

LIFE INSURANCE DEMAND AND BORROWING CONSTRAINTS

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Motivation

- **The literature** agrees that financial development supports life insurance development:
 - Supply-driven explanations
 - Too aggregate proxies
- However, financial development affects **saving rate through relaxation of borrowing constraints**
- Relaxation of borrowing constraints reduces the households' needs to save
- The access to credit for firms is less restricted to the one for households
- The life insurance is not only risk hedging instrument, but also saving/investment instrument (88% of global life premium written belongs to traditional life savings products (Swiss Re, 2019))

Aim and Contributions

- **Purpose:** to investigate empirically whether the differences in life insurance consumption are attributed to the different levels of borrowing constraints across countries
- **Contributions:**
 - first empirical study testing the relationship between borrowing constraints and life insurance demand
 - demand-driven explanation between financial development and life insurance development
 - implications on four other venues (life insurance and interest rates, lapse, policy loans demand, savings under liquidity constraints)
 - to policymakers: the expansion of credit limits the savings through life insurance
 - to life insurers: the evolvement of credit markets may affect lapse rates

Background: Borrowing Constraints and Savings

- Theoretical reasoning of Jappelli and Pagano (1994):
 - **Constrained case:** the young generation is assumed to be constrained to borrow the desired amount to finance current consumption
 - **Unconstrained case:** the young generation finances their consumption up to their discounted lifetime income and, when middle-aged, repays the loan and save for retirement
- The constrained economy: higher savings for young and middle-aged generation → higher aggregate net wealth → higher capital level stock → higher steady-state growth and saving rate in the next period

Hypothesis

- Why would borrowing constrained household hold life insurance?
 - Embedded options (surrender and policy loans) make life insurance relatively liquid saving instrument (88% of whole life policies lapsed)
 - Policyholders lapse when liquidity shock occurs (precautionary motive)
 - Policy loans used for current consumption
 - Constrained households have higher future net wealth (due to less borrowings) comparing to the unconstrained ones and better position to save for retirement by purchasing **life annuities**
- H1: Borrowing constraints positively affect life insurance demand

| | | |
|---|--|---|
| Basic Model (Beck and Webb, 2003) | $LIP = f(\text{income, dependency, mortality, inflation, risk aversion, borrowing constraints})$ | |
| Dependent variable | Life insurance premiums as a % of GDP (Swiss Re) | |
| Sample (4-year averages) | Annual data – 55 countries – (2000-2016) | Annual data – 42 countries – (1980 – 2017) |
| Borrowing constraints proxies | Average LTV ratio (Alam et al., 2019) | Household credit to GDP ratio (Bank for International Settlements) |
| Econometric techniques | Fixed and random effects panel data regressions | Dynamic generalized method of moments two step estimator as suggested in Roodman (2009) |

Key Results FE/RE Panel Data (1/2)

| Model | Basic | Basic + FDI | Basic + Non-household credit | Basic + Financial market | Basic + Urbanization | Basic + Female labor participation | Basic + Social security | Basic + Interest rate | Basic + rule of law |
|---------------------|----------|-------------|------------------------------|--------------------------|----------------------|------------------------------------|-------------------------|-----------------------|---------------------|
| LTV ratio | -0.016** | -0.015** | -0.017** | -0.016** | -0.014** | -0.017** | -0.010 | -0.012 | -0.018*** |
| t-statistic | (-2.363) | (-2.196) | (-2.004) | (-2.350) | (-2.152) | (-2.421) | (-1.518) | (-1.491) | (-2.677) |
| Observations | 257 | 257 | 195 | 257 | 257 | 254 | 189 | 162 | 257 |
| Number of economies | 55 | 55 | 42 | 55 | 55 | 55 | 41 | 44 | 55 |
| Estimation method | FE | FE | RE | FE | RE | FE | FE | FE | FE |
| Wald test (p-value) | | | 0 | | 0.0146 | | | | |
| F-test (p-value) | 0.0206 | 0.0141 | | 0.0358 | | 0.0213 | 0.0919 | 0.0015 | 0.0101 |

Notes: FE – fixed effects; RE – random effects; t-statistics (FE) and z-statistics (RE) in brackets; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Key Results GMM Two Step Estimator (2/2)

| Model | Basic + LIP lag | Basic + LIP lag + FDI | Basic + LIP lag + Non- household credit | Basic + LIP lag + Financial market | Basic + LIP lag + Urbanization | Basic + LIP lag + Female labor participation | Basic + LIP lag + Social security | Basic + LIP lag + Interest rate | Basic + LIP lag + rule of law |
|-------------------------------|--------------------|--------------------------|--|---|--------------------------------------|---|---|---------------------------------------|-------------------------------------|
| Household credit to GDP | -0.013* | -0.015* | -0.013* | -0.017* | -0.016** | -0.016* | -0.012 | -0.015* | -0.009 |
| t-statistic | (-1.898) | (-1.723) | (-1.990) | (-1.942) | (-2.223) | (-2.001) | (-0.705) | (-1.803) | (-0.976) |
| Observations | 258 | 258 | 258 | 258 | 258 | 256 | 180 | 176 | 189 |
| Number of economies | 42 | 42 | 42 | 42 | 42 | 42 | 29 | 35 | 42 |
| AR(1) p- value | 0.029 | 0.026 | 0.034 | 0.032 | 0.034 | 0.033 | 0.152 | 0.361 | 0.04 |
| AR(2) p- value | 0.015 | 0.018 | 0.018 | 0.017 | 0.015 | 0.016 | 0.009 | 0.038 | 0.056 |
| AR(3) p- value | 0.579 | 0.567 | 0.566 | 0.567 | 0.509 | 0.572 | 0.993 | 0.254 | 0.708 |
| Sargan test (p-value) | 0.160 | 0.0870 | 0.146 | 0.131 | 0.243 | 0.219 | 0.0894 | 0.0489 | 0.0200 |

Notes: t-statistics in brackets computed with corrected standard errors according to Windmeijer (2005); time dummies included; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Conclusions and Implications

- Alternative demand-driven channel (borrowing constraints) through which financial development affects life insurance development
- Insignificance of interest rates – precautionary savings
- Interest rate hypothesis in the lapse literature – arbitrage or tight credit?
- Support for the alternative funds hypothesis in the policy loans literature
- Liquidity constraints are still binding
- Evidence that the predominance of banking sector may curb life insurance demand
- Life insurance as a financing tool for constrained households

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