The Inflation-Unemployment Trade-Off in Bangladesh: Empirical Insights for Accelerating Progress towards Zero Poverty (SDG 1)

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Abstract

This study empirically investigates the inflation-unemployment trade-off in Bangladesh and assesses its implications for achieving Sustainable Development Goal 1 (SDG 1) of zero poverty. High inflation erodes the real income of the poor, while unemployment directly limits earning capabilities, making the interplay between these variables a central determinant of poverty reduction. Using annual time-series data from 1990 to 2024, we employ an Autoregressive Distributed Lag (ARDL) model to test for the existence and stability of a long-run relationship. Our findings confirm a significant short-run trade-off but reveal that this relationship is unstable and weakens in the long run, suggesting that other structural factors dominate. The results indicate that unanticipated inflationary shocks disproportionately harm the poor, and persistent unemployment remains a formidable barrier to inclusive growth. The study concludes that a singular focus on either price stability or employment generation is insufficient for attaining SDG 1. Instead, Bangladesh requires an integrated policy framework that combines prudent monetary policy to control the inflation rate with targeted fiscal measures, investments in human capital, and productive sector diversification to generate new employment opportunities. This holistic approach is essential to effectively manage the trade-off and accelerate progress towards eliminating poverty.
Key Words: Inflation, Unemployment, Poverty, SDG 1, Bangladesh, ARDL.

1. INTRODUCTION

The economy of Bangladesh has transformed significantly in the twenty-first century. Evolving from a predominantly agrarian foundation, the country has achieved consistent GDP growth rates of 6–7% annually, driven by a robust ready-made garment industry, substantial remittance inflows, and a growing digital economy (World Bank, 2023). This growth has lifted millions out of poverty. However, persistent macroeconomic challenges, notably inflation and unemployment, threaten equitable and sustainable progress. Nguyen, Islam, & Ali (2011) advocated for stronger financial regulations and necessary reforms. They also propose appointing an ombudsman to independently address complaints regarding financial services. Enhanced competition in the financial industry is expected to yield improved services and a greater variety of financial products. The authors contend that with a more robust regulatory framework and essential reforms, the financial sector can evolve to better meet the developmental needs of the country.

The theoretical relationship between inflation and unemployment is encapsulated by the Phillips Curve, which posits a short-run trade-off: lower unemployment can be achieved at the cost of higher inflation, and vice versa (Phillips, 1958; Samuelson & Solow, 1960). However, the empirical validity of this model in Bangladesh's unique sociolect-economic context—characterized by cost-push inflation drivers, a large informal sector, and structural skill mismatches—remains contested. Understanding this nexus is not merely academic; it is a prerequisite for formulating policies that foster job creation without triggering destabilizing price levels, a critical concern for poverty alleviation aligned with SDG 1.

High inflation acts as a regressive tax, eroding the purchasing power of the poor who spend a larger share of income on essentials (Ravallion, 2014). Conversely, unemployment denies households the primary means of escaping poverty. Despite its importance, a gap exists in context-specific empirical research on this trade-off in Bangladesh. This study aims to fill that gap by providing a robust, multi-variable analysis using advanced time-series econometrics.

The study is guided by three core research questions:

What is the empirical nature and significance of the short-run trade-off between inflation and unemployment in Bangladesh?

Beyond the Phillips Curve, what are the other significant determinants of inflation in the Bangladeshi economy?

What are the policy implications of these findings for designing a coherent strategy to accelerate progress towards zero poverty (SDG 1)?

2. LITERATURE REVIEW

The Phillips Curve, originating from Phillips's (1958) work on wage inflation and unemployment in the UK, was adapted by Samuelson and Solow (1960) to describe a trade-off between price inflation and unemployment. This "naive" curve was challenged by Friedman (1968) and Phelps (1967), who introduced the concepts of the natural rate of unemployment and the expectations-augmented Phillips Curve. They argued the trade-off exists only in the short run; in the long run, the Phillips Curve is vertical at the natural rate of unemployment. The Lucas Critique further emphasized that policy-invariant structural factors determine unemployment (Lucas, 1972). Contemporary views acknowledge the relationship is context-dependent, influenced by globalization, central bank credibility, and supply shocks (Blanchard, 2016). An important aspect

of effective bank management involves aligning banking products with customer needs. When developing new offerings, banks should consider their clients' desires, guided by market research initiatives. This paper investigates whether the banking products available in Bangladesh meet the requirements of customers(Wise & Ali, 2009).

Empirical findings are mixed. In developed economies, the Phillips Curve has flattened since the 1990s (Ball & Mazumder, 2011). In developing nations like India and Pakistan, a significant but unstable short-run trade-off has been documented, often susceptible to supply shocks (Verma, 2017; Hussain, 2009). For Bangladesh, the literature is emerging and inconclusive. Early studies noted a weak trade-off with supply-side shocks as primary inflation drivers (Hossain & Islam, 2005). A recent study by Ruhi, Tithi, and Ahmed (2024) using an ARDL approach found an inverse but statistically insignificant relationship for 1991–2022, challenging the conventional Phillips Curve hypothesis and pointing to stagflationary pressures. Nguyen, Islam, & Ali(2010) depicted that the research considers explanations for interest rate asymmetries in commercial banks .These explanations include the impact of concentrated markets on rate adjustments, and how unsophisticated consumers and search costs affect banks' ability to manipulate rates

Other research highlights multi-causal inflation drivers in Bangladesh, including broad money growth, exchange rate pass-through, and international commodity prices (Bangladesh Bank, 2022). Structural issues—skills mismatch, a dominant informal sector, and inadequate diversification beyond garments—are cited as key unemployment drivers (Mujeri, 2019; World Bank, 2023). Critically, the link between this macroeconomic trade-off and poverty (SDG 1) remains underexplored. Muhibullah and Das (2019) found a significant long-run effect of inflation on income inequality in Bangladesh, underscoring the regressive impact of price rises. Ali, Hossain, Chowdhury, & Nedelea (2017) described that implementation of Sustainable Development Goals (SDG) 1 and 5 through BNF(Bangladesh NGO foundation) funding. Utilizing self-administered questionnaires, the research explores the role of BNF partner organizations in achieving these goals. Notably, 93.9% of organizations assist women entrepreneurs, and 69.6% of respondents agreed that BNF financing effectively addresses social issues. The findings indicate a significant connection between NGO activities and the advancement of poverty reduction and SDG 1 and 5.

This study builds upon and extends existing research by: (1) developing a multi-variable model incorporating wages, FDI, and interest rates; (2) explicitly modeling the transmission channels through wages and interest rates; and (3) directly linking empirical findings to evidence-based policy recommendations for SDG 1.Ali(2010) found that high-powered money significantly influences the money supply, particularly concerning narrow money supply (M1), lending credence to the monetarist perspective. However, to fully comprehend Bangladesh's money supply dynamics, it is essential to consider additional factors identified by Keynesian and structuralist frameworks, including the bank rate, external resources, and financial liberalization. These variables also impact the broader money supply in the country. Nonetheless, the limited efficacy of the narrow money model and the multicollinearity issues present in both models necessitate careful interpretation of the estimated results, even for the broad money model. Ali & Medhekar (2012) found that as Bangladesh continues to grapple with poverty, overpopulation, and inefficient governance so the service sector generates over half of the Gross Domestic Product (GDP), nearly two-thirds of Bangladeshis are employed in agriculture, with rice being the primary crop Economic grow this bolstered by garment exports and remittances from overseas

workers. They argued that in 2008, the country's monetary policy, aimed at maintaining high employment, led to a higher inflation rate. Ali (2025) critically examines how risk governance in micro-banking influences macroeconomic outcomes in Bangladesh, emphasizing the interaction among financial inclusion, institutional oversight, and economic indicators. The study concludes that effective risk governance is crucial for translating financial inclusion into macroeconomic benefits. It highlights the need for stronger institutions, integrated regulatory frameworks, and financial products that mitigate systemic risks like inflation. For micro-banking models, such as Societal Banking (Ali, 2016, 2020, 2025), to fulfill their potential as engines of inclusive growth, the focus should shift from mere numerical expansion to qualitative institutional strengthening. This governance-centric approach is vital for Bangladesh and similar economies.

2.1. Hypotheses Testing

Based on the research objectives and empirical models, the following key hypotheses were tested:

H_1 **(Short-Run Phillips Curve):** There is a significant inverse relationship between the inflation rate and the unemployment rate in the short run.

H_2 **(Long-Run Phillips Curve):** There is no significant long-run relationship between the inflation rate and the unemployment rate (i.e., the long-run Phillips Curve is vertical).

H_3 **(Monetary Policy Channel):** The interest rate has a significant positive long-run impact on the inflation rate.

H_4 **(Structural/Wage Channel):** The average wage level and structural breaks (dummy variable) have significant effects on inflation and wage determination.

3. METHODOLOGY

3.1. Research Design and Data

This study employs a quantitative research design using secondary annual time-series data for Bangladesh from 1990 to 2024 (34 observations). Data were sourced from the Bangladesh Bureau of Statistics (BBS), Bangladesh Bank, the World Bank, and the International Monetary Fund (IMF). Key variables include the inflation rate (In), unemployment rate (U), GDP growth (GDP), average wage level (Wage), foreign direct investment (FDI, % of GDP), interest rate (INT), labor force participation rate (L), and a dummy variable (DUM) representing structural breaks or policy periods.

3.2. Empirical Model and Estimation Technique

The core analysis involves time-series regression. Initial exploratory analysis used Ordinary Least Squares (OLS) to estimate four models:

Core Inflation Model: $In=\beta 0+\beta 1U+\beta 2GDP+\beta 3L+\beta 4FDI+\beta 5INT+\beta 6Wage+\varepsilon$

Inflation Model with Dummy: $In=\beta 0+\beta 1U+\beta 2Wage+\beta 3DUM+\beta 4INT+\beta 5FDI+\varepsilon$

Wage Determination Model: $Wage=\beta 0+\beta 1U+\beta 2DUM+\beta 3INT+\beta 4GDP+\varepsilon$

Interest Rate Determination Model: $INT=\beta 0+\beta 1U+\beta 2DUM+\beta 3GDP+\beta 4In+\beta 5L+\varepsilon$

However, a critical prerequisite for time-series regression is stationarity. Standard OLS on non-stationary data can yield spurious results. Therefore, a comprehensive diagnostic sequence was undertaken:

Stationarity Tests: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were conducted on all variables.

Cointegration Test: If variables were non-stationary and integrated of the same order, the Johansen cointegration test was performed to identify long-run equilibrium relationships.

Model: Given the presence of cointegration, a Vector Error Correction Model (VECM) was estimated to capture both short-run dynamics and long-run equilibrium adjustments. The general form of the VECM is:

$$\Delta Y_t = \alpha \beta' Y_{t-1} + \Sigma \Gamma_i \Delta Y_{t-i} + \varepsilon_t$$

Where $\beta' Y_{t-1}$ represents the cointegrating (long-run) equation and α is the speed of adjustment.

Dynamic Analysis: Impulse Response Functions (IRFs) were derived from the corresponding Vector Auto-regression (VAR) model to trace the dynamic effects of shocks within the system.

Diagnostic Tests: Standard diagnostics, including tests for multicollinearity (VIF), autocorrelation (Durbin-Watson), heteroscedasticity (Breusch-Pagan/White), and normality of residuals (Jarque-Bera), were conducted on appropriate models.

4. RESULTS
4.1. Preliminary OLS and Diagnostics
Initial OLS results (Tables 1-4) showed high R^2 values but produced counter-intuitive findings, such as a significant positive relationship between unemployment and wages in Model 3. Diagnostic tests, however, revealed severe multicollinearity (e.g., VIF for Wage was 8.722 in Model 1) and, critically, low Durbin-Watson statistics (e.g., 0.577 in Model 3) indicating positive autocorrelation.

4.2. Stationarity and Cointegration
Unit root tests (ADF & PP) confirmed that all variables except FDI were non-stationary at level but stationary at first difference—integrated of order one, I(1). FDI was stationary at level, I(0) (Table 5). This invalidated the initial OLS models as potentially spurious. The Johansen cointegration test (Table 6) indicated one cointegrating equation at the 0.05 level, confirming a stable long-run equilibrium relationship among the non-stationary variables.

4.3. Vector Error Correction Model (VECM) Findings
The normalized long-run cointegrating equation for inflation was estimated as:
$$In = 5.221 + 0.715{**}INT + 9.102{***}FDI - 0.198{*}U - 0.051 Wage$$
(Standard errors in parentheses; *, **, *** denote significance at 10%, 5%, and 1% levels).

4.4. Long-Run Interpretation:

Interest Rate (INT) and Foreign Direct Investment (FDI) had a significant positive long-run impact on inflation.

Unemployment (U) had a negative but only weakly significant long-run relationship with inflation.

Wage had an insignificant long-run effect.

The error correction term (CointEq1) was -0.452 and statistically significant (p=0.013), indicating a moderate speed of adjustment where about 45% of any short-run deviation from long-run equilibrium is corrected in the following period.

Impulse Response Functions (IRFs) and Short-Run Dynamics

The IRFs provided clear evidence of a bidirectional short-run Phillips Curve trade-off:
A positive shock to Inflation caused a significant decrease in Unemployment, with the effect lasting several periods.

A positive shock to Unemployment led to a gradual decrease in Inflation.

Interest rates increased in response to an inflation shock (consistent with a Taylor-rule reaction) and decreased in response to an unemployment shock (indicating a counter-cyclical policy stance).

Table 1: Key Results from Empirical Tests

Test / Model	Variable / Relationship	Key Statistic / Coefficient	Result / Implication	Decision for Hypothesis
Stationarity (ADF/PP)	All variables (except FDI)	Non-stationary I(1) at level; Stationary I(0) at 1st difference	Validates use of cointegration/VECM approach. Initial OLS was spurious.	-
Cointegration (Johansen)	Among I(1) variables	Trace Statistic indicates 1 cointegrating eqn. (p<0.05)	Confirms a stable long-run relationship exists.	-
Long-Run Cointegrating Eqn.	**Inflation (In) = 5.221 + 0.715 INT + 9.102 FDI** - 0.198 U - 0.051 Wage	Coefficients (**, ***) significant)	**INT & FDI** drive long-run inflation. **U** is weak/negative. **Wage** is insignificant.	**H₂ Accepted:** No strong long-run In-U link. **H₃ Accepted:** INT has positive long-run effect.
Error Correction Term	CointEq1	Coefficient = **-0.452** (p=0.013)	Significant. ~45% of disequilibrium corrects per period. Confirms model stability.	-

Impulse Response (IRF)	**Shock: Inflation → Unemployment**	Significant negative response of U to In shock.	Evidence of **short-run trade-off**.	H_1 **Accepted:** Significant short-run inverse relationship.
	Shock: Unemployment → Inflation	Significant negative response of In to U shock.	Evidence of **bidirectional trade-off**.	H_1 **Accepted:** Further confirms short-run Phillips Curve.
Initial OLS (Model 3)	Wage = f(U, …)	**Positive U coefficient** (counter-intuitive)	Rejected due to **spurious regression** (low DW=0.577, high VIF). Highlights need for time-series corrections.	Initial evidence for H_4 **is unreliable**. VECM is valid.
VECM/Dummy Variable	Structural Break (DUM)	Significant in preliminary models.	Indicates policy/structural shifts matter for model parameté	

(Source: Authors working)

5. Discussion

5.1. Interpretation of Key Findings

The study's core finding is the validation of a significant **short-run Phillips Curve trade-off** in Bangladesh, coupled with a **vertical long-run Phillips Curve**. The bidirectional relationship revealed by the IRFs confirms that policymakers face a genuine, though temporary, trade-off: expansionary policies can reduce unemployment at the cost of higher inflation, and contractionary policies can curb inflation with a temporary rise in unemployment.

In the long run, the trade-off vanishes. The primary determinants of inflation shift to structural and monetary factors: **Foreign Direct Investment (FDI)** and the **Interest Rate** (largely reflecting the central bank's reaction function). The weak long-run link between unemployment and inflation supports the Natural Rate Hypothesis (Friedman, 1968).

5.2. Policy Implications for SDG 1

The findings have critical implications for poverty reduction strategies:

I. **Nuanced Monetary Policy:** The Bangladesh Bank should adopt a forward-looking, transparent framework. It must acknowledge the short-run trade-off, allowing for cautious flexibility during downturns or inflation spikes, while firmly anchoring long-term policy on price stability to foster a predictable investment climate.

II. **Managing Structural Inflation Drivers:** Policy must address the fundamental drivers identified. This includes strategically channeling FDI into productivity-enhancing sectors (e.g., infrastructure, technology) to expand economic capacity rather than stoking

demand-pull inflation. Furthermore, fostering productivity-led wage growth through skills development and technology adoption is crucial to raise real incomes without triggering proportional inflation.

III. **Holistic and Data-Driven Stabilization:** Policy-making must look beyond the simple inflation-unemployment dichotomy. Supply-side policies—investing in agricultural productivity, energy security, and diversification—are essential to manage cost-push inflation. Robust social safety nets are needed to protect the vulnerable from the short-term costs of disinflationary policies, making such policies socially sustainable.

IV. **Pro-Poor Structural Policies:** The direct link between structural shifts (captured by the dummy variable) and wages highlights a potent tool for poverty reduction. Targeted labor market policies, such as strategic minimum wage adjustments coupled with skills development, can directly lift household incomes.

5.3. Hypothesis Testing Acceptance

I. **Acceptance of the Short-Run Phillips Curve (H_1 Accepted):**
The most compelling evidence comes from the Impulse Response Functions. The bidirectional negative responses between inflation and unemployment shocks confirm a statistically significant short-run trade-off. This implies that in Bangladesh, expansionary demand policies can temporarily reduce unemployment at the cost of higher inflation, and vice-versa. Policymakers must acknowledge this temporary trade-off when designing counter-cyclical measures.

II. **Acceptance of the Vertical Long-Run Phillips Curve (H_2 Accepted):**
The long-run cointegrating equation reveals that the unemployment rate has only a weak (marginally significant) negative effect on inflation, while wages have no significant effect. This aligns with the Natural Rate Hypothesis. The primary long-run determinants of inflation are monetary/structural: the interest rate (INT) and foreign direct investment (FDI). This finding validates the classical view that the long-run Phillips Curve is effectively vertical, and sustained inflation is not a tool for permanent unemployment reduction.

III. **Acceptance of the Monetary Policy Channel (H_3 Accepted):**
The significant positive coefficient for INT in the long-run equation (0.715) strongly supports H_3. This suggests that interest rate policy is a major determinant of inflation in the long run, consistent with the Taylor rule and the central bank's reaction function. The IRFs further support this, showing interest rates rising in response to inflation shocks. This underscores the critical role of Bangladesh Bank's credibility and policy stance in anchoring long-term price stability.

IV. **Partial Acceptance of Structural/Wage Channels (H_4 Partially Accepted):**
While the initial OLS models (now deemed spurious) suggested strong effects, the valid VECM results show wages are insignificant in the long-run inflation equation. This rejects a simple cost-push inflation hypothesis in the long run. However, the consistent significance of the dummy variable (DUM) across preliminary models indicates that structural breaks (e.g., major policy shifts, crises) are crucial in shaping relationships,

particularly for wage determination. Therefore, H_4 is accepted only concerning the importance of structural factors, not a direct long-run wage-inflation link.

The empirical findings on inflation, unemployment, and monetary policy provide a critical macroeconomic framework. When integrated with the grassroots evidence from Ali et al. (2017) on NGO activities, a powerful, multi-tiered strategy for sustainable development, particularly SDG 1 (No Poverty) and SDG 5 (Gender Equality), emerges for Bangladesh.

5.4.   Here are the Key Implications
5.4.1.   *Macroeconomic Stability as a Foundational Enabler for NGO Efficacy*

Implication: The confirmation of a vertical long-run Phillips Curve underscores that sustainable poverty reduction cannot be achieved through inflationary policies. Persistent high inflation erodes the real income gains of the poor and destabilizes the economic environment.

Link to NGO Work: The effectiveness of BNF-funded programs—such as providing capital to women entrepreneurs—is severely undermined in a high-inflation environment. The real value of microloans and business profits diminishes, threatening the sustainability of these enterprises.

Policy Integration: The Bangladesh Bank must prioritize long-term price stability (as shown by the strong influence of INT on inflation). A stable macroeconomic climate acts as a force multiplier for NGO interventions, ensuring that financial assistance and entrepreneurial gains are not wiped out by rising prices.

5.4.2.   *Strategic Management of FDI for Inclusive Growth*
Implication: The finding that FDI is a major long-run driver of inflation is crucial. It suggests that FDI inflows, if not managed properly, can create demand-pull inflation without commensurate productivity gains.

Link to NGO Work: Ali et al. show NGOs are skilled at channeling resources to marginalized groups, especially women. Macro policy must ensure the *type* of FDI complements this.

Policy Integration: The government should strategically direct FDI into productivity-enhancing sectors like export-oriented manufacturing, renewable energy, and digital infrastructure. This expands economic capacity, creates formal jobs, and controls inflation. Simultaneously, NGOs like BNF partners can focus on preparing local communities, particularly women, with the skills (vocational training) and support services to access these new job markets, creating a pipeline from poverty to productivity.

5.4.3.   *Leveraging the Short-Run Trade-off for Protective Social Policy*
Implication: The validated short-run Phillips Curve trade-off means that disinflationary policies (e.g., raising interest rates) will likely cause a temporary rise in unemployment.

Link to NGO Work: This temporary hardship will disproportionately affect the informal sector and the poor. Here, the social protection and community mobilization expertise of NGOs is vital.

Policy Integration: When the central bank must contract the economy to curb inflation, the government should strengthen social safety nets. This is where collaboration with BNF-type organizations becomes essential. They can efficiently deliver targeted cash transfers, food

assistance, or retraining programs to cushion the vulnerable during the adjustment period, making sound macroeconomic policy socially and politically sustainable.

5.4.4. Structural Policies and Direct Interventions to Raise Real Wages

Implication: The insignificant long-run effect of wages on inflation is encouraging. It means real wages can be increased without triggering an inflationary spiral, provided the rise is backed by productivity gains.

Link to NGO Work: This directly complements the finding that 93.9% of BNF partners assist women entrepreneurs. Enhancing productivity at the micro-enterprise level is a direct path to sustainable wage growth.

Argumentation Combination: A dual approach is needed:

Macro/Structural: Government investment in education, skills development, and technology diffusion to raise economy-wide productivity.

Micro/Grassroots: Scaling up NGO programs that provide business development services, market access, and technology to women-led micro-enterprises. This enables them to grow, become more productive, and increase profits/wages, directly reducing poverty (SDG 1) and empowering women (SDG 5).

5.5. Limitations

The methodology's progression from flawed OLS to robust VECM was crucial. It revealed a clear dual reality for Bangladesh: a significant short-run Phillips Curve trade-off co-exists with a vertical long-run curve. Inflation in the long run is a monetary/structural phenomenon driven by interest rates and FDI inflows. For poverty reduction (SDG 1), this argues for a **two-**pronged policy: using short-run demand management with caution while relentlessly pursuing long-term structural policies (productivity-enhancing FDI, skills development, supply-side investments) to increase economic capacity and raise real wages without triggering inflation.

Implication in Bangladesh economy based-on result: Ali, Hossain, Chowdhury, & Nedelea (2017) described that implementation of Sustainable Development Goals (SDG) 1 and 5 through BNF(Bangladesh NGO foundation) funding. Utilizing self-administered questionnaires, the research explores the role of BNF partner organizations in achieving these goals. Notably, 93.9% of organizations assist women entrepreneurs, and 69.6% of respondents agreed that BNF financing effectively addresses social issues. The findings indicate a significant connection between NGO activities and the advancement of poverty reduction and SDG 1 and 5. Table 1: Key Results from Empirical Tests Test / Model Variable / Relationship Key Statistic / Coefficient Result / Implication Decision for Hypothesis Stationarity (ADF/PP) All variables (except FDI) Non-stationary I(1) at level; Stationary I(0) at 1st difference Validates use of cointegration/VECM approach. Initial OLS was spurious. - Cointegration (Johansen) Among I(1) variables Trace Statistic indicates 1 cointegrating eqn. (p<0.05) Confirms a stable long-run relationship exists. - Long-Run Cointegrating Eqn. Inflation (In) = 5.221 + 0.715 INT + 9.102 FDI - 0.198 U - 0.051 Wage Coefficients (**, *** significant) INT & FDI drive long-run inflation. U is weak/negative. Wage is insignificant. H_2 Accepted: No strong long-run In-U link. H_3 Accepted: INT has positive long-run effect. Error Correction Term CointEq1 Coefficient = -0.452 (p=0.013) Significant. ~45% of disequilibrium corrects per period. Confirms model stability - Impulse Response (IRF) Shock:

Inflation → Unemployment Significant negative response of U to In shock. Evidence of short-run trade-off. H_1 Accepted: Significant short-run inverse relationship. Shock: Unemployment → Inflation Significant negative response of In to U shock. Evidence of bidirectional trade-off. H_1 Accepted: Further confirms short-run Phillips Curve. Initial OLS (Model 3) Wage = f(U, ...) Positive U coefficient (counter-intuitive) Rejected due to spurious regression (low DW=0.577, high VIF). Highlights need for time-series corrections. Initial evidence for H_4 is unreliable. VECM is valid. VECM/Dummy Variable Structural Break (DUM) Significant in preliminary models. Indicates policy/structural shifts matter for model paramete

Entail for the Bangladesh Economy: Integrating Macroeconomic Stability with Grassroots Development

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5.6. Here are the key implications:
5.6.1. Macroeconomic Stability as a Foundational Enabler for NGO Efficacy
Implication: The confirmation of a vertical long-run Phillips Curve underscores that sustainable poverty reduction cannot be achieved through inflationary policies. Persistent high inflation erodes the real income gains of the poor and destabilizes the economic environment.

Link to NGO Work: The effectiveness of BNF-funded programs—such as providing capital to women entrepreneurs—is severely undermined in a high-inflation environment. The real value of microloans and business profits diminishes, threatening the sustainability of these enterprises.

Policy Integration: The Bangladesh Bank must prioritize long-term price stability (as shown by the strong influence of INT on inflation). A stable macroeconomic climate acts as a force multiplier for NGO interventions, ensuring that financial assistance and entrepreneurial gains are not wiped out by rising prices.

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Link to NGO Work: Ali et al. show NGOs are skilled at channeling resources to marginalized groups, especially women. Macro policy must ensure the *type* of FDI complements this.

Policy Integration: The government should strategically direct FDI into productivity-enhancing sectors like export-oriented manufacturing, renewable energy, and digital infrastructure. This expands economic capacity, creates formal jobs, and controls inflation. Simultaneously, NGOs like BNF partners can focus on preparing local communities, particularly women, with the skills (vocational training) and support services to access these new job markets, creating a pipeline from poverty to productivity.

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Argumentation Combination: A dual approach is needed:
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6. CONCLUSION

This study thoroughly analyzed the interactions between inflation, unemployment, and essential macroeconomic variables in Bangladesh from 1990 to 2024. A shift from unreliable Ordinary Least Squares (OLS) estimates to a more robust Vector Error Correction Model (VECM) proved crucial for the analysis. The findings reveal a dual economic landscape: a significant short-term Phillips Curve trade-off exists, indicating an inverse relationship between inflation and unemployment. However, this relationship vanishes over time, supporting a vertical long-run Phillips Curve. The main long-term influences on inflation are structural factors and monetary policy, particularly interest rates and foreign direct investment (FDI) inflows. Additionally, complementary studies demonstrate the positive impacts of grassroots initiatives, such as those by the Bangladesh NGO Foundation (BNF), in empowering women entrepreneurs and alleviating poverty. The overarching conclusion emphasizes that achieving sustainable development, specifically SDG 1 (No Poverty) and SDG 5 (Gender Equality), requires a holistically integrated policy framework. Macroeconomic stability and grassroots actions should not be viewed as separate paths, but rather as interconnected elements of a comprehensive strategy for inclusive growth. Ali (2025) views that the micro-banking model, encompassing micro-savings and micro-investment

strategies, can be effectively implemented not only in Bangladesh but also in India, provided the model is rigorously tested in the Indian context may be applied for the betterment of social justice.

Unified Argumentation Necessitate: The results yield actionable recommendations for Bangladeshi policymakers, highlighting the interplay between national economic strategies and community-driven initiatives.

Ensuring Macroeconomic Stability to Protect Gains for the Vulnerable: The central bank must prioritize long-term price stability, given the significant effect of interest rates on inflation. Maintaining a low and stable inflation rate preserves the real value of incomes, savings, and microloans, safeguarding the poverty-reducing effects of NGO initiatives like BNF-funded entrepreneurship. Thus, macroeconomic stability acts as a catalyst for effective development.

Channeling FDI for Productive and Inclusive Results: Due to the inflationary pressures associated with FDI, policies should focus on directing investments towards sectors that enhance productivity, such as high-value manufacturing and green technology. This strategic approach boosts the economy's capacity and generates quality jobs. Concurrently, NGO and government training programs must prepare the workforce, particularly women and marginalized communities, to seize these emerging opportunities, ensuring FDI fosters equitable growth.

Creating Social Safety Nets for Responsible Economic Adjustments: The validated short-run trade-off indicates that policies aimed at reducing inflation may temporarily raise unemployment. To ensure social and political stability during these adjustments, targeted social safety nets must be established. Utilizing grassroots networks and the efficient delivery capabilities of organizations like BNF can provide temporary support, retraining, or cash transfers to vulnerable populations during necessary economic shifts.

Promoting Productivity-Driven Real Wage Growth: Finding that wages do not influence long-run inflation presents an opportunity. Policymakers should focus on improving real wages through productivity enhancements. This entails a dual strategy: (i) investing nationally in education, technology, and infrastructure, and (ii) expanding NGO initiatives that offer micro-entrepreneurs business development services, market access, and technological support. Such measures will increase enterprise productivity, resulting in sustainable income growth for the poor without inciting inflation.

7. FUTURE RESEARCH DIRECTIONS

To further develop this study, future research should address its limitations and investigate emerging areas:

Enhanced and Disaggregated Data Analysis: Future studies should utilize higher-frequency (quarterly) data and larger samples as they become available. Additionally, incorporating disaggregated sectoral or regional data can reveal varying impacts of macroeconomic policies across different sectors, especially the large informal economy.

Integrating Inflation Expectations and External Shocks: A significant future direction involves formally adding inflation expectations to the model. Future analyses should also consider global commodity price shocks and exchange rate fluctuations, critical external factors influencing domestic inflation in an open economy like Bangladesh.

Exploring Non-Linear and Threshold Effects: Investigating non-linear relationships or threshold effects, where the trade-off between inflation and unemployment may shift at different inflation or economic growth levels, could offer more nuanced policy insights.

Linking Micro and Macro Perspectives: A crucial research avenue involves mixed-methods studies that quantitatively and qualitatively connect macroeconomic policy changes (e.g., interest rate adjustments) with micro-level outcomes in households and enterprises, particularly those supported by NGO programs. This approach would directly test the proposed integrated policy synergy.

Addressing Climate Vulnerabilities: Future economic models for Bangladesh should increasingly factor in climate risk indicators to understand how environmental shocks affect inflation, employment, and the effectiveness of poverty reduction initiatives.

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