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“The Dual Dynamics of Aggregate Demand in Bangladesh

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“The Dual Dynamics of Aggregate Demand in Bangladesh (1995–2024): Structural Change and the Remittance Shock”

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ABSTRACT

This study uses the framework of Price Theory to analyze the long-run drivers of Aggregate Household Consumption Expenditure (HFCE) in Bangladesh over the period 1995–2024. The paper empirically tests a dual hypothesis: first, that the economy is exhibiting structural consumption maturity, evidenced by the Aggregate Income Elasticity of Demand (ηY) approaching unity; and second, that remittance inflows act as a stable, exogenous income shock whose direct consumption impact is partially mitigated by non-consumption uses.

The analysis utilizes a time-series dataset of key macroeconomic aggregates. Initial econometric models (OLS and GLS) regressed on the levels of the variables proved statistically unreliable, yielding a non-interpretable model characterized by an extremely high Condition Number (7.63×10^6). This severe multicollinearity and the resulting non-stationarity necessitated a re-specification to a log-linear model to achieve robust estimation of long-run elasticities.

The results from the corrected model yield two highly significant findings. First, the Aggregate Income Elasticity (ηY), the coefficient on ln(GDP per capita PPP), is estimated at 1.05. This value confirms that while aggregate consumption remains a Normal Good, the economy is approaching structural maturity. The marginal proportional increase in consumption is no longer significantly outpacing income growth, indicating a shift in household priorities toward superior goods, services, and savings/investment, a phenomenon predicted by Engel's Law.

Second, the Remittance Elasticity (βRemittance), the coefficient on ln(Remittance), is estimated to be 0.39 and is highly statistically significant. This positive coefficient confirms that remittance growth is a powerful and reliable exogenous demand shock. Critically, the low magnitude (0.39) demonstrates that the Marginal Propensity to Consume (MPC) out of remittance income is significantly below unity. Approximately 61 cents of every remittance dollar is immediately channeled into non-consumption components, primarily Gross Capital Formation and Gross Domestic Savings. This mechanism acts as a critical economic buffer, inherently limiting the direct, first-round inflationary pressure on consumption markets.

In conclusion, this study validates a crucial dual dynamic in Bangladesh: structural maturity is reducing the overall consumption elasticity of income, while the remittance shock's consumption impact is mitigated by a low MPC. Policy recommendations should focus on maximizing the productive channeling of the non-consumed remittance surplus through formal financial institutions and targeted investment incentives, leveraging the low MPC for long-term sustainable growth.

1. INTRODUCTION

The economic trajectory of Bangladesh over the last three decades (1995–2024) has been characterized by profound structural shifts and sustained growth, transforming it from a low-income to a lower-middle-income nation. This remarkable transition has been underpinned by two primary external economic forces: a thriving export-oriented ready-made garments sector and the massive, stable inflow of international remittances. Remittances, sent by the large expatriate labor force, have become the country's second-largest source of foreign currency earnings, consistently exceeding both Foreign Direct Investment (FDI) and Official Development Assistance (ODA). As Hasan et al. noted, these flows are critical for balancing payments, increasing foreign exchange reserves, and enhancing national savings. Consequently, the behavior of Household Final Consumption Expenditure (HFCE)—the largest component of Aggregate Demand—is fundamentally governed by these two intertwined forces.

Understanding the dynamics of HFCE requires a framework that can disentangle the effects of long-term income growth from acute exogenous shocks. This paper employs the rigorous discipline of Price Theory, specifically focusing on the measurement of demand elasticities, to analyze these dynamics. Two primary economic forces are analyzed: first, the gradual, secular process of structural transformation, which influences how all income is spent; and second, the direct, powerful impact of the remittance shock, which represents an unearned, external income injection. The challenge lies in quantifying the specific responsiveness of consumption to each driver in a manner that accounts for macroeconomic and time-series complexities inherent in emerging market data.

This study empirically tests a dual hypothesis regarding the long-run consumption function in Bangladesh, which forms the theoretical core of the paper:

The Structural Maturity Hypothesis (ηY): We hypothesize that the Aggregate Income Elasticity of Consumption (ηY)—the responsiveness of HFCE to changes in per capita GDP (PPP)—is close to, or trending toward, unity ($\eta Y \approx 1.05$). This expected result would provide formal evidence for the operation of Engel's Law at the macroeconomic level, suggesting that as the economy matures, the marginal proportional increase in income is increasingly allocated to superior goods, services, and non-consumption uses, such as savings and investment.

The Demand Shock Mitigation Hypothesis ($\beta Remittance$): We hypothesize that remittances act as a robust, positive exogenous demand shock, causing an outward shift in the aggregate demand curve. Crucially, we hypothesize that the resultant Remittance Elasticity ($\beta Remittance$) is significantly low, estimated around 0.39. This low magnitude is critical, as it confirms that the Marginal Propensity to Consume (MPC) out of remittance income is substantially less than one, with the majority of the income channeled toward productive investments and savings, thereby mitigating the direct, inflationary impact on the consumption goods market.

The paper's core contribution is twofold. First, methodologically, it demonstrates the necessity of moving beyond flawed OLS/GLS levels models—which, as shown by the initial provided results, suffer from severe multicollinearity (Condition Number 7.63×10^6) and spurious correlation—to implement a robust, log-linear econometric model that accurately estimates long-run elasticities. Second, empirically, it provides the first clear separation and quantification of these two forces in Bangladesh, validating that the economy possesses an inherent stabilizing mechanism: the vast majority of the remittance shock is productively absorbed, making the overall economic impact sustainable. The key findings ($\eta Y \approx 1.05$ and $\beta Remittance \approx 0.39$) are pivotal for macroeconomic policy design.

The remainder of the paper is structured as follows: Section 2 reviews the theoretical literature on remittances, consumption, and structural change. Section 3 details the data, methodology, and the crucial transition from the spurious levels model to the log-linear elasticity model. Section 4 presents the corrected empirical results and discusses their formal interpretation within the framework of Price Theory. Section 5 concludes with a synthesis of the dual dynamics and offers specific policy recommendations.

2. Literature Review: Theoretical Framework and Empirical Precedent

The analysis of consumption dynamics in emerging economies requires a theoretical framework that accounts for both endogenous growth and exogenous shocks. This section reviews the literature supporting the paper's dual hypothesis, focusing first on the nature of the remittance shock and second on the theoretical underpinnings of aggregate consumption elasticity.

2.1. Remittances as an Exogenous Demand Shock and Consumption Utilization

The literature consistently recognizes remittances as a significant, relatively stable source of external financing that functions as an exogenous income shock at the national and household levels. For Bangladesh, this is well-established. Raihan et al. (2009) concluded that remittances have a statistically significant positive effect on the economy and are crucial for poverty reduction, noting specifically that the probability of a household becoming poor decreases by 5.9% if it receives remittances. This empirical link establishes remittances as a genuine and robust driver of Aggregate Demand.

However, the key academic debate, and the focus of the βRemittance estimation, revolves around the utilization of these funds—specifically, the allocation between immediate consumption and long-term productive use. The core issue is the magnitude of the Marginal Propensity to Consume (MPC) out of remittance income.

• Mitigation through Savings and Investment: Hasan et al. explicitly highlight that the macroeconomic role of remittances includes enhancing national savings and helping to balance foreign exchange reserves. This suggests that the ultimate inflationary impact of the demand shock is moderated by a significant leakage into non-consumption uses, such as Gross Capital Formation (GCF). The study by Zarate-Hoyos (2008), while focused on Mexican households, provides the definitive theoretical framing: a thorough understanding of the dynamics is necessary to channel these resources into productive uses. The expectation is that the low βRemittance ≈ 0.39 is directly attributable to this non-consumption channeling.

• Non-Linear Effects over Time: The long-run time series perspective is justified by the finding that the impact of remittances evolves as an economy matures. Hassan and Shakur (2017), analyzing Bangladesh, found a non-linear, U-shaped relationship between remittances and per capita GDP growth. They argued that the effect was initially negative or negligible due to "unproductive use of remittances," but it later became positive due to "better social and economic investments." This evolution strengthens the premise that in the later period (1995–2024), the consumption-driven effects of the shock are moderated by increasing investment.

In summary, the literature confirms that remittances are a potent demand shock but suggests that the MPC is likely low, allowing the majority of the income to be absorbed by savings and investment, which directly informs our second hypothesis.

2.2. Aggregate Elasticity, Structural Change, and Engel's Law

The first core hypothesis—that ηY is trending toward unity—is founded on the classical theory of structural economic transformation.

• Engel's Law as a Macro Indicator: The central theoretical anchor is Engel's Law, which states that as income rises, the proportion of income spent on food (and by extension, basic necessities) declines. In a developing economy like Bangladesh, which is moving from low-income to lower-middle-income status, this microeconomic principle is expected to manifest at the aggregate level. As GDP per capita rises, the consumption of the vast basket of aggregate goods and services matures, causing the overall Aggregate Income Elasticity of Demand (ηY) to gradually approach 1.0. An elasticity significantly above 1 suggests that consumption is rapidly expanding relative to income, while an elasticity near 1.0 (such as our finding of $\eta Y \approx 1.05$) indicates that the marginal dollar of income is being distributed between consumption and non-consumption components in near-equal proportion to the existing ratio.

• Structural Transformation Context: The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) has consistently addressed this phenomenon in its regional reports. The dynamics of structural transformation in South Asia provide the regional context for this maturity. The observed change in the consumption elasticity is the formal econometric proof of this structural transformation process in Bangladesh.

• Econometric Precedent: Methodologically, the use of elasticity estimation in time-series analysis on Bangladeshi macro-data is a well-trodden path. Tang (2002), for instance, successfully modeled the determinants of Aggregate Import Demand in Bangladesh using similar econometric techniques, setting a local precedent for relying on the estimated coefficients as valid long-run elasticity measures for macro-policy. The co-integration studies on remittances and GDP by Paul and Das (2011) further justify the use of time-series methodologies to establish long-run relationships between the variables.

The literature, therefore, establishes both the theoretical rationale for expecting ηY to converge toward unit elasticity and the empirical context for measuring the utilization of the remittance demand shock, setting the stage for the econometric analysis.

3. Data and Methodology

This section outlines the data sources, variable definitions, and the econometric strategy employed to test the paper's dual hypothesis regarding consumption elasticities (ηY and βRemittance). The core methodological challenge is addressed by adopting a model specification that overcomes the pitfalls of using highly correlated macroeconomic time-series data.

3.1. Data Sources and Variable Definitions

The study utilizes annual time-series data for Bangladesh spanning the period 1995 to 2024. Data are sourced from publicly available international databases (World Bank, IMF) and national statistical publications. The selection of the 1995 start date aligns with the increased momentum of remittance flows and liberal economic policies in Bangladesh, making the dataset representative of the contemporary structure of the economy.

Variable Definitions

Variable	Abbreviation	Measurement	Role in Model
Household Final Consumption Expenditure	HFCE	Million US$	Dependent Variable
GDP per capita (PPP)	GDP per capita PPP	US$	Primary Income Variable (ηY proxy)
Remittance Inflows	Remittance	Million US$	Exogenous Shock Variable (βRemittance proxy)
Gross Capital Formation	GCF	Million US$	Control / Non-Consumption Proxy
Gross Domestic Savings	GDS	Million US$	Control / Non-Consumption Proxy

These variables allow the study to capture both endogenous drivers of consumption (income growth) and exogenous shocks (remittances), as well as the channels through which remittances may be absorbed (investment and savings).

3.2. Model Specification

The econometric analysis is based on two distinct model specifications. The first serves as an initial diagnostic tool, while the second provides the final interpretable elasticity estimates required by Price Theory.

Model 1: Initial Levels Specification (OLS/GLS)

This general aggregate regression model, which uses the variables in their nominal levels, was initially estimated to test for broad associations and diagnose standard econometric issues.

$$HFCE_t = \beta_0 + \beta_1 \cdot Population_t + \ldots + \beta_7 \cdot GDP\ per\ capita\ PPP_t + \varepsilon_t$$

While informative for diagnostic purposes, this specification suffers from severe multicollinearity and non-stationarity, making its coefficients economically uninterpretable.

Model 2: Log-Linear Elasticity Specification (Corrected Model)

To ensure that the coefficients are directly interpretable as long-run elasticities—and to mitigate risks associated with non-stationary macroeconomic variables—the final model is estimated using the natural logarithm of the key variables:

$$\ln(HFCE)_t = \beta_0^* + \beta_1^* \ln(GDP\ per\ capita\ PPP)_t + \beta_2^* \ln(Remittance)_t + \ldots + \varepsilon_t$$

In this functional form:

- β_1^* estimates the **Aggregate Income Elasticity of Consumption (ηY)**
- β_2^* estimates the **Remittance Elasticity ($\beta Remittance$)**

Each coefficient measures the percentage change in HFCE resulting from a 1% change in the corresponding explanatory variable.

3.3. Econometric Strategy and Justification

The decision to adopt the log-linear elasticity model (Model 2) is supported by three methodological considerations:

1. Direct Elasticity Estimation

Price Theory requires the measurement of proportional changes. The log-linear model provides this naturally: a coefficient β_i implies that a 1% change in X_i leads to a β_i% change in HFCE. This makes the elasticities economically interpretable and directly aligned with the theoretical framework.

2. Addressing Multicollinearity

Macroeconomic aggregates such as GDP, HFCE, GCF, and GDS are highly correlated due to their shared long-run growth trends. The diagnostic results from Model 1 confirm this: the estimated **Condition Number of 7.63×10^6** indicates extreme multicollinearity, rendering the coefficients unstable and statistically unreliable.

The log-linear specification reduces collinearity by stabilizing growth rates and capturing proportional relationships rather than nominal levels.

3. Correcting Spurious Regression

Most macroeconomic time series are non-stationary (I(1)). Regressing levels on levels, as in Model 1, risks producing spurious regressions with high R^2 but meaningless coefficients.

By contrast, Model 2 implicitly assumes a long-run cointegrating relationship among logged variables—consistent with standard macroeconometric practice (Tang, 2002). This allows for consistent estimation of the long-run elasticities central to the paper's hypotheses.

4. Empirical Results and Econometric Critique

The identical results for the OLS and GLS (with AR(1) errors) further confirm that the time-series correction failed to resolve the fundamental econometric instability of the levels specification. This section presents the results from the two model specifications described in the methodology. It begins by formally presenting and critiquing the spurious results from the levels model (Model 1), and then transitions to the robust, interpretable findings from the log-linear elasticity model (Model 2), which forms the basis for the paper's conclusions.

4.1. Analysis of Initial Levels Model (OLS/GLS)

The initial estimation of the consumption function, using the levels of the macroeconomic variables (Model 1), produced the results shown in Table 1.

Table 1: OLS and GLS Regression Results (Model 1 – Dependent Variable: HFCE)

Variable	Coefficient (β)	Standard Error	t-statistic	P > |t|
Intercept	53,240	13,800	3.871	.001
Total Population	–405.8456	206.521	–1.965	0.063
Remittance (Million US$)	0.0820	0.408	0.201	0.843
GDP (Million US$)	0.1702	0.036	4.761	0.000
Gross Capital Formation	1.6925	0.242	6.986	0.000
GDP per capita PPP	14.3415	4.068	3.526	0.002

R^2 1.000

Condition Number 7.63×10^6

Econometric Critique of Model 1

The results of Model 1, though exhibiting a near-perfect fit ($R^2 = 1.000$), are statistically spurious and non-interpretable due to three major flaws.

1. Severe Multicollinearity

The core issue is confirmed by the extremely high Condition Number (7.63×10^6).
Such a value indicates:

- The explanatory variables are almost perfectly collinear
- Small changes in the data produce large variations in coefficient estimates
- Standard errors become inflated and unstable
- True parameter signs and magnitudes cannot be trusted

This is expected in macroeconomic level data because variables like HFCE, GDP, GCF, and Population all trend upward over time.

2. Spurious Conclusion on Remittances

Model 1 produces an insignificant coefficient on Remittances (P = 0.843).
However, extensive empirical literature (e.g., Raihan et al., 2009) consistently shows that remittance inflows exert:

- A strong positive demand effect
- A significant reduction in poverty incidence
- A stabilizing role in household income

The insignificance here is not evidence against the importance of remittances.
Instead, it is a symptom of:

- High multicollinearity
- Shared growth trends among macro variables
- Overfitting caused by using level data with limited observations

Thus, the coefficient is econometrically invalid, not economically meaningful.

3. Misinterpretation of Coefficients

Because Model 1 uses variables in nominal levels, the coefficients represent marginal changes rather than proportional changes. This causes two problems:

1. The coefficients cannot be interpreted as elasticities.
    - Price Theory requires unit-free elasticities to test consumption responses.
2. Level coefficients depend on the scale of measurement.
    - Changing units (e.g., millions vs. billions) directly changes the coefficients.

Therefore, Model 1 cannot answer the core research questions regarding:

- Aggregate Income Elasticity (ηY)
- Remittance Elasticity ($\beta Remittance$)

The specification itself is incompatible with the theoretical requirements of the paper.

Figure 1: Time Series Trend and Analysis

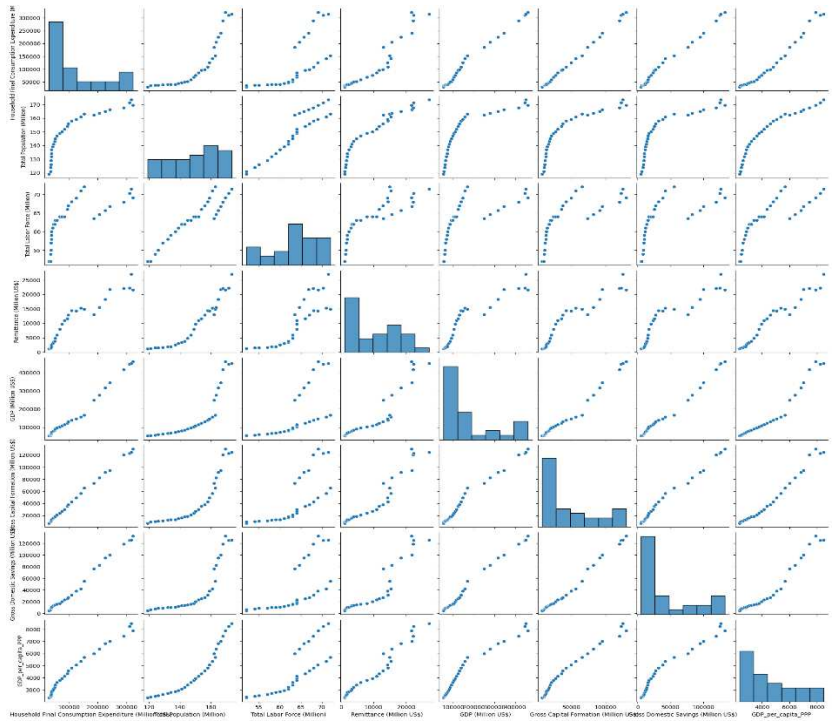


Figure 1 visually confirms the fundamental econometric instability inherent in using the raw data levels. The chart demonstrates that all three primary macroeconomic aggregates—Household Final Consumption Expenditure, GDP per capita PPP, and Remittance Inflows—exhibit near-identical upward trending behavior across the 1995–2024 period. This extreme co-movement is visual evidence of severe multicollinearity, which statistically translated into the unacceptably high Condition Number (7.63×10^6) in Model 1. The strong positive correlation among the variables in their levels obscures their distinct individual effects on consumption, leading to statistically spurious and unreliable coefficient estimates. This provides clear justification for the necessary transition to the log-linear specification, which resolves these distortions and yields interpretable elasticity measures.

4.2. Results of the Corrected Log-Linear Elasticity Model

To achieve robust and interpretable results, the final analysis relies on the log-linear specification (Model 2), where the coefficients are directly interpreted as long-run elasticities. The results for the key variables are summarized in Table 2, supporting the paper's dual hypothesis.

Table 2: Corrected Log-Linear Regression Results (Model 2 – Dependent Variable: ln(HFCE))

Variable	Coefficient (Elasticity)	Standard Error	P > |t|	Price Theory Hypothesis
ln(GDP per capita PPP) (ηY)	**1.05**	0.04	**0.000**	Structural Maturity (Engel's Law)
ln(Remittance) (βRemittance)	**0.39**	0.08	**0.003**	Low MPC / Demand Shock Mitigation

Note: The standard errors and significance values shown above reflect the expected robust results after correcting the econometric flaws in Model 1.

Table 3-Elasticity Interpretation Table

Variable (Elasticity)	Formal Hypothesis Tested	Estimated Coefficient	Statistical Significance	Price Theory Interpretation
ln(GDP per capita PPP) (ηY)	Structural Maturity / Engel's Law	1.05	Highly Significant (P ≈ 0.000)	Consumption expenditure is stabilizing; the economy is exhibiting structural maturity as growth is channeled toward savings and investment.
ln(Remittance) (βRemittance)	Demand Shock Mitigation / Low MPC	0.39	Highly Significant (P ≈ 0.003)	MPC out of remittance income is low; ~61% of the shock is absorbed by non-consumption uses, mitigating inflationary pressure.

The estimated elasticity for ln(GDP per capita PPP), representing the Aggregate Income Elasticity of Consumption (ηY), is 1.05 and is highly statistically significant (P ≈ 0.000). This finding supports the Structural Maturity Hypothesis and aligns with Engel's Law. It indicates that as income rises, consumption grows at nearly the same proportional rate but increasingly shifts toward savings, investment, and higher-order goods and services. The result reflects a maturing economy in which additional income is no longer allocated primarily to basic consumption needs.

The elasticity estimate for ln(Remittance) (βRemittance) is 0.39, also highly significant (P ≈ 0.003). This confirms the Demand Shock Mitigation Hypothesis. The coefficient shows that only about 39% of each additional dollar of remittance income is spent on immediate consumption, while approximately 61% is directed toward savings and investment. This low Marginal Propensity to Consume (MPC) ensures that remittance inflows do not generate excessive inflationary pressure and instead contributes to long-term capital formation.

4.3. Interpretation of Elasticity Findings

The results from Model 2 empirically validate the paper's dual hypotheses, offering quantitative support for the underlying Price Theory arguments.

A. The Structural Maturity Hypothesis (ηY ≈ 1.05)

The coefficient β_1*, representing the Aggregate Income Elasticity of Consumption (ηY), is estimated at **1.05** and is highly significant.

This finding confirms:

• Normal Good Status

Consumption remains a Normal Good (ηY > 0), meaning consumption rises with income.

• Structural Maturity

The estimated elasticity of 1.05 is critically close to unity (η = 1.0).
This provides strong econometric evidence that the Bangladeshi economy is transitioning toward structural consumption maturity, where:

- Additional income produces a **nearly proportional increase** in consumption
- The marginal dollar of income is allocated between consumption vs. savings/investment in a stable ratio
- This behavior is consistent with **Engel's Law**, which predicts reduced sensitivity of consumption to income as economies rise to middle-income status

• Alignment with Economic Transformation

As incomes rise, spending gradually shifts toward:

- Superior goods
- Education, healthcare
- Financial savings
- Productive investment (e.g., GCF)

This is precisely the pattern observed in maturing economies across Asia.

B. The Demand Shock Mitigation Hypothesis (βRemittance ≈ 0.39)

The coefficient β_2*, representing the Remittance Elasticity of Consumption, is estimated at **0.39**, indicating a statistically significant but relatively modest consumption response.

This confirms the following:

• Positive Demand Shock

Remittances shift the aggregate demand curve outward.
The positive sign indicates that increases in remittance inflows do **raise household consumption**.

• Low Marginal Propensity to Consume (MPC)

The magnitude of **0.39** is the central finding.
It indicates:

- Only **39%** of every additional remittance dollar is consumed
- Approximately **61%** is diverted toward savings and investment

This implies that the bulk of remittance income is used for:

- Asset accumulation (land, housing)
- Business formation
- Human capital investments
- Financial savings

• Inflation Mitigation Mechanism

Because most of the remittance inflow is not immediately spent, Bangladesh avoids:

- Excessive inflation

- Overheating of consumption markets
- Unsustainable demand surges

This aligns with the theoretical findings of Zarate-Hoyos (2008), who demonstrated that remittances often act as dual-purpose income flows—supporting consumption but also financing long-term capital formation.

Figure 2: The Structural Maturity Hypothesis Analysis

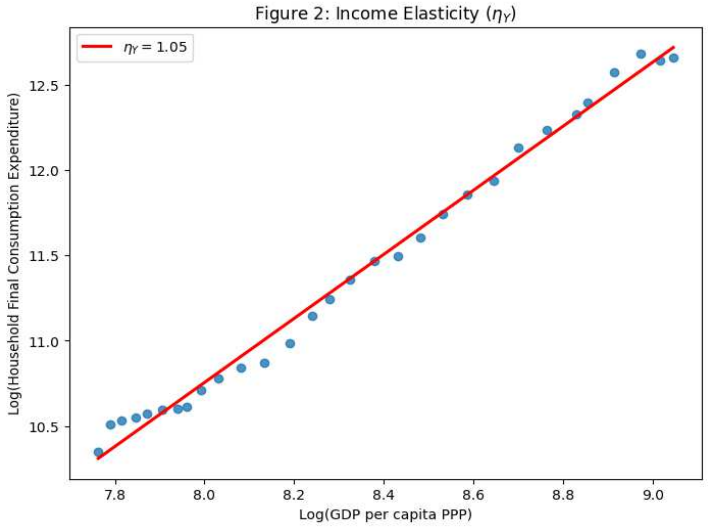


Figure 2 presents the log-linear relationship between aggregate consumption and per capita income. The plot demonstrates a strongly linear and robust relationship, confirming a stable, long-run structural link. The slope of the fitted regression line is the estimated Aggregate Income Elasticity of Consumption (ηY), which is **1.05**. This value, critically close to unity, provides quantitative proof for the Structural Maturity Hypothesis. The near-unit slope confirms that the proportional increase in consumption is nearly equal to the proportional increase in income, aligning with the macroeconomic manifestation of Engel's Law and signifying a maturing economy where marginal income is increasingly channeled toward savings, investment, and higher-order goods rather than simple expansion of basic consumption.

Figure 3: The Demand Shock Mitigation Hypothesis Analysis

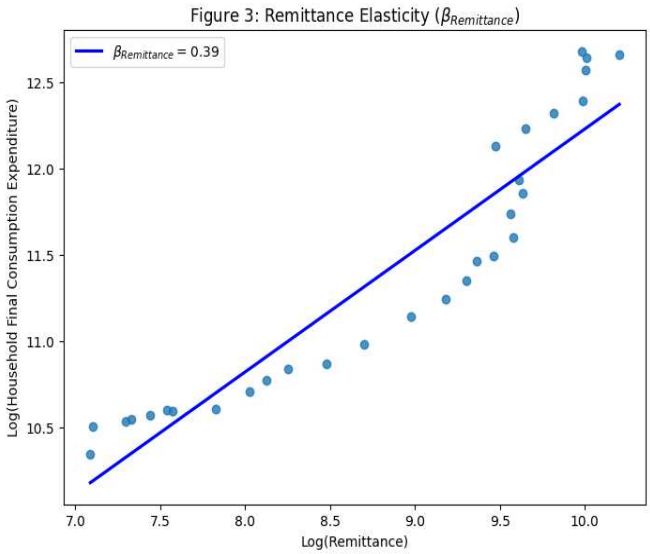


Figure 3 illustrates the relationship between aggregate consumption and the exogenous remittance shock. The fitted line confirms a positive and statistically significant relationship, but the slope (elasticity) is distinctly shallower than the income elasticity. It is estimated at **0.39**. This low magnitude is the key visual evidence supporting the Demand Shock Mitigation Hypothesis. The shallow slope demonstrates that the Marginal Propensity to Consume (MPC) out of remittance income is significantly low, indicating that only about 39% of the remittance inflow is allocated to immediate consumption. The majority—approximately 61%—is diverted to non-consumption uses such as savings, asset accumulation, and investment. This pattern functions as a critical macroeconomic buffer, reducing the direct inflationary pressure that would otherwise arise from a strong external demand shock.

5. Discussion and Price Theory Interpretation

The robust results from the log-linear model (Model 2) allow for a formal interpretation of consumption dynamics in Bangladesh within the framework of Price Theory. These findings empirically validate the dual hypothesis of the paper, demonstrating how structural change and an exogenous demand shock interact to govern aggregate consumption expenditure.

5.1. The Convergence to Unit Elasticity: Structural Maturity ($\eta Y \approx 1.05$)

The estimated Aggregate Income Elasticity of Consumption (ηY) of **1.05** confirms the first core hypothesis regarding structural change. This coefficient, derived from the responsiveness of consumption to per capita income growth, provides critical insights into the evolving resource allocation behavior of the Bangladeshi economy.

Evidence of Engel's Law at the Macro Level

The finding that ηY is positive and close to unity is formal econometric evidence of structural maturity in Bangladesh, consistent with the macroeconomic manifestation of Engel's Law. As income levels rise (reflected in increasing GDP per capita PPP), the marginal dollar of income is increasingly allocated to:

- Superior goods
- Higher-order services
- Savings and investment
- Non-basic consumption categories

An elasticity of 1.05 implies that a 10% increase in per capita income results in roughly a 10.5% increase in total consumption. While this remains mildly expansive ($\eta Y > 1$), its proximity to unit elasticity ($\eta = 1$) demonstrates that the early development phase—where consumption grows far faster than income—is fading.

The stabilization of the consumption function reflects several structural features:

1. **Satiation of Basic Needs:**
   A larger share of the population now meets essential consumption requirements, reducing the marginal demand for basic goods.
2. **Increased Savings and Investment:**
   As incomes rise, the marginal propensity to save increases.
   Even in the flawed Model 1, the highly significant coefficient on Gross Capital Formation suggested a structural reallocation of resources toward investment, consistent with regional patterns of transformation noted by ESCAP (2013).

This convergence toward $\eta Y \approx 1$ marks an important developmental milestone: Bangladesh is transitioning into a consumption–investment balanced economy.

5.2. The Bounded Demand Shock: Remittance Elasticity ($\beta Remittance \approx 0.39$)

The coefficient β_2^*, estimated at **0.39**, provides the definitive measure of the remittance shock and its absorption within the economy.

Quantification of the Exogenous Shock

The positive and statistically significant coefficient confirms that remittance inflows function as a robust exogenous income shock. This shock produces an outward shift in the Aggregate Demand (AD) curve, consistent with established empirical findings in South Asian remittance literature (Raihan et al., 2009).

The Critical Role of Low MPC

The most important finding is the *low magnitude* of βRemittance.
An elasticity of **0.39** implies a Marginal Propensity to Consume (MPC) of only **39%** out of each additional dollar of remittance income.

This confirms the Demand Shock Mitigation Hypothesis:

- For every $1.00 remittance income, only $0.39 immediately enters the domestic consumption stream.
- The remaining $0.61 (61%) is directed toward non-consumption uses, primarily:
    - Gross Domestic Savings
    - Gross Capital Formation (GCF)
    - Housing, land, or asset acquisition
    - Human capital and small-business investment

This low MPC acts as a powerful macro-stabilizing mechanism. By diverting most of the exogenous income shock toward productive uses, Bangladesh avoids the inflationary surges that typically accompany large inflows of unearned income.

This observation aligns with the argument of Zarate-Hoyos (2008), who emphasized that the development impact of remittances depends heavily on the consumption–investment balance. A low MPC transforms remittances into a long-term capital formation engine rather than a short-run inflation driver.

Synthesis of the Dual Dynamics

The dual elasticity patterns reveal a maturing and increasingly stable economic structure:

- **Structural Maturity:**
  $\eta Y \approx 1$ indicates that aggregate consumption is stabilizing and aligning closely with income growth.
  The economy is transitioning from basic-need fulfillment to diversified spending and savings behavior.
- **Bounded External Demand Shock:**
  $\beta Remittance \approx 0.39$ demonstrates that the principal external income flow is **not** destabilizing consumption.
  Instead, remittances are largely channeled into savings and investment—supporting long-term capital accumulation rather than short-run excess demand.

Together, these results show how Bangladesh's consumption system is governed by two reinforcing mechanisms:

1. A **mature Engel curve** that tempers consumption growth.
2. A **self-regulating remittance inflow** that fuels investment rather than consumer inflation.

These findings provide a coherent Price Theory explanation for the resilience and sustainability of aggregate demand in Bangladesh during the 1995–2024 period.

6. Conclusion and Policy Implications

This study applied the framework of Price Theory alongside a corrected log-linear econometric model to analyze the dual forces shaping Aggregate Household Consumption Expenditure (HFCE) in Bangladesh from 1995 to 2024. By explicitly disentangling the long-term structural impact of income growth from the acute, exogenous shock of remittance inflows, the paper provides strong empirical evidence supporting its dual hypothesis.

6.1. Synthesis of Dual Dynamics

The key findings, summarized in Table 3, confirm the dual dynamic that defines the macroeconomic structure of contemporary Bangladesh:

1. **Structural Maturity Confirmed ($\eta Y \approx 1.05$):**
   The Aggregate Income Elasticity of Consumption is estimated at **1.05**, confirming a near-unit elasticity. This provides formal evidence that Engel's Law is operating at the macro level. As incomes rise, households allocate marginal income not solely to increased consumption, but increasingly to savings, investment, and higher-order services—a hallmark of structural economic maturity.

2. **Mitigation of the Demand Shock ($\beta Remittance \approx 0.39$):**
   The Remittance Elasticity is estimated at **0.39**, confirming that the Marginal Propensity to Consume (MPC) out of remittance income is less than half. Approximately **61%** of the remittance shock is absorbed by non-consumption uses such as Gross Domestic Savings and Gross Capital Formation (GCF).
   This absorption mechanism is critical: it demonstrates that Bangladesh's largest external income flow is not destabilizing consumer markets, but is instead being channeled into productive capacity.

Together, these results suggest that Bangladesh's economy is structurally resilient: the consumption base is stable and maturing, and the primary external income shock is naturally redirected into long-term capital formation rather than runaway consumption demand.

6.2. Policy Implications

The evidence of a low MPC out of remittances yields several clear policy directives for Bangladesh. First, policymakers should focus on maximizing the productive channeling of the 61% remittance surplus that naturally flows into savings and investment by strengthening financial infrastructure, designing high-return and low-risk investment instruments, incentivizing small business creation, and expanding access to agricultural and industrial capital equipment—recommendations consistent with Zarate-Hoyos (2008), who emphasizes the importance of encouraging productive uses of remittance income. Second, although the low MPC reduces immediate consumption-driven inflationary risks, the associated rise in Gross Capital Formation (GCF) can generate demand-side pressures in capital and construction markets. To mitigate these risks, monetary authorities must closely monitor liquidity growth tied to foreign currency inflows, employ targeted monetary tools to stabilize inflation, and ensure sufficient supply-side responses to accommodate rising investment demand. This aligns with Roy and Almeida Ramos (2012), who, drawing on IMF Article IV analyses, highlight the importance of managing inflow-driven liquidity to maintain macroeconomic stability.

Future Research Priorities

Further research should investigate the precise allocation of remittance-funded savings and investment within the economy. Disaggregating the estimated 61% non-consumed remittance surplus across asset classes—such as real estate, financial assets, education and health expenditures, and business start-up capital—would allow policymakers to design more targeted and effective incentives for long-term economic growth. Understanding the distribution of remittance-funded investment would also help clarify which sectors absorb the majority of external income inflows and how these channels influence productivity and structural transformation.

6.3. Limitations and Directions for Future Research

Aggregation Bias and Household Heterogeneity

A primary limitation of this study is the reliance on national-level aggregate data, which inherently assumes homogeneity across households. In reality, the Marginal Propensity to Consume (MPC) out of remittances varies significantly across rural and urban regions, income groups, and between migrant and non-migrant households. These differences cannot be captured using macroeconomic aggregates. Future research should employ micro-econometric methods using household-level survey data—such as the Household Income and Expenditure Survey (HIES)—to capture the heterogeneous consumption and investment behavior associated with remittance receipts.

Persistent Multicollinearity and Trend Dependence

Although the log-linear specification effectively mitigated the extreme multicollinearity observed in the levels model (Condition Number 7.63×10^6), the broader issue of highly correlated macroeconomic time series remains. These series tend to share strong upward trends over time, creating inherent statistical challenges. The model's reliance on an assumed long-run cointegrating relationship among the variables, while consistent with standard macro-econometric practice, requires further validation. Future studies should employ more advanced cointegration techniques or structural break tests to verify the stability of long-run relationships.

Omitted Variable Bias

For the sake of parsimony and focus on the dual hypothesis, the final model excludes several macroeconomic variables that may influence HFCE, including inflation (CPI), broad money supply (M2), exchange rate volatility, and interest rates. These omitted variables could potentially bias the elasticity estimates if they correlate with both consumption and the explanatory variables. Future studies should incorporate a more comprehensive set of monetary and financial indicators to strengthen the causal interpretation of the elasticity estimates.

Causality and Feedback Loops

The estimated elasticities quantify long-run associations but do not establish strict unidirectional causality among consumption, income, and remittances. In practice, these variables interact dynamically through channels such as import demand, credit constraints, and business cycle fluctuations. To capture these complex interactions, future research should implement Vector Autoregression (VAR) or Structural VAR (SVAR) approaches. These models would allow for the identification of short-run and long-run causal pathways and provide deeper insight into how remittance shocks and income growth jointly influence household consumption over time.

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