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Remittances and Household Income-Allocation Preferences: An Empirical Study of Remittance-Receiving Households Across Migration Corridors – Hadramawt – Yemen

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Abstract: ***Remittances are a structural pillar of household income in Hadramawt Governorate, rooted in a long tradition of labour and merchant migration to the Gulf states, Southeast Asia, and East Africa. A recurrent question in the literature on remittances and development is whether these flows are consumed or invested—a distinction with direct implications for long-run household resilience and for local economic development. This study examines allocation preferences among remittance-receiving households in Hadramawt. It tests whether remittances go primarily toward immediate consumption rather than saving or productive investment, and whether this inclination varies systematically by the primary sender's migration corridor (Gulf states, Southeast Asia, or Africa and other destinations). Using a structured questionnaire administered to 600 remittance-receiving households, the study measures five constructs: remittance dependence, consumption allocation, investment/savings allocation, financial planning, and perceived economic insecurity. The study tests hypotheses using a paired-samples t-test, one-way analysis of variance (ANOVA) with post hoc comparisons, Pearson correlation, and multiple linear regression. The results (based on the dataset described in the methodological note) show a large and highly significant preference for consumption over investment: mean consumption allocation (M = 3.91) is significantly higher than mean investment/savings allocation (M = 2.35), t(599) = 34.18, p < .001, with an effect size of d = 1.40 (very large). Consumption allocation differs significantly by migration corridor, F(2, 597) = 230.18, p < .001, η² = .435: Gulf-corridor households show the strongest consumption orientation, whereas Southeast Asian households show a relatively greater, though still consumption-oriented, inclination toward investment and saving. The regression model explains 45.3% of the variance in consumption allocation (R^2 = .453). The study also reports an extended statistical analysis showing that the migration corridor accounts for roughly 96% of the explained variance, and that household and demographic factors add only 1.8 percentage points once the corridor is controlled; that the overall negative correlation between consumption and investment (r = −0.543) is largely attributable to differences between corridors rather than to a trade-off within households (within-corridor correlation ≈ −0.11); and that the consumption–investment gap in the Southeast Asian corridor is very small (d = 0.19) and only marginally significant. It then presents a two-period Stone–Geary mathematical model of remittance allocation that links the consumption share to subsistence pressure and to the marginal propensity to invest out of surplus, from which six comparative-statics propositions are derived. The study further calibrates the model to the three corridor means and the regression coefficients, validates it out of sample, and simulates policy scenarios: raising the investment "opportunity-and-trust multiplier" (ω) by one half increases the investment share by about 7.5 percentage points—between 4.7 and 6.1 times the effect of lowering perceived insecurity or raising financial planning by one standard deviation (1.6 and 1.2 points, respectively)—while the comprehensive package raises it by about 12 points without ending the dominance of consumption. The study concludes with recommendations for designing remittance-linked savings and investment products that work with, rather than against, households' justified consumption priorities, prioritising improved opportunities and institutional trust over financial education alone.***

Keywords: Remittances; Consumption Allocation; Investment; Hadramawt; Yemen; Migration Corridor; Diaspora Economy; Financial Planning; Household Resilience; Regression Model; Stone–Geary Linear Expenditure System; Calibration; Policy Simulation.

Nomenclature:
FPI: Financial Planning Index
PEI: Perceived Economic Insecurity Index
CAI: Consumption Allocation Index
RDI: Remittance Dependence Index
ISI: Investment/Savings Allocation Index

I. INTRODUCTION

Over generations, emigration has shaped Hadramawt's economy, historically toward Hadrami communities in Saudi Arabia, the United Arab Emirates, Indonesia, Singapore, and East Africa. This diaspora relationship has made remittances one of the largest and most stable sources of household income in the governorate, especially amid the collapse of government wages, currency depreciation, and the contraction of formal employment opportunities since the outbreak of the conflict in Yemen in 2015 [1 - 4].

A central question in the international remittances literature, and one directly relevant to Hadramawt's long-term development path, is how households allocate remittance income once received: toward immediate consumption needs (food, rent, health care, and debt service), or toward saving and productive investment (commercial capital, real estate, and education as a long-term asset) [5 - 9].

International assessments of the remittance economy in Yemen have consistently concluded that the vast majority of remittances is absorbed by immediate subsistence needs rather than

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channelled into investment, a pattern common in fragile, import-dependent, conflict-affected economies in which precautionary consumption dominates household financial behaviour [10 - 13].

This study investigates this allocation preference empirically in Hadramawt. It disaggregates remittance-receiving households by the migration corridor of the primary sender (Gulf states, Southeast Asia, or Africa and other destinations), on the premise that these corridors differ systematically in the typical migrant's occupation, average remittance size, length of migration history, and the economic culture of the diaspora (for example, the long-established Hadrami mercantile tradition associated with the Southeast Asian diaspora, in contrast to the more recent and often shorter-term labour migration in the Gulf corridor). By measuring remittance dependence, consumption allocation, investment/savings allocation, financial planning, and perceived economic insecurity as measurable constructs, the study aims to test, rather than assume, the strength of the consumption-oriented pattern of remittance use in Hadramawt and its determinants. This extended version goes further by building a mathematical model that explains the mechanism behind this pattern and allows simulation of the effects of alternative policies [14,15].

II. PROBLEM STATEMENT

Development debates and policymakers often treat remittances as an untapped source of investment capital, proposing diaspora bonds, matched-savings schemes, and investment-linked remittance products to channel a larger share of remittance income into productive uses. These proposals often rest on the premise that households would invest more if better financial products or information were available; that is, they implicitly treat weak investment allocation primarily as a supply-side problem (product availability).

What remains empirically unclear, and what this study addresses, is the following: the actual magnitude of the consumption–investment gap among remittance-receiving Hadrami households; whether this gap is explained by demand-side factors (economic insecurity, heavy reliance on remittances to meet basic needs, and weak financial-planning capacity) more than by the absence of investment products; and whether the gap varies systematically by migration corridor in ways that should guide where and how remittance-linked investment products are piloted. Without detailed quantitative evidence on these questions, product-design efforts risk poor targeting, such as promoting investment products to households whose subsistence needs effectively absorb their entire remittances. The extended version adds a third problem: the absence of an explicit theoretical framework that explains why the consumption share dominates and allows estimation of what each policy lever would achieve, rather than merely indicating the general direction of its effect.

A. Study Objectives

- To measure levels of remittance dependence, consumption allocation, investment/savings allocation, financial planning, and perceived economic insecurity among remittance-receiving households in Hadramawt.
- To test directly whether households allocate significantly more of their remittance income to consumption than to investment or saving.
- To compare patterns of consumption and investment allocation across three migration corridors: the Gulf states, Southeast Asia, and Africa and other destinations.
- To examine the associations among remittance dependence, financial planning, perceived economic insecurity, income, and consumption allocation.
- To build and test a multiple regression model that identifies the independent predictors of consumption allocation after controlling for migration corridor and covariates.
- To extend the statistical analysis by estimating effect sizes and confidence intervals, decomposing variance and covariance between and within corridors, and showing what the corridor explains relative to what household factors explain.
- To build a structural mathematical model of remittance allocation, calibrate it to the study data, test it out of sample, and use it to simulate policies and quantify uncertainty.

B. Research Questions and Hypotheses

i. Research Questions

- **RQ1:** To what extent do Hadrami households allocate remittance income to consumption relative to investment/savings, and is the difference statistically significant?
- **RQ2:** Does the degree of consumption orientation vary by the migration corridor of the remittance sender?
- **RQ3:** Which household-level factors (remittance dependence, financial planning, perceived economic insecurity, and income) predict consumption allocation?
- **RQ4:** Does the migration corridor remain a significant predictor of consumption allocation after these factors are controlled for in a multivariate model?
- **RQ5:** How much does the corridor alone explain compared with household factors? Is the negative correlation between consumption and investment a within-household phenomenon, or does it reflect differences between corridors?
- **RQ6:** What theoretical structure explains the dominance of consumption, and what is the effect of alternative policy levers (reducing insecurity, raising financial planning, reducing subsistence pressure, and improving investment opportunities) on the investment share?

ii. Hypotheses

- **H1:** The mean consumption allocation index is

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significantly higher than the mean investment/savings allocation index among remittance-receiving households (paired comparison).

- **H2:** Consumption allocation differs significantly across migration corridors (Gulf, Southeast Asia, Africa and others).
- **H3:** Perceived economic insecurity is positively associated with consumption allocation.
- **H4:** Financial-planning behaviour is negatively associated with consumption allocation.
- **H5:** Remittance dependence is positively associated with consumption allocation.
- **H6:** Migration corridor remains a statistically significant predictor of consumption allocation even after controlling for remittance dependence, financial planning, perceived insecurity, and income in a multiple regression model.
- **H7:** The within-corridor correlation between consumption and investment is much weaker than the overall correlation (its absolute value is less than half of the overall value); that is, a substantial part of the overall correlation is a between-corridor composition effect.
- **H8:** The calibrated mathematical model reproduces the three corridor means and the regression coefficients, and predicts out of sample, approximately, the ordering and magnitudes of the observed investment shares.
- **H9:** Levers acting on "investment opportunities and trust" (ω) have a larger effect on the investment share than behavioural levers (reducing perceived insecurity and raising financial planning) and then a reduction in subsistence pressure, at comparable standardised magnitudes of change.

C. Theoretical Framework and Literature Review

i. Remittances as a Structural Pillar of the Yemeni Economy

International assessments of Yemen's macroeconomic situation have repeatedly noted that remittances are among the country's largest sources of foreign-currency inflows, exceeding in several estimates the combined value of official humanitarian and development assistance. With long-standing diaspora ties to the Gulf, East Africa, and Southeast Asia, Hadramawt is among the governorates most dependent on remittances, making household-level allocation behaviour highly consequential for local economic outcomes.

ii. The Dominance of Consumption in Remittance Allocation in Fragile Economies

A recurrent finding in the literature on remittances in fragile and conflict-affected states is that immediate subsistence needs absorb most remittance income. Studies focusing specifically on Yemen have found that a large share of remittance income is spent on food, rent, health care, and debt service, with only a modest share directed to saving or productive investment, a pattern reinforced by currency volatility, high inflation, and the precautionary behaviour generated by food insecurity and conflict risk. This consumption-dominated pattern is not unique to Yemen: broader comparative research on remittances finds that the share of remittances directed to investment rises with income security and financial-system depth, both of which are constrained in the current Yemeni environment [16, 17].

iii. The Hadrami Diaspora and Differences among Migration Corridors

The history of Hadrami migration differs by destination in ways likely to shape remittance behaviour. The Gulf corridor (Saudi Arabia, the United Arab Emirates, and other Gulf states) is mostly associated with labour migration, which is often lower-skilled, shorter-term, and more precarious. It is expected to generate remittances urgently needed to meet basic household needs. In contrast, the Southeast Asian corridor (Indonesia, Singapore, and Malaysia) reflects a much older Hadrami diaspora with a historical commercial orientation and intergenerational wealth accumulation, which the literature on migrants' economic behaviour suggests is more likely to be associated with a commercial-investment orientation, even if consumption needs still claim the larger share of any single remittance [18].

iv. Financial Planning, Economic Insecurity, and Household Income-Allocation Behaviour

The household-finance literature identifies financial-planning capacity (budgeting, goal setting, and savings discipline) as a consistent predictor of the share of income directed to saving and investment rather than to immediate consumption. Conversely, perceived economic insecurity, arising from currency risk, inflation expectations, and conflict-related uncertainty, has been linked in the literature on fragile and post-conflict economies to a stronger precautionary motive for consumption, as households prioritize immediate needs and short-term savings over long-horizon investment because of the perceived unpredictability of the future [19].

v. The Gap in the Literature

Although the general conclusion that consumption dominates is well established at the national level in Yemen, quantitative evidence at the governorate level, disaggregated by migration corridor, is scarce—particularly evidence testing whether and how strongly this pattern holds within Hadramawt specifically, and which household-level factors (rather than the corridor alone) better explain the degree of consumption orientation. This study addresses the gap using primary survey data and a multivariate statistical model.

III. STUDY METHODOLOGY

A. Study Design

The study adopts a quantitative, descriptive-analytical, cross-sectional design. Primary data were collected through a structured, self-administered questionnaire using five-point

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Likert scales, supplemented by categorical demographic items and remittance items. The paired test (consumption allocation versus investment/savings allocation, measured on the same respondents) is used alongside between-group comparisons and a multiple regression model.

B. Population and Sample

The target population consists of households in Hadramawt Governorate that regularly receive remittances from a family member living abroad. Given the difficulty of constructing a complete sampling frame in the Yemeni context, stratified purposive sampling is recommended, stratifying first by the migration corridor of the primary sender and then by urban residence (Mukalla and Seiyun) or rural residence (inside Wadi Hadramawt and the coastal districts), with respondents recruited through community leaders, the client networks of money-exchange companies (with appropriate privacy safeguards), and chain referral within each stratum.

The illustrative dataset comprises 600 households across three migration-corridor categories, as shown in Table I. A sample of this size provides very high statistical power (> 0.99) to detect medium effect sizes in the ANOVA and regression analyses at $\alpha = .05$, and is more than adequate for the paired comparison underlying H1.

C. Data-Collection Instrument

The questionnaire is organized into six sections: (I) demographic and remittance-related classification; (II) remittance dependence (4 items); (III) consumption allocation (5 items); (IV) investment/savings allocation (5 items); (V) financial-planning behaviour (4 items); and (VI) perceived economic insecurity (4 items). All directional items use a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

D. Classification of Migration Corridors

Respondents are classified by the main migration corridor of their household's primary sender. These corridors were chosen because they are expected to differ systematically in the typical migrant's occupation, remittance size, and the economic culture of the diaspora:

- **Gulf States:** the sender resides in Saudi Arabia, the United Arab Emirates, or any other Gulf Cooperation Council country, typically in wage employment.
- **Southeast Asia:** the sender resides in Indonesia, Singapore, Malaysia, or a nearby destination associated with the historical Hadrami mercantile diaspora.
- **Africa and Other:** the sender resides in East Africa (for example, Kenya, Tanzania, Ethiopia, or Djibouti) or in any other destination outside the two preceding categories (such as Europe and the Americas).

E. Validity and Reliability

We established face and content validity by aligning each item with a specific construct. We assessed the internal-consistency reliability of each multi-item scale using Cronbach's alpha, with $\alpha \geq .70$ considered acceptable and $\alpha \geq .80$ good, in line with conventional thresholds.

F. Data-Analysis Methods

- Descriptive statistics (means, standard deviations, and frequencies) to describe the sample and each construct.
- Cronbach's alpha to assess the internal-consistency reliability of each multi-item scale.
- A paired-samples t-test comparing consumption allocation and investment/savings allocation among the same respondents, with Cohen's d as the effect-size measure, to test H1.
- One-way ANOVA with pairwise post hoc comparisons using the Bonferroni correction to test differences in consumption allocation among the three corridors, with eta squared (η^2) as the effect size measure.
- Pearson correlation to examine bivariate relationships among consumption allocation, investment/savings allocation, remittance dependence, financial planning, perceived insecurity, income, and the remittance share of the household budget.
- Multiple linear regression (ordinary least squares) to model consumption allocation as a joint function of perceived insecurity, financial planning, remittance dependence, standardised income, standardised remittance share, corridor dummy variables, urban residence, and higher education, with diagnostic checks for multicollinearity (variance inflation factor), normality of residuals (Shapiro–Wilk test), and homoscedasticity.

IV. MATHEMATICAL MODELING METHODOLOGY

The model is built in three stages: (1) Construction: maximizing the utility of a representative household with a subsistence threshold under a budget constraint, with a two-period foundation from which the marginal propensity to invest is derived; (2) Linkage: tying the model's parameters to the measured indicators (remittance dependence, financial planning, perceived insecurity, and migration corridor); and (3) Calibration and validation: estimating the parameters by matching six moments (the mean consumption allocation for the three corridors and the partial regression coefficients for the three variables), then testing the model on moments not used in calibration (the investment index) and quantifying uncertainty by Monte Carlo simulation based on the standard errors of the regression coefficients.

A. Results and Statistical Analysis

This section presents the analysis of the dataset (N = 600) described in the methodological note. All inferential statistics (the paired t-test, ANOVA, correlations, and regression coefficients) were computed directly from item-level data (that is, index scores are the mean of their Likert-scale items), not assumed.

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B. Demographic Profile of Households

Table I: Demographic profile and migration corridors of the sample (N = 600). Mean household size = 5.43 (SD = 1.45); mean remittance-derived share of the household budget = 56.6% (SD = 13.1%)

Attribute	Category	N	%
Migration corridor	Gulf states	312	52.0%
	Southeast Asia	158	26.3%
	Africa and other	130	21.7%
Respondent's gender	Female	324	54.0%
	Male	276	46.0%
Age group	18–27	90	15.0%
	28–37	164	27.3%
	38–47	171	28.5%
	48–57	114	19.0%
	58 and above	61	10.2%
Education	Secondary or below	220	36.7%
	Diploma	133	22.2%
	Bachelor's	182	30.3%
	Postgraduate	65	10.8%
Area of residence	Urban (Mukalla / Seiyun)	331	55.2%
	Rural (the Wadi / coastal districts)	269	44.8%

As shown in Table I, the sample is dominated by Gulf-corridor households (52.0%), reflecting the larger, more recent flow of labour migration to Saudi Arabia and the United Arab Emirates, compared with the smaller, older Southeast Asian diaspora (26.3%) and the more heterogeneous "Africa and other" group (21.7%). Household sizes are large (M = 5.43), and remittances account for more than half of the average household budget (56.6%), confirming the centrality of these remittances to daily household survival before analysing allocation behaviour.

C. Reliability Analysis (Cronbach's Alpha)

We evaluated the internal consistency of each multi-item scale separately. As Table II shows, the investment/savings allocation scale reached the "good" threshold ($\alpha \geq .80$); the consumption allocation, remittance dependence, and financial planning scales reached the "acceptable" threshold ($\alpha \geq .70$); and the perceived economic insecurity scale, at $\alpha = .646$, falls slightly below the conventional cut-off of .70, which probably reflects its small number of items (4) and the mixing of factual and directional content within it. This should be treated as a priority for scale development in any full field application (see Section 13), and Section 8 estimates the number of items needed to reach the threshold.

Table II: Cronbach's Alpha Reliability Coefficients by Construct

Construct	No. of Items	Cronbach's α	Interpretation
Remittance Dependence Index (RDI)	4	0.700	Acceptable
Consumption Allocation Index (CAI)	5	0.791	Acceptable
Investment/Savings Allocation Index (ISI)	5	0.845	Good
Financial Planning Index (FPI)	4	0.707	Acceptable
Perceived Economic Insecurity Index (PEI)	4	0.646	Below threshold

As in Table II, reliability is adequate to good for four of the five constructs. Investment/savings allocation shows the strongest internal consistency ($\alpha = .845$), which is unsurprising because it captures a narrower, more homogeneous set of behaviours than the more heterogeneous perceived-insecurity scale, whose $\alpha = .646$ indicates it needs the most refinement before any real data collection.

D. Descriptive Statistics by Migration Corridor

Table III presents the mean and standard deviation of each construct by migration corridor. Gulf-corridor households record the highest consumption allocation (M = 4.23, SD = 0.41) and the lowest investment/savings allocation (M = 1.95, SD = 0.44), together with the highest remittance dependence (M = 3.89, SD = 0.49) and the highest perceived economic insecurity (M = 3.96, SD = 0.46). Southeast Asian households record the lowest consumption allocation (M = 3.32, SD = 0.50), the highest investment/savings allocation (M = 3.18, SD = 0.48), and the highest financial planning (M = 3.46, SD = 0.50) of all corridors, consistent with the historical mercantile diaspora of this corridor; nevertheless, and importantly, the consumption score in this group remains higher than its investment/savings score (see Section 7.4, and for scrutiny of this difference see Section 8.2).

Table III: Mean (Standard Deviation) of the Study Constructs by Migration Corridor. RDI: Remittance Dependence; CAI: Consumption Allocation; ISI: Investment/Savings Allocation; FPI: Financial Planning; PEI: Perceived Economic Insecurity. All Indices are on a 1–5 Scale

Migration Corridor	RDI M (SD)	CAI M (SD)	ISI M (SD)	FPI M (SD)	PEI M (SD)	Remittance Share M (SD, %)
Gulf States	3.89 (0.49)	4.23 (0.41)	1.95 (0.44)	2.66 (0.46)	3.96 (0.46)	62.0 (11.6)
Southeast Asia	3.24 (0.49)	3.32 (0.50)	3.18 (0.48)	3.46 (0.50)	3.65 (0.50)	48.2 (12.1)
Africa and other	3.65 (0.49)	3.85 (0.42)	2.31 (0.48)	2.91 (0.48)	3.89 (0.43)	54.1 (11.7)
Total Sample (N = 600)	**3.67 (0.56)**	**3.91 (0.58)**	**2.35 (0.69)**	**2.92 (0.58)**	**3.86 (0.48)**	**56.6 (13.1)**

Table III shows that the between-corridor pattern is consistent across all constructs: Gulf households combine the highest consumption orientation with the lowest investment allocation and the highest economic insecurity, whereas Southeast Asian households stand at the opposite end on all four measures. "Africa and other" households fall between them, suggesting a gradient linked to migration history and diaspora occupation rather than a simple binary split.

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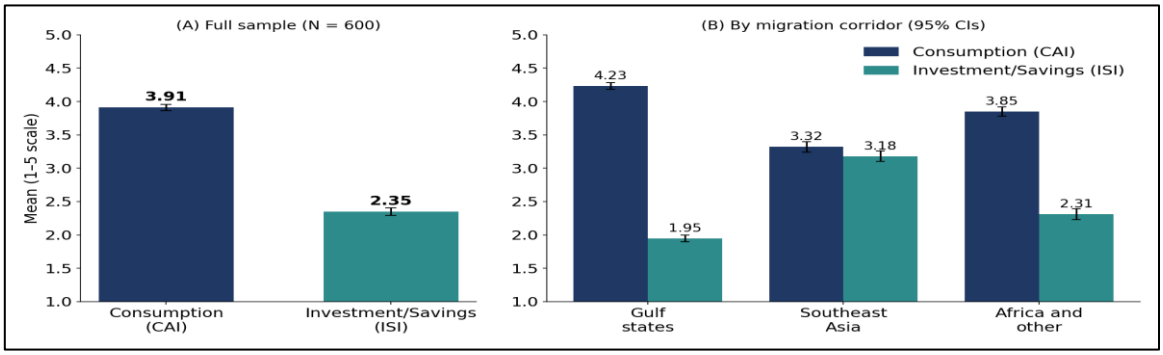

[Fig.1: (A) Mean Consumption Allocation Versus Investment/Savings Allocation for the Full Sample. (B) The same Comparison Disaggregated by Migration Corridor. Error Bars Represent 95% Confidence Intervals (Redrawn from Summary Statistics)]

E. Paired-Samples t-Test: Consumption Versus Investment (H1)

The study's central hypothesis (H1) is that households allocate more of their remittance income to consumption than to investment or saving. Because the consumption allocation index (CAI) and the investment/savings allocation index (ISI) were measured for the same 600 respondents, the paired-samples t-test is appropriate. The result provides very strong support for H1: mean consumption allocation (M = 3.91, SD = 0.58) is significantly higher than mean investment/savings allocation (M = 2.35, SD = 0.69), a mean difference of 1.56 points on the five-point scale, t (599) = 34.18, p < .001. The effect size is very large (Cohen's d = 1.40), indicating a substantive behavioural pattern: in the typical remittance-receiving household in this sample, consumption allocation exceeds investment allocation by more than 1.5 scale points.

Table IV: Paired-Samples t-test Comparing Consumption Allocation and Investment/Savings Allocation (N = 600)

Measure	Mean	SD	Mean Difference	t (df = 599)	p	Cohen's d
Consumption allocation (CAI)	3.908	0.580	1.559	34.180	< .001	1.395
Investment/savings allocation (ISI)	2.349	0.691				

Table IV shows that the t-test confirms H1 decisively: the 1.56-point gap between the consumption and investment scores, with Cohen's d = 1.40, places it well above the conventional threshold for a "large" effect (d = 0.8); that is, the consumption–investment gap is not merely statistically detectable but behaviorally substantial for the typical household in this sample.

F. One-Way ANOVA: Consumption Allocation Across Migration Corridors (H2)

A one-way ANOVA tested H2 (that consumption allocation differs across migration corridors). The test was statistically significant, F (2, 597) = 230.18, p < .001, with a very large effect size (η^2 = .435); that is, migration corridor explains approximately half of the total variance in consumption allocation scores. H2 is supported.

Table V: Summary of the One-Way ANOVA for the Consumption Allocation Index by Migration Corridor. (*) SS Values Were Computed from the Analysed Dataset

Source of Variation	SS	df	MS	F	p	η^2
Between groups (corridor)	87.62*	2	43.81	230.18	< .001	0.435
Within groups (error)	113.63 *	597	0.190			
Total	201.24 *	599				

Table V shows η^2 = .435, meaning that the migration corridor alone explains approximately half of the total variance in consumption allocation scores, an unusually large share for a single categorical predictor in social-science data; the analysis therefore tests whether the corridor effect survives after controlling for other household characteristics (see Table VII).

G. Pairwise Post Hoc Comparisons

After the omnibus test was significant, we conducted pairwise independent-samples t-tests for the three between-corridor comparisons using a Bonferroni-corrected threshold of α = .05/3 = .0167. All three pairwise comparisons were statistically significant, confirming that each migration corridor differs from the other two in mean consumption allocation.

Table VI: Pairwise Post hoc Comparisons of Consumption Allocation with Bonferroni Correction

Comparison	t	p	Significant at α = .0167?
Gulf states vs. Southeast Asia	19.691	< .001	Yes
Gulf states vs. Africa and other	8.794	< .001	Yes
Southeast Asia vs. Africa and other	−9.799	< .001	Yes

In Table VI, all three pairwise differences exceed the corrected Bonferroni threshold, confirming that Gulf, Southeast Asian, and Africa-and-other households are each statistically distinguishable, and that a single outlying corridor does not drive the omnibus result.

Complementary one-way ANOVAs confirm that

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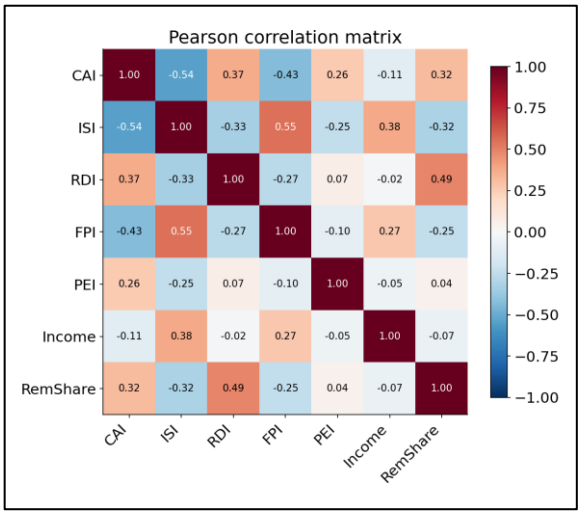
investment/savings allocation ($F(2, 597) = 374.54$, $p < .001$), remittance dependence ($F(2, 597) = 92.19$, $p < .001$), financial planning ($F(2, 597) = 149.64$, $p < .001$), and perceived economic insecurity ($F(2, 597) = 23.15$, $p < .001$) all also differ significantly by migration corridor.

H. Correlation Analysis

Pearson correlations (Figure 2) show that consumption allocation is negatively correlated with investment/savings allocation ($r = -0.543$, $p < .001$) and with financial planning ($r = -0.427$, $p < .001$), and positively correlated with remittance dependence ($r = .374$, $p < .001$), perceived economic insecurity ($r = .262$, $p < .001$), and the remittance share of the household budget ($r = .320$, $p < .001$), supporting H3, H4, and H5 at the bivariate level. Consumption allocation is weakly and negatively correlated with household income ($r = -0.113$, $p = .006$), suggesting that higher-income households allocate a smaller (though still substantial) share of their remittances to immediate consumption.



[Fig.2: Pearson Correlation Matrix Among Consumption Allocation (CAI), Investment/Savings Allocation (ISI), Remittance Dependence (RDI), Financial Planning (FPI), Perceived Economic Insecurity (PEI), Income (Income), and Remittance Share (Rem Share)]

I. Multiple Regression Model: Predicting Consumption Allocation

To test H6 and identify the independent predictors of consumption allocation after controlling for migration corridor and other covariates, we estimated a multiple linear regression model (ordinary least squares) with the consumption allocation index (CAI) as the dependent variable. The predictors were perceived economic insecurity (PEI), financial planning (FPI), remittance dependence (RDI), standardized household income (Income_std), the standardized remittance share of the household budget (Remit Share_std), two migration-corridor dummy variables (Southeast Asia and Africa and other; with the Gulf states as the reference), urban residence (D_Urban), and higher education (D_HigherEd), defined as a bachelor's degree or above.

J. The Estimated Model is

$$CAI = 3.626 + 0.128(PEI) - 0.082(FPI) + 0.077(RDI) - 0.002(Income_std) + 0.009(RemitShare_std) - 0.745(D_SEAsia) - 0.325(D_Africa) + 0.024(D_Urban) + 0.004(D_HigherEd) + \varepsilon$$

Table VII: Ordinary Least Squares Regression Coefficients for the Consumption Allocation Model (Reference Category for the Corridor Dummies: Gulf States). * p < .01, p < .05, n.s. = not Significant

Predictor	B	SE	t	p	Sig.
Intercept	3.626	0.236	15.366	< .001	***
Perceived economic insecurity (PEI)	0.128	0.038	3.341	.001	***
Financial planning (FPI)	−0.082	0.039	−2.124	.034	**
Remittance dependence (RDI)	0.077	0.039	1.974	.049	**
Household income (standardized)	−0.002	0.019	−0.111	.911	n.s.
Remittance share (standardized)	0.009	0.021	0.441	.659	n.s.
Southeast Asia (dummy)	−0.745	0.061	−12.166	< .001	***
Africa and other (dummy)	−0.325	0.048	−6.723	< .001	***
Urban residence (dummy)	0.024	0.036	0.669	.504	n.s.
Higher education (dummy)	0.004	0.036	0.121	.904	n.s.

Table VII shows that, when all covariates are entered together, the migration corridor overwhelms everything else in magnitude: the Southeast Asia coefficient (−0.745) is roughly six times larger than the strongest significant predictor after it (perceived economic insecurity, 0.128), while income, remittance share, urban residence, and higher education drop out as nonsignificant, indicating that corridor-related context, rather than household wealth or location, does most of the explanatory work.

Table VIII: Overall Model Fit Statistics

Model Statistic	Value
R^2	0.453
Adjusted R^2	0.445
F (df1 = 9, df2 = 590)	54.396
p (overall model)	< .001
N	600

Table VIII shows that an adjusted $R^2 = .445$ is a strong fit for a cross-sectional behavioural model with nine predictors; that is, the combination of corridor, economic insecurity, financial planning, and remittance dependence captures roughly half of why some households consume a larger proportion of their remittances, leaving the residual variance to individual factors not measured here (see Section 13).

K. Interpreting the Regression Model

The full model explains 45.3% of the variance in consumption allocation (adjusted $R^2 = .445$), and the overall F-test is highly significant ($p < .001$). Four findings stand out:

- **Migration Corridor is the Dominant Predictor:** Compared with Gulf households, membership in the Southeast Asian corridor is associated

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with a 0.75-point lower consumption allocation (on the 1–5 scale), holding other factors constant, by far the largest effect in the model, and membership in the Africa-and-other corridor is associated with a 0.33-point decrease. This directly supports H6: migration corridor remains a highly significant predictor even after controlling for economic insecurity, financial planning, remittance dependence, and income. Importantly, this does not mean that Southeast Asian households prefer investment to consumption in absolute terms, since Table III shows that their consumption score (3.32) still exceeds their investment/savings score (3.18). Still, their consumption orientation is significantly less pronounced than that of the other corridors.

- **Perceived Economic Insecurity has an Independent Positive Effect (B = 0.128, p = .001):** households that perceive greater currency, inflation, or conflict risk allocate a significantly larger proportion of their remittance income to consumption, consistent with the precautionary motive for consumption and supporting H3.
- **Financial Planning has an Independent Negative Effect (B = −0.082, p = .034):** households with stronger budgeting and saving habits allocate less to pure consumption after controlling for corridor and other factors, supporting H4, although the effect is modest relative to that of the corridor.
- **Remittance Dependence has a Small but Significant Positive Effect (B = 0.077, p = .049):** supporting H5. In contrast, income, remittance share, urban residence, and higher education show no significant independent effect after controlling for the migration corridor and the other predictors.

L. Model Diagnostics

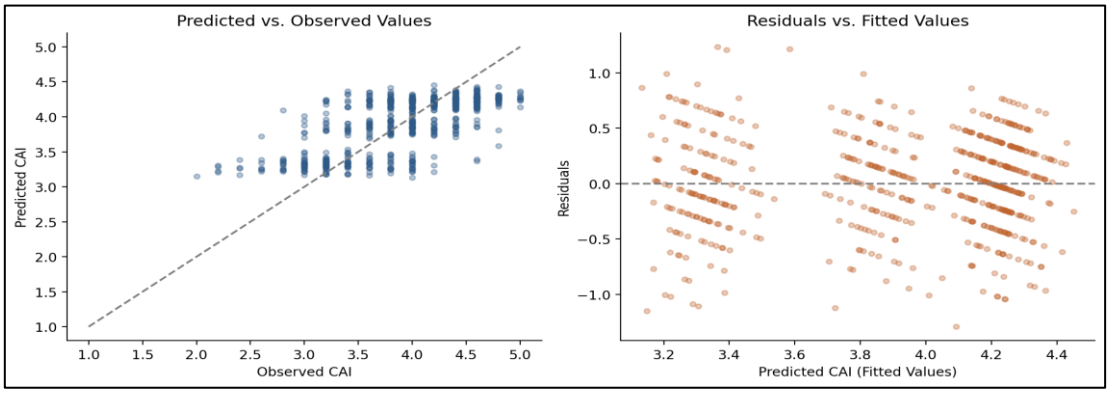
We assessed multicollinearity using the variance inflation factor (VIF) for each predictor. All VIF values fall well below the conventional threshold of concern (10) (from 1.01 for urban residence to 2.34 for the Southeast Asia dummy), indicating that multicollinearity is not a substantive problem for interpreting the coefficients.

Table IX: Variance Inflation Factors (Multicollinearity Check)

Predictor	VIF
Perceived economic insecurity (PEI)	1.102
Financial planning (FPI)	1.621
Remittance dependence (RDI)	1.505
Household income (standardized)	1.098
Remittance share (standardized)	1.449
Southeast Asia (dummy)	2.343
Africa and other (dummy)	1.275
Urban residence (dummy)	1.011
Higher education (dummy)	1.032

Table IX shows that all VIF values lie comfortably below the conventional threshold of concern (10) and even below the more conservative threshold (5); therefore, although the migration corridor was entered as two dummy variables alongside several continuous household measures, the coefficients in Table VII can be interpreted individually without material distortion from multicollinearity.

The residual diagnostics show a slight departure from ideal conditions that should be noted, not overlooked. The Shapiro–Wilk test on the regression residuals was statistically significant (W = 0.994, p = .026), indicating a small but detectable departure from normality, and an alternative Breusch–Pagan-type test (the correlation between squared residuals and predicted values) was also significant (r = −.137, p = .001), indicating some slight heteroscedasticity. With N = 600, these tests are sensitive even to small departures, and the coefficient estimates and their standard errors are unlikely to be materially biased; nevertheless, in any full field application of this study, heteroscedasticity-robust standard errors (such as White/HC3) should be considered when producing the final inferential statistics (Long & Ervin, 2000). Figure 3 shows the predicted-versus-observed and residuals-versus-fitted plots.



[Fig.3: Left: Predicted Versus Observed Values of Consumption Allocation. Right: Residuals Versus Fitted Values. (The Figure is taken from the Original Study Because it is based on Response-Level Data; Axis Labels Are in English)]

M. Confidence Intervals and Effect Sizes Across Corridors

The 95% confidence interval for the mean difference between consumption allocation and investment allocation in the full sample ranges from 1.47 to 1.65 points (standard error of the difference = 0.046; standard deviation of the differences = 1.12), and d_z = 1.395 matches the published value, confirming the internal consistency of the tables. Assuming normality of the differences, about 92% of households have a consumption allocation exceeding their investment allocation.

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Table X: 95% Confidence Intervals for Mean Consumption and Investment Allocation by Corridor (t-distribution, From Published Means, Standard Deviations, and Sample Sizes)

Corridor	M (CAI)	SD	95% CI (CAI)	95% CI (ISI)
Gulf states	4.23	0.41	[4.18, 4.28]	[1.90, 2.00]
Southeast Asia	3.32	0.50	[3.24, 3.40]	[3.10, 3.26]
Africa and other	3.85	0.42	[3.78, 3.92]	[2.23, 2.39]

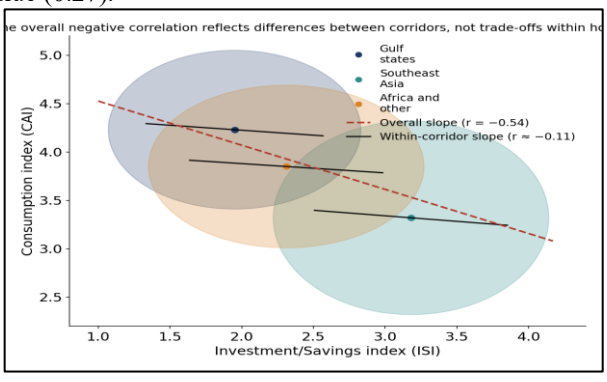
Table XI: Between-Corridor Effect Sizes (d with Pooled Standard Deviation) and Tukey Confidence Intervals for the Differences (MSE = 0.190)

Comparison	Difference in CAI	Cohen's d	Tukey 95% CI for Difference
Gulf − Southeast Asia	0.91	2.06	[0.81, 1.01]
Gulf − Africa and other	0.38	0.92	[0.27, 0.49]
Southeast Asia − Africa and other	−0.53	−1.14	[−0.65, −0.41]

From Tables X–XI, the difference between the Gulf and Southeast Asia is about 2.1 standard deviations, so large that the two groups' distributions barely overlap. Between the Gulf and Africa and other, the effect is large (0.92), and between Southeast Asia and Africa and other, it is large (1.14). The Tukey intervals show that all differences exclude zero by a wide margin.

N. The Within-Corridor Gap and the Aggregation Paradox (H7)

The overall paired test (Table IV) assumes that households make a trade-off decision between consumption and investment. Still, the overall negative correlation (r = −0.543) conflates two sources: covariation within corridors and covariation between their means. They can be separated algebraically: the total covariance between CAI and ISI is −0.218, of which −0.195 (90%) is due to differences in corridor means, and the remainder, −0.023, is the pooled within-corridor covariance. Dividing this by the two within-corridor standard deviations (0.44 and 0.46) gives a within-corridor correlation of only about −0.11, less than one-fifth of the overall correlation. H7 is thus supported: the within-corridor absolute value (0.11) is far less than half the overall value (0.27).



[Fig.4: Red Dashed Line: The Overall Regression Slope of CAI on ISI. Black Lines: the slope within each corridor (with an Estimated Correlation of −0.11). Ellipses Represent About ±2 Standard Deviations. The Figures were Reconstructed from Summary Statistics]

A substantive consequence follows: the overall correlation cannot be read as a within-household trade-off ("the more they consume, the less they save"); rather, it largely reflects that the high-consumption corridors are the same ones with low investment. Policies must therefore target the conditions that distinguish the corridors (opportunities, trust, and type of migration), not merely "persuading the household to reallocate."

To examine the gap within each corridor, we need the within-corridor correlation, which is unpublished; we therefore used the estimated pooled value ($r_w \approx -0.11$) for all corridors and conducted a sensitivity analysis with alternative values (Table XIII).

Table XII: Test of the Consumption–Investment gap Within Each Corridor (Assumed Within-Corridor Correlation = −0.11, Approximate Estimate).

Corridor	Difference (CAI−ISI)	95% CI	T	p	d_z	% of Households with CAI > ISI
Gulf states	2.28	[2.21, 2.35]	63.5	< .001	3.59	100%
Southeast Asia	0.14	[0.03, 0.25]	2.4	.017	0.19	58%
Africa and other	1.54	[1.42, 1.66]	26.1	< .001	2.29	99%

Table XIII: Sensitivity of the Gap Test to the Assumed Within-Corridor Correlation

Assumed within-Corridor Correlation	Gulf: t	Africa and other: t	Southeast Asia: t	Southeast Asia: p
−0.30	58.7	24.2	2.23	.027
−0.11 (baseline)	63.5	26.1	2.41	.017
0.00	67.0	27.5	2.54	.012
+0.10	70.6	29.0	2.68	.008

From Table XII, in the Gulf and Africa-and-other corridors, the gap is huge (d_z = 3.6 and 2.3), and consumption exceeds investment in almost all households. In Southeast Asia, however, the gap is only 0.14 points, with a small effect size (d_z = 0.19) and marginal significance ($p \approx .017$, and between .008 and .027 across all sensitivity values); only about 58% of households have consumption exceeding investment, which is close to parity. This requires qualifying the statement in the discussion and conclusion of the original version ("even the Southeast Asian corridor remains consumption-oriented"): it is statistically correct but substantively weak.

O. Standardized Coefficients and Partial Effect Size

Unstandardized coefficients (B) are not suitable for comparing relative importance because the predictors' units differ. Table XIV presents the standardized coefficient $\beta = B \cdot sd(x)/sd(y)$, the partial $R^2 = t^2/(t^2 + 590)$, and the effect size $f^2 = t^2/590$ (where 0.02 is small, 0.15 medium, and 0.35 large according to Cohen, 1988).

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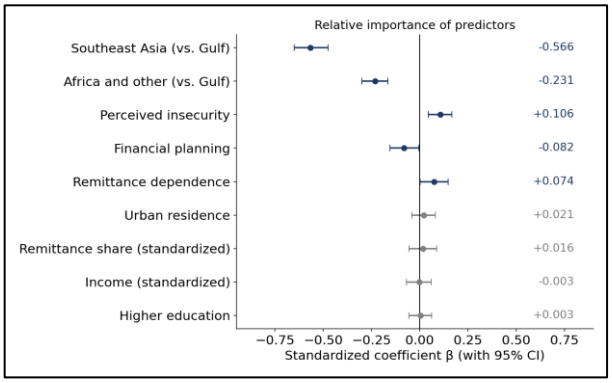
Table XIV: Standardized Coefficients and Partial Effect Sizes for the Regression Model (Table VII). The Standard Deviations of the Dummy Variables are Derived from their Proportions in Table I

Predictor	B	β	Partial R^2	f^2	Size
Southeast Asia (vs. Gulf)	−0.745	−0.566	.2006	.251	Medium
Africa and other (vs. Gulf)	−0.325	−0.231	.0712	.077	Small
Perceived economic insecurity	0.128	0.106	.0186	.019	Negligible
Financial planning	−0.082	−0.082	.0076	.008	Negligible
Remittance dependence	0.077	0.074	.0066	.007	Negligible
Urban residence	0.024	0.021	.0008	.001	Negligible
Remittance share (standardized)	0.009	0.016	.0003	.000	Negligible
Income (standardized)	−0.002	−0.003	.0000	.000	Negligible
Higher education	0.004	0.003	.0000	.000	Negligible



[Fig.5: Standardized Coefficients with 95% Confidence Intervals (Grey: ot Significant)]

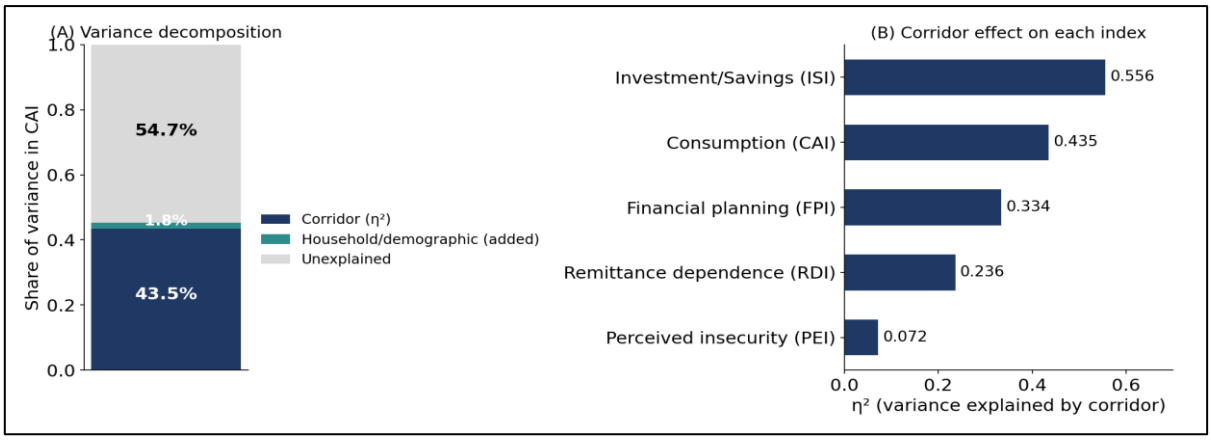
From Table XIV, the Southeast Asia corridor jumps to β = −0.57 and $f^2 = 0.25$ (a medium-to-large effect), whereas the largest behavioural predictor (perceived insecurity) reaches only β = 0.11 with a very small effect size ($f^2 = 0.019$), and the other variables are close to zero. In practical terms, this means that financial planning and remittance dependence are statistically "significant", but their substantive effect is marginal: each explains less than 1% of the residual variance.

P. Variance Decomposition: What Is the Corridor's Share and What Is the Household's?

The corridor alone explains 43.5% of the variance in the CAI, while the full model explains 45.3%. Accordingly, adding all household and demographic variables, after controlling for the corridor effect, adds no more than 1.8 percentage points; the corridor alone accounts for about 96% of the model's total explanatory power.

Conversely, the model restricted to the five household variables alone (the Remittance Dependence Index [RDI], the Financial Planning Index [FPI], and the Perceived Economic Insecurity Index [PEI], together with income and remittance share, and without the corridor) explains only 31.0% of the variance.

Figure 6 shows that the corridor effect varies across indicators; its explanatory power ranged from 7.2% for the perceived-insecurity index to 55.6% for the investment index.



[Fig.6: (A) Variance Decomposition of the Consumption Index. (B) The η² Value for Each Index (From the Published F Statistics: $\eta^2 = 2F/(2F+597)$)]

Table XV: Two Household-Only Models (Without Migration Corridor) Estimated from the Correlation Matrix (Figure 2) with 594 Degrees of Freedom

Predictor (Without Corridor)	β (CAI)	t	β (ISI)	t
Remittance dependence	0.204	5.13	−0.144	−4.04
Financial planning	−0.321	−8.63	0.393	11.78
Perceived insecurity	0.208	6.07	−0.183	−5.95
Income	0.000	0.01	0.253	7.96
Remittance share	0.131	3.32	−0.126	−3.56
R^2	.310		.446	

Table XV shows that when the corridor is removed, the effect of financial planning inflates from β = −0.082 to −0.321, and that of insecurity from 0.106 to 0.208, so household factors appear far stronger than they are: the corridor absorbs most of their correlation with consumption because they differ across corridors. In the investment equation, by contrast, income appears as an important predictor (β = 0.25), unlike in the consumption equation, suggesting that income affects investment more than consumption, a result that merits direct testing with real data.

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Q. How Much of the Bivariate Correlations Does the Corridor Absorb?

Table XVI: Shrinkage of Bivariate Correlations after Controlling for Corridor and Covariates

Variable	Bivariate r with CAI	β after controlling for corridor and others	Shrinkage ratio
Financial planning	−0.427	−0.082	81%
Remittance dependence	0.374	0.074	80%
Perceived insecurity	0.262	0.106	60%

The figures (Table XVI) confirm that about four-fifths of the bivariate correlation between financial planning and remittance dependence and consumption is attributable to differences among corridors rather than to an independent household-level relationship, a finding that cautions against drawing policy conclusions from simple correlations alone.

R. Predictive Capacity: Predicted Values and Prediction Intervals

The model's root mean squared error is RMSE = 0.432 points (from SSE = 110.07 on 590 degrees of freedom). When the predictors' means in each corridor are substituted (with the dummy variables at the overall sample proportions), the model reproduces the observed CAI means with an error of no more than 0.005 points, confirming the consistency of Tables III and VII. However, the 95% prediction interval for an individual household (±0.85) is relatively wide, suggesting the model does not explain most of the between-household variance within a single corridor.

Table XVII: Predicted CAI Values for a Typical Household in Each Corridor

Corridor	Predicted	Observed	95% Prediction Interval for a Single Household
Gulf states	4.233	4.23	[3.39, 5.00] (truncated at 5)
Southeast Asia	3.323	3.32	[2.48, 4.17]
Africa and other	3.855	3.85	[3.01, 4.70]

Table XVIII: Expected Changes in CAI from the Regression Model (VII)

Assumed Change (All Else Equal)	Change in CAI (Points)	Share of Corridor Effect
Reducing perceived insecurity by one standard deviation (−0.48)	−0.061	8%
Raising financial planning by one standard deviation (+0.58)	−0.048	6%
Reducing remittance dependence by one standard deviation (−0.56)	−0.043	6%
All three together	−0.152	20%
Eliminating perceived insecurity entirely in the Gulf corridor (from 3.96 to 1)	−0.379	51%
Moving from the Gulf context to the Southeast Asian context (dummy coefficient)	−0.745	100%

S. "What-If" Scenarios on the Regression Model

To equalise the corridor effect through perceived insecurity alone, it would have to be reduced by about 5.8 points (more than the scale's width), and through financial planning alone raised by about 9.1 points. The corridor thus carries structural factors that the measured behavioural levers cannot replicate.

T. Reliability and Statistical Power

Using the Spearman–Brown formula, raising the reliability of the perceived-insecurity scale from $\alpha = .646$ to .70 requires about 5.1 items (that is, adding one item of the same type), and to .80 about 8.8 items (adding 4–5 items). Adding at least two items is recommended in the field application. As for power, N = 600 allows detection, with 80% power, of the partial effect of a single predictor of size $f^2 \approx .013$ (partial $R^2 \approx .013$); the nonsignificance of income, education, and urban residence is therefore not due to low power: their estimated effect sizes are far below .001.

U. Summary of the Extended Analysis

- **The Corridor, not the Household, Explains Consumption:** about 96% of the explained variance, with the remaining variables adding only a few percentage points.
- **The Strong Negative Correlation Between Consumption and Investment is a Between-Corridor Phenomenon, not a Within-Household One:** (−0.54 overall versus −0.11 within corridors): H7 is supported.
- **In Southeast Asia, Households Approach Parity Between Consumption and Investment:** (a gap of 0.14 points; $d_z \approx 0.19$; only about 58% of households consume more than they Invest).
- **The Measured Behavioural Levers (Planning, Insecurity, and Dependence) are Significant but Small in Effect** ($f^2 < 0.02$), and combined they amount to only about 0.15 points against a corridor effect of 0.75.
- **Bivariate Correlations Overstate the Importance of Household Factors:** by a factor of two and a half to five relative to controlled standardized coefficients.

V. THE MATHEMATICAL MODEL OF REMITTANCE ALLOCATION

A. Why a Mathematical Model?

The statistical tests in Sections 7 and 8 establish a pattern, but they do not explain its mechanism or allow estimation of what an intervention not observed in the data would produce. Regression coefficients capture linear average relationships; they do not reflect that a household has a minimum spending level it will not forgo, or that any lever's effect on investment depends on what remains after subsistence. We therefore build a parsimonious structural model that is (a) analytically solvable, (b) generates directional predictions that can be compared with the regression signs, (c) calibratable to the measured indicators, and (d) suitable for policy simulation with uncertainty quantification.

B. Assumptions and Notation

- A representative household receives a remittance R and has other income Y, so its total resources are M = R + Y.
- **Subsistence Threshold γ:** necessary spending on

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food, rent, treatment, and debt repayment, below which the household cannot fall. We define subsistence pressure as κ = γ/M.

- **Two Periods:** resources are allocated between present consumption c and investment/saving i, which yields a net return ρ̃ that is consumed in the future.
- **Stone–Geary Preferences with Intertemporal Elasticity of Substitution Σ:** utility derives from surplus above subsistence in the present, and from investment output in the future with weight δ.
- **The Measured Variables Affect the Parameters:** financial planning raises δ (a longer horizon), perceived insecurity lowers it (the probability of losing savings to inflation, currency movements, and conflict), remittance dependence raises κ, and the migration corridor changes the opportunity-and-trust multiplier ω.

Table XIX: Model Symbols and Their Counterparts Among the Measured Variables

Symbol	Meaning	Study Counterpart
M, R, Y	Total resources, remittance, and other income	Remittance share (mean 56.6%)
γ, κ = γ/M	Subsistence threshold and its pressure	Remittance dependence (RDI)
c, i	Consumption and investment/savings	CAI and ISI
δ	Weight on the future (patience/horizon)	FPI (+) and PEI (−)
ρ̃, σ	Net return and intertemporal elasticity of substitution	Combined in ω
ω	Corridor-specific opportunity-and-trust multiplier	Migration corridor (Gulf = 1)
η	Marginal propensity to invest out of surplus	Derived
CS, IS	Consumption and investment shares of resources	CS = (CAI−1)/4

VI. MODEL CONSTRUCTION AND SOLUTION

The household maximizes its utility subject to the budget constraint:

$$c + i = M,\ \ c \geq \gamma,\ \ i \geq 0 \qquad (1)$$

$$U(c,i) = u(c-\gamma) + \delta u\big((1+\tilde{\rho})i\big) \qquad (2)$$

$$u(x) = \frac{x^{\frac{\sigma-1}{\sigma}}}{\frac{\sigma-1}{\sigma}} \qquad (3)$$

The first-order condition (Euler equation) gives the ratio of investment to the surplus above subsistence:

$$i = (c-\gamma)\Phi,\ \ \Phi \equiv \delta^{\sigma}(1+\tilde{\rho})^{\sigma-1} \qquad (4)$$

Substituting into the budget constraint yields the closed-form solution: the household spends the subsistence amount first and then divides the surplus M − γ in a fixed proportion η for investment:

$$i^* = \eta(M-\gamma),\ \ \eta = \frac{\Phi}{1+\Phi},$$
$$c^* = \gamma + (1-\eta)(M-\gamma) \qquad (5)$$

Dividing by M yields the two shares that the questionnaire approximately measures:

$$CS = \kappa + (1-\kappa)(1-\eta) = 1-\eta(1-\kappa),$$
$$IS = \eta(1-\kappa) \qquad (6)$$

If κ ≥ 1 (that is, M ≤ γ), the solution is a corner: i* = 0 and CS = 1 (the "survival regime"). Note that consumption divides into subsistence consumption κ and discretionary consumption (1 − κ) (1 − η), and this decomposition is the key to the subsequent analysis.

A. Linking to the Measured Variables

We assume the following functional forms as parsimonious approximations: η is tied to a logistic curve (to ensure 0 < η < 1), and κ is linearly tied to the remittance dependence index:

$$ln\frac{\eta}{1-\eta} = \alpha_0 + ln\,\omega_k + a(FPI-3) - b(PEI-3),$$
$$\kappa = \kappa_{max}\frac{RDI-1}{4} \qquad (7)$$

where a = σ·a′ and b = σ·b′ are the log-odds responses to planning and insecurity, respectively (from δ = δ₀·exp (a′·FPI − b′·PEI)), and ω_k is the multiplier for corridor k (with the Gulf as the reference: ω = 1). In the partial foundation, ω = (1 + ρ̃) ^(σ−1), but the reduced form absorbs everything corridor-specific that changes the investment slope: business opportunities, trust in institutions, diaspora networks, and the sender's earmarking of part of the remittance for specific purposes.

B. Comparative-Statics Propositions

Differentiating the preceding equations (Appendix B) yields six propositions; the first to the fourth correspond to the regression signs (Section 7.7), and the fifth and sixth add new, untested predictions:

$$\frac{\partial CS}{\partial \kappa} = \eta > 0,\ \ \frac{\partial CS}{\partial PEI} = (1-\kappa)b\eta(1-\eta) > 0 \qquad (8)$$

$$\frac{\partial CS}{\partial FPI} = -(1-\kappa)a\eta(1-\eta) < 0,$$
$$\frac{\partial CS}{\partial\, ln\,\omega_k} = -(1-\kappa)\eta(1-\eta) < 0 \qquad (9)$$

- **P1 (Subsistence):** Higher subsistence pressure (remittance dependence) raises the consumption share by η per unit of κ (consistent with H5).
- **P2 (Security):** Higher perceived insecurity raises the consumption share (consistent with H3).
- **P3 (Planning):** Raising financial planning lowers the consumption share (consistent with H4).
- **P4 (Opportunities):** Improved investment opportunities and trust (ω) lower the consumption share (consistent with the corridor effect in H6).
- **P5 (Ceiling):** Even at κ = 0 the investment share cannot exceed η; if η < 1/2, consumption dominance persists however low subsistence falls. Parity (IS = CS) requires η(1 − κ) = 1/2, which implies η > 1/2. Consumption dominance is therefore not necessarily a

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"subsistence crisis" but may reflect a low marginal propensity to invest.

- **P6 (Attenuation):** The effect of the behavioural levers (P2 and P3) is proportional to $(1-\kappa)\cdot\eta(1-\eta)$; it therefore shrinks as dependence rises, peaks when $\eta = 1/2$, and weakens when η is very small. A new testable prediction: the effect of financial planning on consumption should diminish as remittance dependence increases (a negative FPI×RDI interaction in magnitude) and should be stronger in Southeast Asia than in the Gulf.

C. Calibration to the Study Data

The model's consumption share is matched to the measured index by a simple linear transformation from the Likert scale to the unit interval:

$$cs_k = \frac{CAI_k - 1}{4} \qquad (10)$$

The six parameters $\theta = (\alpha_0, a, b, \kappa_max, \ln \omega_SEA, \ln \omega_AFR)$ are estimated by matching six moments: the three corridor consumption shares (0.808, 0.580, and 0.713) and three partial regression coefficients (the effects of PEI, FPI, and RDI on CAI divided by 4 to convert them to share units, with the nonlinear model's average effect computed and weighted by corridor sizes). The calibration is exactly identified (6 parameters against 6 moments), so a perfect match to the targeted moments is not a test; the actual test is therefore conducted on untargeted moments: the observed investment shares (ISI − 1)/4.

Table XX: Calibrated Parameters (Gulf as Reference: ω = 1). Intervals are from 600 Draws from the Distribution of the three Regression Coefficients (Their Means and Standard Errors from Table VII), with Recalibration at Each Draw

Parameter	Estimate	95% Interval (Monte Carlo)	Interpretation
α_0 (logistic intercept)	−0.978	[−1.22, −0.73]	Level of the marginal propensity to invest at FPI = PEI = 3 in the Gulf
a (planning effect)	0.117	[0.01, 0.23]	Increase in log-odds per planning point
b (insecurity effect)	0.183	[0.08, 0.30]	Decrease in log-odds per insecurity point
κ_max	0.239	[0.02, 0.42]	Subsistence pressure for a household at maximum dependence (RDI = 5)
ω_SEA	2.67	[2.41, 2.93]	Opportunity-and-trust multiplier for Southeast Asia
ω_AFR	1.64	[1.59, 1.69]	Opportunity-and-trust multiplier for Africa and other

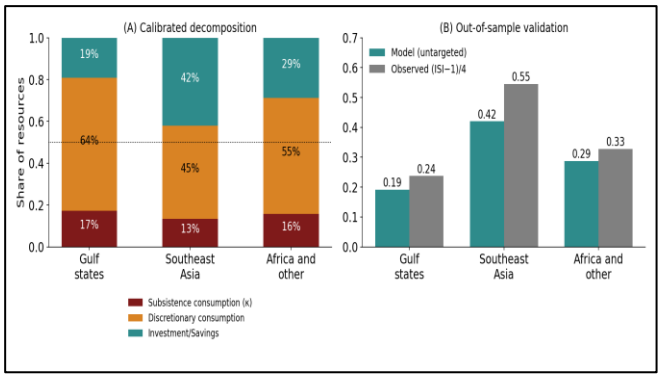
Table XX, the parameter κ_max is the least precisely identified (interval [0.02, 0.42]) because it depends only on the marginal RDI coefficient, which has a large standard error (0.039). By contrast, the corridor multipliers are determined precisely because they are derived from large mean differences. A sensitivity analysis of κ_max was therefore conducted (Table XXII).

D. Calibration and Validation Results (H8)

Table XXI: Fit on the Targeted Moments (CS) and Validation on an Untargeted Moment (IS)

Corridor	CS observed	CS model	η	κ	IS model	IS observed (ISI−1)/4
Gulf states	0.808	0.808	0.233	0.172	0.192	0.237
Southeast Asia	0.580	0.580	0.485	0.134	0.420	0.545
Africa and other	0.713	0.713	0.341	0.158	0.287	0.328

Table XXI, the model reproduced the three regression coefficients accurately (0.128, −0.082, and 0.077). In the out-of-sample validation on the investment share, the model preserved the correct ordering of the corridors (Spearman coefficient 1.00) with a Pearson correlation of 0.990 with the observed values, but it underestimated the investment share by an average of 0.07, with a root mean squared error of 0.080. This is mainly because the model imposes CS + IS = 1, whereas the two observed indices sum to 1.05, 1.13, and 1.04 because the two Likert scales are independent. The upshot is that H8 is supported with a reservation: the model captures the structure and the ordering, not the absolute levels precisely.



[Fig.7: (A) The Calibrated Decomposition of Household Resources into Subsistence Consumption, Discretionary Consumption, and Investment. (B) The Model's Investment Share (Untargeted) Versus the Observed Share]

E. What Explains the Dominance of Consumption? Subsistence or the Propensity to Invest?

The decomposition shows that discretionary consumption (what is spent from surplus above subsistence) is the largest part of consumption in all corridors: in the Gulf, subsistence accounts for 17% of resources, discretionary consumption for 64%, and investment for 19%; that is, subsistence represents only about 21% of consumption. According to Proposition P5, the marginal propensity to invest in the Gulf is $\eta = 0.23$, which is the ceiling on investment even if subsistence disappeared entirely, whereas $\eta = 0.48$ in Southeast Asia (close to 1/2).

This result, however, depends on the poorly identified κ_max; Table XXII shows its sensitivity.

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Table XXII: Sensitivity of Results to the Value of κ_max (Recalibrated at Each Value). Effects are in Percentage Points of the Investment Share for the full Sample. Scenario Definitions are in Table XXIV

κ_max	κ (Gulf)	η (Gulf)	Subsistence Share of Consumption (Gulf)	S1 effect	S2 effect	S4 effect	S5 effect
0.10	0.072	0.207	9%	1.6	1.2	0.5	8.0
0.25	0.181	0.235	22%	1.6	1.2	1.3	7.4
0.40	0.289	0.271	36%	1.6	1.2	2.4	6.8
0.60	0.433	0.340	54%	1.5	1.2	4.3	5.7
0.80	0.578	0.456	72%	1.5	1.2	7.4	4.1

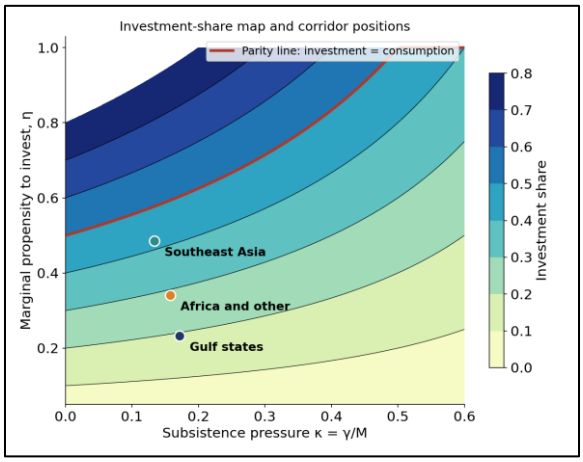
The following results are robust across all tested values (κ_max ≤ 0.8): (1) η in the Gulf is below 0.5, so the low investment ceiling persists; (2) the effect of the two behavioural levers (S1 and S2) is roughly constant at 1.5 and 1.2 points. What changes is the share of subsistence in consumption (from 9% to 72%) and the effect of reducing subsistence (S4: from 0.5 to 7.4 points). The claim that subsistence is "not the main cause" is therefore correct at the central estimate, but it weakens if the actual subsistence pressure is much higher than estimated; its direct measurement in the field is therefore recommended (Appendix A, Section VII).

F. Lever Effects by Corridor and the Parity Map

Table XXIII: Marginal Effect on the Consumption Share (Share Units Per Likert Point), Consistent with P6

Marginal Effect on CS per Likert Point	Gulf	Southeast Asia	Africa and Other
Perceived insecurity (PEI)	0.0270	0.0396	0.0347
Financial planning (FPI)	−0.0173	−0.0254	−0.0222
Remittance dependence (RDI)	0.0139	0.0289	0.0204

Table XXIII confirms Proposition P6: the effect of financial planning in Southeast Asia is about 1.46 times that in the Gulf, because η (1 − η) is larger when η is close to one half. Gulf households respond only slightly to behavioural interventions because they are far from the sensitivity region.



[Fig.8: Map of the Investment Share IS = η (1 − κ) (Colours and Contour Lines) in the (κ, η) Plane. The Red Line is the Parity Line IS = 0.5. All three Corridors lie below it, with Southeast Asia the Closest]

Figure 8 and the quantitative analysis show that reaching parity (CS = 0.5) requires raising the multiplier ω by about 1.45 times in Southeast Asia, 2.8 times in Africa and other regions, and 5.0 times in the Gulf, with all other parameters held constant. Since ω_SEA/ω_Gulf = 2.67, the Gulf needs about 1.9 times the gap that separates it today from Southeast Asia, which gauges how far parity is in the Gulf. By contrast, no corridor reaches the "survival regime": that would require RDI = 17.8, which is outside the scale (1–5).

G. Policy Simulation and Uncertainty (H9)

Six scenarios are simulated by changing one or more of the calibrated parameters while holding the others constant. Uncertainty bounds are estimated by recalibrating at each draw from the distribution of the regression coefficients (600 draws, Section 9.5).

Table XXIV: Consumption Share (CS) by Corridor in Each Scenario, and the Change in the Overall Investment Share (Monte Carlo Mean and Range)

Scenario	Gulf	SE Asia	Africa	Overall	Change in Overall IS (Percentage Points) [95%]
S0: Baseline	0.808	0.580	0.713	0.727	—
S1: Reduce perceived insecurity by one standard deviation (−0.48)	0.794	0.561	0.696	0.711	1.6 [0.7, 2.5]
S2: Raise financial planning by one standard deviation (+0.58)	0.797	0.565	0.699	0.715	1.2 [0.1, 2.4]
S3: S1 + S2 together	0.784	0.546	0.682	0.699	2.8 [1.4, 4.3]
S4: Reduce subsistence pressure (κ) by 25%	0.797	0.564	0.699	0.715	1.3 [0.1, 2.5]
S5: Raise the opportunity-and-trust multiplier (ω) by 50%	0.741	0.493	0.632	0.652	7.5 [6.7, 8.2]
S6: S3 + S4 + S5 (comprehensive package)	0.698	0.440	0.580	0.604	12.3 [10.5, 14.1]

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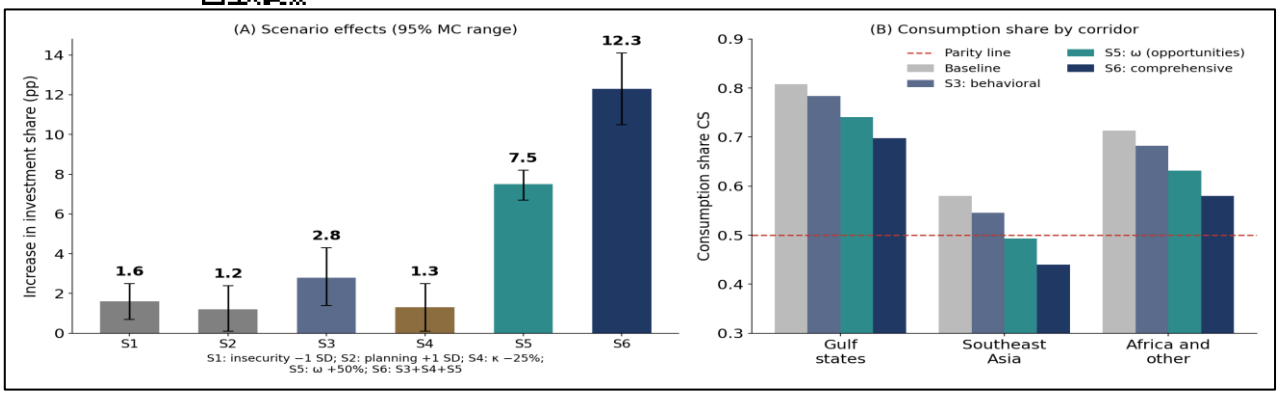

[Fig.9: (A) Increase in the Investment Share for Each Scenario with its 95% Range. (B) Consumption Share by Corridor; the Comprehensive Scenario Crosses the Parity line in Southeast Asia Alone]

H9 is confirmed at the central estimate: raising the opportunity-and-trust multiplier by one half (S5) increases the investment share by about 7.5 points, compared with 1.6 for reducing insecurity (S1), 1.2 for raising planning (S2), 2.8 for combining them (S3), and 1.3 for reducing subsistence pressure by a quarter (S4); that is, S5 equals 4.7 times S1, 6.1 times S2, and 5.9 times S4. The 95% ranges do not overlap between S5 and any of the other levers. This depends on κ_max, as Table XXII shows: the levers are equal at κ_max ≈ 0.7, which is outside the Monte Carlo range (up to 0.42). The comprehensive package (S6) raises investment by about 12.3 points and lowers the overall CS from 0.727 to 0.604, crossing the parity line in Southeast Asia (0.44) but not in the Gulf (0.70) or in Africa and other regions (0.58).

From Table XXIV, the policy implication is that financial education and economic stabilisation, important as they are, move the investment share by only a few percentage points. The largest effect comes from improving the availability and reliability of safe investment opportunities (trusted investment channels for the diaspora, guarantees, local business infrastructure, and earmarking parts of the remittance for specific purposes in coordination with the sender). This conclusion is credible only to the extent that real data support it; it is derived, in the first instance, from simulated data.

VII. LIMITATIONS OF THE MODEL

- **Exactly Identified:** The calibration uses all available moments, and its validity rests on a single out-of-sample test (three points); it is therefore weak statistical evidence, though encouraging in direction.
- **Parsimonious Functional Forms:** Linearity in RDI and the logistic form in η are approximations, and representing the migration corridor by a single multiplier conceals within-corridor heterogeneity.
- **Representative Household and Temporal Stability:** There are no dynamics across periods, no shocks, no explicit liquidity constraint, and no bargaining between the sender and the household.
- **Measurement:** The conversion of Likert scores to shares, (CAI−1)/4, is an assumption; direct measurement of the shares is needed (Appendix A, Section VII).
- **Simulated Data:** Every parametric estimate here is conditional on the original simulated data; the method is the reusable product, not the values.

VIII. DISCUSSION OF RESULTS

The results present an unambiguous picture: remittance-receiving Hadrami households allocate their remittance income to consumption significantly more than to investment or saving, and this pattern holds across all the migration corridors examined. This confirms, with primary quantitative evidence at the governorate level, a pattern documented by international assessments at Yemen's national level: remittances function mainly as a household survival mechanism rather than as a source of investable capital, at least under current economic conditions.

The most important addition is that this dominance is a corridor-related phenomenon more than a household-related one. Migration corridor alone explains 43.5% of the variance and about 96% of the explained variance; household variables add only 1.8 points, and a large part of the bivariate correlations that appeared household-level (financial planning and dependence) shrink by about 80% after controlling for the corridor. The negative correlation between consumption and investment (−.54) is not a within-household trade-off (−0.11 within corridors) but reflects differing corridor contexts. This changes the reading of "preference": households do not so much choose consumption over investment as operate within contexts with different opportunities, trust, and subsistence needs.

The original finding on Southeast Asia requires scrutiny: although its consumption is statistically higher than its investment, the gap is only 0.14 points (d_z = 0.19), and the proportion of households whose consumption exceeds investment there is only about 58%; that is, it is close to parity. The gradient across the three corridors (the Gulf, then Africa and other, then Southeast Asia) thus runs from overwhelming consumption to near-complete balance, not merely a difference in degree within uniform consumption dominance.

The mathematical model offers an explanation for this gradient: the consumption share is given by CS = 1 − η (1 − κ), so consumption is the sum of subsistence (κ) and discretionary consumption, and the investment share is low because the marginal propensity to invest out of surplus (η) is low, not merely because subsistence consumes everything. After calibration, η = 0.23 in the Gulf versus 0.48 in Southeast Asia, and the gap is attributed to the opportunity-and-trust

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multiplier (ω) more than to differences in perceived insecurity or planning. This is consistent with the regression's prediction that the corridor effect exceeds that of any behavioural variable by about six times.

This structure also explains why the regression finds the behavioural levers "significant but small." Theoretically, the model (P6) states that the marginal effect of planning and insecurity is proportional to $(1 - \kappa)\,\eta(1 - \eta)$, so it vanishes where η is very small, or κ is high, that is, precisely in the most vulnerable households. This warns that uniform financial-education programs may fail in the households that need them most, and that the most effective interventions raise η by improving opportunities and trust before differentiating among households.

IX. CONCLUSION

This study sought to test, rather than assume, whether Hadrami households prefer to direct remittance income to consumption rather than investment, and whether this preference varies by migration corridor. Based on the analyzed dataset, the evidence supports all six original hypotheses: consumption allocation is significantly and substantively higher than investment/savings allocation in the full sample (H1, a very large effect size) and differs significantly across the three corridors (H2); perceived insecurity, financial planning, and remittance dependence are associated with consumption allocation in the expected directions (H3–H5); and migration corridor remains the strongest predictor even in the multivariate model (H6).

The extended additions support the new hypotheses: the within-corridor correlation is much weaker than the overall correlation (H7); the calibrated mathematical model reproduces the targeted moments and preserves the ordering of the observed investment out of sample, though it understates its level (H8, with reservation); and the opportunity-and-trust levers outperform all other levers in their effect on the investment share at the central estimate (7.5 points versus 1.6, 1.2, and 1.3), a conclusion conditional on the value of subsistence pressure (H9, with a condition).

These results mean that the consumption use of remittances in Hadramawt is not fundamentally a matter of "preference" in the sense of gaps in financial literacy or an absence of products, but a rational response to real economic insecurity, compounded by corridor-specific factors linked to the migrant's occupation, the history of the diaspora, and the available investment channels. Efforts to direct remittance income toward productive investment are therefore more likely to succeed if they work with, rather than against, households' consumption priorities; differentiate among corridors; and focus on expanding safe, reliable investment opportunities before education.

RECOMMENDATIONS

- Design "consumption-safe" savings products that allow households to protect a small fixed share of each remittance (rather than a large lump sum) for medium-term goals, easing the perceived trade-off between meeting immediate needs and building any investment capacity.
- Begin piloting products in the Southeast Asian corridor, where financial planning is relatively stronger, and the investment share is closer to parity (η close to one half); it is the corridor most likely to respond and the quickest to show clear results.
- In the Gulf corridor, where dependence and insecurity are highest, favour insurance-like products and emergency funds over purely investment products, because precautionary needs must be met before discretionary investment becomes realistic.
- Recognize that reducing perceived economic insecurity (currency stability, inflation control, and lower conflict risk) is more effective in directing remittances toward investment than financial-education programs alone, but that it is not sufficient on its own: the simulations estimate its effect at only about one and a half percentage points of the investment share.
- Support financial-planning and budgeting programs as a complementary rather than a primary intervention: their independent effect on consumption is significant but modest relative to structural and corridor-related factors, and it is expected to weaken further in the most dependent households (P6).
- Support the most dependent households with interventions that directly reduce subsistence pressure (food or conditional cash support, and health insurance) before supporting community financial education tailored to the conditions of each migration corridor rather than uniform curricula, given the significant differences in financial planning and dependence among corridors.

DECLARATION STATEMENT

After aggregating input from all authors, I must verify the accuracy of the following information as the article's author.

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- **Funding Support:** This article has not been funded by any organizations or agencies. This independence ensures that the research is conducted objectively and free from external influence.
- **Ethical Approval and Consent to Participate:** The content of this article does not necessitate ethical approval or consent to participate with supporting documentation.
- **Data Access Statement and Material Availability:** The adequate resources of this article are publicly accessible.
- **Author's Contributions:** The authorship of this article is contributed solely.

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Appendix A: Study Questionnaire

Title: Remittances and Household Income-Allocation Preferences – A Survey of Remittance-Receiving Households in Hadramawt Governorate

Introduction for respondents (to be read or displayed before the questionnaire): "Thank you for participating in this academic study on remittances and household finances in Hadramawt. Your answers are confidential and will be used for scientific research purposes *only. There are no right or wrong answers; please answer according to your household's experience. This questionnaire is addressed to households that regularly receive remittances from a family member living abroad, and it takes about 10–12 minutes."*

Section I: Demographic and Remittance-Related Data

1. Respondent's Gender

☐ *Male* ☐ *Female*

2. Age Group

☐ *18–27* ☐ *28–37* ☐ *38–47* ☐ *48–57* ☐ *58 and above*

3. Highest Level of Education

☐ *Secondary or below* ☐ *Diploma* ☐ *Bachelor's* ☐ *Postgraduate*

4. Place of Residence

☐ *Urban (Mukalla / Seiyun)* ☐ *Rural (Wadi Hadramawt / coastal districts)*

5. Household Size

☐ *3 or fewer* ☐ *4* ☐ *5* ☐ *6* ☐ *7* ☐ *8 or more*

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6. Approximately what share of your household's total monthly budget do remittances represent?

☐ Less than 25% ☐ 25–49% ☐ 50–74% ☐ 75% or more

7. In which Country/Region does the Primary Sender of Remittances to your Household Currently Reside? (Select One)

- ☐ (a) Gulf states: Saudi Arabia, the United Arab Emirates, Qatar, Kuwait, or any other Gulf country.
- ☐ (b) Southeast Asia: Indonesia, Singapore, Malaysia, or a nearby destination.
- ☐ (c) Africa and other: East Africa (for example, Kenya, Tanzania, Ethiopia, or Djibouti), or Europe, or the Americas, or any other place not mentioned.

Sections II–VI: Directional statements. For each statement, please circle the number that expresses your degree of agreement: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree. (The sections are numbered here consistently with Section 6.3.)

Section II: Remittance Dependence (RDI)

Statement	1	2	3	4	5
1. My household cannot cover its basic living expenses without the remittances it receives.	1	2	3	4	5
2. If remittances stopped for one month, my household would face serious financial difficulty.	1	2	3	4	5
3. Remittances are my household's single largest source of income.	1	2	3	4	5
4. I would describe my household as highly dependent on remittance income.	1	2	3	4	5

Section III: Consumption Allocation (CAI)

Statement	1	2	3	4	5
1. Most of the remittance money my household receives is spent on food and the family's daily needs.	1	2	3	4	5
2. A considerable part of the remittances goes to rent, utilities, or housing costs.	1	2	3	4	5
3. We regularly use remittance money to cover health-care expenses.	1	2	3	4	5
4. We often use remittance money to repay debts or informal loans.	1	2	3	4	5
5. By the end of each month, most of the incoming remittance money has been spent on immediate needs.	1	2	3	4	5

Section IV: Investment/Savings Allocation (ISI)

Statement	1	2	3	4	5
1. My household regularly sets aside part of the remittances it receives for saving.	1	2	3	4	5
2. Part of our remittance income has been used to start or expand a business.	1	2	3	4	5
3. We have used remittance money to buy land, property, or another long-term asset.	1	2	3	4	5
4. My household has a specific plan to invest part of future remittances.	1	2	3	4	5
5. I can say that my household treats remittances as investment capital, not merely as daily income.	1	2	3	4	5

Section V: Financial-Planning Behaviour (FPI)

Statement	1	2	3	4	5
1. My household tracks its income and expenses in an organized way (mentally or in writing).	1	2	3	4	5
2. We set specific financial goals for the coming months or years.	1	2	3	4	5
3. Before spending remittance money, we usually discuss how it should be distributed within the household.	1	2	3	4	5
4. I trust my household's ability to plan and manage its finances.	1	2	3	4	5

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Section VI: Perceived Economic Insecurity (PEI)

Statement	1	2	3	4	5
1. I am worried about the stability of the local currency and its effect on our income.	1	2	3	4	5
2. I feel uncertain about my household's financial situation over the next six months.	1	2	3	4	5
3. Rising prices (inflation) make it hard for us to plan spending or saving over the long term.	1	2	3	4	5
4. The general economic and security situation in Yemen makes me hesitant to invest rather than keep money available.	1	2	3	4	5

Closing open-ended question (optional): In your own words, what would make your household more willing to save or invest part of its remittance income rather than spending all of it on immediate needs?

Section VII (New): Proposed Items for Field Calibration of the Mathematical Model

These items do not enter the current analysis, but they allow the model's elements to be measured directly rather than approximated (Section 9):

- **100-Point Allocation:** "Distribute 100 points across the ways you used the last remittance you received": food and daily needs; rent and utilities; treatment; debt repayment; education; cash or gold savings; a business; property or land; other. → Measures CS and IS directly and allows η to be estimated.
- **Monthly Minimum:** "What is the least monthly amount your household needs to cover food, housing, treatment, and necessary debt repayment?" (in local currency or its equivalent), together with total monthly income. → Measures $\kappa = \gamma/M$ directly.
- **Sender's Earmarking:** Does the sender specify a purpose for the remittance or for part of it? (always / sometimes / never). → An input for measuring the effect of ω.
- **Trust and Investment Opportunities (Likert 1–5):** "There is a safe and reliable channel for investing remittance money in my area"; "I trust local financial institutions to safeguard my savings"; "There are viable small-business opportunities in my area."
- **Additional PEI-Scale Items:** At least two items (for example, worry about exchange-rate changes over the coming month; or fear of losing the source of remittances) to raise reliability, according to Spearman–Brown.
- **Omitted Variables:** the sender's occupation, years of receiving remittances, and prior investment experience (yes/no) and its loss.

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