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IBA Karachi

12 December 2013

Online at <https://mpra.ub.uni-muenchen.de/53805/>

MPRA Paper No. 53805, posted 20 Feb 2014 12:46 UTC

Micro Foundations of Savings Behavior in Urban Pakistan

Salman Ahmed Shaikh¹

Abstract

Savings rate in Pakistan is one of the lowest in the regional countries. As a result, investment to GDP ratio has been dismally low as well. Low investment results in low capital formation and hence lower long term growth and hence low levels of development. The long term growth literature from Harrod (1939)-Domer (1946), Solow (1956) to Romer (1986) is almost unanimous on the role of savings in long term economic growth. There have been studies in past on the macroeconomic determinants of savings in Pakistan. But, few studies have explored micro foundations of savings behavior in Pakistan. This study uses primary data collected through survey questionnaire to study the micro foundations of savings behavior in urban areas of Pakistan. We use descriptive as well as inferential tools for our study. We use LPM, Logit and Probit models to explore the determinants of investment and precautionary motive for savings.

Keywords Savings, Intertemporal Consumption, Savings Motive, Investments, Rational Expectations, Asset Markets

JEL Codes G11, G21, G23, J22

1. Introduction

1.1. Brief Background

Pakistan is a country with one of the lowest savings and investment ratio in the vicinity of 12%-16% over the past several decades. Marginal Propensity to Save (MPS) using macro data is approximately 0.20 over the past 65 years. In Figure 1, we provide data on national savings rate, private savings rate and public savings rate. It can be seen that private savings constitute almost 90% of the national savings. On the other hand, public savings share in national savings had been negligible. Vincelette (2006) also noted that private savings accounts for 90% of the total savings in Pakistan in the period 1981-2005.

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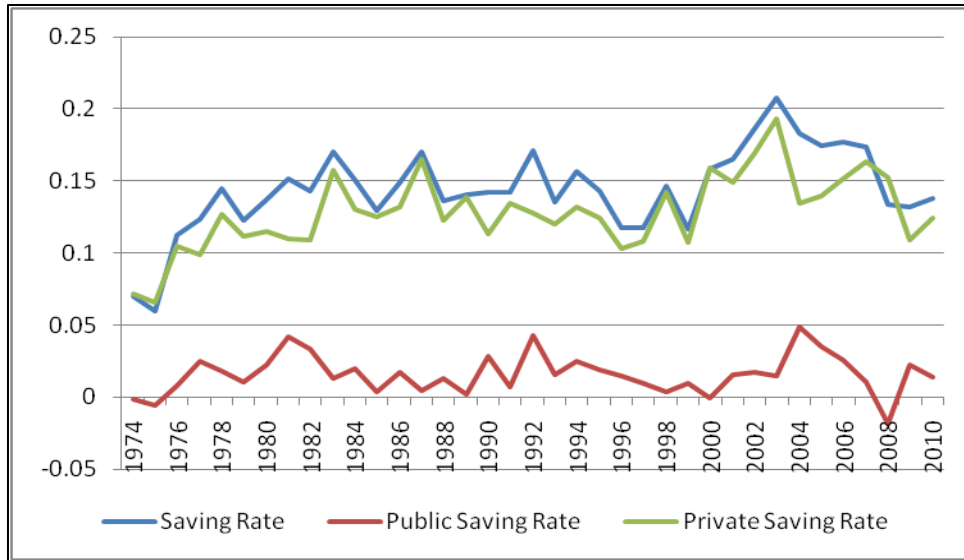


Figure 1: National Savings, Private Savings & Public Savings Rate (in proportion)

As a result, Pakistan has one of the lowest investments to GDP ratio in the world. Figure 2 provides a comparison of investment to GDP ratio in Pakistan as compared to the regional countries. One of the prime reasons of low investment to GDP ratio include the high cost of doing business which includes i) high taxes in the formal sector, ii) supply side bottlenecks, iii) weak security, iv) weak legal system and enforcement etc.

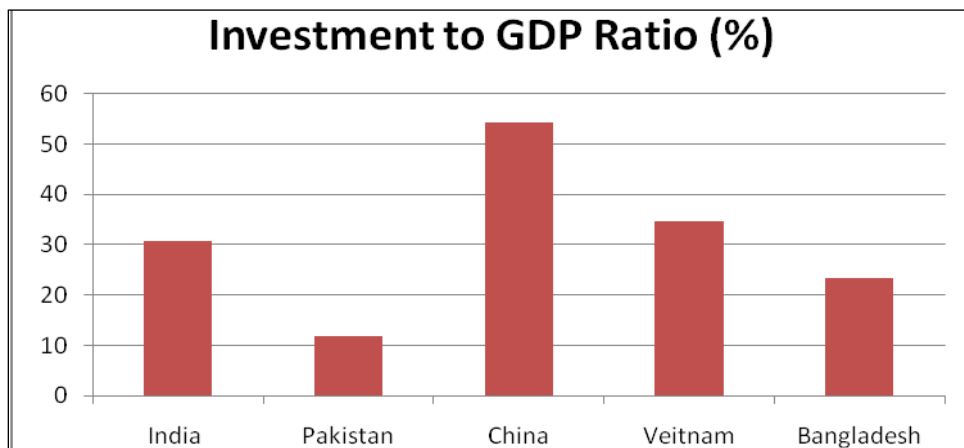


Figure 2: Investment to GDP Ratio (%)

Hence, it is important to know the savings behavior in Pakistan and see whether low savings ratio is reason of low demand because of low incomes or is a result of supply side factors like underdeveloped financial markets and ineffective financial intermediation. China and other developing countries with low per capita incomes and high savings ratio point to the fact that income alone is not a sole determinant of the level of savings. Hence, there is a case for studying savings behavior.

It can be seen while going through the literature on Pakistan that there have been several studies in past on the topic, but very few are based on primary data at the micro level. This becomes more important when we consider the fact that the consumption time series in Pakistan is an estimated series and computed as a residual. Hence, it is pertinent to use micro data in a primary research to understand the savings behavior at the micro level.

1.2. Problem Statement

Understanding the savings behavior of individual persons using primary data collected through structured questionnaire.

1.3. Research Objectives

- To understand the savings behavior at the micro level.
- To highlight the potential gaps in the financial sector of Pakistan in terms of institutions.
- To get understanding of risk preferences of the people.
- To find out the level of awareness people have about different investment class assets.
- To know and explain the various ways people use to make use of surplus disposable income.
- To identify the motives behind savings.
- To discern the asset class choices for different savings motive.
- To establish the asset class preferences and analyze the implication of results.

1.4. Research Methodology

1.4.1. Nature of Data

Primary data is collected from 300 people from urban cities of Pakistan including Karachi, Hyderabad, Sukkur, Lahore and Islamabad. Data is collected through structured questionnaire.

1.4.2. Sampling Unit

Sample unit comprises individual persons who are earning regular income from some identifiable source.

1.4.3. Sampling Methodology

For sampling, a mix of convenience and quota sampling is used. For this Survey, Karachi, Hyderabad, Sukkur, Lahore and Islamabad is selected.

1.4.4. Methods

For analysis of data, descriptive and inferential tools are used. Linear probability model, Logit model and Probit model are used for assessing the probabilities of success in binary dependent variables. Contingency tables used in the study also enable us to highlight possible relationships between different factors in the study.

2. Literature Review

2.1. Intertemporal Consumption Literature in Macroeconomics

In one of the first studies on consumption, Keynes (1935) postulated that consumption is a function of current income and that marginal propensity to consume is positive but less than 1.

His model can be expressed mathematically as:

$$C = \beta_0 + \beta_1 Y + \mu$$

Where,

C = Aggregate Real Consumption.

Y = Aggregate Real Income.

μ = Random error term.

β_0, β_1 are parameters of the model.

As per Keynes (1935), MPC (β_1) is positive but less than 1. As a result, Average Propensity to Consume (APC) would fall with successive increase in income.

Hall (1978) argued that consumption is a random walk and hence it is not determinable through income. Income changes cannot determine changes in consumption. As per his hypothesis, consumption function is given by:

$$C_t = \beta_0 + \beta_1 C_{t-1} + \mu$$

Where, Hall (1978) hypothesized that $\beta_0=0$ and $\beta_1=1$

$$C_t = C_{t-1} + \mu$$

Where,

C_t = Aggregate Real Consumption in time period t.

C_{t-1} = Aggregate Real Consumption in time period t-1.

μ = Random error term

Friedman (1957) argued that consumption is a function of permanent income.

$$C = cY_p + \mu$$

Where,

C = Aggregate Real Consumption.

Y_p = Permanent Income.

μ = Random error term.

He argued that APC would not fall and consumption would be smooth. According to his model, consumption choices differ from changes in transitory income and permanent income.

Change in permanent income will make consumption to change, but change in transitory income will mostly be saved as per Friedman (1957).

Ando & Modigliani (1963) introduced lifecycle hypothesis. In their model, the consumer makes consumption decision intertemporally. The consumer could borrow from the future to spend more in current time period or could invest the current surplus income and have more consumption in future.

Decision about current consumption also in turn decides about future consumption possibilities and hence the current consumption decision is done in an intertemporal context. The hypothesis posits that the consumer would want to smooth the consumption. Initially, the consumer will dissave and then enter into labor force and during the working years of lifetime, the consumer will save for retirement. After retirement, the consumer will decumulate the savings.

2.2. Determinants of Savings: Empirical Studies in Pakistan

Now, we give a brief account of studies that have taken primary data to analyze the consumption and savings behavior at the micro and household level. Since consumption data in Pakistan is only calculated through a residual approach, the micro data analysis provides more useful insights and foundation.

In an empirical study taking primary data through a structured questionnaire, Abid & Afridi (2010) found that rural areas have more savings ratio as compared to urban areas. It is possibly due to the fact that remittances received by rural households in the sample were taken as transitory income and were mostly saved.

Quite possibly, expenditure on education and health is lower in rural areas and furthermore, they are able to afford food supplies at much lesser cost as compared to urban households and they are able to save more as a result. It is also plausible that

due to dependence on agriculture and weather conditions, people in rural areas have a tendency to save for the precautionary motive.

In the study by Abid & Afridi (2010), it was found that family size is inversely related to savings. One plausible explanation is that people in large family size and especially with increased number of non-working age family members and non-participating women tend to have lesser savings. In a study by Farhan (2011), age-dependency ratio also had inverse relationship with savings in the long run.

Abid & Afridi (2010) also established that savings is inversely related with education. It maybe a characteristic of the sample being chosen. One of the possible explanations could be that people who have just completed their higher education tend to start careers at nominal salaries and most have already accumulated debt from private sector education. Also, people with more education tend to spend relatively more on education of siblings/children, health and quality food supplies. Their formal sector employment may necessitate tax deduction at source which may decrease their disposable income and hence savings. Rehman et al. (2010) also found that Marginal propensity to save for job holders is lower than labor class savings due to more consumption habit in the former group.

However, at macro level, a study by Vincelette (2006) discovered that demographic changes, captured by urban migration have a positive influence over national savings rate on average at the macro level. Possible explanation of this result could be that richer households in urban localities have more saving opportunities in urban localities and increased awareness about financial planning, consumption smoothing and its advantages.

Rehman et al. (2010) through a sample based micro-econometric study in Multan concluded that spouse participation, total dependency rate, total income of household and size of landholdings significantly raise household savings. Education of household head, children's educational expenditures, family size, liabilities to be paid, marital status, and value of house significantly reduce savings level of households.

The study also found empirical evidence in support of life cycle hypothesis by Ando & Modigliani (1963). It is established by including both household's head age and square of household's head age in the model. Age variable has positive relationship with savings and square of age has negative relationship with savings. This indicates that age versus savings is a concave up function. However, this goes against the observation that people save for their children in our society. However, it can be reconciled by noting that usually people leave behind tangible assets or property and usually distribute the holdings mostly in their lifetimes.

In the study, it was established that female participation in labor force had the highest positive nominal effect on savings. This shows that income earned by female household is mostly regarded as transitory income and hence, it is mostly saved as explained by the large value of the coefficient.

Next, we list the studies that have taken macro data to analyze savings and consumption in Pakistan and identify the various determinants and factors influencing consumption and savings.

Chaudhry et al. (2010) concluded positive relationship of savings with exports as a proportion of GDP, remittances, inflation as measured by CPI, interest rate and government consumption. In their study, public loans in the long run had a negative relationship with savings.

Hussain (1995) noted that increased savings in post 1970 era were majorly influenced by financial deepening. He measured financial deepening as the ratio of money stock divided by total aggregate income.

The study by Nasir & Khalid (2004) estimated savings function for Pakistan economy and found that fiscal deficit has a negative influence on savings while real interest rate had a positive influence on savings. The positive relationship between real interest rate and savings signify that the substitution effect is greater than the income effect. Remittances are also found to be positively associated with savings which is consistent with other studies.

3. Analysis of Descriptive Statistics

Table 1 gives profile of respondents by occupation.

| Occupation Type | Number of Respondents | Percent in Sample |
|-------------------------|-----------------------|-------------------|
| Salaried – Academic | 58 | 19.60% |
| Salaried – Non Academic | 174 | 58.80% |
| Self-Employed | 43 | 14.5% |
| Entrepreneur | 21 | 7.1% |

Table 1: Respondents Profile by Occupation

Table 2 gives descriptive statistics for 'age' (Age of Respondent), 'hhsz' (Household Size), 'emf' (Earning Members in Family) and 'dmf' (Dependent Members in Family).

In the sample of 300 individual persons providing data about their household, the ratio 'emf to hhsz' is 37%. This ratio could be a good proxy of labor force participation rate (LFPR). Estimate is close to Economic Survey estimates. Since the average income of the sample is greater than Rs 100,000 per month, it shows that low LFPR is not necessarily a phenomenon in low income families.

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|----------|-----|----------|-----------|-----|-----|
| age | 296 | 31.63514 | 9.700008 | 18 | 85 |
| hhsz | 296 | 5.533784 | 2.357579 | 1 | 18 |
| emf | 296 | 2.064189 | 1.024745 | 1 | 7 |
| dmf | 296 | 3.469595 | 2.02336 | 0 | 13 |

Table 2: Summary Descriptive Statistics

Table 3 reports the dependency statistics. Table 3 shows that about two-third of the sample has at least two non-earning family members. Less than 5% of the household surveyed had no non-earning family members. It is consistent with joint family phenomenon and low incidence of nuclear families in Pakistani culture.

| Criteria | Count | Proportion in Total Sample |
|-----------------------|-------|----------------------------|
| count if hhsz>emf | 283 | 95.2% |
| count if (hhsz-1)>emf | 260 | 87.5% |
| count if (hhsz-2)>emf | 201 | 67.7% |
| count if (hhsz-3)>emf | 125 | 42% |
| count if (hhsz-4)>emf | 73 | 24.6% |
| count if (hhsz-5)>emf | 35 | 11.8% |

Table 3: Dependency Statistics

Figure 3 illustrates the income distribution in the sample. Income is not normally distributed. Though, it is consistent with Gini coefficient in excess of 0.30 for Pakistan, but the sample results are not generalizable. Skewness in savings is even more than income, which hints at heterogeneity in savings.

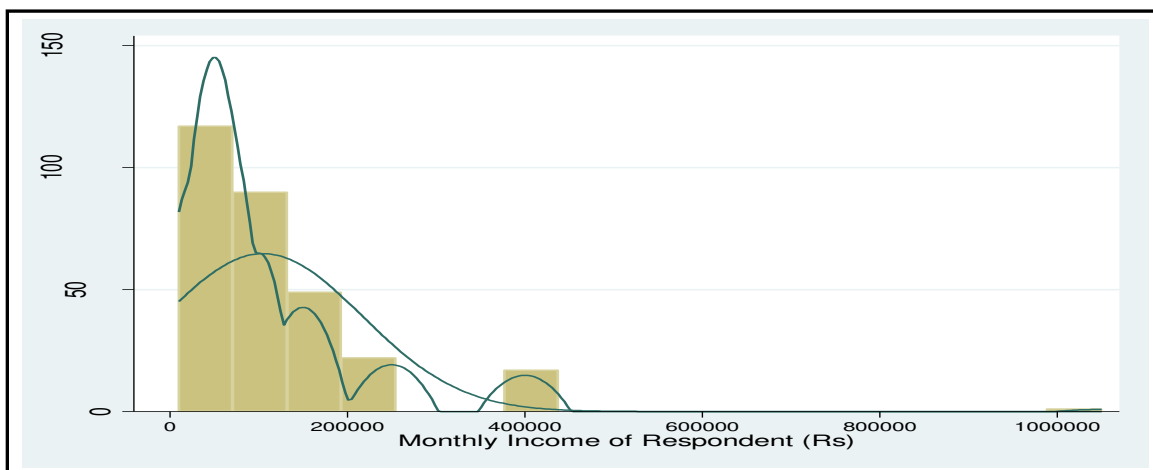


Figure 3: Income Distribution (Kernel & Normal)

Table 4 gives regression results of simple linear regression of Monthly Savings on Monthly Income. MPS is found to be 0.34. For mean income of greater than Rs100,000 in the sample, higher MPS is plausible. This is consistent with the theory that richer households save more than poorer households because of low discretionary surplus funds in the latter category.

| Source | SS | df | MS | | | |
|----------|------------|-----|------------|-----------------|--------|--|
| Model | 4.4227e+11 | 1 | 4.4227e+11 | Number of obs = | 296 | |
| Residual | 2.7046e+11 | 294 | 919920068 | F(1, 294) = | 480.77 | |
| Total | 7.1273e+11 | 295 | 2.4160e+09 | Prob > F = | 0.0000 | |
| | | | | R-squared = | 0.6205 | |
| | | | | Adj R-squared = | 0.6192 | |
| | | | | Root MSE = | 30330 | |

| savings | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
|---------|-----------|-----------|-------|-------|----------------------|-----------|
| income | .3471375 | .0158319 | 21.93 | 0.000 | .3159793 | .3782957 |
| _cons | -12502.77 | 2422.606 | -5.16 | 0.000 | -17270.62 | -7734.925 |

Table 4: Regression of Monthly Savings on Monthly Income

Next we plot savings against 'age', 'age squared', 'hsize', 'income' and 'emf'.

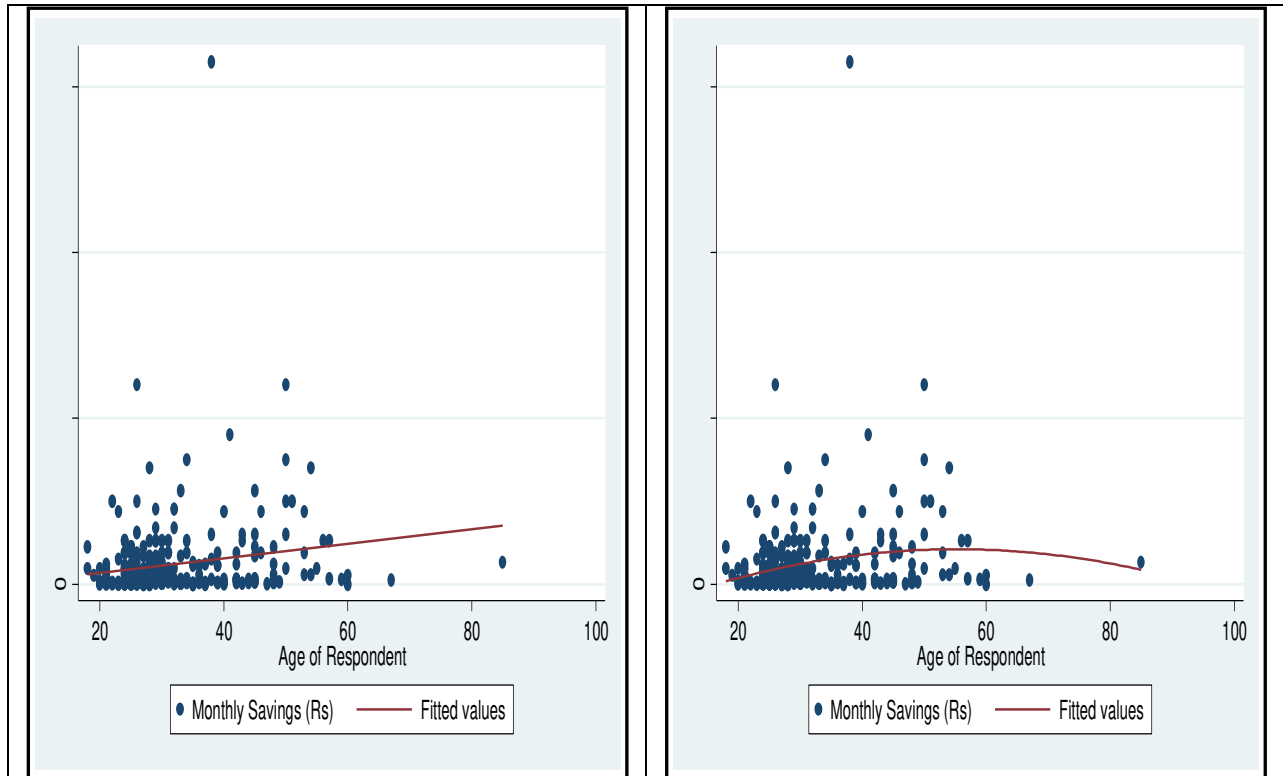


Figure 3 (a): SAVINGS & AGE

Figure 3 (b): SAVINGS & AGE SQUARED

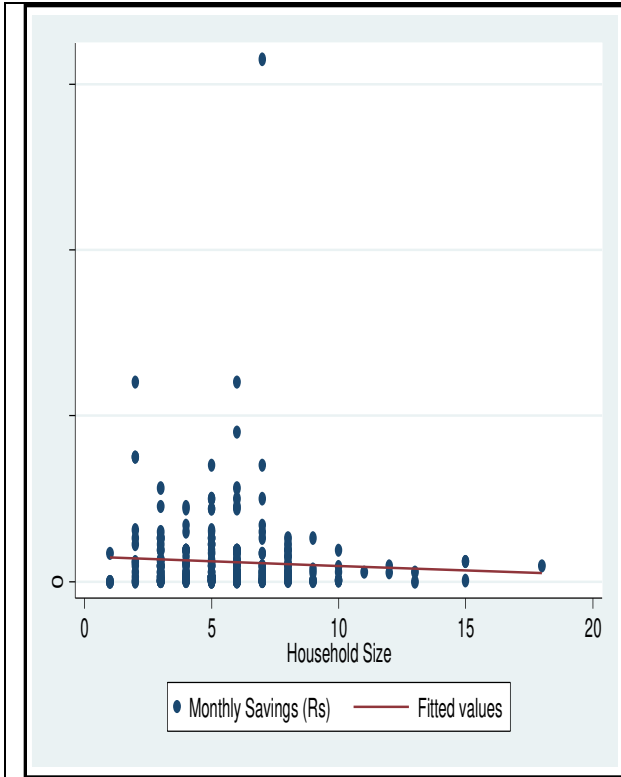


Figure 3 (c): SAVINGS & HHSIZE

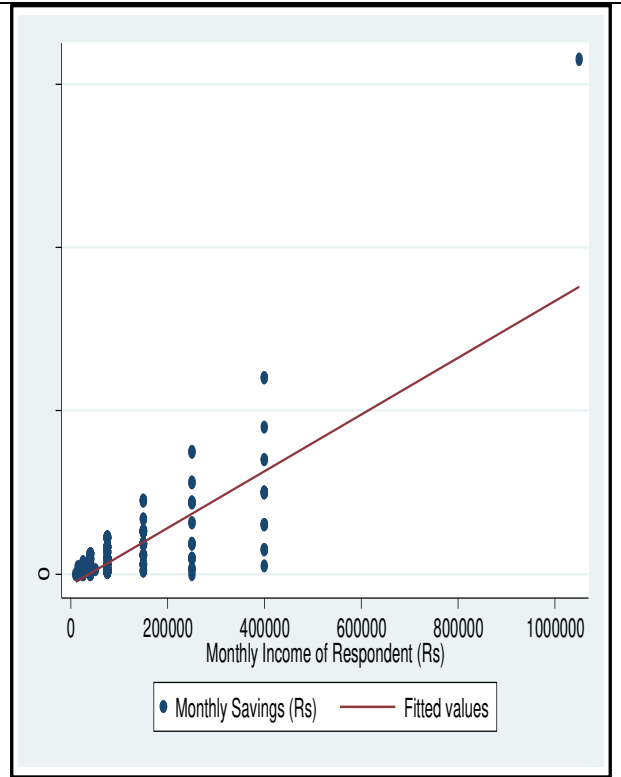


Figure 3 (d): SAVINGS & Income

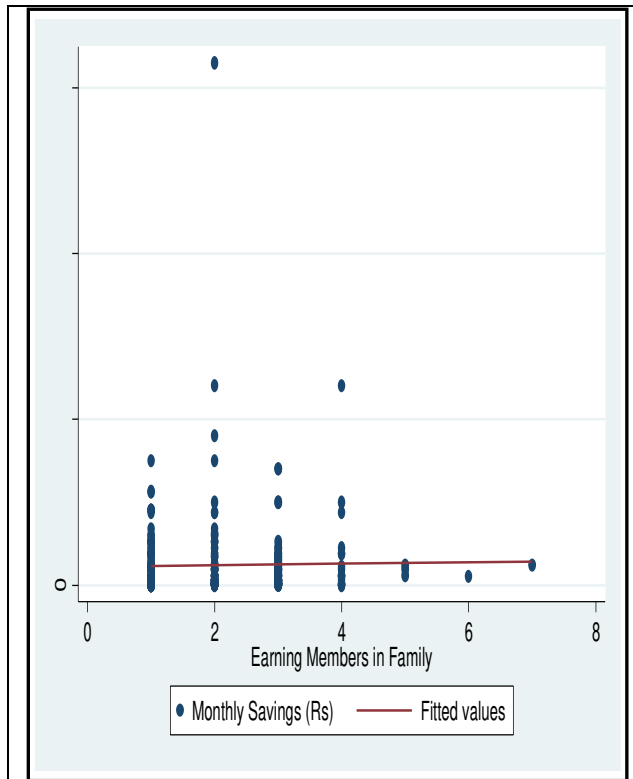


Figure 3 (e): SAVINGS & EMF

Figure 3 (a): Plot of Savings against Age

Savings are positively associated with age. As age increases, savings increase as the rational agent enters working age and earns more income.

Figure 3 (b): Quadratic Plot of Savings against Age

Savings are positively associated with age, but after some age, there is decline in savings. It is consistent with rational agent models. It hints at possible existence of Life Cycle Hypothesis and intertemporal consumption model.

Figure 3 (c): Plot of Savings against Household Size

Savings are negatively associated with household size which is consistent with theory and empirical literature on Pakistan.

Figure 3 (d): Plot of Savings against Income

Using Keynesian tradition, savings is a positive linear function of income. There is possibly more heteroskedasticity in high income individuals as seen in the increased dispersion around mean for higher levels of income.

Figure 3 (e): Plot of Savings against Earning Members

Savings are only marginally positively associated with earning members in family. This is plausible as it will lead to lesser need for savings with regards to family requirements.

Though, nothing causal can be said here. But, increase in current income leading to significant increase in income point towards possible liquidity constraints. This gets little more substance from almost a freeze in consumer lending after 2008 and till now which is the period of study.

Next we discuss the savings motive. Table 5 reports the distribution of responses.

| Savings Motive | Number of Respondents |
|-----------------------|------------------------------|
| Precautionary Motive | 150 |
| Investment Motive | 89 |
| Family Requirements | 163 |
| Business Requirements | 27 |

Table 5: Savings Motives of Respondents

Almost two-thirds of the people saved because of precautionary motive. This hints towards possible liquidity constraints which hinder intertemporal consumption smoothing. Less number of people during the period of study opted for savings because

of investment motive. It shows possible lack of inflation beating savings alternatives and increased volatility and risk in the ones that are available.

Next, we report the different asset classes which are used by people to park their savings. We compute the frequency weighted grouped mean reported as mean score in the table.

Rank of 1 indicates first preference for the asset class in the portfolio. Grouped mean rank score closer to one, i.e. a lower number will indicate that lexicographically, that asset class will be preferred more over other assets. Table 6 reports the results.

| Rank/Asset Class | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Mean Score |
|------------------|----|----|----|----|----|----|----|----|------------|
| Stocks | 37 | 35 | 49 | 49 | 33 | 21 | 17 | 21 | 3.92 |
| Bonds | 3 | 28 | 33 | 49 | 52 | 41 | 36 | 20 | 4.85 |
| NSS | 28 | 22 | 44 | 37 | 42 | 36 | 30 | 23 | 4.47 |
| MMFs | 7 | 8 | 19 | 33 | 56 | 65 | 58 | 16 | 5.40 |
| Equity Funds | 9 | 13 | 11 | 21 | 44 | 49 | 57 | 58 | 5.84 |
| Real Estate | 75 | 53 | 38 | 20 | 13 | 28 | 16 | 19 | 3.33 |
| Gold | 75 | 67 | 29 | 26 | 9 | 7 | 37 | 12 | 3.21 |
| Deposits | 28 | 36 | 39 | 27 | 13 | 15 | 11 | 93 | 4.97 |

Table 6: Asset Class Preference with Mean Score

Table 7 reports the asset classes by rank from highest mean score to the lowest. At least for the sample, this result shows that people in the sample are not necessarily risk averse. Depending on the objective, they may prefer riskier asset class to beat inflation and earn more returns.

| Ordered by Most Preferable to Least |
|--|
| Gold |
| Real Estate |
| Stocks |
| NSS |
| Bonds |
| Bank Deposits |
| Income & MMFs |
| Equity Funds |

Table 7: Asset Class Preference by Rank

The results also point to the fact that people have less inclination to invest in income securities that recently are unable to offer inflation beating returns. The result also highlights that people's stated preference seems to have some required real interest rate in mind. This is more plausible than the explanation in other studies in which investors are believed to be indifferent between nominal returns and real returns.

Less inclination towards preferring mutual funds, both income and equity is interesting. It may be due to:

- Corporate governance issues in intermediation.
- Lack of sales distribution centers vs. banks.
- High asset management fee.
- Risk neutrality among individuals in the sample.

4. Inferential Analysis with LPM, Logit & Probit

4.1. Determinants of Investment Motive

4.1.1. LPM Model Interpretation

To estimate determinants of investment motive, we estimate the following model.

$$im = \beta_0 + \beta_1 hhsiz e + + \beta_2 age + \beta_3 income + \mu$$

Where

im = Investment Motive, a binary dependent variable.

hhsiz e = Household Size.

age = Age of the respondent.

income = *Monthly* Income of the respondent.

$\beta_0, \beta_1, \beta_2, \beta_3$ are the parameters of the model.

μ = Random error term.

Table 8 reports the LPM results. Coefficients are in line with theory. Higher income leads to decline in relative risk aversion. Increase in age leads to lesser risk taking. Likewise, increased household size will lead to more risk averse saving motive.

| Source | SS | df | MS | | | |
|----------|------------|-----|------------|-----------------|--------|--|
| Model | 1.66923261 | 3 | .55641087 | Number of obs = | 296 | |
| Residual | 60.5706323 | 292 | .207433672 | F(3, 292) = | 2.68 | |
| Total | 62.2398649 | 295 | .210982593 | Prob > F = | 0.0470 | |
| | | | | R-squared = | 0.0268 | |
| | | | | Adj R-squared = | 0.0168 | |
| | | | | Root MSE = | .45545 | |

| im | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
|--------|----------|-----------|-------|-------|----------------------|----------|
| hhsz | -.010127 | .0113552 | -0.89 | 0.373 | -.0324755 | .0122214 |
| age | -.004259 | .0028707 | -1.48 | 0.139 | -.0099088 | .0013909 |
| income | 6.41e-07 | 2.48e-07 | 2.59 | 0.010 | 1.54e-07 | 1.13e-06 |
| _cons | .4241542 | .1173205 | 3.62 | 0.000 | .1932533 | .6550552 |

Table 8: LPM Results on Investment Motive Determinants

4.1.2. Logit Model Interpretation

Second, the Logit results are reported in Table 9. Coefficient table shows log of odds ratio. All variables seem to have lesser impact on investment motive. In line with LPM, age and hhsz marginally lowers the odds ratio for incidence of investment motive. Income increase marginally increases the odds ratio in favor of investment motive. Model is overall significant. Tukey link test shows that model is correctly specified.

| | | | | | | |
|-----------------------------|--|--|----------------------|--|--|--|
| Logistic regression | | | Number of obs = 296 | | | |
| | | | LR chi2(3) = 7.80 | | | |
| | | | Prob > chi2 = 0.0504 | | | |
| Log likelihood = -177.08654 | | | Pseudo R2 = 0.0215 | | | |

| im | Odds Ratio | Std. Err. | z | P> z | [95% Conf. Interval] | |
|--------|------------|-----------|-------|-------|----------------------|----------|
| hhsz | .948772 | .0550042 | -0.91 | 0.364 | .846865 | 1.062942 |
| age | .9783199 | .0146287 | -1.47 | 0.143 | .9500642 | 1.007416 |
| income | 1.000003 | 1.23e-06 | 2.44 | 0.015 | 1.000001 | 1.000005 |

Table 9: Logit Results on Investment Motive Determinants

4.1.3. Probit Model Interpretation

Third, the Probit results are reported in Table 10. Coefficients represent increased or decreased probability based on Z-score. Again results are consistent with LPM and Logit with regards to sign. Model is overall significant. Tukey link test shows that model is correctly specified.

| Probit regression | | Number of obs | = | 296 | | |
|-----------------------------|-----------|---------------|-------|--------|----------------------|----------|
| Log likelihood = -176.98133 | | LR chi2(3) | = | 8.01 | | |
| | | Prob > chi2 | = | 0.0459 | | |
| | | Pseudo R2 | = | 0.0221 | | |
| im | Coef. | Std. Err. | z | P> z | [95% Conf. Interval] | |
| hhsize | -.0316882 | .0342169 | -0.93 | 0.354 | -.0987521 | .0353757 |
| age | -.0138546 | .0090023 | -1.54 | 0.124 | -.0314988 | .0037896 |
| income | 1.88e-06 | 7.56e-07 | 2.48 | 0.013 | 3.93e-07 | 3.36e-06 |
| _cons | -.1163941 | .3567647 | -0.33 | 0.744 | -.81564 | .5828518 |

Table 10: Probit Results on Investment Motive Determinants

4.2. Precautionary Motive

4.2.1. LPM Model Interpretation

To estimate determinants of precautionary motive, we estimate the following model.

$$pm = \beta_0 + \beta_1 emf + \beta_2 age + \beta_3 income + \mu$$

Where

im = Investment Motive, a binary dependent variable.

emf = Number of earning members in family.

age = Age of the respondent.

income = Monthly Income of the respondent.

$\beta_0, \beta_1, \beta_2, \beta_3$ are the parameters of the model.

μ = Random error term.

Table 11 reports the LPM results. Coefficients are in line with theory. Higher income leads to decline in relative risk aversion and hence lesser precautionary savings. Likewise, increase in earning members in family will lead to lesser risk averse saving motive. Increase in age leads to more precautionary savings.

| Source | SS | df | MS | | | |
|----------|------------|-----|------------|-----------------|--------|--|
| Model | 1.07939855 | 3 | .359799518 | Number of obs = | 296 | |
| Residual | 36.3800609 | 292 | .12458925 | F(3, 292) = | 2.89 | |
| | | | | Prob > F = | 0.0359 | |
| | | | | R-squared = | 0.0288 | |
| | | | | Adj R-squared = | 0.0188 | |
| Total | 37.4594595 | 295 | .126981219 | Root MSE = | .35297 | |

| pmotive | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
|---------|-----------|-----------|-------|-------|----------------------|-----------|
| emf | -.0386711 | .0207883 | -1.86 | 0.064 | -.079585 | .0022428 |
| age | .0022218 | .0022863 | 0.97 | 0.332 | -.0022779 | .0067214 |
| income | -3.83e-07 | 1.92e-07 | -2.00 | 0.047 | -7.61e-07 | -5.21e-09 |
| _cons | .901115 | .0929325 | 9.70 | 0.000 | .7182126 | 1.084017 |

Table 11: LPM Results on Precautionary Motive Determinants

4.2.2. Logit Model Interpretation

Second, the Logit results are reported in Table 12. Coefficient table shows log of odds ratio. Earning members in family will lead to lesser odds ratio in favor of precautionary savings. Likewise, Higher income leads to decline in relative risk aversion and hence lesser odds ratio in favor of precautionary savings. Increase in age leads to more precautionary savings. Model is overall significant. Tukey link test shows that model is correctly specified.

| | | | | | | |
|-----------------------------|--|--|-----------------|--------|--|--|
| Logistic regression | | | Number of obs = | 296 | | |
| | | | LR chi2(3) = | 7.81 | | |
| | | | Prob > chi2 = | 0.0501 | | |
| Log likelihood = -120.52036 | | | Pseudo R2 = | 0.0314 | | |

| pmotive | Odds Ratio | Std. Err. | z | P> z | [95% Conf. Interval] | |
|---------|------------|-----------|-------|-------|----------------------|----------|
| emf | .7572276 | .117965 | -1.79 | 0.074 | .5579839 | 1.027617 |
| age | 1.019486 | .0209766 | 0.94 | 0.348 | .9791901 | 1.061439 |
| income | .9999975 | 1.32e-06 | -1.89 | 0.059 | .9999949 | 1 |

Table 12: Logit Results on Precautionary Motive Determinants

4.2.3. Probit Model Interpretation

Third, the Probit results are reported in Table 13. Coefficients represent increased or decreased probability based on Z-score. Again results are consistent with LPM and Logit with regards to sign. Model is overall significant. Tukey link test shows that the model is correctly specified.

| Probit regression | | Number of obs | = | 296 | |
|-----------------------------|-----------|---------------|-------|--------|---------------------|
| Log likelihood = -120.59209 | | LR chi2(3) | = | 7.67 | |
| | | Prob > chi2 | = | 0.0534 | |
| | | Pseudo R2 | = | 0.0308 | |
| pmotive | Coef. | Std. Err. | z | P> z | [95% Conf. Interva] |
| emf | -.1497028 | .0870096 | -1.72 | 0.085 | -.3202385 .0208329 |
| age | .0110594 | .0109799 | 1.01 | 0.314 | -.0104607 .0325795 |
| income | -1.42e-06 | 7.88e-07 | -1.80 | 0.072 | -2.96e-06 1.26e-07 |
| _cons | 1.177895 | .4226669 | 2.79 | 0.005 | .3494835 2.006307 |

Table 13: Probit Results on Precautionary Motive Determinants

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