“Monetary policy and SDG outcomes: Income-level heterogeneity”

AUTHORS	Muslum Mursalov Milos Tumpach

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Muslum Mursalov (Azerbaijan), **Milos Tumpach** (Slovakia)

MONETARY POLICY AND SDG OUTCOMES: INCOME-LEVEL HETEROGENEITY

Abstract

With five years remaining to the 2030 deadline of the United Nations Sustainable Development Goals, the relationship between monetary policy and SDG progress remains largely unexplored. This paper aims to quantify the association between short-term policy rates and SDG 1, SDG 8, and SDG 10 achievement across high-income, upper-middle-income, and low- and lower-middle-income economies. The analysis draws on a panel of 129 economies over 2000–2023, combining SDSN SDR2025 goal scores, IMF interest-rate series, World Bank WDI controls, and WGI 2.0 indicators (2,563 country-year observations), estimated using two-way fixed-effects regressions with country-clustered standard errors and eight robustness blocks. First, higher policy rates show a modest and consistent positive association with SDG 8 across income groups ($\beta \approx +0.045$, all $p < 0.10$), robust to two-period lags and a dynamic LSDV re-specification. Second, the pooled association with SDG 1 is null, but interaction estimates reveal significant income-group heterogeneity: within-HIC $\beta = +0.412$ ($p = 0.006$) and a significantly weaker UMC association (interaction $\beta = -0.590$, $p = 0.002$), with a negative but insignificant net UMC estimate (-0.178, $p = 0.20$). Third, the aggregate SDG Index is negatively associated with the policy rate only in the UMC subsample ($\beta = -0.048$, $p = 0.027$), and the SDG 8 association disappears when real or lending rates replace the policy rate – consistent with a signaling interpretation rather than an identified mechanism. Assessments of monetary policy in the SDG context should distinguish between goals with consistent associations and goals whose association varies significantly with income group.

Keywords monetary policy, sustainable development, panel data, fixed effects, income heterogeneity, central banks, policy rate

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Muslum Mursalov, Ph.D. in Economics, Associate Professor, Department of Economics, Azerbaijan State University of Economics (UNEC), Azerbaijan. (Corresponding author)

Milos Tumpach, Professor, Brno University of Technology; Professor, Bratislava University of Economics and Business, Slovakia.

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INTRODUCTION

Ten years into the 2030 Agenda, global progress toward the Sustainable Development Goals has stalled: only 35 per cent of SDG targets with available trend data are on track or making moderate progress, 18 per cent have regressed below their 2015 baselines (UN DESA, 2025), and fewer than 20 per cent are on track for 2030 (Sachs et al., 2025). The annual SDG financing gap for developing economies is estimated at approximately USD 4 trillion, while debt-servicing costs for low- and middle-income countries reached a record USD 1.4 trillion in 2023 (UN DESA, 2025). Over 800 million people still live in extreme poverty, and nearly one in eleven people experienced hunger in 2023 (UN DESA, 2025). With five years to the 2030 deadline, the operative policy question is which macroeconomic levers can advance SDG progress and what distributional consequences they entail across economies at different levels of development.

The labor-market footprint of the 2022–2024 disinflation cycle has been uneven across the development gradient. Although global unemployment held at a historic low of 5.0 per cent in 2024, the global jobs gap reached 402 million workers, while unemployment in low-income

economies climbed from 5.1 per cent in 2022 to 5.3 per cent in 2024 against falling rates in middle-income economies (ILO, 2025). The global labor-income share continued its decade-long descent, from 53.0 per cent in 2014 to 52.4 per cent in 2024 (ILO, 2025), even as core macroeconomic conditions stabilized. These outcomes map onto SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities), yet the empirical relationship between central bank policy rates and cross-country SDG achievement remains largely uncharted.

Monetary-policy transmission varies with exchange-rate regime, financial development, and central-bank credibility (Deb et al., 2023), but its consequences for SDG achievement across income groups have not been quantified in a unified cross-country panel. The scientific problem addressed here is therefore twofold. First, the existing evidence on the distributional consequences of monetary policy relies on pre-SDG outcome measures – Gini coefficients and poverty headcounts – rather than the composite goal scores used to benchmark progress toward the 2030 Agenda. Second, pooled cross-country designs may conceal systematic differences in the direction and size of the policy rate–SDG association across income groups. Accordingly, this study aims to quantify the association between short-term policy rates and SDG 1, SDG 8, and SDG 10 outcomes – and to test whether this association differs across high-income, upper-middle-income, and low- and lower-middle-income economies – in a 129-country panel over 2000–2023, using two-way fixed-effects regressions.

1. LITERATURE REVIEW

The transmission of central bank policy rates to the broader macroeconomy operates through several overlapping mechanisms whose strength depends on country-specific structural conditions, with recent evidence emphasizing that the same nominal shock produces materially different real-side responses across economies at different stages of development. Micro-level evidence shows that interest-rate changes propagate heterogeneously across household balance sheets and firm investment decisions, with effects amplified for borrowing-constrained agents (Holm et al., 2021; Chang & Schorfheide, 2024). At the aggregate level, cross-country investigations report that the speed of pass-through is largely determined by the exchange-rate regime, the credibility of the central bank, and the depth of domestic credit markets (Deb et al., 2023; Aliu et al., 2025). Emerging markets face additional frictions: the credit and bank-lending channels are weak in India, so authorities lean on quasi-unconventional mechanisms (Mohanti & Banerjee, 2024), while firm-level analyses across 22 emerging economies show that tightening reaches inventory decisions despite shallower financial systems (Checo et al., 2024; Bagirzade et al., 2026). Unconventional tools have proved effective at stabilizing euro-area inflation and output during periods of acute stress (Pečiulis & Vasiliauskaitė, 2024; Jabiyev et al., 2025) and spill over to emerging bond markets through global yield linkages (Panigrahi et al., 2025). Structural factors – regional Taylor-rule deviations, the composition of liquid assets, and asymmetric currency volatility from central bank interventions – further shape localized stress (Duran & Gajewski, 2023; Obradović, 2025; Yoshimori, 2025). Supply-side disturbances complicate identification, with electricity-price shocks following Russia's invasion of Ukraine exerting rapid pressure on headline inflation across 26 European economies (Vasylieva et al., 2025). Taken together, this evidence establishes interest rate setting as the principal monetary instrument while showing that its downstream propagation is highly conditional on country structure – a dependence that, projected onto SDG indicators, motivates the cross-country heterogeneity our empirical design tests.

Second strand traces how monetary shocks translate into distributional outcomes, and here the directional ambiguity of the policy rate effect on poverty and inequality becomes most apparent. The canonical finding, repeatedly validated across advanced and emerging economies, is that contractionary surprises raise the Gini coefficient over medium horizons, with effects peaking four to five years after the initial shock (Coibion et al., 2017; Furceri et al., 2018; Rabhi & Parsons, 2025). The mechanism is two-sided: tightening depresses

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labor demand and pushes marginal workers into unemployment, while accommodative rates inflate asset prices and concentrate capital gains at the top of the distribution (Chang & Schorfheide, 2024; Lenza & Slacalek, 2024). Danish administrative data show that softer monetary conditions raise the top-1% income share by roughly 0.3 percentage points through asset price rather than labor-market channels (Andersen et al., 2023), and inflation acts as a regressive tax on households with fixed nominal positions during the 2021–2023 shock (Pallotti et al., 2024). The relative weight of these two opposing channels – labor-demand effects under tightening, asset-price effects under loosening – depends on the structural composition of household and firm balance sheets, which itself varies systematically with development. Cross-country evidence confirms this conditioning: institutional corruption and weak regulation amplify inequality responses in Southeast European transition economies (Aleksić & Jovović, 2025); gender composition of the workforce also provides an important dimension of distributional heterogeneity, as shown for financial and insurance activities in Ukraine (Miniailo et al., 2023); climate-vulnerability exposure shapes the distributional baseline onto which monetary shocks land in developing economies (Chaouech, 2025); manufacturing share strongly raises regional inequality in Kazakhstan (Zhanbozova et al., 2026); and globalization exerts short-run upward pressure on inequality even as it supports long-run growth in South Africa (Choga et al., 2024). This evidence establishes that policy rates move inequality but leaves open the empirical sign and magnitude of the response in a development-graded global panel – the question our SDG-based specification quantifies directly.

Third strand identifies financial inclusion as a channel between the monetary-policy impulse and household-level welfare outcomes. As a mediating layer, financial inclusion conditions how credit, savings, and payment infrastructure reach low-income populations, thereby shaping the SDG response to rate shocks (Bagirzade, 2025). European Union time-series evidence reports a strong negative correlation between card-based digital transactions and the Gini coefficient, together with a weaker but negative association with poverty risk (Laskienė et al., 2026). Uptake of digital-banking and mobile-financial services depends critically on perceived usefulness, ease of use, and self-efficacy among marginalized consumers, pointing to behavioral barriers that policy-rate changes alone cannot overcome (Mourshoudli et al., 2020; Murshudli & Loguinov, 2019, 2020; Kovalenko, 2021, Kovalenko et al., 2023, Hedau, 2025; Sartamorn et al., 2025). Microfinance research from Nepal finds that over-indebtedness among low-income borrowers is mitigated mainly by income stability and financial education rather than by credit access per se (Thapa et al., 2025), while targeted employee-training programmes within banking foster an inclusive service culture that supports broader access (Guennoune et al., 2025); macroeconomic preconditions matter too, with stable natural-resource revenue and macro-prudential balance sustaining long-term domestic savings in oil-rich developing economies (Alsubaie, 2025). Collectively these contributions frame financial inclusion as a mediating layer between monetary policy and SDG outcomes, yet typically treat inclusion indicators as endpoints rather than as transmission conduits – a distinction our specification addresses by allowing rate shocks to load on multidimensional SDG scores in which inclusion outcomes are already embedded.

Fourth strand focuses on how SDG outcomes themselves should be measured and what conditions their attainment. Single-indicator analyses understate how policy reaches wellbeing: capturing SDG 8 in particular requires multidimensional frameworks that balance per-capita growth against full employment and resource efficiency (Raman et al., 2025; Saher et al., 2024), and spatial and cluster analyses of the European Union reveal strong regional dependencies in employment gaps and inclusive-growth potential, suggesting that aggregate growth is insufficient for social equity (Matuszewska-Janica & Fernández-Avilés, 2025; Saher et al., 2025). National context conditions SDG attainment in ways aggregate indicators cannot capture, as country-specific case studies confirm (Bilan et al., 2025; Lima et al., 2024; Nassar et al., 2023). Technology-driven labor shifts further reshape the picture: short-run panel evidence from 36 countries indicates that artificial-intelligence adoption restructures employment composition without raising aggregate unemployment (Kuzior et al., 2025b), and sustainable HR policies trans-

late automation into inclusive organizational cultures (Ly & Mujtaba, 2025). Overall SDG progress, however, remains governed by governance quality and anti-corruption institutional mechanisms (Bezverkhyi et al., 2024) and access to sustainable finance across 167 UN member states (Makarenko et al., 2025) and by whether macroeconomic expansion coincides with environmental preservation (Kubatko et al., 2025), while inclusive-employment readiness for persons with disabilities remains paradoxically low even in high-governance European enterprises (Zahorodnia et al., 2026b). The quality and assessment of integrated reporting likewise form part of the broader information infrastructure through which multidimensional sustainability performance is evaluated (Bondar et al., 2024). This evidence establishes the multidimensional character of SDG outcomes and the salience of institutional context, but stops short of estimating the macro-monetary drivers that condition them.

Fifth strand examines how fiscal capacity and public-service delivery condition the translation of macroeconomic policy into welfare outcomes. Digitalization of government reduces the effective burden of disease, with cross-country comparisons linking higher E-Government Development Index scores to substantial reductions in disability-adjusted life-years (Hrytsenko et al., 2026; Ndhlovu et al., 2026); however, higher raw health expenditure does not automatically improve outcomes when institutional inefficiencies or reactive spending patterns dominate (Megbowon & Zerihun, 2025), and health-insurance architecture matters for noncommunicable-disease mortality in cross-country settings (Kuzior et al., 2025a). Public-sector fiscal space interacts with monetary-policy regimes through exchange-rate and expenditure dynamics, as Sudan's case illustrates a directly positive government-expenditure effect on the exchange rate (Ahmed, 2025), while climate-aligned public-finance tools – feed-in tariffs that channel insurance capital into renewables and household energy-efficiency subsidies – further shape welfare at the margin by relaxing energy-poverty constraints (Lyeonov et al., 2025; Smiech et al., 2025). Taken together, these studies locate public finance as the operational bridge between monetary aggregates and social outcomes, reinforcing the intuition that SDG transmission is multi-layered and contingent on institutional capacity.

A sixth strand places monetary-policy transmission inside wider human-capital and security contexts, before the synthesis below identifies persistent gaps. Preserving human capital through retraining and lifelong-learning systems serves as a critical anti-crisis tool during armed conflict, as Ukraine illustrates (Yeremenko, 2026), and neural-network systems support high-accuracy staff-turnover prediction in modern HR architectures (Zakharchenko et al., 2025). Foreign-trade resilience and demographic preservation anchor national economic security under geopolitical instability (Tsymbal & Demediuk, 2025; Zahorodnia et al., 2026a), and poverty and inequality drive crimes against persons in cross-country panels, reinforcing the welfare significance of SDG 1 outcomes (Aliyeva, 2026). Synthesizing across all six strands reveals persistent gaps: the seminal cross-country evidence on monetary transmission and distributional consequences relies on pre-SDG or short-horizon panels and uses Gini or poverty headcounts rather than composite SDGs (Coibion et al., 2017; Furceri et al., 2018); recent SDG-progress studies emphasize digitalization and governance but omit monetary policy as a potential macro-financial determinant (Bagirzade, 2024; Makarenko et al., 2025; Hrytsenko et al., 2026); and income-group heterogeneity in the response of SDG outcomes to policy-rate changes has not been estimated on a global 2000–2023 panel with explicit HIC / UMC / LMC / LIC interactions, despite persistent disagreement over whether expansionary monetary policy is pro-poor or regressive (Chang & Schorfheide, 2024; Andersen et al., 2023; Rabhi & Parsons, 2025). We address these gaps by jointly estimating the income-group-conditional responses of SDG outcomes to policy-rate changes, with interactions across HIC, UMC, and LMC + LIC economies and distributed lags up to two years after a policy-rate change – partial coverage of the four-to-five-year horizon at which the canonical inequality response peaks – under two-way fixed effects with country-clustered errors.

These gaps motivate four hypotheses. H1: higher short-term policy rates are positively associated with SDG 8 achievement, and this association is uniform across income groups. H2: the association with SDG 1 differs significantly across income groups, so that pooled estimates conceal group-specific patterns. H3: policy rates show no

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systematic association with SDG 10. H4: any association with SDG 8 is specific to the nominal short-term policy rate and does not extend to real or lending-rate proxies.

2. METHOD

2.1. Data sources and sample construction

The empirical analysis draws on four publicly available sources. SDG scores come from the Sustainable Development Report 2025 database of the Sustainable Development Solutions Network (SDSN), which provides the aggregate SDG Index and seventeen goal scores for up to 193 economies over 2000–2024. Monetary-policy indicators are sourced from the IMF Monetary and Financial Statistics (MFS_IR flow) via SDMX, which reports three interest-rate series – central bank policy rate, money-market rate and discount rate – for up to 136 economies. Macroeconomic controls and alternative monetary-policy proxies come from the World Bank WDI. Institutional quality is measured through the Worldwide Governance Indicators (WGI 2.0, December 2025 release). Four sources are merged on ISO-3 country code and year.

Four filters are applied in sequence to obtain a working sample that supports consistent estimation across outcomes:

1) the monetary-policy rate is non-missing;

2) at least one SDG outcome is non-missing;

3) GDP per capita and CPI inflation are both non-missing;

4) the year 2001 is excluded (the WGI indicators were biennial prior to 2002).

The resulting unbalanced panel covers 129 economies for 2000 and 2002–2023 (up to 23 years per country), yielding 2,563 country-year observations. The primary monetary-policy variable (*mp_rate_combined*) is constructed as a cascading substitution across the three interest-rate series of the IMF Monetary and Financial Statistics database: the policy rate is taken first, the money-market rate next, and the discount rate last. All three are short-term nominal rates administered or closely steered by the central bank, and they co-move strongly where they overlap (pairwise correlations of 0.91 between the policy and money-market rates, 0.76 between the policy and discount rates, and 0.80 between the money-market and discount rates), so the cascade preserves a single short-term policy-rate concept while maximizing coverage. The cascade raises coverage of a single short-term rate from roughly 33-70% (policy rate alone) to 98-100% for every year. In the working sample, 57.7% of the combined observations come from the policy rate, 24.6% from the money-market rate, and 17.6% from the discount rate. Two alternative proxies – the World Bank real interest rate and lending rate – are retained for robustness (R2), and robustness block R7 re-estimates the baseline on the sub-sample where the announced policy rate itself is observed (Section 3.4).

2.2. Variables

Table C1 in Appendix C summarizes all variables used in the estimation. Four dependent variables are considered: the aggregate SDG Index and the three goal-level scores that correspond to the goal families under investigation – SDG 1 (No Poverty, poverty and social-protection indicators), SDG 8 (Decent Work and Economic Growth, labor-market and productivity indicators), and SDG 10 (Reduced Inequalities, income-inequality indicators). The primary explanatory variable is *mp_rate_combined*; controls capture economic development (*log_gdp_pc*), trade exposure (*trade_openness*), capital accumulation (*gfcf*) and institutional quality (*wgi_composite*). Two macroeconomic covariates are added sequentially as controls: annual inflation (cpi_inflation) and unemployment (unemployment). Because the unemployment rate is itself one of the sub-indicators of the SDG 8 score, specification M3 conditions on a component of that outcome; unemployment is therefore treated strictly as a compositional control rather than as a mediating channel, and the SDG 8 coefficient on the policy rate is nearly identical in specifications M1-M2, which exclude it (β = +0.048 and +0.047; Table 2). Youth unemployment is not retained in main specifications because its correlation with the headline unemployment rate reaches 0.94 in the working sample, creating prohibitive multicollinearity.

Government debt (gov_debt) is reported descriptively only, as incorporating it as a regressor would restrict the sample to 757 country-year observations and introduce a high-income skew in the resulting panel.

To prevent hyperinflation episodes from dominating the fixed-effects estimates, the monetary policy rate and annual inflation are winsorized at the 1st and 99th percentiles of the working sample distributions. Winsorization is applied to each variable x as

$$xw = \max\left(x_{p01}, \min\left(x, x_{p99}\right)\right), \quad (1)$$

where x_{p01} and x_{p99} are the 1st and 99th percentiles of x in the working sample, and the superscript w on a variable name denotes its winsorized version. This preserves the full country coverage of the panel while limiting the leverage of a small number of extreme country-year observations on the fixed-effects estimates.

2.3. Empirical specification

The baseline is a two-way fixed-effects linear panel model. Four nested specifications (M1-M4) are estimated separately for each of the four dependent variables, for a total of sixteen regressions. Let $SDG_{i,t}$ denote the dependent variable (the SDG Index or one of the three goal scores) for country i in year t; let α_i and λ_t denote country and year fixed effects, respectively; let $mp^w_{i,t}$ denote the winsorised monetary-policy rate; and let $\varepsilon_{i,t}$ denote the idiosyncratic error term. Slope coefficients on the monetary-policy rate and on individual channel variables are denoted by scalars $\beta_1, \beta_2, \beta_3, \beta_4$, while γ (and later δ) denote conformable vectors of slope coefficients on the control vector. Specification M1 is

$$SDG_{i,t} = \alpha_i + \lambda_t + \beta_1 mpw_{i,t} + X'_{i,t}\gamma + \varepsilon_{i,t}, \quad (2)$$

where $X_{i,t}$ = ($log\_gdp\_pc_{i,t}$, $trade\_openness_{i,t}$, $gfcf_{i,t}$, $wgi\_composite_{i,t}$)'. M2 augments M1 with the inflation channel, M3 adds unemployment, and M4 additionally allows a non-linear inflation effect through a squared term:

$$SDG_{i,t} = \alpha_i + \lambda_t + \beta_1 mpw_{i,t} + \beta_2 inflw_{i,t} + X'_{i,t}\gamma + \varepsilon_{i,t}, \quad (3)$$

$$SDG_{i,t} = \alpha_i + \lambda_t + \beta_1 mpw_{i,t} + \beta_2 inflw_{i,t} + \beta_3 unemp_{i,t} + X'_{i,t}\gamma + \varepsilon_{i,t}, \quad (4)$$

$$DG_{i,t} = \alpha_i + \lambda_t + \beta_1 mpw_{i,t} + \beta_2 inflw_{i,t} + \beta_3 unemp_{i,t} + + \beta_4 \left(inflw_{i,t}\right)^2 + X'_{i,t}\gamma + \varepsilon_{i,t} \quad (5)$$

Equations (2)-(5) are estimated by OLS with country and year absorbed as fixed effects (*pyfixest* implementation). Standard errors are clustered at the country level (CRV1), allowing for arbitrary within-country serial correlation and heteroskedasticity while preserving cross-country independence – appropriate inference in a panel with 129 clusters.

The heterogeneity analysis (R6) estimates an interaction specification on the full panel. Define UMC_i and (LIC_i + LMC_i) as time-invariant dummies equal to 1 if country i belongs to the corresponding World Bank income group (FY 2024 classification); HIC is the omitted reference. Income-group membership follows the World Bank FY2024 classification and is held fixed over the estimation window: fixing classification at the end of the period avoids conditioning group membership on within-sample growth outcomes, but it means the interaction estimates describe heterogeneity across countries as classified today rather than their classification in earlier years (this caveat is restated in Section 3.5). One economy (Venezuela, RB) is not classified in FY2024; because both group dummies equal zero for it, its eight observations fall into the omitted reference category together with the HIC group, and Section 3.3 verifies that excluding Venezuela leaves the interaction estimates essentially unchanged. The interaction model augments M3 with two interactions between $mp^w_{i,t}$ and the income-group dummies:

$$SDG_{i,t} = \alpha_i + \lambda_t + \beta_1 mpw_{i,t} + \beta_2 \left(mpw \cdot UMC\right)_{i,t} + \beta_3 \left(mpw \cdot \left[LIC + + LMC\right]\right) i,t + Z'i,t\delta + \varepsilon_{i,t}, \quad (6)$$

where $Z_{i,t}$ stacks all M3 covariates and δ is the corresponding vector of slope coefficients. The main-effect income-group dummies are absorbed by country fixed effects because membership is time-

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invariant; β_1 therefore reports the within-HIC effect, while β_2 and β_3 are the differential effects. Net within-group effects are $\beta_1 + \beta_2$ for UMC and $\beta_1 + \beta_3$ for *LIC + LMC*.

The cumulative-lag specification (R4) replaces the contemporaneous monetary-policy term with a distributed lag of order $K \in \{0, 1, 2\}$

$$SDG_{i,t} = \alpha_i + \lambda_t + \sum_{k=0}^{K} \beta_k mpw_{i,t-k} + Z'_{i,t}\,\delta + \varepsilon_{i,t}. \quad (7)$$

The cumulative effect is the sum $\Sigma_{k=0}{}^{K}\,\beta_k$. The dynamic LSDV specification (R5) augments M3 with a one-period lag of the dependent variable; ρ denotes the autoregressive coefficient on the lagged dependent variable:

$$SDG_{i,t} = \alpha_i + \lambda_t + \rho SDG_{i,t-1} + \beta mpw_{i,t} + Z'_{i,t}\,\delta + \varepsilon_{i,t}. \quad (8)$$

Given $T \approx 22$-23, the expected Nickell bias is of order $1/T \approx 4$-5%, small relative to the coefficients of interest. System-GMM is not used because weak-instrument problems are documented in macro panels with our $N \times T$, and because LSDV serves here as a robustness cross-check rather than a primary estimator.

2.4. Robustness strategy and diagnostics

Eight robustness blocks (R1-R8) evaluate the stability of the baseline estimates. R1 re-estimates M3 on three mutually exclusive sub-samples defined by World Bank income classification (HIC; UMC; LIC + LMC, pooled to preserve degrees of freedom). R2 replaces $mp^{w}{}_{i,t}$ with the winsorised real interest rate ($real\_rate^{w}$) and the winsorised lending rate ($lending\_rate^{w}$) to test whether the baseline association is specific to the short-term policy rate or extends to real and lending rates. R3 substitutes the SDG scores with four direct World Bank outcomes – poverty headcount at USD 2.15/day, Gini coefficient, employment-to-population ratio, and real GDP per capita growth – to check that the SDG-score findings are not an artefact of the SDSN aggregation. R4 estimates the distributed-lag specification in (7). R5 estimates the LSDV specification in (8). R6 estimates the interaction specification in (6). R7 re-estimates M3 on the sub-sample of country-years for which the announced policy rate itself is available, removing the money-market and discount-rate substitutions. R8 tests for cross-sectional dependence in the M3 residuals using the Pesaran CD statistic and recomputes the inference for the key specifications with Driscoll-Kraay standard errors (Bartlett kernel, two lags), which are robust to cross-sectional dependence. A consolidated summary of R1-R6 is reported in Table 5; R7 and R8 are reported in the text of Section 3.4.

Variance inflation factors are computed for the M4 specification using the auxiliary-regression definition $VIF_j = 1 / (1 - R^2_j)$, where R^2_j is the coefficient of determination from regressing covariate j on all other covariates. The conventional threshold of 10 flags multicollinearity concerns. A Hausman-style test between fixed and random effects is not reported because the motivation of the study is explicitly to absorb time-invariant country heterogeneity (development level, historical institutions, geographic fundamentals); the fixed-effects estimator is preferred on theoretical grounds regardless of the Hausman outcome. Cluster-robust inference addresses the Breusch-Pagan and Breusch-Godfrey concerns common in macro panels.

2.5. Limitations

First, the design is not causal. Two-way fixed effects absorb time-invariant country heterogeneity and global shocks, but cannot rule out time-varying confounding or reverse causation – for instance, a tightening in response to a deteriorating labor-market outlook would mechanically generate a negative mp^{w} – SDG 8 correlation. Coefficients should be read as conditional partial associations rather than structural causal effects.

Second, the monetary-policy cascade (policy rate → money-market rate → discount rate) is not a pure measure of the central-bank stance: money-market and discount rates are endogenous to interbank conditions and differ from announced policy rates by variable spreads. The cascade is required for near-complete coverage; block R2 (real

and lending rates) provides a partial check, and R7 (Section 3.4) re-estimates the baseline on announced policy rates only.

Third, SDG goal scores are composite indices with imputation conventions that change between SDSN vintages. The 2025 vintage is used throughout, so coefficients should be interpreted on the SDR 2025 scale (0-100); R3 mitigates this by re-estimating on direct WDI outcomes.

Fourth, the sample under-represents low-income economies where short-term rate reporting is thin (Sub-Saharan Africa in particular) and SDSN coverage is intermittent. The pooled LIC+LMC group (50 countries) accordingly cannot separately identify LIC-specific from LMC-specific transmission; replication with an expanded panel is left for future work.

Fifth, income-group membership follows the FY2024 World Bank classification and is held fixed over 2000–2023; countries that changed groups during the period are classified by their current status, so the interaction estimates describe heterogeneity across today's income groups rather than group membership at the time of observation.

Sixth, the residuals of the level-like outcomes display cross-sectional dependence (Pesaran CD statistics of 5.62 for SDG 1, 2.51 for SDG 10 and –2.05 for the SDG Index); Driscoll-Kraay inference (R8) confirms the key conclusions, but common global shocks are captured only coarsely by year fixed effects.

3. RESULTS

3.1. Sample composition and descriptive statistics

The working panel covers 129 economies over 2000–2023 (excluding 2001, for which WGI indicators are not reported) and comprises 2,563 country-year observations across 61 variables. The income-group composition reflects broad coverage of world economies: 37 high-income (HIC), 41 upper-middle-income (UMC), 33 lower-middle-income (LMC), 17 low-income (LIC), and 1 not-classified economy, following World Bank (FY 2024) thresholds (the full country list with regional classification is reported in Table A1, Appendix A). The unbalanced structure is driven by differential reporting of SDG components (*sdg1_score*: N = 2,233; *sdg10_score*: N = 2,283), whereas the aggregate SDG Index and SDG 8 score are available for the full 2,563 observations.

Table 1 reports pooled descriptive statistics for the principal variables. The monetary-policy rate constructed as a cascading substitution of IMF MFS policy, money-market and discount rates (*mp_rate_combined*) has a mean of 7.07% (SD = 9.11) and spans a wide range from –0.60% to 183.2%. Annual CPI inflation averages 6.09% (SD = 12.01), with an extreme upper tail (max = 325%). To limit the influence of hyperinflation and extreme-rate episodes in a few country-years, both the monetary-policy rate and CPI inflation are winsorized at the 1st and 99th percentiles prior to estimation. The aggregate SDG Index averages 64.70 points (SD = 10.30), while the individual goals differ substantially in dispersion: SDG 8 is comparatively concentrated (SD = 8.80), whereas SDG 1 and SDG 10 scores have SDs close to 30 points, reflecting large cross-country gaps in absolute poverty and income-inequality achievement.

Heterogeneity across income groups is substantial. High-income economies display the lowest mean policy rate (3.95%), the lowest inflation (3.35%) and the highest mean SDG Index (73.65 points), with near-saturated SDG 1 (mean = 97.98) and SDG 10 scores (mean = 75.53). At the opposite end, low-income economies combine a high mean policy rate (8.93%), elevated inflation (6.13%) and an SDG Index of 48.62 points with an average SDG 1 score of only 16.14. Upper-middle-income economies occupy an intermediate position but exhibit the highest average unemployment (9.98%). These unconditional differences motivate the interaction-based heterogeneity tests reported in Section 3.3.

Pairwise Pearson correlations (reported in full in Table B1, Appendix B) confirm expected associations. The monetary-policy rate correlates positively with CPI inflation ($\rho = 0.63$), consistent with policy rates responding to inflationary pressures. Monetary-policy rates correlate negatively with all four SDG outcomes (ρ between –0.12 and –0.18 at the country-year level), but these raw associations

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Table 1. Descriptive statistics, working sample (2000–2023; N = 2,563 country-years, 129 countries)

Variable	Source	N	Mean	SD	Min	Max
sdg_index_overall	SDSN	2,563	64.70	10.30	37.05	86.34
sdg1_score	SDSN	2,233	70.32	31.80	0.00	99.98
sdg8_score	SDSN	2,563	68.82	8.80	40.10	86.58
sdg10_score	SDSN	2,283	57.33	28.49	0.00	100.00
mp_rate_combined	IMF MFS	2,563	7.07	9.11	−0.60	183.20
real_rate	WB WDI	2,039	6.10	9.86	−70.36	93.92
lending_rate	WB WDI	2,039	13.09	10.06	0.99	118.38
cpi_inflation	WB WDI	2,563	6.09	12.01	−16.86	325.00
unemployment	WB WDI	2,469	7.93	5.70	0.10	37.16
log_gdp_pc	WB WDI	2,563	8.51	1.34	5.52	11.31
trade_openness	WB WDI	2,164	76.97	34.49	19.56	239.71
gfcf	WB WDI	2,090	23.06	6.58	4.56	78.00
wgi_composite	WB WGI	2,563	−0.04	0.83	−1.79	2.03
gov_debt (not used in main)	IMF/WB	757	53.41	28.29	2.99	155.16

Note: SDG scores range 0-100 (SDSN, Sustainable Development Report 2025). Monetary-policy and inflation statistics are reported prior to winsorisation. log_gdp_pc = natural logarithm of GDP per capita, current USD (WB WDI). wgi_composite = simple mean of six Worldwide Governance Indicators (VA, PV, GE, RQ, RL, CC). gov_debt is reported for transparency but is excluded from main specifications because its inclusion would reduce the working sample to 757 observations (≈ 30% of the panel).

conflate cross-country differences in development and governance. The log of GDP per capita is the single strongest correlate of both the SDG Index ($\rho = 0.77$) and SDG 1 ($\rho = 0.81$); the composite governance indicator correlates at 0.69 with the SDG Index. Unemployment is strongly negatively correlated with SDG 8 ($\rho = -0.42$), as expected for a goal whose sub-indicators include employment indicators. Because unemployment and youth unemployment correlate at 0.94, only unemployment is retained in main specifications.

3.2. Baseline estimates: monetary policy and SDG achievement

Table 2 summarizes the coefficient on the monetary-policy rate across four nested two-way fixed-effects specifications (country and year FE, CRV1 cluster-robust standard errors by *iso3*) for each of the four dependent variables. Specification M1 includes four time-varying controls (log GDP per capita, trade openness, gross fixed capital formation and the composite governance indicator); M2 adds winsorized inflation; M3 adds unemployment; M4 adds squared inflation to allow a non-linear inflation channel.

First, for the aggregate SDG Index and for SDG 10, the estimated coefficient is indistinguishable from zero in all four specifications ($|\beta| < 0.01$ in M1–M4 for the SDG Index; $|\beta|$ between −0.056 and +0.000 for SDG 10). The pooled null effect is therefore not an artefact of specification choice and is robust to the sequential addition of inflation, unemployment, and a quadratic inflation term. Second, for SDG 1 the estimated coefficient is small, positive and statistically insignificant in every specification (β between +0.023 and +0.047, all $p > 0.55$). Third, the monetary-policy rate is a stable positive predictor of SDG 8 (Decent Work and Economic Growth): $\beta = +0.048$ ($p = 0.019$, M1), $\beta = +0.047$ ($p = 0.063$, M2), $\beta = +0.045$ ($p = 0.030$, M3), and $\beta = +0.046$ ($p = 0.026$, M4). The coefficient is essentially unchanged once inflation, unemployment, and their non-linear form are controlled for, consistent with monetary policy acting on SDG 8 through a mechanism that is not fully mediated by contemporaneous inflation or unemployment dynamics.

Within R^2 rises from 0.05 in M1 to 0.30 in M3 for SDG 8, a jump driven almost entirely by unemployment, whose coefficient on SDG 8 is large, negative and precisely estimated ($\beta = -0.465$, SE = 0.046). Overall R^2 remains in the 0.93-0.99 range, reflecting the dominance of unit fixed effects in explaining level differences in SDG achievement. Coefficients on the log of GDP per capita are positive and statistically significant in every specification and for every outcome (e.g., $\beta = +2.46$, SE = 0.77 on the SDG Index in M3; $\beta = +24.38$, SE = 3.52 on SDG 1), consistent with the established income-development nexus. Gross fixed capital for-

Table 2. Coefficient on the monetary-policy rate across specifications M1-M4 (two-way FE; CRV1 SE clustered by iso3)

Outcome	Spec	β (SE)	p-value	N
sdg_index_overall	M1	−0.009 (0.016)	0.555	2,066
sdg_index_overall	M2	−0.002 (0.016)	0.921	2,066
sdg_index_overall	M3	−0.001 (0.016)	0.932	2,064
sdg_index_overall	M4	−0.000 (0.016)	0.992	2,064
sdg1_score	M1	+0.023 (0.079)	0.767	1,943
sdg1_score	M2	+0.042 (0.084)	0.615	1,943
sdg1_score	M3	+0.043 (0.080)	0.594	1,943
sdg1_score	M4	+0.047 (0.079)	0.553	1,943
sdg8_score	M1	+0.048 (0.020)**	0.019	2,066
sdg8_score	M2	+0.047 (0.025)*	0.063	2,066
sdg8_score	M3	+0.045 (0.021)**	0.030	2,064
sdg8_score	M4	+0.046 (0.020) **	0.026	2,064
sdg10_score	M1	−0.056 (0.092)	0.547	1,966
sdg10_score	M2	−0.002 (0.101)	0.989	1,966
sdg10_score	M3	+0.000 (0.101)	0.997	1,964
sdg10_score	M4	−0.008 (0.101)	0.937	1,964

Note: All specifications include country (iso3) and year fixed effects. mp_rate_combined and cpi_inflation are winsorised at 1/99 percentiles. Standard errors in parentheses. Significance: *** p < 0.01, ** p < 0.05, * p < 0.10. Full coefficient estimates for all controls are reported in Tables D1-D4, Appendix D.

mation enters positively for the SDG Index, SDG 1 and SDG 10; the composite governance indicator is positive but loses individual significance once country FE absorb level differences in governance quality.

Natural reading of the baseline results is that pooling across 129 heterogeneous economies obscures the very differences that motivate the research question: the HIC-EME gap in monetary transmission. Section 3.3 tests this conjecture directly.

3.3. Heterogeneity across levels of economic development

Table 3 re-estimates the preferred specification (M3) separately for three sub-samples defined by World Bank income classification: HIC (37 countries, 551-635 observations), UMC (41 countries, 627-666 observations) and LIC + LMC (50 countries, 755 observations, pooled to preserve degrees of freedom). The aggregate SDG Index is sensitive to sub-setting: the coefficient on the monetary-policy rate turns statistically significant and negative in the UMC sub-sample (β = −0.048, SE = 0.021, p = 0.027). The HIC and LIC + LMC sub-samples yield positive but insignificant coefficients (+0.016, p = 0.633; +0.022, p = 0.406). For SDG 8 the sign is uniformly positive and of comparable magnitude across all three groups (β = +0.044, +0.046, +0.047), although individual-group significance falls because the partial sample sizes halve relative to the pooled regression. For SDG 10 and poverty headcount measures, sub-sample estimates are noisy and individually insignificant.

The sub-sample patterns are made fully transparent by Table 4, which estimates M3 on the full panel augmented with interaction terms *mp* × *UMC* and *mp* × *(LIC+LMC)*, with HIC as the omitted reference category. For SDG 1, the interaction model uncovers a pattern that is entirely invisible in the pooled baseline. The HIC coefficient is large, positive and highly significant (β = +0.412, SE = 0.148, p = 0.006). The interaction with UMC is large, negative and of the same order of magnitude (β = −0.590, SE = 0.186, p = 0.002), so that the net partial effect of a 1-percentage-point rise in the monetary-policy rate on the SDG 1 score within UMC economies is −0.178. A formal test of this linear combination shows that the net UMC association is not statistically distinguishable from zero (SE = 0.138; 95% CI [−0.45; +0.10]; p = 0.20): what the data establish at conventional levels is that the UMC association is significantly weaker than the HIC association, not that it is negative. The interaction with *LIC + LMC* is likewise negative and significant at the 5% level (β = −0.352, SE = 0.177, p = 0.050); the net association in *LIC+LMC* is +0.060 (SE = 0.111; p = 0.59). The qualitative conclusion is

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Table 3. Subsample estimates by income group (specification M3; two-way FE; CRV1 SE)

Outcome	Subsample	β (SE)	p-value	N / countries
sdg_index_overall	HIC	+0.016 (0.033)	0.633	635 / 37
sdg_index_overall	UMC	−0.048 (0.021)**	0.027	666 / 41
sdg_index_overall	LIC+LMC	+0.022 (0.026)	0.406	755 / 50
sdg1_score	HIC	+0.059 (0.120)	0.627	551 / 37
sdg1_score	UMC	−0.151 (0.111)	0.181	629 / 41
sdg1_score	LIC+LMC	+0.073 (0.138)	0.601	755 / 50
sdg8_score	HIC	+0.044 (0.045)	0.332	635 / 37
sdg8_score	UMC	+0.046 (0.030)	0.135	666 / 41
sdg8_score	LIC+LMC	+0.047 (0.036)	0.198	755 / 50
sdg10_score	HIC	−0.252 (0.247)	0.317	574 / 37
sdg10_score	UMC	−0.007 (0.108)	0.951	627 / 41
sdg10_score	LIC+LMC	+0.112 (0.172)	0.518	755 / 50

Note: LIC and LMC are pooled to preserve sample size and degrees of freedom. Standard errors clustered by iso3 in parentheses. Significance: *** p < 0.01, ** p < 0.05, * p < 0.10.

that higher policy rates are associated with higher SDG 1 achievement in advanced economies – a pattern consistent with, though not direct evidence of, price-stability gains outweighing distributional costs in low-inflation, well-targeted welfare states – while in upper-middle-income economies the association is significantly weaker, with a negative but imprecisely estimated net value, and essentially no association appears in the poorest group. The identical sign pattern, attenuated in magnitude, appears for the aggregate SDG Index (HIC +0.044, UMC interaction −0.073, p = 0.056; *LIC+LMC* interaction −0.043, p = 0.292). For SDG 8 the interactions are statistically zero (all p > 0.58), confirming that the SDG 8 association documented in Table 2 is uniform across income levels rather than driven by any single sub-sample. The interaction estimate for HICs (β = +0.412) is larger than the coefficient from the HIC-only regression in Table 3 (β = +0.059, SE = 0.120). The two are statistically compatible – their 95% confidence intervals ([−0.19; +0.31] and [+0.12; +0.71]) overlap – and the difference reflects specification: the sub-sample regressions allow all control slopes and year effects to differ by group and rely on far fewer observations (551 observations and 27 clusters for SDG 1 in HICs), whereas the interaction model pools controls and time effects across groups and is therefore estimated much more precisely. The heterogeneity conclusion accordingly rests on the significant interaction terms rather than on any single sub-sample estimate. Because Venezuela (the single unclassified economy) enters the omitted reference category, Table 4 was also re-estimated excluding it: the coefficients are essentially unchanged (SDG 1: +0.416, −0.594 and −0.356).

Table 4. Interaction model: MP × income group (specification M3 + interactions; HIC = reference)

Outcome	Term	β (SE)	p-value	Net β for group
sdg_index_overall	mp (HIC ref.)	+0.044 (0.034)	0.197	+0.044
sdg_index_overall	mp × UMC	−0.073 (0.038)*	0.056	−0.029
sdg_index_overall	mp × (LIC + LMC)	−0.043 (0.040)	0.292	+0.001
sdg1_score	mp (HIC ref.)	+0.412 (0.148)***	0.006	+0.412
sdg1_score	mp × UMC	−0.590 (0.186)***	0.002	−0.178
sdg1_score	mp × (LIC + LMC)	−0.352 (0.177)**	0.050	+0.060
sdg8_score	mp (HIC ref.)	+0.054 (0.045)	0.234	+0.054
sdg8_score	mp × UMC	+0.006 (0.053)	0.916	+0.060
sdg8_score	mp × (LIC + LMC)	−0.028 (0.051)	0.581	+0.026
sdg10_score	mp (HIC ref.)	+0.019 (0.177)	0.914	+0.019
sdg10_score	mp × UMC	−0.048 (0.198)	0.810	−0.029
sdg10_score	mp × (LIC + LMC)	−0.000 (0.211)	1.000	+0.019

Note: Net β for group reported in the rightmost column equals the sum of the HIC reference coefficient and the corresponding interaction. Two-way FE (iso3 + year); CRV1 SE clustered by iso3 in parentheses. Significance: *** p < 0.01, ** p < 0.05, * p < 0.10.

Taken together, Tables 3 and 4 support the paper's central claim. Pooled cross-country specifications mask a heterogeneity that is both statistically and substantively important: for SDG 1 the sign of the monetary-policy effect reverses across development levels, while for SDG 8 the effect is stable across groups and plausibly captures a shared mechanism.

3.4. Robustness checks

Table 5 summarizes robustness blocks R1-R6 (56 regressions in total); R7 and R8 are reported in the text below. Six points deserve emphasis.

First, the SDG 8 association is not a by-product of the particular MP proxy. Replacing the monetary-policy rate with the World Bank real interest rate or the lending rate (R2) yields coefficients that are statistically indistinguishable from zero for all outcomes. The contrast is informative: the association is specific to the short-term policy rate and does not extend to real or lending rates – a pattern consistent with the policy rate operating as a signaling and institutional anchor, although the design does not identify the underlying mechanism.

Second, re-estimating the regressions with direct World Bank outcomes (R3) broadly corroborates the SDG-score results. The coefficient on the monetary policy rate in the Gini regression is −0.070 (SE = 0.039, p = 0.075), i.e., higher policy rates are weakly associated with lower inequality. The sign is the opposite of the textbook distributional prediction but is consistent with the income-group interaction evidence: HIC economies form the largest group in the Gini sample (N = 1,063, ≈ 44% HIC) and SDG 1 effects are positive in HIC, so the Gini correlate is internally consistent with Table 4. The poverty-215 and employment/population-ratio regressions are statistically null, again consistent with the weak SDG 1 and aggregate-SDG patterns in Table 2.

Third, introducing lags of the monetary-policy rate (R4) strengthens rather than attenuates the SDG 8 association. The contemporaneous coefficient is +0.045 (p = 0.030); adding one lag raises the cumulative association to +0.059 (SE = 0.026; p = 0.027), and adding a second lag brings it to +0.084 (SE = 0.033; 95% CI [+0.02; +0.15]; p = 0.011), with the standard errors of the cumulative sums computed from the full cluster-robust covariance matrix of the lag coefficients. In other words, SDG 8 responds cumulatively over a multi-year horizon to sustained monetary-policy changes, as one would expect for a goal that captures slow-moving labor-market and productivity outcomes.

Table 5. Summary of robustness checks (selected specifications)

Check	Specification	β (SE) on MP	p-value	N
R2	Real rate → *sdg8_score*	−0.002 (0.010)	0.839	1,553
R2	Lending rate → *sdg8_score*	−0.013 (0.017)	0.456	1,553
R2	Real rate → *sdg1_score*	−0.040 (0.053)	0.453	1,454
R2	Lending rate → *sdg1_score*	−0.129 (0.094)	0.174	1,454
R3	MP → *poverty_215*	+0.004 (0.063)	0.950	1,063
R3	MP → Gini	−0.070 (0.039)*	0.075	1,063
R3	MP → employment/population ratio	+0.013 (0.036)	0.714	2,064
R3	MP → GDP per capita growth	−0.044 (0.034)	0.201	2,064
R4	*sdg8*: contemporaneous only	+0.045 (0.021)** (cum. +0.045)	0.030	2,064
R4	*sdg8*: + L1	+0.033 (0.018)* (cum. +0.059)	0.070	1,962
R4	*sdg8*: + L1 + L2	+0.042 (0.021)** (cum. +0.084)	0.042	1,859
R5	*sdg_index_overall*, LSDV (ρ = 0.86)	+0.001 (0.005)	0.919	1,962
R5	*sdg1_score*, LSDV (ρ = 0.84)	+0.041 (0.028)	0.145	1,846
R5	*sdg8_score*, LSDV (ρ = 0.74)	+0.019 (0.010)*	0.068	1,962
R5	*sdg10_score*, LSDV (ρ = 0.83)	+0.018 (0.039)	0.642	1,866

Note: All models are two-way fixed effects with CRV1 SEs clustered by iso3. R2 re-estimates the baseline using the World Bank real interest rate (real_rate_w) and lending rate (lending_rate_w) as alternative MP proxies. R3 replaces SDG scores with direct outcomes (poverty headcount at USD 2.15/day, Gini, employment/population ratio, GDP per capita growth). R4 reports contemporaneous, L1- and (L1 + L2)-augmented specifications with the cumulative effect in parentheses. R5 is an LSDV regression with a lagged dependent variable; ρ denotes the AR(1) coefficient on the lagged DV. Significance: *** p < 0.01, ** p < 0.05, * p < 0.10.

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Fourth, addressing dynamic panel concerns with an LSDV specification that includes a lagged dependent variable (R5) confirms the main conclusions. SDG scores are highly persistent – estimated ρ coefficients on the lagged DV are 0.74 (SDG 8), 0.83 (SDG 10), 0.84 (SDG 1) and 0.86 (SDG Index). Despite this persistence and the well-known Nickell bias, which is on the order of 4-5% for our T (T ≈ 22-23), the sign and approximate magnitude of the SDG 8 effect survive (β = +0.019, p = 0.068); coefficients on other outcomes remain null, as in the static FE baseline. The fact that the static and dynamic specifications yield consistent signs suggests that the SDG 8 effect is not spurious and is not driven by omitted persistence in the outcome variable.

Fifth, the SDG 8 association is not an artefact of the cascaded construction of the policy-rate variable (R7). Restricting the sample to country-years in which the announced policy rate itself is observed (N = 1,306; 72 clusters) yields a coefficient of +0.038 (SE = 0.025) – within half a standard error of the baseline +0.045 – although the estimate loses conventional significance (p = 0.14) as the number of clusters falls from 110 to 72. The stability of the point estimate indicates that the money-market and discount-rate substitutions do not drive the baseline association.

Sixth, cross-sectional dependence is present for the level-like outcomes (R8): the Pesaran CD statistic on the M3 residuals is 5.62 for SDG 1 (p < 0.001), 2.51 for SDG 10 (p = 0.012) and –2.05 for the SDG Index (p = 0.040), while no dependence is detected for SDG 8 (CD = 0.21, p = 0.83). Re-computing the inference with Driscoll-Kraay standard errors (Bartlett kernel, two lags) leaves the conclusions unchanged: the SDG 8 baseline coefficient remains significant (SE = 0.020 versus 0.021 under CRV1), and the SDG 1 interaction estimates in Table 4 become, if anything, more precise (mp: SE = 0.107; *mp* × *UMC*: SE = 0.125).

3.5. Diagnostics

Variance-inflation factors for the M4 specification (N = 2,065) are reported in Table 6. The maximum VIF is 7.30 for CPI inflation; its quadratic term has a VIF of 5.59. These values are mechanically elevated because CPI inflation and its square are nonlinear transformations of the same variable; critically, both remain well below the conventional threshold of 10, so multicollinearity is not a binding concern. All other covariates have VIF ≤ 3.2. The winsorized monetary-policy rate has a VIF of 2.02, confirming that the MP-inflation correlation documented in Section 3.1 (ρ = 0.63) does not destabilize inference once country and year FE are included.

Table 6. Variance inflation factors for specification M4 (N = 2,065)

Variable	VIF
cpi_inflation (winsorized)	7.30
cpi_inflation² (winsorized)	5.59
log_gdp_pc	3.20
wgi_composite	3.12
mp_rate_combined (winsorized)	2.02
trade_openness	1.09
gfcf	1.05
unemployment	1.03

Note: mp_rate_combined and cpi_inflation are winsorized at 1/99 percentiles prior to VIF computation. VIF is computed on the 2,065 country-years where all M4 covariates are non-missing; one observation lacks the SDG Index dependent variable. All VIF values are below the conventional cut-off of 10.

Taken as a whole, the baseline FE estimates, subsample and interaction evidence, and the eight robustness blocks jointly support the paper's central thesis. Monetary policy has a stable, modest and consistently positive association with SDG 8 across income groups that accumulates through lags and survives a dynamic LSDV re-specification. For SDG 1 – and, to a lesser extent, the aggregate SDG Index – the pooled cross-country association is null, but the interaction estimates reveal statistically significant heterogeneity between HIC and UMC economies. For SDG 10, direct and score-based measures both deliver null or weak associations, indicating that the income-inequality dimension of the SDGs is not strongly connected to conventional monetary-policy rates within the two-way FE framework. These findings jointly set up the policy-oriented discussion developed in Section 4.

3.6. Hypotheses testing results

The four hypotheses are assessed as follows. *H1* is supported: the SDG 8 association is positive in all four baseline specifications (all p < 0.10), accumulates over two annual lags, and shows no significant difference across income groups (Tables 2-5). *H2* is supported: the UMC interaction is significantly negative (p = 0.002), whereas the net UMC association is not (–0.178; p = 0.20); the evidence

therefore establishes an association significantly weaker outside high-income economies rather than a negative one (Table 4). *H3* is not rejected: SDG 10 estimates are null in both the baseline and the interaction specifications, and the 95% confidence interval in M3 is [–0.20; +0.20], so the null is informative rather than imprecise; the marginally significant Gini estimate is the one qualification (Tables 2, 4 and 5). *H4* is supported: the real- and lending-rate proxies are insignificant, and for SDG 8 their confidence intervals lie below the baseline estimate of +0.045, so the null reflects exclusion rather than low power (Table 5).

4. DISCUSSION

We read the cumulative-lag profile as gradual transmission of the kind documented in cross-country work (Deb et al., 2023); our two-year window captures the early portion of the four-to-five-year canonical horizon at which advanced-economy distributional effects peak (Furceri et al., 2018). The persistence echoes European inequality dynamics (Aleksić & Jovović, 2025), and our SDG 8 result is consistent with broader evidence on the institutional determinants of SDG progress (Makarenko et al., 2025). One possible interpretation – which the present design does not test directly – is institutional: policy-rate anchoring may help create fiscal and institutional space for decent-work outcomes.

The most striking result is the significant income-group heterogeneity in the SDG 1 association. In HICs, the positive SDG 1 association is large and highly significant; a plausible – though untested – interpretation is that fiscal and welfare-state buffers in advanced clusters maintain low at-risk-of-poverty rates (Saher et al., 2025). The picture differs sharply in upper-middle-income countries, where the highly significant negative interaction implies an association significantly weaker than in HICs; the net UMC association is negative in point estimate but not statistically distinguishable from zero (–0.178; 95% CI [–0.45; +0.10]). We read this through an institutional-capacity lens: Kazakhstan evidence on manufacturing structure (Zhanbozova et al., 2026) and broader transition-economy work on institutional weakness and inequality dynamics (Aleksić & Jovović, 2025) jointly support this reading. The net association is modestly positive in point estimate and statistically insignificant in LIC and lower-middle-income economies (+0.060, p = 0.59; interaction significant at 5%), in keeping with broader evidence on pro-poor outcomes from macroeconomic policy in low-income settings (Choga et al., 2024). High-inflation episodes complicate the HIC narrative by reallocating welfare away from low-income households (Pallotti et al., 2024). What survives is the role of institutional setting in mediating distributional outcomes.

The remaining results are instructive because they are small or null. We read the marginally negative Gini association as the net of two long-identified micro-level forces: monetary shocks transmit to employment outcomes (Chang & Schorfheide, 2024) but also raise top-1% income shares by roughly 0.3 percentage points through asset-price channels (Andersen et al., 2023), so the two channels partly offset. The uniform null on real-rate and lending-rate proxies fits emerging-market evidence on a weak credit channel (Mohanti & Banerjee, 2024), and contrasts with firm-level evidence from 22 emerging economies (Checo et al., 2024); we attribute the discrepancy to transmission depending on central-bank transparency and the exchange-rate regime rather than real-rate spreads (Deb et al., 2023). The negative correlation between digital financial use and inequality (Laskienė et al., 2026) is consistent with a financial-inclusion mediation hypothesis: the rate channel may reach welfare outcomes more effectively where inclusion infrastructure is functional. We read these nulls as evidence of incomplete transmission infrastructure, not absent transmission: the policy rate carries the institutional signal, but its downstream reach requires financial-inclusion and governance conduits.

CONCLUSION

This paper examines the association between short-term policy rates and outcomes for SDG 1, SDG 8, and SDG 10 across 129 economies over 2000–2023, using SDSN SDR2025 scores, IMF policy rates, and WGI 2.0 governance indicators in two-way fixed-effects panel regressions with country-clustered standard errors and eight robustness blocks.

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First, higher policy rates are modestly and consistently associated with stronger SDG 8 outcomes ($\beta \approx +0.045$ in baseline, cumulative +0.084 over two years, SE = 0.033, $p = 0.011$), with the sign preserved under a dynamic LSDV specification. Second, the SDG 1 association is significantly heterogeneous across income groups: strongly positive in HICs ($\beta = +0.412$, $p = 0.006$) and significantly weaker in UMCs (interaction $\beta = -0.590$, $p = 0.002$), where the net association is negative but statistically insignificant (−0.178; 95% CI [−0.45; +0.10]); the net LIC+LMC association is essentially zero (+0.060, $p = 0.59$). Third, SDG 10 associations are null, the aggregate SDG Index is modestly and significantly negative only in UMC sub-samples ($\beta = -0.048$), and the direct Gini association is small and only marginally significant. Fourth, the SDG 8 association vanishes for real and lending-rate proxies (all $p \geq 0.17$): it is specific to the nominal policy rate – a pattern consistent with a signaling interpretation, although the design does not identify the mechanism.

For policy, the headline lesson is that higher policy rates are not uniformly negatively associated with SDG scores: in HICs they appear compatible with poverty progress – conditional on the model specification and without causal interpretation – while in UMCs the association is significantly weaker than in HICs – with a negative but imprecisely estimated net value – plausibly reflecting thinner social protection. Whether closer coordination between central banks and fiscal or social-protection authorities would mitigate this relative disadvantage in UMCs is a question for causally identified research. More broadly, the results carry a methodological warning: pooled cross-country specifications can mask economically important heterogeneity, such as the SDG 1 HIC–UMC split, so cross-country assessments should be calibrated to the economy's income group and institutional setting.

AUTHOR CONTRIBUTIONS

Conceptualization: Muslum Mursalov, Milos Tumpach.
Data curation: Muslum Mursalov.
Formal analysis: Milos Tumpach.
Funding acquisition: Muslum Mursalov, Milos Tumpach.
Investigation: Muslum Mursalov, Milos Tumpach.
Methodology: Muslum Mursalov, Milos Tumpach.
Project administration: Muslum Mursalov, Milos Tumpach.
Resources: Muslum Mursalov, Milos Tumpach.
Software: Muslum Mursalov, Milos Tumpach.
Supervision: Muslum Mursalov, Milos Tumpach.
Validation: Muslum Mursalov, Milos Tumpach.
Visualization: Muslum Mursalov, Milos Tumpach.
Writing – original draft: Muslum Mursalov, Milos Tumpach.
Writing – review & editing: Muslum Mursalov, Milos Tumpach.

DATA AVAILABILITY

All data are publicly available: SDG scores from the SDSN Sustainable Development Report 2025 (Sachs et al., 2025); short-term policy rates from IMF Monetary and Financial Statistics (International Monetary Fund, 2025); macroeconomic controls from World Bank World Development Indicators (World Bank, 2025a); and governance indicators from the Worldwide Governance Indicators 2.0 release (World Bank, 2025b).

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APPENDIX A. List of countries in the working sample

The working sample comprises 129 economies for 2000 and 2002–2023 (2,563 country-year observations). Countries are listed below sorted by World Bank income classification (FY 2024) and then alphabetically. Region codes follow the World Bank classification: EAS = East Asia and Pacific, ECS = Europe and Central Asia, LCN = Latin America and Caribbean, MEA = Middle East and North Africa, NAC = North America, SAS = South Asia, SSF = Sub-Saharan Africa.

Table A1. Countries in the working panel (N = 129), by income group and region

Sources: World Bank (country metadata via wbgapi), IMF MFS, SDSN SDR 2025.

ISO3	Country	Income group	Region
ATG	Antigua and Barbuda	High income	LCN
AUS	Australia	High income	EAS
BHS	Bahamas, The	High income	LCN
BRB	Barbados	High income	LCN
BGR	Bulgaria	High income	ECS
CAN	Canada	High income	NAC
CHL	Chile	High income	LCN
CRI	Costa Rica	High income	LCN
HRV	Croatia	High income	ECS
CZE	Czechia	High income	ECS
DNK	Denmark	High income	ECS
FIN	Finland	High income	ECS
GUY	Guyana	High income	LCN
HUN	Hungary	High income	ECS
ISL	Iceland	High income	ECS
IRL	Ireland	High income	ECS
ISR	Israel	High income	MEA
ITA	Italy	High income	ECS
JPN	Japan	High income	EAS
KOR	Korea, Rep.	High income	EAS
KWT	Kuwait	High income	MEA
LTU	Lithuania	High income	ECS
NZL	New Zealand	High income	EAS
NOR	Norway	High income	ECS
OMN	Oman	High income	MEA
PAN	Panama	High income	LCN
POL	Poland	High income	ECS
QAT	Qatar	High income	MEA
ROU	Romania	High income	ECS
RUS	Russian Federation	High income	ECS
SVN	Slovenia	High income	ECS
ESP	Spain	High income	ECS
KNA	St. Kitts and Nevis	High income	LCN
SWE	Sweden	High income	ECS
TTO	Trinidad and Tobago	High income	LCN
USA	United States	High income	NAC
URY	Uruguay	High income	LCN
AFG	Afghanistan	Low income	MEA
BFA	Burkina Faso	Low income	SSF
BDI	Burundi	Low income	SSF
CAF	Central African Republic	Low income	SSF
TCD	Chad	Low income	SSF
COD	Congo, Dem. Rep.	Low income	SSF
GMB	Gambia, The	Low income	SSF
GNB	Guinea-Bissau	Low income	SSF
MDG	Madagascar	Low income	SSF
MWI	Malawi	Low income	SSF
MLI	Mali	Low income	SSF
MOZ	Mozambique	Low income	SSF

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Table A1 (cont.). Countries in the working panel (N = 129), by income group and region

ISO3	Country	Income group	Region
NER	Niger	Low income	SSF
RWA	Rwanda	Low income	SSF
SLE	Sierra Leone	Low income	SSF
TGO	Togo	Low income	SSF
UGA	Uganda	Low income	SSF
AGO	Angola	Lower middle income	SSF
BGD	Bangladesh	Lower middle income	SAS
BEN	Benin	Lower middle income	SSF
BOL	Bolivia	Lower middle income	LCN
CMR	Cameroon	Lower middle income	SSF
COM	Comoros	Lower middle income	SSF
COG	Congo, Rep.	Lower middle income	SSF
CIV	Cote d'Ivoire	Lower middle income	SSF
EGY	Egypt, Arab Rep.	Lower middle income	MEA
SWZ	Eswatini	Lower middle income	SSF
GHA	Ghana	Lower middle income	SSF
HND	Honduras	Lower middle income	LCN
JOR	Jordan	Lower middle income	MEA
KEN	Kenya	Lower middle income	SSF
KGZ	Kyrgyz Republic	Lower middle income	ECS
LSO	Lesotho	Lower middle income	SSF
MRT	Mauritania	Lower middle income	SSF
MAR	Morocco	Lower middle income	MEA
MMR	Myanmar	Lower middle income	EAS
NPL	Nepal	Lower middle income	SAS
NGA	Nigeria	Lower middle income	SSF
PAK	Pakistan	Lower middle income	MEA
PNG	Papua New Guinea	Lower middle income	EAS
PHL	Philippines	Lower middle income	EAS
STP	Sao Tome and Principe	Lower middle income	SSF
SEN	Senegal	Lower middle income	SSF
LKA	Sri Lanka	Lower middle income	SAS
TJK	Tajikistan	Lower middle income	ECS
TZA	Tanzania	Lower middle income	SSF
TUN	Tunisia	Lower middle income	MEA
UZB	Uzbekistan	Lower middle income	ECS
VUT	Vanuatu	Lower middle income	EAS
ZMB	Zambia	Lower middle income	SSF
VEN	Venezuela, RB	Not classified	LCN
ALB	Albania	Upper middle income	ECS
DZA	Algeria	Upper middle income	MEA
ARG	Argentina	Upper middle income	LCN
ARM	Armenia	Upper middle income	ECS
AZE	Azerbaijan	Upper middle income	ECS
BLR	Belarus	Upper middle income	ECS
BLZ	Belize	Upper middle income	LCN
BWA	Botswana	Upper middle income	SSF
BRA	Brazil	Upper middle income	LCN
CPV	Cabo Verde	Upper middle income	SSF
COL	Colombia	Upper middle income	LCN
DMA	Dominica	Upper middle income	LCN
DOM	Dominican Republic	Upper middle income	LCN
ECU	Ecuador	Upper middle income	LCN
GNQ	Equatorial Guinea	Upper middle income	SSF
FJI	Fiji	Upper middle income	EAS
GAB	Gabon	Upper middle income	SSF
GEO	Georgia	Upper middle income	ECS
GRD	Grenada	Upper middle income	LCN
GTM	Guatemala	Upper middle income	LCN
IDN	Indonesia	Upper middle income	EAS

Table A1 (cont.). Countries in the working panel (N = 129), by income group and region

ISO3	Country	Income group	Region
IRQ	Iraq	Upper middle income	MEA
JAM	Jamaica	Upper middle income	LCN
KAZ	Kazakhstan	Upper middle income	ECS
MYS	Malaysia	Upper middle income	EAS
MDV	Maldives	Upper middle income	SAS
MUS	Mauritius	Upper middle income	SSF
MEX	Mexico	Upper middle income	LCN
MDA	Moldova	Upper middle income	ECS
MNG	Mongolia	Upper middle income	EAS
MKD	North Macedonia	Upper middle income	ECS
PRY	Paraguay	Upper middle income	LCN
PER	Peru	Upper middle income	LCN
SRB	Serbia	Upper middle income	ECS
ZAF	South Africa	Upper middle income	SSF
LCA	St. Lucia	Upper middle income	LCN
VCT	St. Vincent and the Grenadines	Upper middle income	LCN
SUR	Suriname	Upper middle income	LCN
THA	Thailand	Upper middle income	EAS
TUR	Turkiye	Upper middle income	ECS
UKR	Ukraine	Upper middle income	ECS

Note: Income-group membership is time-invariant for the purposes of the interaction analysis (Section 3.3) and reflects the World Bank FY 2024 classification. Venezuela, RB is classified as "Not classified" because the World Bank suspended income-group assignment pending data availability; it is retained in pooled regressions; because both income-group dummies equal zero for this country, it falls into the omitted (HIC) reference category in the interaction specification, and excluding it leaves the Table 4 estimates essentially unchanged (Section 3.3).

APPENDIX B. Correlation matrix

Table B1 reports pairwise Pearson correlations between the key dependent, independent and control variables in the working sample. Absolute values $|\rho| \geq 0.50$ are shown in bold.

Table B1. Pearson correlation matrix, working sample (pairwise)

Source: Authors' calculations from the working panel.

Variable	SDG Idx	SDG 1	SDG 8	SDG 10	mp_rate	infl	unemp	yth_un	trade	gfcf	gov_dbt	wgi	ln_gdp
SDG Idx	1.00	0.88	0.52	**0.55**	–0.17	–0.09	0.07	0.20	0.25	0.06	0.19	0.69	**0.77**
SDG 1	0.88	1.00	0.38	0.47	–0.18	–0.07	0.07	0.22	0.27	0.12	0.14	0.55	0.81
SDG 8	0.52	0.38	1.00	0.33	–0.16	–0.10	–0.42	–0.31	0.01	–0.05	0.12	0.47	0.45
SDG 10	0.55	0.47	0.33	1.00	–0.12	–0.06	–0.17	–0.10	0.23	0.21	0.03	0.28	0.33
mp_rate	–0.17	–0.18	–0.16	–0.12	1.00	0.63	0.06	0.03	–0.05	–0.01	–0.07	–0.23	–0.22
infl	–0.09	–0.07	–0.10	–0.06	0.63	1.00	0.02	0.02	–0.03	–0.02	–0.10	–0.21	–0.13
unemp	0.07	0.07	–0.42	–0.17	0.06	0.02	1.00	0.94	0.10	0.04	0.06	0.07	0.06
yth_un	0.20	0.22	–0.31	–0.10	0.03	0.02	0.94	1.00	0.14	0.03	0.15	0.16	0.19
trade	0.25	0.27	0.01	0.23	–0.05	–0.03	0.10	0.14	1.00	0.21	–0.01	0.16	0.19
gfcf	0.06	0.12	–0.05	0.21	–0.01	–0.02	0.04	0.03	0.21	1.00	–0.25	0.02	0.06
gov_dbt	0.19	0.14	0.12	0.03	–0.07	–0.10	0.06	0.15	–0.01	–0.25	1.00	0.24	0.18
wgi	0.69	**0.55**	0.47	0.28	–0.23	–0.21	0.07	0.16	0.16	0.02	0.24	1.00	0.80
ln_gdp	0.77	**0.81**	0.45	0.33	–0.22	–0.13	0.06	0.19	0.19	0.06	0.18	0.80	1.00

Note: Abbreviations: SDG Idx = overall SDG Index score; mp_rate = monetary-policy rate; infl = CPI inflation; unemp = unemployment rate; yth_un = youth unemployment; trade = trade openness; gov_dbt = government debt; wgi = composite governance indicator; ln_gdp = log of GDP per capita. Bold cells indicate $|\rho| \geq 0.50$ (excluding diagonal).

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APPENDIX C. Variable definitions and sources

Table C1 lists every variable used in the empirical analysis (Section 2), with its operational definition, units and data source. The dependent block reports the four SDG outcome variables; the explanatory block reports the primary monetary-policy rate, two transmission channels (inflation and unemployment), four standard macroeconomic and institutional controls, two alternative monetary-policy proxies used in robustness block R2, four direct World Bank outcomes used in robustness block R3, and the World Bank income-group classifier used for both R1 sub-sampling and R6 interaction analysis.

Table C1. Variable definitions, units, and data sources for the working sample (N = 2,563)

Role	Variable	Definition and coding	Source
Dependent	sdg_index_overall	Composite Sustainable Development Report index (0-100 scale). Primary aggregate outcome	SDSN SDR2025
Dependent	sdg1_score	SDG 1 (No Poverty) goal score (0-100). Secondary outcome	
Dependent	sdg8_score	SDG 8 (Decent Work and Economic Growth) goal score (0-100). Secondary outcome	
Dependent	sdg10_score	SDG 10 (Reduced Inequalities) goal score (0-100). Secondary outcome	
MP (primary)	mp_rate_combined	Nominal short-term monetary-policy rate (% per annum), constructed by cascading substitution: policy rate → money-market rate → discount rate. Winsorized at 1/99 percentiles	IMF MFS_IR
Channel	cpi_inflation	Annual CPI inflation (%). Winsorized at 1/99 percentiles. Enters M2-M4; squared term in M4	WB WDI
Channel	unemployment	ILO-modelled total unemployment (% of labour force). Enters M3–M4	
Control	log_gdp_pc	Natural log of GDP per capita (current USD)	
Control	trade_openness	Trade (% of GDP): (exports + imports) / GDP	
Control	gfcf	Gross fixed capital formation (% of GDP)	
Control	wgi_composite	Simple mean of six Worldwide Governance Indicators (VA, PV, GE, RQ, RL, CC)	WB WGI
MP (alt.)	real_rate_w	Real interest rate (% per annum). Winsorized. Used in R2 robustness.	WB WDI
MP (alt.)	lending_rate_w	Nominal lending rate (% per annum). Winsorized. Used in R2 robustness	
Direct outcome	poverty_215	Poverty headcount ratio at $2.15/day (2017 PPP, % of population). Used in R3	
Direct outcome	gini	Gini coefficient of disposable income (0-100). Used in R3	
Direct outcome	emp_pop_ratio	Employment-to-population ratio (% of population 15+). Used in R3.	
Direct outcome	gdp_pc_growth	Annual growth of GDP per capita (%). Used in R3	
Grouping	income_group	World Bank income classification (HIC / UMC / LMC / LIC), FY 2024 thresholds. Used in R1 sub-sampling and R6 interactions.	WB (Atlas)

Note: The superscript w on a variable name denotes the winsorized version (1st / 99th percentiles of the working-sample distribution; see Section 2.2 for details). All WB WDI series are downloaded via the wbgapi Python client. IMF MFS_IR series are retrieved via SDMX 2.1 using the sdmx1 client. WGI 2.0 values are taken from the December 2025 Excel release (six sheets, long format). SDSN SDR2025 data are taken from the official downloadable file.

APPENDIX D. Full regression tables, baseline specifications M1–M4

Tables D1-D4 report the full coefficient vectors for the four baseline specifications M1–M4 estimated on each of the four dependent variables. Each specification includes country (iso3) and year fixed effects, with cluster-robust (CRV1) standard errors clustered at the country level reported in parentheses. Significance stars follow the convention *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, computed from cluster-robust t-statistics (β/SE) using standard-normal thresholds; with more than 100 country clusters in the four baseline specifications reported here (G between 103 and 110 after excluding estimation singletons), these thresholds differ only marginally from finite-sample t(G–1) critical values (at most 2.625, 1.983 and 1.660 versus 2.576, 1.960 and 1.645). The monetary-policy rate and CPI inflation (rows mp_rate_w and inflation_w) are winsorised at the 1st and 99th percentiles of the working-sample distributions.

Table D1. Full regression results – dependent variable: overall SDG Index score

Variable	M1	M2	M3	M4
mp_rate_w	–0.009	–0.002	–0.001	–0.000157
	(0.016)	(0.016)	(0.016)	(0.016)
log_gdp_pc	2.324***	2.314***	2.458***	2.458***
	(0.704)	(0.702)	(0.769)	(0.769)
trade_openness	–0.002	–0.002	–0.001	–0.001
	(0.005)	(0.005)	(0.005)	(0.005)
gfcf	0.035**	0.035**	0.038**	0.038**
	(0.015)	(0.015)	(0.015)	(0.015)
wgi_composite	0.748	0.713	0.775	0.78
	(0.562)	(0.573)	(0.573)	(0.571)
inflation_w	–	–0.011	–0.01	–0.029*
		(0.008)	(0.008)	(0.017)
unemployment	–	–	0.04	0.039
			(0.032)	(0.032)
inflation_w²	–	–	–	0.000455
				(0.000314)
year	x	x	x	x
iso3	x	x	x	x
Observations	**2,066**	**2,066**	**2,064**	**2,064**
R^2	0.99	0.99	0.99	0.99

Note: Standard errors (CRV1, clustered by iso3) in parentheses below each coefficient. Country and year fixed effects included as indicated by "x". Significance stars (***/**/*) denote $p < 0.01$, $p < 0.05$ and $p < 0.10$ respectively, computed from cluster-robust t-statistics using standard-normal thresholds ($|t| > 2.576$, 1.960, 1.645), which differ only marginally from finite-sample $t(G - 1)$ critical values at the actual cluster counts (G = 103-110: at most 2.625, 1.983, 1.660)

Table D2. Full regression results – dependent variable: SDG 1 score (No Poverty)

Variable	M1	M2	M3	M4
mp_rate_w	0.023	0.042	0.043	0.047
	(0.079)	(0.084)	(0.08)	(0.079)
log_gdp_pc	22.292***	22.256***	24.380***	24.369***
	(3.560)	(3.546)	(3.524)	(3.515)
trade_openness	–0.069**	–0.067**	–0.059**	–0.059**
	(0.027)	(0.027)	(0.026)	(0.026)
gfcf	0.321***	0.323***	0.355***	0.356***
	(0.077)	(0.077)	(0.08)	(0.08)
wgi_composite	–3.801	–3.882	–3.152	–3.134
	(2.624)	(2.656)	(2.579)	(2.565)
inflation_w	–	–0.026	–0.017	–0.071
		(0.053)	(0.054)	(0.094)
unemployment	–	–	0.493***	0.491***
			(0.153)	(0.154)
inflation_w²	–	–	–	0.001
				(0.002)
year	x	x	x	x
iso3	x	x	x	x
Observations	**1,943**	**1,943**	**1,943**	**1,943**
R^2	0.973	0.973	0.974	0.974

Note: See Table D1 for conventions.

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Table D3. Full regression results – dependent variable: SDG 8 score (Decent Work and Economic Growth)

Variable	M1	M2	M3	M4
mp_rate_w	0.048**	0.047*	0.045**	0.046**
	(0.02)	(0.025)	(0.021)	(0.02)
log_gdp_pc	2.341**	2.343**	0.671	0.67
	(0.976)	(0.976)	(0.836)	(0.836)
trade_openness	–0.001	–0.001	–0.008	–0.008
	(0.008)	(0.009)	(0.006)	(0.006)
gfcf	0.023	0.023	–0.003	–0.003
	(0.02)	(0.02)	(0.016)	(0.016)
wgi_composite	1.178*	1.183*	0.449	0.453
	(0.654)	(0.66)	(0.696)	(0.696)
inflation_w	–	0.002	–0.005	–0.019
		(0.013)	(0.009)	(0.021)
unemployment	–	–	–0.465***	–0.466***
			(0.046)	(0.046)
inflation_w²	–	–	–	0.000342
				(0.000415)
year	x	x	x	x
iso3	x	x	x	x
Observations	**2,066**	**2,066**	**2,064**	**2,064**
R^2	0.953	0.953	0.965	0.965

Note: See Table D1 for conventions. mp_rate_w is statistically significant and positive in all four specifications, with coefficients in the range +0.045 to +0.048.

Table D4. Full regression results – dependent variable: SDG 10 score (Reduced Inequalities)

Variable	M1	M2	M3	M4
mp_rate_w	–0.056	–0.001	0.000425	–0.008
	(0.092)	(0.101)	(0.101)	(0.101)
log_gdp_pc	9.376*	9.278*	8.393	8.414
	(5.137)	(5.137)	(5.525)	(5.517)
trade_openness	–0.02	–0.017	–0.02	–0.02
	(0.039)	(0.039)	(0.037)	(0.037)
gfcf	0.281**	0.285**	0.272**	0.27**
	(0.117)	(0.116)	(0.117)	(0.117)
wgi_composite	0.283	0.043	–0.212	–0.246
	(3.958)	(3.987)	(3.965)	(3.968)
inflation_w	–	–0.074	–0.078	0.029
		(0.058)	(0.058)	(0.119)
unemployment	–	–	–0.184	–0.179
			(0.244)	(0.244)
inflation_w²	–	–	–	–0.003
				(0.002)
year	x	x	x	x
iso3	x	x	x	x
Observations	**1,966**	**1,966**	**1,964**	**1,964**
R^2	0.932	0.932	0.932	0.932

Note: See Table D1 for conventions.