

Mutual Risk Sharing and Fintech: The Case of Xiang Hu Bao

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Abstract

Xiang Hu Bao (*XHB*), meaning ‘mutual treasure’ in Chinese, is a novel online mutual aid platform operated by Alibaba’s Ant Financial to facilitate mutual sharing of critical illness risks. *XHB* reached nearly 100 million members in less than one year since its launch and so far has offered its members critical illness protections at significantly lower cost than traditional critical illness insurance. There are three major distinctions between *XHB* and traditional insurance products. First, *XHB* leverages the tech giant’s platform and digital technology to lower enrollment and claim processing costs. Second, different from insurance applying sophisticated actuarial pricing models, *XHB* collects no premiums ex ante from members, but instead equally allocates indemnities and administrative costs among participants during each claims period. Third, *XHB* limits coverage amount, often below that offered by critical illness insurance products, particularly for older participants. We show this restriction potentially leads to separating equilibrium, à la Rothschild-Stiglitz, where low-risk individuals enroll in *XHB* while high-risk individuals purchase the traditional critical illness insurance. Data shows that the incidence rate of the covered illnesses among *XHB* members is well below that of comparable critical illness insurance. Our findings further suggest the role of advantageous selection in explaining the cost advantages of the Fintech-based mutual aid programs.

Motivation

A cornerstone of insurance is pooling/diversification. Mutuality principle (Borch, 1962)

- Optimal for participants to voluntarily share idiosyncratic risks (mutual risk sharing)
- Market risks are allocated among participants based on risk tolerance

In reality, mutual risk sharing is largely missing. Insurance companies play a central role in pooling the risks, setting the premiums for policyholders with a goal to maximize their own value (Marshall, 1974).

- Opaque and high premium

Development of Fintech makes decentralized mutual risk sharing possible.

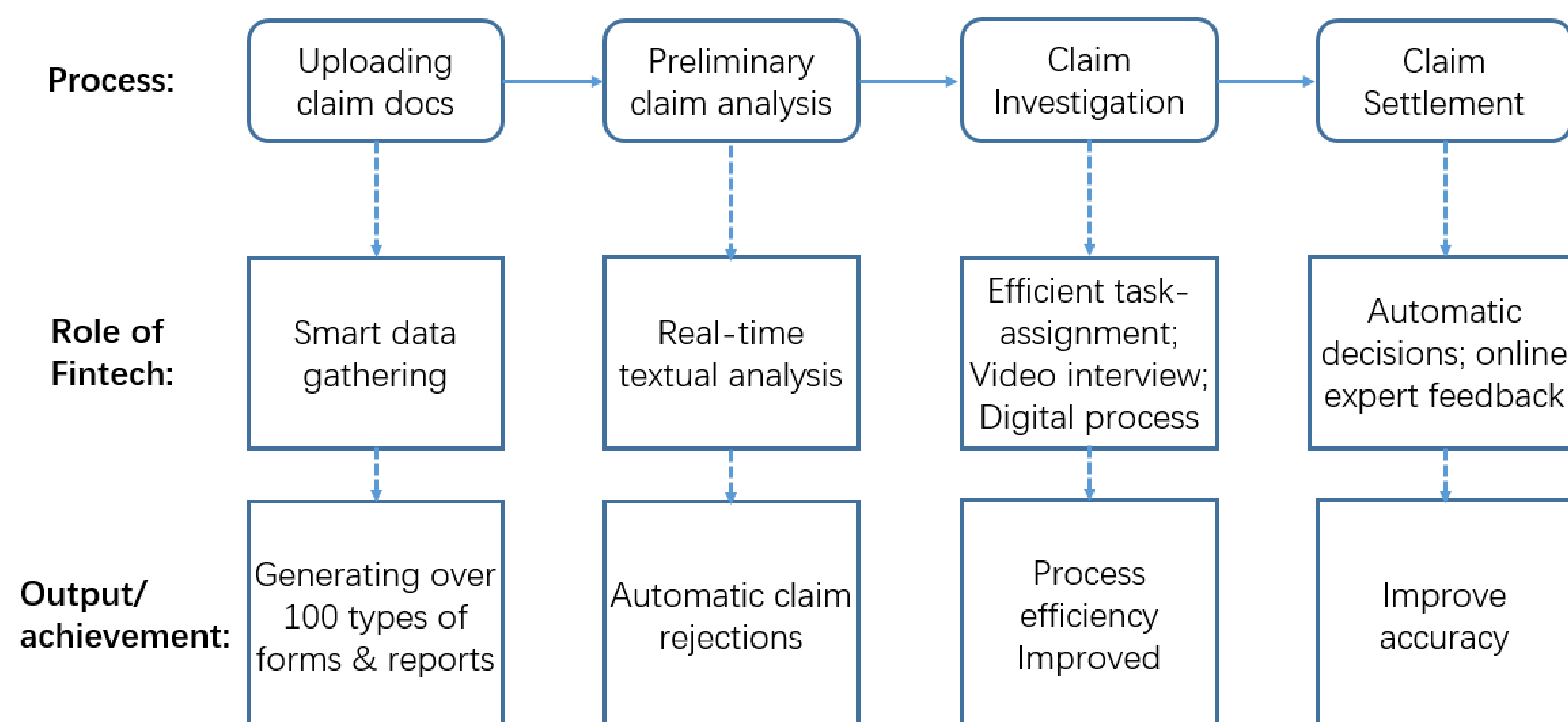
Mutual Aid and XHB

Among known “Mutual Aid” platforms, XHB is largest

- Launched in late 2018
- Providing indemnity payments to members
- Covering over 100 critical illness
- RMB 300,000 for members below 40 (“Young”)
- RMB 100,000 for members 40-60 (“Middle-aged”)
- Had 100 million participants in 2019/01
- To be closed on Jan. 28, 2022

Replaced by government-sponsored supplementary medical insurance

Fintech and XHB Claim Process



An Illustrative Model

Let us write p_x as the average incidence rate of the covered critical illnesses for *XHB* members, K as the indemnity amount, λ_x as *XHB*’s loading factor (currently, 8%), then we have the per member cost sharing, denoted by π_x , as:

$$\pi_x = p_x K (1 + \lambda_x) \quad (1)$$

Similarly, the premium π_i for the traditional CII with the same indemnity coverage K is

$$\pi_i = p_i K (1 + \lambda_i) \quad (2)$$

where λ_i is the loading factor for traditional insurance.

$\Delta\pi = \pi_x - \pi_i$ can be decomposed as:

$$\Delta\pi = [p_x - p_i]K(1 + \lambda_x) \quad (\text{IR difference})$$

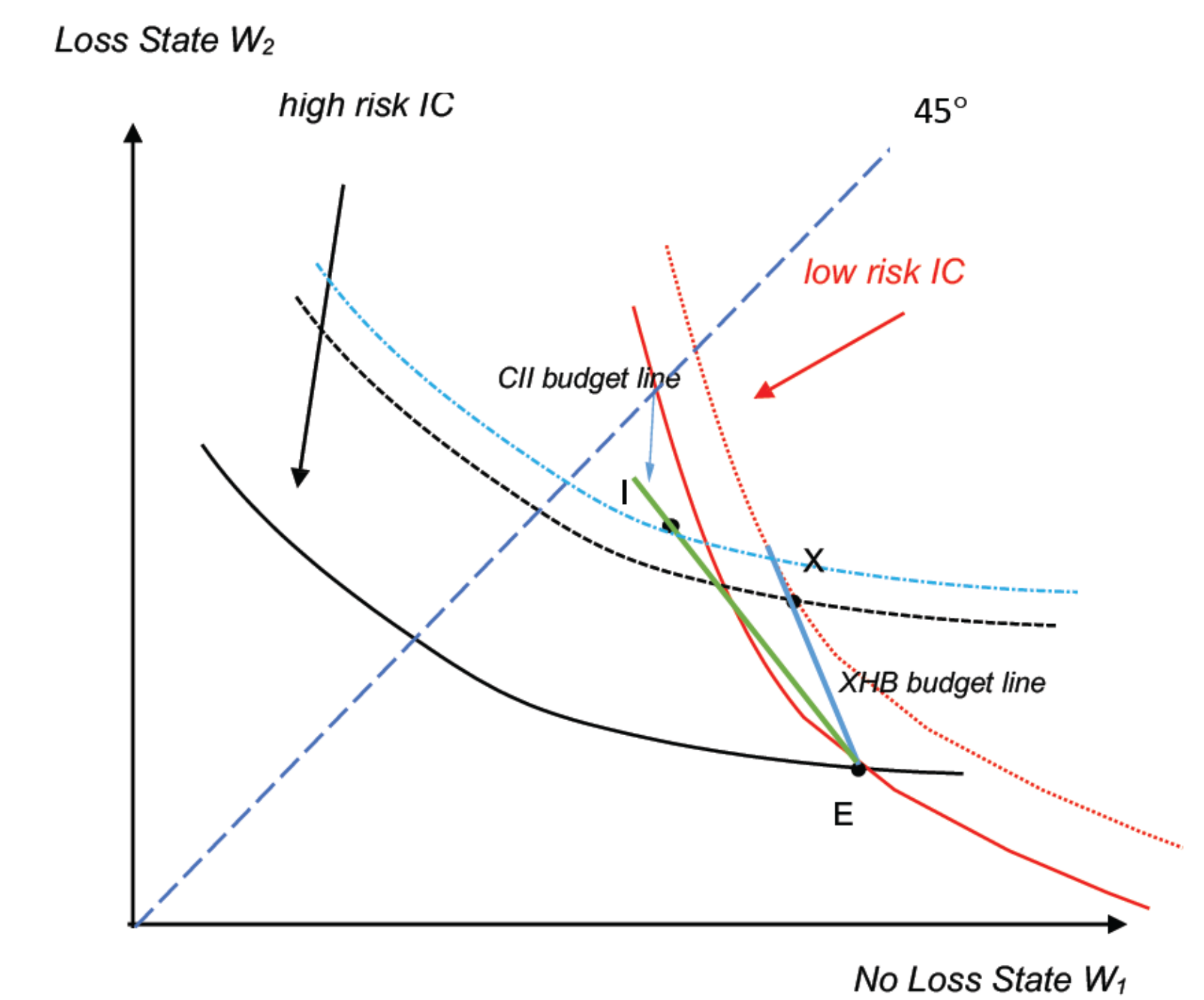
$$+ p_i K (\lambda_x - \lambda_i) \quad (\text{Loading difference})$$

Role of the Coverage Gap: CII vs. XHB

Separating Equilibrium: XHB vs CII

Proposition: Choice between XHB and CII
Given different coverages of mutual protection and insurance, individuals with high risk (private information) choose CII and individuals with low risk choose XHB

Advantageous selections: Participants are heterogeneous. Less risk averse individuals, high incomers, and people not purchasing insurance are more likely to have mutual aid.



Data

XHB Data Sets

Proprietary data: XHB’s total number of participants in each two week period from January 2019 to April 2021.

For two periods (2020 January #1 and 2021 November #1): number of enrolled participants by six age groups: 0-9; 10-19; 20-29; 30-39; 40-49; and 50-59.

Claims Data: manually collected from XHB’s public announcement bulletin, detailed information of each approved claim during the period from January 2019 to December 2020.

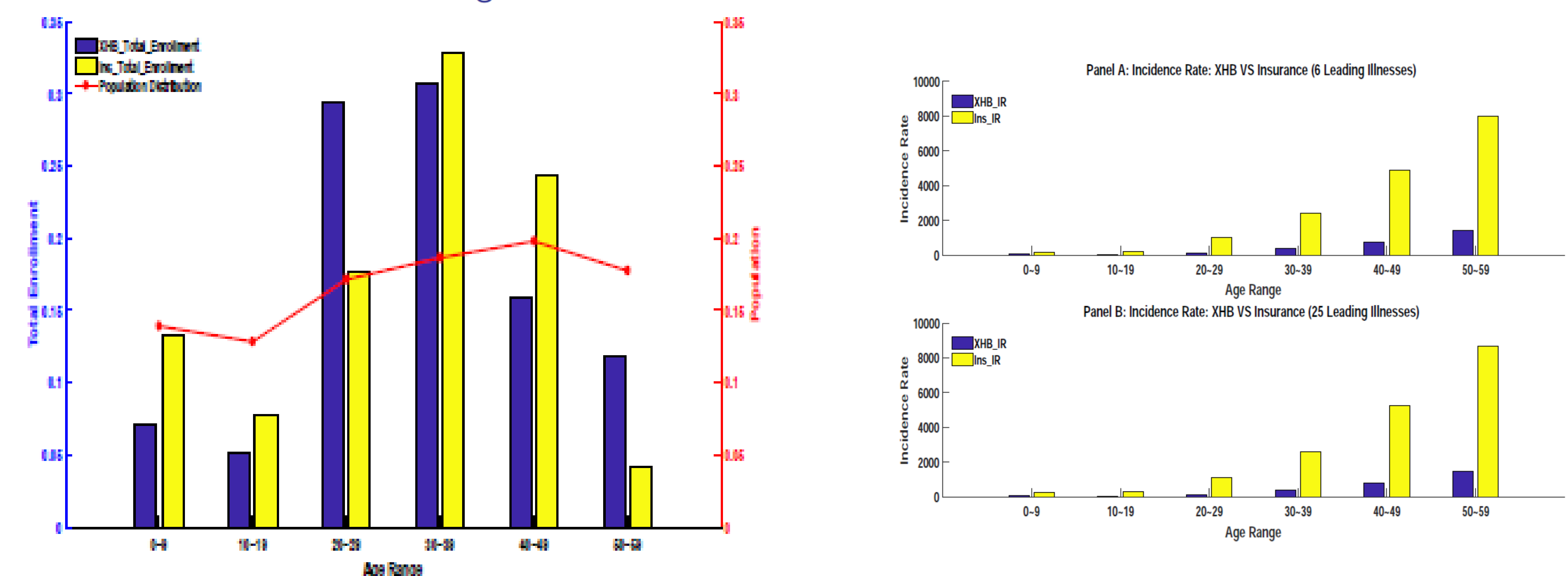
- payment date, claimant’s name, city of residence, age, gender;
- covered critical illness (including identifiers for mild critical illnesses), indemnity amount, and number of participants who share the costs.

CAA Incidence Rate Data (2020): Participation and claims of CII come from the 2020 Historical Critical Illness Incidence Rate Table report published by the China Association of Actuaries (CAA). The table reports the incidence rates separately for, by age:

- 6 leading critical illnesses; 25 leading critical illnesses.

Empirical Evidence

Enrollment Distribution across Ages: XHB vs. CII Incidence Rates across Age Groups: XHB vs. CII



Age Gradient of Incidence Rate and Cost Sharing

	XHB			CII		CII/XHB	
	IR6	IR25	IR100	IR6	IR25	IR6	IR25
0-39	233	244	283	1183	1300	5.08	5.32
40-59	1055	1091	1200	6167	6656	5.85	6.10
40-59/0-39	4.53	4.47	4.24	5.21	5.12		

Note: IR is measured by number of cases per million.

Conclusion Remarks

Fintech makes mutual risk sharing possible;
Mutual risk sharing such *XHB* are different from traditional insurance

- Ex-post cost sharing; Low coverage.
- It may generate risk externalities for traditional CII;
- It can be more efficient risk sharing arrangement than traditional insurance.
- Broad Fintech applications