An Empirical Investigation of Consumption Behaviour in OIC Countries

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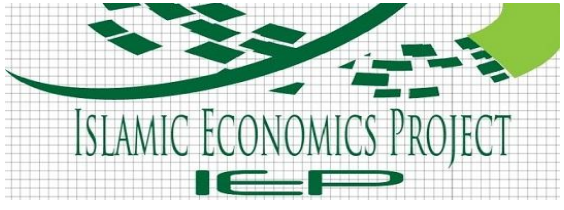

ISLAMIC ECONOMICS PROJECT
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Outline

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Theoretical Background

Theories	Findings
AIH Keynes (1935)	•$C=f(Y_d)$ •$C = a + bY_d$; $b<1$. •As Y_d rises, C/Y_d would fall.
LCH Modigliani & Brumberg (1954) Ando & Modigliani (1963)	•$C=(W+RY)/T$. •Consumption choices are intertemporal and based on lifetime resources. •People dis-save in young age, earn and save in working age and dis-save in retirement.
PIH Friedman (1957)	•$C=f(Y^p)$ •Changes in Y^p will affect consumption, but changes in Y^T will mostly be saved.

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Issues

Critical Aspects of CT with Islamic/Muslim Framework

- Religious Dimension
  - Voluntary Financial Exclusion.
    - Prohibition of Riba.
- Economic Dimension
  - General High Incidence of Poverty in OIC Countries.
    - 50% Share in Global Poverty vs. 25% Share in Population.
  - Involuntary Financial Exclusion.
    - Low Outreach
    - Income Based Lending Criteria of Commercial Banks.
  - Low Access to Public Social Security.
    - Weak Governments
    - Low Development Expenditure.

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Problem Statement

Characterising the nature of consumption behaviour by examining the evidence of forward looking consumption behaviour in OIC countries.

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Research Questions (RQs)

1. Does the empirical data from a broad cross section of OIC countries provide evidence in favour of AIH or RE-PIH? Does consumption follow a random walk and do only unanticipated changes in income affect consumption behaviour?

2. Does the phenomenon of liquidity constraints, myopia or loss aversion impede forward looking consumption behaviour and how strong is the intertemporal elasticity of substitution in OIC countries?

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Objectives

1. To explore the consumption behaviour in OIC countries by examining AIH and RE-PIH, i.e. whether consumption follows a random walk and whether unanticipated income changes and/or anticipated income changes affect consumption.

2. To investigate the impact of liquidity constraints, myopia or loss aversion on forward looking consumption behaviour and the extent of intertemporal elasticity of substitution.

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Significance of the Study

- Despite the importance of consumption behaviour in economic theory and policy making, relatively **scarce literature is available on consumption behaviour in OIC countries**. Therefore, this study will explore consumption behaviour in OIC countries.

- It will **examine and characterize the nature of consumption in OIC countries**.

- It will contribute in **investigating the extent of forward looking consumption behaviour in OIC countries.**

- It will measure the degree to which **liquidity constraints, myopia or loss aversion** may impede forward looking consumption behaviour in OIC countries.

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Brief Summary of Literature Review

Tests of RE-PIH	Findings
Hall's RE-PIH (1978)	Lags of Income & Consumption Don't explain Ct.
Flavin (1985)	Consumption is excessively smooth.
Zeldes (1989)	**Liquidity constraints** bind consumers.
Campbell & Mankiw (1990)	Rule-of-thumb & forward looking consumers.
Runkle (1991)	Consumer behaviour reflects **myopia**.
Deaton (1991)	RE-PIH fails due to **buffer stock saving**.
Shea (1995)	Consumer behaviour reflects **loss aversion**.
Wolff (1998)	RE-PIH fails due to little wealth with HHs.

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Brief Summary of Literature Review: Continued

Empirical Evidence for RE-PIH in Developing Countries	Country	Findings
Juan & Seater (1997)	Cross-Country	Holds for Industrial; Not for LDCs.
Gomes & Paz (2010)	Brazil	Binding **liquidity constraints**.
Gomes & Paz (2010)	Colombia	Binding **liquidity constraints**.
Gomes & Paz (2010)	Peru	Evidence for **loss aversion**.
Gomes & Paz (2010)	Venezuela	Inconclusive.
Drakos (2002)	Greece	Consumers are **myopic**.
Khan & Nishat (2011)	Pakistan	AIH holds; RE-PIH doesn't.
Yazdan & Sina (2013)	Iran	Evidence against RE-PIH.

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Underlying Theory/ Theoretical Model

- Rational Expectations Permanent Income Hypothesis (RE-PIH)
  - Micro founded.
  - Incorporates intertemporal consumption behaviour.

- Consumer wishes to maximize:

$$E_t \sum_{\tau=0}^{T-t} (1+\delta)^{-\tau} \mu(c_{t+\tau}), \quad u' > 0, u'' < 0$$

- If U(.) is quadratic,

$$s.t.(1+\delta)^{-\tau}(c_{t+\tau} - Y_{t+\tau}) = A_t$$

$$E(\mu) = \left[\sum_{t=1}^{T} C_t - \frac{a}{2} C_t^2\right], a > 0$$

- Utility maximization yields Euler equation, which is testable as:

$$C_{t+1} = \beta_0 + C_{t-1} + e_{t+1}$$

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Research Methodology: Empirical Models

Empirical Models	Model Specification
Hall (1978)	$\Delta C_t = \alpha + \lambda \Delta Y_t + e_t$
Flavin (1981)	$\Delta C_t = \mu + \delta \Delta Y_t + \theta r_t + e_t$
Hall (1988)	$\Delta C_t = \sigma + \rho r_t + e_t$
Campbell & Mankiw (1990)	$\Delta C_t = \varphi_0 + \varphi_1 C_{t-1} + \varphi_2 (Y_t - Ey_t) + \varphi_3 Ey_t + e_t$
Shea (1995)	$\Delta C_t = \tau + \lambda_1 (POS) \Delta Y_t + \lambda_2 (NEG) \Delta Y_t + \sigma r_t + e_t$

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Research Methodology: Hypotheses Development

Empirical Models	Hypotheses	Criteria
$\Delta C_t = \alpha + \lambda \Delta Y_t + e_t$	**H1:** RE-PIH Holds	$\lambda=0$
$\Delta C_t = \mu + \delta \Delta Y_t + \theta r_t + e_t$	**H2:** RE-PIH Holds	$\delta=0$
$\Delta C_t = \varphi_o + \varphi_1 C_{t-1} + \varphi_2(Y_t - Ey_t) + \varphi_3 Ey_t + e_t$	**H3:** RE-PIH Holds	$\varphi_2 > 0, \varphi_3 = 0$
$\Delta C_t = \sigma + \rho r_t + e_t$	**H3:** IES Positive	$\rho > 0$
$\Delta C_t = \tau + \lambda_1(POS)\Delta Y_t + \lambda_2(NEG)\Delta Y_t + \sigma r_t + e_t$	**H4:** RE-PIH Holds	$\lambda_1=\lambda_2=0$
	H5: RE-PIH Fails Due to Myopia	$\lambda_1=\lambda_2, \lambda_1>0; \lambda_2>0$
	H6: RE-PIH Fails Due to Liquidity Constraints	$\lambda_1<\lambda_2, \lambda_1>0; \lambda_2>0$
	H7: RE-PIH Fails Due to Loss Aversion	$\lambda_1>\lambda_2, \lambda_1>0; \lambda_2>0$

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Research Methodology: Method of Analysis

- Instrumental Variable (IV) Regression Framework.
  - Two-Stage Least Squares (2SLS).
  - Limited Information Maximum Likelihood (LIML).
  - Generalized Method of Moments (GMM).

Instrument List	Instrument Variables (Used in Campbell & Mankiw, 1990)
1	$\Delta Y_{t-2}, \Delta Y_{t-3}, \Delta Y_{t-4}, \Delta Y_{t-5}, \Delta Y_{t-6}$
2	$\Delta C_{t-2}, \Delta C_{t-3}, \Delta C_{t-4}, \Delta C_{t-5}, \Delta C_{t-6}$
3	$\Delta i_{t-2}, \Delta i_{t-3}, \Delta i_{t-4}, \Delta_{it-5}, \Delta i_{t-6}$
4	$\Delta Y_{t-2}, \Delta Y_{t-3}, \Delta Y_{t-4}, \Delta C_{t-2}, \Delta C_{t-3}, \Delta C_{t-4}$
5	$\Delta Y_{t-2}, \Delta Y_{t-3}, \Delta Y_{t-4}, \Delta C_{t-2}, \Delta C_{t-3}, \Delta C_{t-4}, \Delta i_{t-2}, \Delta i_{t-3}, \Delta i_{t-4}$

- For Hall (1988), use Δi_{t-1}, Δr_{t-1} and ΔC_{t-1} as instruments.

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Research Methodology: Diagnostic Testing

- Hausman test to decide between fixed effects and random effects.
- Testing for panel unit root.
  - Levin-Lin-Chu test (2002).
  - Harris-Tzavalis test (1999).
  - Breitung test (2005).
  - Im-Pesaran-Shin test (2003).
  - Fisher-type tests (2001).
  - Hadri Lagrange multiplier stationarity test (2000).

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Research Methodology: Data

- **Sample Unit:** OIC Member Countries.
- **Sample Size:** 44 years for time series and 21 years for panel data.
- **Period of Study:** 1971-2014 for time series and 1993-2014 for panel data.
- **Data Source:** World Development Indicators, OIC Stat.

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Research Methodology: Data

- **Sample Unit:** OIC Member Countries.
- **Sample Size:** 32.
- **Period of Study:** 1981-2014.
- **Data Source:** World Bank.

Results and Findings

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Stylized Facts for FINDEX and WDI Database

- **Saving for Old Age**
- Poor respondents find it difficult to save for the old age.
- Rich respondents in relatively high-income countries like Malaysia, Bahrain and United Arab Emirates have higher tendency to save for the old age.
- In 28 out of 35 OIC countries, not even 10% of the respondents in bottom income group (Q1) have the tendency to save for the old age.

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Stylized Facts for FINDEX and WDI Database

- **Main Source of Borrowing**
- Lower reliance or accessibility to financial institutions in OIC countries.
- On average, 7.7% of the poorest 40% people in selected OIC countries borrow from financial institutions.
- This is even lower than the average for the poorest 40% countries in the low-income countries.

An Empirical Investigation of Consumption Behaviour in OIC Countries

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Mean APC in OIC Countries

Mean APC				
Country	1970-80	1980-90	1990-00	2000-13
Albania	-	-	0.999	0.842
Algeria	.376	.400	.362	.366
Azerbaijan	-	-	.529	.415
Bangladesh	-	.966	.886	.732
Benin	-	.846	.804	.755
Burkina Faso	.804	.806	.696	.695
Cameroon	.733	.697	.704	.734
Chad	-	.461	.427	.305
Egypt	.855	.825	.783	.736
Gabon	.294	.357	.282	.316
Guinea-Bissau	-	.880	.917	.905
Guyana	-	.693	.599	.816
Indonesia	-	.555	.602	.628
Jordan	.893	.932	.804	.850
Kazakhstan	-	-	.560	.511
Kuwait	.237	.449	.392	.320
Lebanon	-	.988	.958	.849
Libya	.155	.176	.192	.205
Malaysia	.485	.459	.422	.461
Mali	-	.922	.827	.691
Mauritania	.685	.780	.727	.666
Morocco	.701	.631	.622	.577
Mozambique	-	-	.774	.735
Niger	.492	.680	.721	.733
Nigeria	.694	.700	.783	.790
Oman	.403	.312	.255	.325
Pakistan	.859	.813	.775	.760
Senegal	.806	.828	.787	.801
Syria	.763	.762	.675	.617
Togo	.589	.703	.814	.935
Turkey	.763	.736	.691	.700
Uganda	-	.702	.720	.678

Empirical Results of Panel Data Regressions

Model	$\Delta C_t = \alpha + \lambda \Delta Y_t + e_t$			$\Delta C_t = \mu + \delta \Delta Y_t + \theta r_t + e_t$				$\Delta C_t = \tau + \lambda_1 P\Delta Y_t + \lambda_2 N\Delta Y_t + \sigma r_t + e_t$				
Estimators	α	λ	R^2	μ	δ	θ	R^2	τ	λ_1	λ_2	σ	R^2
GLS	.001	.788**		.001	.788**	.038		.004	.643**	.896**	.031	
MLE	.001	.788**		.001	.788**	.037		.004	.642**	.896**	.031	
Instrumental Variable Regression (Fixed Effects)												
IV (1a)	.005	.609**	0.47	-.014	.729**	.936	0.19	-.014	.733**	.722**	.952	0.19
IV (1b)				-.372	.831**	.946	0.10	-.414	.698**	.929**	1.06	0.10
IV (1c)				-.004	.819**	0.000	0.46	-.004	.701**	.900**	.000	0.45
IV (2a)	.001	.860**	0.47	-.006	.777**	.449	0.35	-.004	.716**	.820**	.452	0.36
IV (2b)				-.353	.830**	.899	0.12	-.357	.698**	.925**	.916	0.12
IV (2c)				-.025	.806**	.0001	0.26	-.019	.702**	.883**	.000	0.28
IV (3a)	.017	.037	0.47	.003	.835**	-.134	0.44	.006	.697**	.931**	-.115	0.45
IV (3b)				1.22	.792**	-3.08	0.0004	1.25	.709**	.851**	-3.17	0.0005
IV (3c)				-.244	.671	.0004	0.008	-.26	.714**	.625**	.001	0.007
IV (4a)	-.001	.906**	0.45	-.004	.783**	.338	0.38	-.001	.691**	.850**	.332	0.38
IV (4b)				-.413	.821**	1.038	0.08	-.587	.659**	.945**	1.48	0.06
IV (4c)				-.017	.803**	.000	0.31	-.015	.680**	.891**	.000	0.31
IV (5a)	.001	.828**	0.45	-.002	.789**	.267	0.40	-.001	.689**	.861**	.275	0.41
IV (5b)				-.401	.821**	1.01	0.09	-.578	.660**	.945**	1.46	0.06
IV (5c)				-.018	.802**	-.018	0.31	-.017	.680**	.889**	.000	0.29

*Statistical significance at 10% level. **Statistical significance at 5% level.

- IV a) uses real interest rate, IV b) uses labour supply and IV c) uses government real consumption as regressors.
- Labor supply and government real consumption are used in place of real interest rate to test for nonseparability in the utility function.

Empirical Results of Panel Data Regressions: Continued

Model	$\Delta C_t = \alpha + \lambda \Delta Y_t + e_t$			$\Delta C_t = \mu + \delta \Delta Y_t + \theta r_t + e_t$				$\Delta C_t = \tau + \lambda_1 P\Delta Y_t + \lambda_2 N\Delta Y_t + \sigma r_t + e_t$				
Estimators	α	λ	R^2	μ	δ	θ	R^2	τ	λ_1	λ_2	σ	R^2
Instrumental Variable Regression (GLS Random Effects)												
IV (1a)	.001	.846**	0.47	.002	.822**	-.027	0.47	.006	.694**	.932**	-.136	0.45
IV (1b)				-.007	.810**	.023	0.46	-.007	.680**	.899**	.029	0.47
IV (1c)				.002	.819**	0.000	0.47	.006	.695**	.909**	0.000	0.47
IV (2a)	-.005	1.16**	0.47	-.002	.798**	.230	0.44	-.001	.707**	.862**	.237	0.44
IV (2b)				-.038	.776**	.101	0.43	-.035	.629**	.882**	.103	0.44
IV (2c)				-.041	.830**	.0001	0.16	-.040	.792**	.857**	.000	0.16
IV (3a)	.013	.249	0.47	.004	.832**	-.138	0.44	.006	.695**	.928**	-.114	0.45
IV (3b)				.028	.849**	-.069	0.46	.028	.743**	.922**	-.064	0.47
IV (3c)				-.031	.827**	.000	0.22	-.037	.785**	.861**	.000	0.17
IV (4a)	.001	.822**	0.45	.001	.798**	.037	0.45	.003	.660**	.897**	.058	0.46
IV (4b)				.004	.804**	-.005	0.45	.001	.651**	.906**	.008	0.46
IV (4c)				-.043	.820**	.000	0.14	-.035	.742**	.873**	.000	0.17
IV (5a)	.002	.803**	0.45	.001	.795**	.073	0.45	.002	.661**	.890**	.099	0.46
IV (5b)				.004	.804**	-.005	0.45	.002	.653**	.906**	.006	0.46
IV (5c)				-.029	.814**	.000	0.21	-.023	.717**	.884**	.000	0.25

*Statistical significance at 10% level. **Statistical significance at 5% level.

- IV a) uses real interest rate, IV b) uses labour supply and IV c) uses government real consumption as regressors.
- Labor supply and government real consumption are used in place of real interest rate to test for nonseparability in the utility function.

Empirical Results of Panel Data Regressions: Continued

Model	$\Delta C_t = \alpha + \lambda \Delta Y_t + e_t$			$\Delta C_t = \mu + \delta \Delta Y_t + \theta r_t + e_t$				$\Delta C_t = \tau + \lambda_1 P\Delta Y_t + \lambda_2 N\Delta Y_t + \sigma r_t + e_t$				
Estimators	α	λ	R^2	μ	δ	θ	R^2	τ	λ_1	λ_2	σ	R^2
Instrumental Variable Regression (Between Effects)												
IV (1a)	.002	.793**	0.47	.001	.800**	.061	0.47	.007	.644**	.939**	-.123	0.45
IV (1b)				.009	.915**	-.025	0.47	.014**	.906**	1.02**	-.035	0.47
IV (1c)				.001	.807**	0.000	0.47	.004	.658**	.936**	0.000	0.48
IV (2a)	-.001	.922**	0.47	.004	.797**	-.110	0.44	.007	.645**	.939**	-.099	0.46
IV (2b)				.020**	1.06**	-.058**	0.47	.016**	.978**	1.03**	-.045	0.47
IV (2c)				-.001	.824**	-.001	0.47	.001	.709**	.926**	0.000	0.48
IV (3a)	.003	.786**	0.47	.005	.796**	-.182	0.42	.008	.641**	.940**	-.174	0.43
IV (3b)				.005	.846**	-.010	0.47	.004	.615**	.928**	.005	0.47
IV (3c)				-.009	.875**	.000	0.43	-.006	.823**	.903**	.000	0.45
IV (4a)	.004	.717**	0.45	.005	.721**	-.087	0.43	.010**	.476**	.950**	-.083	0.44
IV (4b)				.033**	1.17**	-.09**	0.45	.029**	1.13**	1.11**	-.087**	0.45
IV (4c)				.004	.715**	0.000	0.45	.009**	.466**	.942**	0.000	0.45
IV (5a)	.004	.719**	0.45	.005	.721**	-.078	0.44	.010**	.478**	.951**	-.104	0.43
IV (5b)				.026**	1.06**	-.07**	0.45	.025**	1.01**	1.08**	-.07**	0.46
IV (5c)				.004	.715**	0.000	0.45	.009**	.469**	.942**	0.000	0.45

*Statistical significance at 10% level. **Statistical significance at 5% level.

- IV a) uses real interest rate, IV b) uses labour supply and IV c) uses government real consumption as regressors.
- Labor supply and government real consumption are used in place of real interest rate to test for nonseparability in the utility function.

Results for Intertemporal Elasticity of Substitution

Model / Country / Estimators	Time Period	$\Delta C_t = \varphi_0 + \varphi_1 C_{t-1} + \varphi_2 (Y_t - EY_t) + \varphi_3 EY_t + \mu_t$					
		φ	φ_1	φ_2	φ_3	Adjusted R^2	ARIMA (p, d, q)
Algeria	1974–2013	-1.06**	-0.23**	0.00	0.34**	0.17	(1,1,1)
Bangladesh	1981–2013	3.70**	-0.45**	0.00**	-0.23	0.37	(1,1,1)
Benin	1981–2013	-0.01	-1.07**	-0.00**	1.06**	0.69	(1,1,1)
Burkina Faso	1970–2013	1.76	-0.46**	0.00	0.12	0.24	(1,1,0)
Cameroon	1970–2013	0.42	-0.05	0.00	-0.007	0.03	(1,1,1)
Chad	1981–2013	1.68	-0.37**	-0.00	0.036	0.22	(0,1,1)
Egypt	1970–2013	0.15	-0.37**	0.00	0.34**	0.29	(1,1,1)
Gabon	1970–2013	0.97	-0.33**	-0.00	0.19**	0.23	(1,1,0)
Guinea-Bissau	1990–2013	-1.11	-0.86**	0.00	0.99**	0.34	(1,1,1)
Guyana	1981–2013	0.83	-0.28	0.00	0.11	0.27	(1,1,1)
Indonesia	1990–2013	1.85	-0.22**	0.00	-0.07	0.50	(0,1,1)
Jordan	1970–2013	-0.10	-0.42**	0.00	0.43**	0.14	(1,1,1)
Kuwait	1975–2013	1.21	-0.41**	0.00	0.25**	0.41	(1,1,1)
Lebanon	1981–2013	5.65**	-1.13**	0.00**	0.44*	0.54	(1,1,1)
Libya	1970–2013	2.67**	-1.21**	0.00**	0.63**	0.60	(1,1,1)
Malaysia	1970–2013	1.65**	-0.34**	0.00**	0.09	0.27	(1,1,1)
Mali	1981–2013	1.93*	-0.62**	-0.00	0.28	0.31	(1,1,1)
Mauritania	1980–2013	1.23	-0.49**	0.00	0.28	0.23	(0,1,1)
Morocco	1970–2013	6.34**	-0.85**	0.00	-0.12*	0.64	(1,1,0)
Niger	1970–2013	1.94**	-0.59**	0.00**	0.19	0.32	(0,1,1)
Nigeria	1970–2013	2.79**	-0.61**	0.00**	0.15	0.28	(1,1,1)
Oman	1980–2013	2.52	-0.15	0.00	-0.14	0.07	(0,1,2)
Pakistan	1970–2013	0.87*	-0.38**	0.00	0.22	0.16	(1,1,0)
Senegal	1970–2013	0.59	-0.17	0.00**	0.07	0.13	(1,1,1)
Syria	1970–2013	2.98**	-0.37*	0.00	-0.07	0.24	(1,1,1)
Togo	1970–2013	3.82**	-0.81**	0.00**	0.12	0.46	(1,1,1)
Turkey	1970–2013	4.08**	-0.65**	0.00**	0.12	0.39	(1,1,1)
Uganda	1990–2013	-1.09	-0.84**	-0.00	1.00**	0.34	(1,1,1)

*Statistical significance at 10% level. **Statistical significance at 5% level.

Conclusion

- The evidence suggests that loss aversion impedes forward looking consumption behaviour.
- The empirical evidence challenges the existence of consumption smoothing phenomena as envisaged in permanent income hypothesis (PIH).
- In several countries, the consumption responds to expected income changes, which is against the intuition implied by PIH.
- The intertemporal elasticity of substitution is also statistically insignificant in majority of OIC countries.

Policy Implications

- The excess sensitivity of consumption to income suggests that redistribution efforts to enhance incomes of poor households could help in enhancing their consumption levels.

- Income redistribution and financial inclusion policies could be effective in enabling the households to smooth incomes and subsequently consumption.

- Given high aversion to loss among consumers as revealed in the study, it is pertinent to use social finance institutions like Zakat, Waqf and Qard-e-Hassan since commercial finance institutions would be hesitant to use equity financing instruments when consumers have high loss aversion.

Thank You

For Questions, Comments & Feedback

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