates were as expected and except incidence of outpatient care, regular salaried activity status and formal education level of household head, the remaining explanatory variables had significant impact on average monthly healthcare expenditure of sample households. Next, to investigate the factor(s) influencing distress healthcare financing of sample households we fitted a seemingly unrelated (SUR) Bivariate Probit model in which distress healthcare financing was outcome variable (binary in nature; coded as 1 if a household faced distress financing) and catastrophic healthcare expenditure, self-help group membership, total number of working-members, principal earning member's activity status and education of household-head were the explanatory variables. We considered any OOP healthcare spending exceeding 10 per cent of household's expenditure as catastrophic. The dummy variable catastrophic healthcare expenditure (it was coded 1 if a household's share of healthcare expenditure in total expenditure exceeded 10 per cent) was treated as endogenous and incidence of

hospitalisation, size of the vulnerable age group and healthcare seeking from private provider (including traditional healer) were found as valid instruments. The ML estimation results showed that households that incurred CHE were more likely to face distress healthcare financing. If principal earning member of household was in regular-salaried job, the family had a lower risk of borrowing (with interest) to finance healthcare compared to the households with self-employed principal earning member. The probability of distress financing was low for the households that had considerably higher working members' size.

In chapter-5, we shall develop a simple theoretical model of MHI scheme which was initiated by a commercial insurance firm and managed in collaboration with a local NGO. Against this analytical framework, we analysed the financial sustainability of a for-profit insurance firm and derived the optimal incentive contracts between firm and NGO. We considered a risk-neutral insurance firm, naïve of rural community preferences aimed to provide MHI to risk-averse individuals with identical level of initial wealth and risk type (so, there was no adverse selection in the present framework). The potential beneficiaries faced risk of income loss due to health shock(s) which was(were) covered under MHI scheme offered. The level of preventive care (or effort) taken by the individual influenced only the probability of illness, but not the absolute size of income loss due to illness. To operate the scheme the insurance firm hires a risk-neutral NGO which is working among the low-income households of that locality for sometimes. Such an NGO usually enjoys the trust of the local households and has better local information. The NGO was assigned (by firm) to execute two tasks: enrolling potential beneficiaries in the scheme (in stage-1) and encouraging and monitoring their preventive efforts (in stage-2). Enrolment under the scheme was dependent on NGO's effort in creating awareness of individuals and improving the insurer's familiarity with the preferences and behaviour of them. In addition, the NGO had the access to local informal network and also used to enjoy the trust of the local people. So, it could encourage and monitor preventive effort of beneficiaries. The firm cannot monitor the NGO's effort level in both stages. The NGO was altruist such that it put weight on a utility gain of an individual joining the scheme. In the stage-1, firm offered a linear contract (with a fixed and variable compensation component) to NGO. Assuming that the limited-liability constraint of NGO binds, from the firm's optimal contracting problem in Stage-1 we found that:

(i) variable compensation component and the enrolment go down when NGO's cost of effort goes up,

- (ii) optimal bonus decreases with the higher altruism of NGO and
- (iii) optimal effort increases with the altruism of the NGO.

Moreover, we also derive the condition under which net-income of the scheme at its commencement (stage-1) will increase following an upsurge in bonus incentive. When both the limited liability and participatory constraints of NGO bind, we found:

- (i) variable compensation component and the enrolment go down when NGO's cost of effort goes up, and
- (ii) optimal bonus decreases with the higher altruism of NGO but optimal effort does not depend on the altruism of the NGO.

Next, we discussed the stage-2's interaction between firm and NGO. Here we first focused on the issue of aggregate claim analysis. The firm could not design a compensation scheme for a beneficiary based on occurrence of an illness episode, since even taking the maximum possible prevention, a beneficiary may face a health shock. Moreover, the firm could not monitor his/her preventive action. Hence, the MHI scheme was at risk of moral hazard which has an implication on scheme's financial sustainability. But the NGO can encourage and monitor the preventive effort of a beneficiary. The model assumed that probability of an MHI beneficiary would exert high effort depends on effort put by the NGO in motivating and monitoring preventive care of community. This assumption suggested that presence of an NGO reduced the average probability of illness. On the basis of this lemma, we arrived to another important result: if the individual claims are independent and identically distributed random variables, for any fixed level of coverage the level of aggregate expected claims is decreasing in the NGO's effort level. At the end of stage-2 the scheme yielded a binary output to the firm: high or low. The output was considered 'high' if firm earns a non-negative financial profit; otherwise, its output was considered 'low'. In case of high output, the firm gets a non-negative utility, otherwise it gets zero utility. The firm in our framework could financially sustain if its expected payoff was non-negative. The NGO's effort, stochastically improves the probability of making non-negative financial profit of firm. The insurance firm offered a state contingent contract to the NGO. We assumed NGO's income in any state of the world must be above a certain minimum level. In this situation insurance firm's optimal contracting problem yielded the optimal effort level and optimal bonus payment of NGO for which insurance firm remained financially sustainable. In this situation insurance firm's optimal contracting problem yielded the optimal effort level and optimal bonus payment of

NGO for which insurance firm remained financially sustainable. We also showed that the insurance firm prefers the NGO which has a much lower outside option. Finally, we made an enquiry on the role of firm-NGO collaboration in risk loading. We found that the firm can set a lower threshold level of risk-loading with the higher monitoring effort of the NGO. threshold level implies the minimum level of risk loading that an insurance firm will use to remain solvent in the business.

In chapter-6, we addressed the question of demand for MHI. The MHI as a product is quite different from the commercial health insurance. The proper designing of an MHI scheme is immensely crucial to encourage participation of target group. The MHI scheme must be designed based on target group's preference. None of the revealed preference method or contingent valuation method investigate the effect of characteristics of the health insurance schemes while estimating the demand for it. The characteristics of an MHI scheme (i.e., premium level and benefit package) could have a significant impact on its demand among the target group. Hence the method of Discrete Choice Experiment (DCE) was applied in our study to elicit the preferences for MHI scheme of sample households. In any DCE application we can determine the characteristics that describe a product and to what extent the respondent is willing to trade-off one characteristic to another. In the absence of actual MHI scheme in the market, the demand for insurance can be estimated by using a DCE. The study area of DCE exercise was Purulia district of West Bengal. The experiment was undertaken along with the household survey mentioned in the chapter-4. We considered the households without any health insurance as our sample for the DCE. The MHI schemes had not penetrate in our study area at the time of our survey (implying dearth of real market data) which ruled out the use of revealed preference method to investigate the preference for (any existing) MHI scheme. In the present study five attributes with three levels for each were identified on the basis of literature as well as from the pilot survey and focus group discussion in the study area. These were as follows:

Attribute-1: Unit of Enrolment; with levels: (i) individual, (ii) maximum 3 members, (iii) maximum 5 members.

Attribute-2: Premium(quarterly); with levels: (i) 150, (ii) 250, (iii) 300.

Attribute-3: Coverage (in Rs p.a.); with levels: (i) 25000, (ii) 45000, (iii) 60000.

Attribute-4: Benefit; with levels: (i) Drug, Free consultation, (ii) Drug, Lab test, 50per cent of Transportation cost, (iii) Drug, Lab test (including one preventive test), Transportation cost, less-costly in-patient surgical.

Attribute-5: Cash-back; with levels: (i) No, (ii) 25 per cent in case of claim less than 5000 p.a., (iii) 50 per cent in case of claim less than 5000 p.a.

The five attributes with three levels each, resulted in 3^5 i.e., 243 possible combinations (choice sets) of MHI products. However, it was impractical to consider 243 combinations for our study. So, we used orthogonal design of experiment (by SPSS 20 software) and found that 16 combinations were required to estimate the main effects of five attributes. These 16 alternatives were used to make eight choice sets of two alternatives each. In addition, an opt-out alternative was also included to control overestimation of preference. So, in the final design we had eight choice sets with two alternatives and one opt-out option. But given five attributes and different levels, choosing eight alternatives would be burdensome on the respondents. So, each respondent was asked to choose only one alternative from the only choice set shown to him/her. The choice sets were randomly assigned to them. Then the question asked was ‘What will you do?’ All the qualitative attributes were dummy-coded to allow for non-linear effects in the levels of attributes. Our empirical strategy relied on estimation taking help of conditional logit model. The estimation results suggested that the respondents preferred an MHI scheme which gives family coverage, covers transport, diagnostics and a cash-back of the total premium deposited in case of no claim. In addition, their willingness to join the scheme increased with the lower premium and higher coverage amount. Again, to allow the heterogeneity of preferences among the sample respondents, we included interactions of case-specific regressors (which do not vary with alternatives) such as monthly income of household, average monthly healthcare expenditure, dependency (defined as household size divided by its total working members), awareness about insurance with the alternative-specific attributes in the utility function and estimated a conditional logit model with interactions. Since the household characteristics remained constant across the MHI alternatives, they were multiplied with the monetary value, (in our case premium). The result showed that choice of an MHI scheme was influenced by most of the household’s

characteristics. The dependency of family members on its working-members was found to be insignificant in the choice of MHI scheme.

In chapter 7, we summarized the major findings of the thesis and had drawn conclusions. In chapter 8, we tried to delve into policy implications particularly with respect to some recent government health insurance schemes and for future development of MHI as an instrument(option) for informal sector. In chapter 9, we listed the references that we followed and cited for this thesis.