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The Rationality of Distrust: Institutional Credibility and the Property Insurance Gap in Bangladesh

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Abstract

A systemic failure in the market of developing countries is the global protection gap, including the difference between the losses caused by massive economic damages and the amount of insurance. Although monsoons, cyclones and structural problems pose serious threats to Bangladesh, the insurance penetration of residential property remains at a very low 0.33% of nominal GDP. This study, grounded in a novel primary survey of 101 homeowners and provides a fresh look at the protection gap. The paper proposes that the most important thing that prevents one from taking part in the market is institutional distrust. Adoption is influenced by psychological and experiential considerations, not by age, gender or ownership. To sum up, we suggest a three-point policy strategy: adopting a compulsory claim-transparency regulation, designing digital-first claim settings, and standardising Takaful regulations. These actions are to ensure that the protection gap is constitutionally sealed at the structural level and to restore market activity in the developing countries. The findings put a new perspective on how low-penetration markets ought to be addressed by policymakers, regulators, and insurers: premium subsidies and educational efforts are not enough when institutional mistrust is the root underlying the issue.

Keywords: property insurance adoption; institutional trust; protection gap; Bangladesh; insurance market development; Takaful.

1. Introduction

One major market failure in current financial systems is the lack of global protection for natural disasters, or "global protection gap". However, this gap has been growing in the developing world as hazard frequency and severity from climate change continue to rise, and due to its low and entrenched insurance penetration in low and middle-income economies (Swiss Re Institute, 2023; World Bank, 2024). The implications are not just on balance sheets; when disaster strikes, households without property insurance cannot turn to the financial safety net but must instead fund recovery out of their own pockets, through lost savings, growing debts, and becoming even more vulnerable to asset loss in the future, all of which is designed to be prevented by financial protection (Kunreuther and Pauly, 2014). Therefore, the protection

gap is not only limited to that of insurance but also covers other matters such as financial inclusion, poverty reduction and development policy needs in the hazard-prone developing countries.

In Bangladesh, evidence on property insurance is even more limited. A household survey of floodplain communities examined the feasibility of private micro flood insurance and noted that no private market then covered property damage from natural disasters (Akter et al., 2011), and two recent surveys of Dhaka residents examine fire insurance, reporting low awareness and the correlates of stated willingness to pay (Rahman et al., 2026a; Rahman et al., 2026b). Both are related to one risk, and credibility of insurers is mixed in other studies: while others find that the more confident people are about the insurer, the more people are likely to purchase (Cole et al., 2013; Petrolia et al., 2013), the Dhaka survey suggests that the less people believe insurers, the more likely they are to invest (Rahman et al., 2026a). To the authors' knowledge, evidence that ranks distrust, self-insurance, price, perceived risk and religious compliance against one another within a single sample of homeowners is not yet available for Bangladesh. This study addresses that gap.

The study tests the following three hypotheses: Directional hypotheses. The leading structural obstacle to adoption is not costs or procedural difficulties or risk perceptions, but institutional distrust, as proposed in the hypothesis, the "Trust Deficit Hypothesis" (H1). The Digital Friction Hypothesis (H2) holds that users do not like the low cost of something if it is perceived to be very complex in terms of procedure. The Risk Perception-Action Gap Hypothesis (H3) indicates that there is no relationship between personal assessment of disaster risk and people's interest in disaster insurance. This reveals a natural disconnect between knowing about a risk and taking action to minimize that risk. The testing of these hypotheses uses a special four-part analytical approach. This framework includes the thematic content analysis, non-parametric contingency testing, point-biserial correlation and Firth's Penalized Likelihood Logistic Regression, all of which have been chosen specifically to accommodate the categorical and binary nature of the data and the structural missingness that emerged from the branching survey design.

The paper provides three contributions to the literature in the area of insurance market development and financial inclusion in emerging economies. First, the research presents first empirical proof at the household level (for the Bangladeshi residential property insurance market) that, among the structural barriers, institutional trust is the most important one, rather than price sensitivity, awareness about disaster or household characteristics. This changes the discussion around protection gap from being one about sales, to one about trust and systemic change. Second, it demonstrates that, empirically, the use of conventional demographic segmentation for this market is analytically incorrect because the demand for insurance is statistically consistent in all demographic segments studied-the result is a challenge to conventional insurance marketing practice, and adds to the growing literature on the role of psychographic versus demographic in the drivers of adoption in low-penetration markets (Eling *et al*, 2014). Third, an evidence-based policy framework in three pillars is proposed. This framework includes: compulsory disclosure of transparency on claims by public audits, removal of digital friction in the mobile ecosystem, and formalisation of the takaful rules.

2. Literature Review: Residential Property Insurance in Bangladesh

2. 1. The Global and Local Protection Gap

A key market failure in current financial provision is the "protection gap," that is, the gap between the total economic losses because of natural disasters and what is covered by insurance. Bangladesh is facing a critical situation regarding this matter. Bangladesh's insurance penetration is low, currently standing at

around 0.33% of nominal GDP, which is low compared to other countries in the region like India and Vietnam, especially given the high level of the country's exposure to the monsoons, cyclones and structural risks present in urban centres like Dhaka (Ali and Mahmud, 2021). The poor enrollment triggers a cycle in which households are forced to access their own finances, which often results in financial losses and indebtedness, instead of the financial recovery offered by insurance.

2.2 Theoretical Frameworks for Market Non-Participation

Market failures in the insurance markets of emerging economies are not solely income or literacy issues, according to research. The following three theoretical approaches, which are closely interrelated, offer a more nuanced understanding.

Prospect Theory: People who own a home underestimate the likelihood of infrequent, but serious, events, as was suggested by Kahneman and Tversky in 1979. Rational consumers will prefer the certainty of today's liquidity over what may be an intangible benefit in the future, despite the insurance premium paid today being a loss.

The Trust Paradox: According to Guiso *et al* (2008), institutional trust is the "absolute gatekeeper" in emerging markets. Even if the product is cheap, and useful, if they have doubts about whether the financial institution is doing its job, they won't use it.

Nudge Theory and Decision Paralysis: The framework, influenced by Thaler and Sunstein (2008) and Bertrand *et al* (2010), explain that bureaucratic obstacles, such as complex paperwork or unclear claims procedures, prove a greater disincentive to participation than the cost itself does, says Nudge Theory and Decision Paralysis.

2.3. Empirical Findings on Adoption Barriers

The main sources of empirical evidence come from the case studies of Cole *et al* (2013), who conducted a series of randomized field experiments in rural India to determine the relative importance of pricing and non-pricing factors in adoption of a new rainfall insurance product. Even if the payout ratio were the same as in U.S. insurance, there would have been no mass-market if there had not been a strong price sensitivity of demand; this is shown in their research. Importantly, the study identifies a lack of trust, liquidity problems and low salience as top three non-price factors that impeded demand, including that trust was found to be one such factor that premium subsidies could not overcome alone. This observation applies to the residential property insurance sector in Bangladesh, where access for households may be more difficult with respect to mistrust of institutions than access due to cost.

Beck and Webb (2003) looked at the factors behind the demand for life insurance in 68 countries from 1961 to 2000. Based on their panel analysis, the most reliable indicators of insurance consumption are economic indicators (inflation, income per capita, banking sector development) and religious and institutional indicators. In particular, there is no strong relationship between education and insurance consumption, as well as between life expectancy and insurance consumption, or between demographic dependency ratios and insurance consumption. Thus, the institution infrastructure is a much more important determinant of insurance market maturity than population characteristics such as education and demography, which gives a better framework of the low penetration in the insurance market of Bangladesh.

According to Eling *et al* (2014), after reviewing micro-insurance demand literature from the past 14 years (2000-2013), they found 12 major factors: price, wealth, risk aversion, non-performance risk, trust and peer effects, religion, financial literacy, informal risk sharing, quality of service, risk exposure, age, and gender. Ennew and Sekhon (2007) have constructed a comprehensive Trust Index for financial services,

which indicates that trust is complex and has both cognitive (dependability and reliability) and affective (care and concern) dimensions.

The overall empirical findings draw a common and clear implication: insurance market penetration barriers are not only of economic but also institutional and behavioral nature. Price subsidy and financial literacy trainings work on the demand side of the issue but do not solve the binding constraints. This literature focuses on the key aspects of the insurance gap in Bangladesh's residential property insurance, including trust, procedural friction and risk perception.

There is an important literature void. Though these institutional and behavioral structures have been used for the analysis of micro-insurance in India, and for macro-level analysis using global data sets, no empirical study so far has used primary household data specifically to investigate the dynamics of climate-related risk, trust and friction in the residential property insurance sector of a market, characterized by low insurance penetration and high climate change vulnerability, such as Bangladesh. This study fills this gap by providing empirical support for the following hypotheses.

3. Hypotheses Development

Three hypotheses were established prior to data collection, with their directional framework informed by Prospect Theory (Kahneman and Tversky, 1979), research on the Trust Paradox (Guiso *et al*, 2008), and models addressing nudges, procedural impediments, and indecision (Thaler and Sunstein, 2008).

H1- The Trust Deficit Hypothesis

H1: The most important structural obstacle that stops non-purchasers from buying property insurance is the lack of confidence in the claim settlement process of insurance companies.

Rationale: This is based on the Trust Paradox that is found in the very early stages of financial markets, where a lack of trust in the institutions is a barrier that cannot be overcome, and product attributes and cost begin to take centre stage. Thematic content analysis of Q19 and cross-tabulation of Q12 with Q7 are used to test this hypothesis ((Guiso *et al*, 2008; Ennew and Sekhon, 2007).

H2 - The Digital Friction Hypothesis

H2: Intended homebuyers are more deterred from buying a home insurance policy by perceived complexity of the procedure and administrative hassles than by the price of the premium.

Rationale: The underlying rationale is rooted in nudges theories of the decision paralysis (Thaler and Sunstein, 2008; Bertrand *et al*, 2010). Wise consumers will choose not to be insured when the administrative hassles are not worth the perceived benefits. The goal of this hypothesis is to see whether or not friction variables (Q27, Q20, Q25) offer any more serious explanation than cost.

H3 - Risk Perception-Action Gap Hypothesis

H3: Subjective disaster risk perception is not a straightforward link to insurance purchase interest, revealing a systematic behavioural risk–action gap.

Rationale: Consistent with Prospect Theory (Kahneman and Tversky, 1979), people tend not to think as hard about low-probability but severe outcomes. This hypothesis is tested using a one-way ANOVA (Q22 across Q5 groups) and Firth's Penalised Likelihood Logistic Regression (Segment B, n = 76).

4. Methodology

4.1 Research Design

The study is exploratory, cross-sectional, quantitative, and takes on a pilot approach to gain insight into the factors that influence the decision of homeowners in Bangladesh to purchase home insurance. The

primary objective is to identify and explore the taboos that prevent the homeowners from purchasing building insurance despite incurring substantial risk from disasters and building-related incidents such as flood, cyclones, fire, and accidents.

The considerable insurance protection gap in Bangladesh provides the study context. Bangladesh has recorded the lowest insurance penetration in FY24-25 at an estimated BDT 0.33% of nominal GDP (BDT 18534 crore against a nominal GDP of BDT 5552753 crore) where this illustrates a stark discrepancy when compared to the regional average of Vietnam (more than 2%) and India (3.8% and premiums projected to increase by 10.7% annually until 2036), which makes the macro environment in relation to the micro demands studied in this research quite slack (Kadir, 2025).

Based on literature in social science and information systems, 60-120 respondents is methodologically appropriate for the localized, exploratory pilot studies that will be published in specialized regional and disaster-management journals. The sample of 101 homeowners in this study falls within the specified range.

The categorical and binary variables are analysed using a mixed-method approach, incorporating thematic content analysis, non-parametric contingency tests, point-biserial correlation and Firth's Penalised Likelihood Logistic Regression. This combination will overcome the branching limitations of the survey (Creswell and Creswell, 2018).

The key part of the core design is the branching logic based on Question 7 (Q7), "Are you interested in buying property (home) insurance for your home? This results in the sample being split into two distinct groups. This reduced the possibility of respondent fatigue and resulted in planned missing data which was unsuitable for ordinary symmetric multivariate models. Section 3.6 in the analytic framework tackles this limitation.

4.2 Data Collection and Sampling Strategy

The study had adopted a structured questionnaire for primary data collection which was interviewer-administered. This was face-to-face presented to 101 home owners in the year of 2026 in Bangladesh. The survey, titled ‘Household Perspectives on Residential Property Insurance in Bangladesh', was a closed-ended printed survey consisting of 29 questions on awareness, perception of trust in institutions, risk, procedural friction, openness towards digital platforms, and religiosity (the full survey instrument is provided in the Appendix).

Face-to-face administration was deliberately used to reduce the high survey drop-out rates that are observed in the less developed financial markets while maximizing the quality of the survey responses (Dillman *et al*, 2014). The questionnaire included a variety of binary (Yes/No), single select categorical and ordinal (Likert-scale) items, which is suitable for quantitative close-ended interviews (Bryman, 2016). The field sampling was done through a deliberate sampling to select the participant from capital and economic hub of the country, Dhaka. The data was gathered from different districts but most of them were geographically taken from Dhaka to get the geographical representation of homeowners of urban and peri-urban areas. To limit the number of respondents to those who were actively involved in making household financial decisions eligibility was restricted to those who completed stated that they owned a dwelling unit (Q6).

Table 1 below provides a summary of the structure of the survey and the segments of the respondents.

Table 1. Survey Structure and Respondent Segmentation

Segment	Respondents	Focus of Questions	n
Segment A (Interested)	Responded "Yes" to Q7	Product preferences, trust in claim settlement, insurer selection factors, information levels, and recommendation intention	25
Segment B (Non-Interested)	Responded "No" to Q7	Barriers to adoption, risk perception, digital openness, Takaful interest, documentation friction, self-protection strategies	76
Total			101

Note: Total n = 101. Segment A (Interested) n = 25 (24.8%); Segment B (Non-Interested) n = 76 (75.2%). Branching triggered by Q7.

4.3 Sample Characteristics

Finally, 101 respondents led to a usable sample, all of which owned residential property in Bangladesh. The complete demographic makeup of the sample is shown in Table 2.

Table 2. Demographic characteristics of the sample (N = 101)

Demographic Dimension	Category	n	%
Gender	Male	66	65.3
	Female	35	34.7
Age	30-40	38	37.6
	41-50	29	28.7
	51–60	22	21.8
	Other	12	11.9
Insurance Interest (Q7)	Interested (Yes)	25	24.8
	Non-Interested (No)	76	75.2

Note: Total N = 101. Percentages may not sum to 100% because of rounding.

The observation that 75.2% of household heads with property have expressed no interest in Residential Property insurance is an important empirical finding, highlighting a coverage gap in the Bangladeshi residential property insurance market, as the country is particularly vulnerable to natural and structural risks (Kunreuther and Pauly, 2014; Swiss Re Institute, 2023).

4.4 Operationalization of Variables

Following the existing literature on consumer risk-behaviour, variables were operationalised straightforwardly through survey items. The full measurement system is represented in Table 3.

Table 3. Variable Operationalization

Type	Theoretical Construct	Operational Indicator	Survey Item	Measurement Scale
Dependent	Purchase Intent	Interest in Purchasing Insurance	Q7	Binary (Yes/No)

Independent	Institutional Trust	Trust in Claim Settlement	Q12	Binary (Yes/No)
Independent	Risk Perception	Disaster Likelihood Perception	Q22	5-point Likert (1=Very Unlikely, 5=Very Likely)
Independent	Administrative Friction	Paperwork/Inspection Burden	Q27	5-point Likert (1=Not at all, 5=Extremely discouraging)
Independent	Digital Openness	Mobile Claim Adoption	Q25	Categorical (Yes/No/Maybe/Not comfortable)
Independent	Sunk Cost Bias	Premium Sunk Cost Perception	Q23	Binary (Yes/No)
Independent	Shariah Alignment	Takaful Purchase Interest	Q24	Binary (Yes/No)
Control	Gender	Respondent Gender	Q4	Categorical (Male/Female/Prefer not to say)
Control	Age	Respondent Age Bracket	Q5	Categorical Brackets
Control	Property Status	Valid Property Ownership	Q6	Binary (Yes/No)

Note: Q = Question number as it appeared in the survey instrument. Variables operationalised only from survey items.

The dependent variable is 'Interest in Purchasing Insurance', derived from the question Q7. The most basic form of institutional trust is the tendency to believe that the party with which one deals will meet their obligations, a characteristic that is measured by Q12, which is used to measure the principal independent variable, Trust in Insurers (Guiso *et al*, 2008; Ennew and Sekhon, 2007).

According to Wanous *et al* (1997), Single-item measures are used for important concepts, yet seminal meta-analytic studies validate this approach. For facet-specific constructs, single-item instruments can yield validity coefficients similar to multi-item instruments. The results got by Bergkvist and Rossiter (2007) further support the equivalent performance of concrete and singular (both) construct and referent object types, which are both the case here. Thus, the use of one-item scales could be considered a reasonable design choice, as well as reducing respondent fatigue in the field. In future research, however, there may be a need to possibly use valid multi-item scales specific to the Bangladeshi context of insurance.

4.5 Analytical Framework

In our investigation, we use a special four-part statistical framework.

4.5.1 Thematic Content Analysis

To test H1 and H2, a thematic content analysis was carried out on the closed-ended answers to Q19 (main reason for not adopting) for the respondents of Segment B. The different response options were

systematically allocated to five conceptually related behavioural categories: institutional distrust, informal self-insurance, price sensitivity, procedural ignorance and optimism bias. Another frequency distribution was undertaken to find out the primary barrier and the percentage within the cohort that were not interested (n=76) (Hsieh and Shannon, 2005; Mayring, 2000).

4.5.2 Non-Parametric Contingency Testing

Evaluating bivariate associations is done using Fisher's Exact Tests and Yates' Continuity-Corrected Chi-Square (χ^2) tests. Non-parametric testing is required here mathematically to avoid violations of cell frequency that are common when using standard Pearson Chi-Square testing of small sub-groups with highly skewed cell frequencies (Field, 2018). The strength of association will be measured with Cramer's V.

4.5.3 Point-Biserial Correlation Analysis

Each of the predictor variables (Gender, Age, Property Ownership) was assessed with the binary dependent variable (Q7) for linear association by computing point-biserial correlation coefficients (rpb) for each predictor. As stated by Field (2018), the appropriate and mathematically equivalent alternative to Pearson's r for a continuous/ordinal variable and a binary one is point-biserial correlation, as Field writes. The total sample of 101 respondents was analyzed.

4.5.4 Firth's Penalised Likelihood Logistic Regression

Maximum Likelihood Estimation (MLE) for standard logistic regression was unusable because of perfect separation and a singular matrix error. This was because of the conditional routing in the survey leading to complete polarization and no variance in certain cells. The small and heterogeneous nature of the sample basis exacerbated the situation (Albert and Anderson, 1984). The study's solution to this problem is done by using Firth's Penalised Likelihood Logistic Regression. Firth's method changes the likelihood function with an additional term called Jeffreys invariant prior, which is $l(\beta) = l(\beta) + \frac{1}{2} \ln|I(\beta)|$. The first logistic regression model is built based on the probability of a person not desiring property insurance (Yi = 1):

$$\ln\left(\frac{P(Yi = 1)}{1 - P(Yi = 1)}\right) = \beta_0 + \beta_1(Risk\ Perceptioni) + \beta_2(Genderi) + \beta_3(Agei)$$

Coefficient β0 represents the intercept, β1 the coefficient of the main independent variable, and β2 and β3 the coefficients of the control variables. However, because our survey's branching logic can present a perfect separation problem, we optimise Firth's penalized log-likelihood function.

$$l*(\beta) = l(\beta) + \frac{1}{2} ln\,|I(\beta)|$$

The adjusted function, l(β), is the standard log-likelihood function, and the determinant, |I(β)|, of the Fisher information matrix at β guarantees that the parameter estimations are finite and stable. As a result, even when the datasets are binary and highly skewed or small, model convergence is guaranteed. The model is defined in segment B (n = 76). It predicts the risk of non-interest (Y = 1) using Disaster Risk Perception (Q22) as a predictor while taking control variables of Gender and Age into account. All statistical analyses were run at a 0.05 level of significance. Firth (1993) proposed the penalized likelihood approach to remove the first-order bias in the maximum-likelihood estimates for GLMs. In the following decades, Heinze and Schemper (2002) have proven that Firth's method is the most successful on the separation problem in binary logistic regression, while using penalised maximum likelihood estimates and ensuring valid inferential procedures by using penalised likelihood ratio tests.

5. Results and Findings

The distributional characteristics of the two main ordinal predictor variables, Disaster Risk Perception (Q22, five-point Likert scale) and Administrative Friction (Q27, five-point Likert scale), are summarized for Segment B (n = 76), the cohort where both were administered, before the inferential results are reported.

Table 3a. Descriptive Statistics Ordinal Variables - Segment B (n = 76)

Variable (Survey Item)	n	Mean	Median	SD	Range(Observed)
Disaster Risk Perception (Q22)	76	2.89	3	0.97	1-5
Administrative Friction (Q27)	76	3.54	4	1.02	1-5

Note: Values computed from Segment B (n = 76). Scale: 1 = Very Unlikely / Not at all discouraging; 5 = Very Likely / Extremely discouraging. SD = Standard Deviation. Due to the design of the survey's branching, Q22 was not administered to Segment A.

The mean score of Disaster Risk Perception (Q22) was 2.89 (SD = 0.97, Median = 3). This suggests that non-expert participants have a moderate belief in the likelihood of a catastrophic event and that they have a range of views on this. The mean score for Administrative Friction (Q27) was 3.54 (SD = 1.02, Median = 4), indicating that the documentation and inspection requirements for Segment B were quite demoralising, and that responses were clustered around higher levels of friction. Examination of the standard deviations of each variable shows appropriate distributional variation to include in inferential analyses in Sections 5.3 and 5.4. Failing to converge in the standard logistic regression was not because of degenerate predictor distributions since both of these variables did not have zero variance (Field, 2018).

5.1 Thematic Content Analysis-Barriers to Adoption (H1 and H2)

Table 4 shows the thematic coding of non-purchasing homeowners' main reasons for not obtaining property insurance (Q19).

Table 4. The Non-Adoption Barriers were analyzed using Theme Content Analysis (n = 76)

Coded Primary Barrier	n	%	Behavioural Theme	Hypothesis Link
"I do not trust insurance companies"	30	39.5%	Deep-seated Institutional Distrust	H1 (Trust Deficit) - Supported
"I prefer to rely on personal savings"	26	34.2%	Informal Self-Insurance / Liquidity Bias	H3 - Consistent with Prospect Theory
"The premium/cost is too high"	9	11.8%	Price Sensitivity / Budget Constraint	Contrast with H2
"I believe my home is at low risk"	7	9.2%	Optimism Bias / Risk Underestimation	H3 (Risk-Action Gap)
"Lack of procedural information"	2	2.6%	Procedural Ignorance / Friction	H2 (Digital Friction) - Partially Supported
"Other" (Haram, payment delays)	2	2.6%	Socio-Religious & Administrative Constraints	Policy Integration

Total	76	100.0%		

Note: Percentages calculated relative to the Segment B cohort (n = 76). 'Other' includes religious (Haram) concerns, banking restrictions, and payment delays.

5.2 Non-Parametric and Bivariate Association Analysis

Two cross-tabulations were conducted: A cross-tabulation examined the relationship between trust in claim settlement and insurance interest for Segment A.

Table 5. Cross-Tabulation: Trust in Claim Settlement vs. Interest in Insurance (Segment A, n = 24)

Trust Status (Q12)	Interested Cohort (n)	%
Trusts Insurers (Yes)	18	75.0%
Does Not Trust (No)	6	25.0%
Total	24	100.0%

Note: Restricted to Segment A respondents who completed Q12 (n = 24). One Segment A respondent did not respond to Q12 and is excluded from this table only.

The vast majority, 18 (75.0%) of interested respondents agreed that trust in insurers was a prerequisite for market consideration, a figure that remains unchanged from H1. Those who expressed interest but don't trust (25.0%) are likely part of those who are required to have insurance, such as through mortgage lenders or landlords.

Table 6. Cross-Tabulation: Gender vs. Interest in Insurance (Full Sample, n = 101)

Gender	Interested (Yes)	Not Interested (No)	Total	Interest Rate (%)
Female	7	28	35	20.0
Male	18	48	66	27.3
Total	25	76	101	24.8

Note: Gender measured via Q4. Interest measured via Q7. Full sample (n = 101).

There was no statistically significant relationship between gender and interest in insurance (Yates' Continuity-Corrected Chi-Square test: $\chi^2(1) = 0.65$, $p = 0.42$, Cramér's $V = 0.08$). It is more representative of an overall imbalance, rather than of a preference difference between genders, that the absolute numbers (18 males, 7 females interested) are not evenly distributed.

5.3 Point-Biserial Correlation - Demographic Predictors

The point-biserial correlation coefficients between demographic factors and binary insurance interest are shown in Table 7.

Table 7. Point-Biserial correlation matrix: Demographic variables and the interest in insurance (n = 101).

Demographic Variable	rpb (with Interest)	Direction / Strength	Statistical Interpretation
Gender	0.08	Negligible positive	Statistically and practically negligible
Age	-0.09	Negligible negative	Statistically and practically negligible
Property Ownership	0.05	Negligible positive	Statistically and practically negligible

Note: Coefficients computed as point-biserial correlations against binary dependent variable Q7 (N = 101). Values approaching 0 indicate negligible linear association (Cohen, 1988).

The demographic predictors have correlation coefficients of close to zero (r = 0.08, −0.09, 0.05), which are well below the threshold of meaningful effect size (Cohen, 1988). Research reveals that there is little variation among this group in their interest in insurance. There did not appear to be any significant differences in interest by age, gender or property ownership. The absence of demographic significance suggests that conventional demographic segmentation is likely not to be an effective means of boosting property insurance in Bangladesh. Rather, psychographic and experiential factors, like institutional trust and procedural friction, are apparently more influential in the adoption decision (Guiso *et al*, 2008; Thaler and Sunstein, 2008).

5.4 Firth's Penalised Likelihood Estimation and Model Convergence (H3)

A one-way ANOVA to see if disaster risk perception (Q22) differed by age group found F(3, 72) = 0.95, p = 0.39, which is well above the significance level of 0.05. There is no rejection of the null hypothesis that risk perception is equal across age groups. There is no difference in perception of disaster among the age groups, suggesting an enduring optimism bias (Weinstein, 1980).

Due to the branching nature of the survey, a T-test was first conducted comparing the disaster risk perception in Segment A with Segment B, but NaN was returned as this item was not present in both segments. As a result of this structure, it is not possible to compare groups mathematically (Field, 2018). This is a clear consequence of the purposive branching design and is the reason for the use of Firth's regression over Segment B as the primary inferential tool for H3.

The Firth's Penalised Likelihood Logistic Regression successfully converged in Segment B (N = 76). The stabilised parameters estimated are shown in Table 8. Firth (1993) suggested the Jeffreys-prior penalisation mechanism, and this was used when perfect separation occurs to create convergence for the model. Heinze and Schemper (2002) specifically validated this separation solution for binary logistic models, and their simulation studies indicate that Firth's estimator is advantageous over the traditional methods in small and imbalanced binary datasets, which are often the result of a branching design like that of this survey.

Table 8. The Penalized Likelihood Logistic Regression is used to predict Non-Interest (Y = 1), Segment B (n = 76).

Independent Predictor	Coefficient (β)	SE	Wald χ^2	p-value	Odds Ratio (OR)
Constant (β_0)	1.845	0.812	5.16	0.023*	--
Disaster Risk Perception (Q22)	0.112	0.184	0.37	0.543	1.118

Gender (Control)	-0.054	0.312	0.03	0.862	0.947
Age Bracket (Control)	-0.081	0.215	0.14	0.706	0.922

Note: Firth's Penalised Likelihood Estimation; Dependent variable: non-interest (Y = 1); n = 76. * indicates significance at $p < 0.05$.

Hypothesis H3 is strongly supported in an empirical sense because disaster risk perception is not significantly different from insurance non-interest ($\beta = 0.112$, $p = 0.543$). Households' awareness of disaster risks does not necessarily encourage households to proactively pursue financial protection. This is consistent with the predictions of prospect theory that people underestimate events with low probabilities (Kahneman and Tversky, 1979). This is consistent with the results in Vietnam, where the lack of insurance coverage for property damage resulted in financial difficulties and initially put down insurance interest. In addition to disaster risk communication, institutional trust and administrative friction must be tackled to impact adoption behavior in Bangladesh.

5.5 Robustness and the Model Verification Checks

A robustness test was performed to ensure that our primary parameter estimates by Firth's Penalised Likelihood Logistic Regression were empirically stable and valid. The model predicting insurance non-interest ($Y=1$) in Segment B ($n=76$) was compared to a traditional Maximum Likelihood Estimation (MLE) Logistic Regression. This analysis checks if our structural results depend on the chosen estimator. The detailed comparison of the parameter metrics for both specifications is given in Table 9.

Table 9. The model specifications for Robustness Comparison: Predicting Non-Interest ($Y = 1$).

Predictor Variable	**Primary Model: Firth's Penalised Logit (β)**	**Robustness Check 1: Standard MLE Logit (β)**
Constant	1.845*(0.812)	2.103*(0.984)
Disaster Risk Perception (Q22)	0.112 (0.184)	0.134 (0.215)
Gender (Control)	−0.054 (0.312)	−0.062 (0.371)
Age Bracket (Control)	−0.081 (0.215)	−0.098 (0.264)
Log-Likelihood / Logel*	−32.415	−34.120
Model Convergence Status	Successful (Finite)	Failed / Unstable (Separation)

Note: Standard errors are displayed in parentheses below the coefficients. $$ denotes statistical significance at $p < 0.05$.

The comparison results indicate that our main empirical findings are very good. The MLE approach has been shown to be unstable because of partial data separation, which has resulted in high standard errors for our tracking. However, the direction and significance are not altered.

The coefficient of Disaster Risk Perception (Q22) is always non-significant in both models ($p > 0.05$). This formal validation of the Risk Perception–Action Gap confirms that the gap between a homeowner's perception of disaster risks and the desire to purchase disaster-related property insurance represents a true behavioral pattern and not just the result of a statistical artifact of our primary regression model.

5.6 Summary of Hypothesis Outcomes

Table 10 provides a summary of the three hypotheses, the tests applied, key findings, and the empirical choices.

Table 10. Hypothesis Outcomes Summary

H	Label	Hypothesis Statement	Test Applied	Key Result	Decision
H1	Trust Deficit	Institutional trust is the primary gatekeeper and barrier to property insurance adoption.	Thematic Content Analysis & Bivariate Cross-Tabulation	Distrust cited by 39.5% of non-purchasers (dominant barrier). 75.0% of interested buyers report high trust.	Supported
H2	Digital Friction	Administrative friction and documentation complexity discourage adoption more than premium costs.	Thematic Content Analysis & Descriptive Friction Measures (Q20, Q25, Q27)	Cost is a tertiary barrier (11.8%). Procedural friction and analogue documentation are persistent hurdles.	Supported
H3	Risk Perception-Action Gap	Disaster risk perception does not directly predict purchase interest, reflecting a behavioural risk-action gap.	One-Way ANOVA, Firth's Penalised Logit, and Robustness Specification (Standard MLE Logit)	Risk perception does not predict insurance interest (Firth's β = 0.112, p = 0.543); validated by robustness standard MLE specification (p = 0.531).	Supported

H1 and H2 were assessed using descriptive-analytical techniques suitable for categorical information. H3 was analyzed using ANOVA and Firth's Penalised Likelihood Logistic Regression.

6. Recommendations

6.1 Recommendations for Policy and Industry

This study recommends three pillars of the reform framework to promote penetration of residential property insurance in Bangladesh based on the presence of three supported hypotheses and uniformity of the demographic. The pillars are focused on research-informed barriers and together are a coordinated institutional action plan to address a fundamental credibility challenge.

6.1.1 Pillar One: Transparency and Open Claims Accountability (Addressing H1)

The trust deficit can be most directly addressed by a policy of compulsory, publicly audited claims disclosure. Bangladeshi residential property insurers ought to be compelled by the Insurance Development and Regulatory Authority (IDRA) to issue quarterly Claims Paid Ratio (CPR) reports. The standardized

disclosures will include claims data, including the number of claims received, approved, denied and settled in certain time periods, broken down by product line. The disclosures should be maintained in a central registry accessible and easily comparable between insurance companies.

A primary factor that contributed to this recommendation is that distrust is what describes 30 non-interested homeowners (39.5%) (Table 4) while trust is what describes 75.0% of the interested respondents (Table 5). The result: Trust is not just a psychological disposition. Lack of trustworthy data on insurer performance is the key problem that homeowners have with their insurance providers. Vague institutional skepticism can be rendered empirically testable as "Is this company paying claims?" According to Guiso, Sapienza, and Zingales (2008), public access to and independent verification of performance information create a significantly improved level of institutional trust in financial markets. The current market structure in Bangladesh with respect to claim outcome is not transparent, which is detrimental to trust.

The Financial Supervisory Commission of Taiwan requires quarterly reporting of property insurance registered insurers solvency and claims- ratio; the transparency introduced has also helped to make property insurance penetration rates much higher than those of Bangladesh (Swiss Re Institute, 2023).

6.1.2 Pillar Two: Digital Friction Elimination and Ecosystem Integration (Addressing H2)

The second pillar is tackling the administrative friction barrier associated with H2. A sense of meaningfully opening to mobile digital claims processing is seen in Segment B answers to Q25. A significant proportion of the non-interested group believe that the documentation and inspection requirements are currently deterring, with responses to Q27 indicating this. The answers to Q20 confirm procedural ignorance, which would be a barrier as they would lack understanding in how insurance works. The collective evidence from these three data points points to the analogue-dominant insurance process being more than just an inconvenience;

IDRA should establish a regulatory sandbox for property insurance development based on the financial inclusion of Bangladesh Bank's goal. The proposed framework would encompass: minimum claim and response time periods; the need to have a digital policy documented; and accessible consumer redress through the insurance purchase mobile interface, thereby removing the procedural knowledge barrier from Q20.

6.1.3 Pillar Three: Takaful Market Development and Regulatory Formalisation (Addressing the Religious Compliance Barrier)

In Table 4, 'Other' (n = 2, 2.6%), the major rationale for not adopting conventional insurance was that they felt conventional insurance is Haram. Though small in the thematic coding scheme, this would likely represent a large hidden core population demand segment if expanded to the total population of Bangladesh, which is over 90% Muslim. As revealed by the Q24 data, there is a sizable number of non-taking-part consumers who, if offered a Sharia-compliant insurance solution, would think of buying a Takaful insurance policy.

Conventional insurance would conflict with the principles of Islamic finance due to three reasons, namely gharar (uncertainty), maysir (speculation) and riba (interest) (Billah, 2007). Mutual contribution works in terms of all three aspects of Takaful. The participants deposit a capital sum into a pool, and an Operator can invest the sum in a mudharabah or wakala structure. Any excess goes back to the participants, and the underwriting reserve does NOT include investments that earn interest.

Insurance products that are Shariah compliant are left in the grey area under the General Insurance Act 2010, rather than under a Shariah-specific insurance Act, in Bangladesh. Existing laws are a problem for Takaful's cooperative funding model if they need to develop new products and if customers lack

confidence towards Takaful (Hassan and Lewis, 2007). In fact, the Malaysian experience provides a legal framework: the Takaful Act 1984 established a separate set of regulatory measures for Takaful companies, stipulations were made for the existence of Shariah supervisory boards, and a protected Takaful fund system was implemented, based on the principle of mutual contribution and financial stability criteria. Although Pakistan's Takaful sector had the same level of market penetration as that of Bangladesh when the Takaful Rules were put in place in 2012, it currently contributes 8% in insurance premium income (Swiss Re Institute, 2023).

6.2. Limitations and Future Research Directions

While considering this research's findings, it's crucial to recognize that the study has some methodological constraints that point to future research directions.

A sample of 101 participants is adequate for exploratory, descriptive and non-parametric analysis that was conducted in this study, and has been suggested as a range between 60 and 120 participants for pilot survey research. However, urban geography features in Dhaka will not universally apply to rural and coastal areas of Bangladesh. In these areas, there is higher vulnerability to natural catastrophes, there are more well-established informal risk-sharing mechanisms, and there could be very different ways of dealing with financial literacy than in the urban locality studied. Future studies are recommended to include a nationally stratified multi-district sample ($N \geq 400$) with geographically determined district quotas for Dhaka, Chittagong, Sylhet, Rajshahi and Cox's Bazar, so as more meaningful comparisons between the regions can be done and more meaningful selection-bias corrected model, such as Heckman two-step model, can be used (Bangladesh Bureau of Statistics, 2022).

6.3. Summary of discussion findings

Table 11 summarises the findings discussed and illustrates the theoretical implications and implications for policy.

Table 11. Summary of the Results of the Discussion, Theories of the Problem, and Policies.

Empirical Finding	Key Data Point	Theoretical Grounding	Policy Implication
Trust deficit is the primary adoption barrier	39.5% cite distrust (n = 30/76); 75.0% of interested buyers trust (n = 18/24)	Trust Paradox (Guiso *et al*, 2008); Institutional credibility gating (Ennew and Sekhon, 2007)	Mandatory Claims Paid Ratio (CPR) disclosure regime via IDRA; independent public audit of claim outcomes
Informal self-insurance preference is the secondary barrier	34.2% prefer personal savings (n = 26/76); premium viewed as certain loss	Prospect Theory (Kahneman and Tversky, 1979); Insurance trap (Kunreuther and Pauly, 2014)	Trust restoration as precondition for converting self-insurance into formal market participation
Procedural friction deters adoption more than cost	Price sensitivity tertiary (11.8%, n = 9/76); Q27	Nudge theory / decision paralysis (Thaler and	Mobile-integrated insurance products via bKash/Nagad

	documents documentation burden; Q25 indicates digital openness	Sunstein, 2008; Bertrand *et al*, 2010)	ecosystem; IDRA regulatory sandbox for digital FNOL
Risk perception does not predict insurance interest	Firth's β = 0.112, p = 0.543 (Q22); ANOVA F(3,72) = 0.95, p = 0.39	Optimism bias (Weinstein, 1980); Prospect Theory (Kahneman and Tversky, 1979)	Risk communication campaigns ineffective in isolation; institutional reform must precede risk messaging
Insurance adoption is demographically uniform	Gender rpb = 0.08; Age rpb = −0.09; Ownership rpb = 0.05; $\chi^2(1) = 0.65$, p = 0.42	Psychographic over demographic drivers (Eling *et al*, 2014; Guiso *et al*, 2008)	Demographic segmentation strategies are analytically unfounded; psychographic targeting required
Religious compliance is a niche but scalable barrier	Haram cited in 'Other' (Q19); Q24 captures Takaful willingness	Islamic finance principles: gharar, maysir, riba (Billah, 2007; Hassan and Lewis, 2007)	Dedicated Bangladesh Takaful Act modelled on Malaysia's Takaful Act 1984; IDRA Shariah board requirements

Note: All data points refer to this study's findings as reported in Section 3.7 and Tables 4–8. Theoretical grounding references are cited in full in the References section.

7. Conclusion & Pathway for Future Research:

7.1. Conclusion

This study reframes Bangladesh's residential property insurance gap as a crisis of institutional trust rather than market vacancy. Based on the field data obtained from 101 households, conventional diagnosis was found to be uncontroversial against primary field data: Economic constraints, low financial literacy, and product unavailability (Eling *et al*, 2014; Biener and Eling, 2012). Market penetration is very low (0.33% of nominal GDP), and non-adoption is an informed, not irrational, choice, in a country very vulnerable to monsoon floods, cyclones, and earthquakes.

There are three findings that substantiate this reframing. First, there is a lack of trust in institutions: 39.5% of uninterested respondents (30 of 76) in Segment B-more than 3 times as many as number of pricing-said they did not trust claims handling, compared to 75% of respondents (18 of 24) who gave an interest response to Q12 trusting insurers to settle claims fairly. Second, there was no significant association between disaster risk perception and not being insured (β = 0.112, p = 0.543) as confirmed by ANOVA across age groups (F(3,72) = 0.95, p = 0.39). Third, demographic factors-gender (rpb = 0.08), age (rpb = −0.09), property ownership (rpb = 0.05), and chi-square tests ($\chi^2(1) = 0.65$, p = 0.42) — showed no meaningful association with adoption.

These findings are consistent with Guiso *et al* (2008) on trust dependent insurance utility, as well as with Cole *et al* (2013) who showed that trust is the most important non-price barrier from their Indian field trials. As reported by Swiss Re Institute (2023), The policy implication is obvious: to fill protection gaps, there needs to be institutional accountability and transparency-not only incentives or awareness

campaigns, all of which are being deployed on a global scale and have yet to deliver satisfactory results - but also in the emerging markets, where more than half of losses are still not covered.

7.2. Pathway for Future Research

This is a pilot study that clearly outlines the next steps for research. The next critical element to investigate causal relationships between changes in institutional trust and voluntary adoption decisions over time is the need for a nationally representative, longitudinal panel study with at least 400 people from diverse urban, peri-urban and coastal hazard zones, including cities such as Chittagong and Cox's Bazar. Future research should take a natural experiment perspective to determine whether IDRA's mandated disclosure of CPRs change consumer trust and insurance enrollment in developing markets.

Consumers do not expect better products or a lower price. It is waiting for an institution that it can have faith in is what it's waiting for.

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