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MACROECONOMIC DETERMINANTS of INCOME INEQUALITY: GMM PANEL DATA ANALYSIS for TÜRKİYE and EMERGING MARKET ECONOMIES

Sinem Gözde BEŞBALLI¹

Abstract

Income inequality remains one of the foremost socioeconomic challenges of the 21st century, yet the macroeconomic drivers of this inequality in emerging market economies remain insufficiently understood. This study examines the macroeconomic determinants of income inequality using an unbalanced panel dataset covering 20 emerging market economies over the period 2000-2024. A review of the existing literature reveals that while the two-step System Generalized Method of Moments (GMM) estimator—developed by Arellano and Bover (1995) and Blundell and Bond (1998)—has been widely applied to developed and Asian economies, its use for a broad panel of emerging markets, and for Türkiye in particular, remains limited. This estimator is employed to address endogeneity, dynamic panel bias, and unobserved country-specific heterogeneity inherent in inequality dynamics. The findings reveal that trade openness significantly reduces income inequality, while unemployment exerts a strong and robust positive effect. Inflation exhibits a non-linear U-shaped relationship with inequality, turning positive only above approximately 11 percent annually. Evidence for the Kuznets hypothesis is found to be modest and specification-sensitive. Türkiye-specific analysis demonstrates that inflation's inequality-increasing effect is approximately 50 percent stronger than in peer economies, with inflation volatility generating additional distributional pressure. Diagnostic tests, including the Hansen and Arellano-Bond tests, confirm instrument validity and the absence of second-order serial correlation across all specifications. These results carry important policy implications for emerging market economies: achieving price stability, supporting employment, and maintaining trade openness emerge as the primary levers for inclusive and equitable growth.

Keywords : Income Inequality; Gini Coefficient; System GMM; Kuznets Hypothesis; Emerging Markets.

Jel Classification : C23; D63; E24; O11; O15.

¹ Asst. Professor, Artvin Çoruh University, sinemgozde@artvin.edu.tr, ORCID: 0000-0003-2367-7252

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GELİR EŞİTSİZLİĞİNİN MAKROEKONOMİK BELİRLEYİCİLERİ: TÜRKİYE VE GELİŞMEKTE OLAN PİYASA EKONOMİLERİ İÇİN GMM PANEL VERİ ANALİZİ

Öz

Gelir eşitsizliği, 21. yüzyılın en önemli sosyoekonomik sorunlarından biri olmayı sürdürmekte; bu eşitsizliğin makroekonomik belirleyicilerinin, özellikle gelişmekte olan piyasa ekonomileri bağlamında, yeterince açıklanamamış olması araştırma boşluğunu derinleştirmektedir. Bu çalışmada, 2000-2024 dönemine ait 20 gelişmekte olan piyasa ekonomisini kapsayan dengesiz bir panel veri seti kullanılarak gelir eşitsizliğinin makroekonomik belirleyicileri incelenmektedir. Mevcut literatür, Arellano-Bover (1995) ve Blundell-Bond (1998) tarafından geliştirilen iki aşamalı Sistem Genelleştirilmiş Momentler Yöntemi (GMM) tahmincisi ağırlıklı olarak gelişmiş ve Asya ekonomilerine uygulamakla birlikte, gelişmekte olan piyasaların geniş bir örnekleme, özellikle de Türkiye'ye yönelik uygulamalar oldukça sınırlı kalmıştır. İçsellik, dinamik panel yanlılığı ve gözlemlenemeyen ülkeye özgü heterojenlik sorunlarını gidermek amacıyla söz konusu tahminci tercih edilmiştir. Bulgular, ticari açıklığın gelir eşitsizliğini anlamlı düzeyde azalttığını; işsizliğin ise güçlü ve tutarlı bir artırıcı etkiye sahip olduğunu ortaya koymaktadır. Enflasyonun eşitsizlik üzerindeki etkisi doğrusal olmayıp yıllık yaklaşık yüzde 11 eşiğinin üzerinde pozitif dönen U-şekilli bir ilişki sergilenmektedir. Kuznets hipotezi için elde edilen kanıtlar mütevazı ve spesifikasyona duyarlı bulunmaktadır. Türkiye'ye özgü analizler, enflasyonun eşitsizliği artırıcı etkisinin emsal ülkelere kıyasla yaklaşık yüzde 50 daha güçlü olduğunu; enflasyon oynaklığının ise ek bir dağılımsal baskı yarattığını göstermektedir. Hansen ve Arellano-Bond tanısıl testleri araç değişkenlerin geçerliliğini ve ikinci dereceden seri korelasyon bulunmadığını doğrulamaktadır. Elde edilen sonuçlar, gelişmekte olan ülke politika yapıcılara önemli çıkarımlar sunmakta; fiyat istikrarının sağlanması, istihdamın desteklenmesi ve ticaret açıklığının korunmasının kapsayıcı ve adil büyüme için temel politika araçları olduğunu vurgulamaktadır.

Anahtar Kelimeler : Gelir Eşitsizliği; Gini Katsayısı; Sistem GMM; Kuznets Hipotezi; Gelişmekte Olan Piyasalar.

Jel Sınıflandırılması : C23; D63; E24; O11; O15.

INTRODUCTION

Income inequality has emerged as one of the most pressing socioeconomic challenges of the 21st century, attracting significant attention from policymakers, academics, and international organizations alike. Rising inequality not only threatens social cohesion and political stability but also undermines long-term economic growth and sustainable development (Cingano, 2014; Ostry, Berg & Tsangarides, 2014). The COVID-19 pandemic has further exacerbated these concerns, with unequal health and economic impacts widening pre-existing disparities across countries and income groups (World Bank, 2022).

Understanding the macroeconomic drivers of income inequality is crucial for designing effective redistributive policies. While extensive literature has examined this relationship in developed economies, emerging market economies present a distinct set of challenges and opportunities. These countries are characterized by rapid structural transformation, volatile macroeconomic environments, and varying degrees of institutional development—all factors that significantly influence income distribution dynamics.

Türkiye represents a particularly interesting case study within this context. As a rapidly developing economy straddling Europe and Asia, Türkiye has experienced significant economic volatility, including high inflation episodes, currency crises, and substantial structural changes over the past two decades. These macroeconomic fluctuations have had profound implications for income distribution, making Türkiye an ideal candidate for comparative analysis within the broader emerging market context.

The primary aim of this study is to identify and quantify the macroeconomic determinants of income inequality across a diverse panel of 20 emerging market economies over the period 2000–2024, with particular attention to Türkiye's distinctive dynamics. Specifically, this study investigates the roles of trade openness, unemployment, inflation (including its potential non-linearity), economic growth,

government expenditure, and financial development in shaping distributional outcomes, employing the two-step System GMM estimator to address endogeneity, dynamic panel bias, and unobserved country heterogeneity.

This study makes several contributions to the existing literature. First, unlike most previous studies that focus on developed economies or specific regions, a diverse sample of 20 emerging markets spanning four continents is analyzed, enhancing the external validity of the findings. Second, data quality issues that plague inequality research are explicitly addressed: five countries in the sample have Gini coverage below 50 percent, and the robustness of the results to their exclusion. Third, it is tested and found important non-linearities in the inflation-inequality relationship, which may explain why previous linear specifications often yielded insignificant results. Fourth, Türkiye-specific analysis revealing that inflation's inequality-increasing effect is substantially stronger in Türkiye than in peer countries is provided, offering actionable policy guidance. Finally, the extensive robustness checks—including alternative lag structures, comparison with difference GMM, and time-period subsamples—confirm the stability of the key findings.

The findings reveal several important patterns. Trade openness emerges as a significant equalizing force, reducing income inequality by approximately 1.5 Gini points for every 10%-point increase in trade-to-GDP ratio. Unemployment shows a strong positive association with inequality, with each percentage point increase in unemployment raising the Gini coefficient by 0.3 points. Weak evidence is found for the Kuznets hypothesis, with the turning point occurring at GDP per capita levels that only a subset of the sample countries has achieved. Inflation exhibits a non-linear relationship with inequality, becoming significantly positive only at high inflation rates above 11 percent annually. Government expenditure shows modest equalizing effects, though the relationship is sensitive to expenditure composition. Türkiye-specific analysis reveals that inflation volatility contributes disproportionately to inequality compared to peer economies, highlighting the need for macroeconomic stability as a prerequisite for inclusive growth.

The remainder of this paper is organized as follows. Section I reviews the theoretical framework and empirical literature on inequality determinants. Section II describes the data sources, sample selection criteria, variable definitions, and System GMM methodology, with particular attention to missing data treatment and instrument selection. Section III presents the empirical results, including baseline estimates, non-linear effects, regional heterogeneity, Türkiye-specific analysis, extensive robustness checks, and policy implications. Section IV concludes.

I. LITERATURE REVIEW

I.I. Theoretical Framework

The relationship between economic development and income inequality has been a central theme in development economics since Kuznets (1955) proposed his seminal inverted-U hypothesis. Kuznets argued that in the early stages of development, inequality rises as the economy transitions from agriculture to industry, creating income gaps between modern and traditional sectors. As development proceeds and more workers shift to the higher-productivity modern sector, inequality eventually declines. While this hypothesis has received mixed empirical support, it continues to provide a valuable theoretical framework for analyzing inequality dynamics.

More recent theoretical work has emphasized the role of specific macroeconomic factors. Trade liberalization can affect inequality through multiple channels: the Stolper-Samuelson theorem predicts that trade benefits the abundant factor, while skill-biased technological change associated with globalization may increase returns to education (Goldberg & Pavcnik, 2007). Inflation's impact operates primarily through its differential effect on asset holders versus wage earners, with the poor typically holding minimal financial assets and facing greater difficulty protecting themselves against inflation (Easterly & Fischer, 2001). Unemployment directly affects the income distribution by creating non-earners and may have persistent scarring effects even after recovery.

I.II. Empirical Evidence from System GMM Studies

The System GMM estimator has become increasingly popular in panel data analysis of income inequality due to its ability to address endogeneity and dynamic panel bias. Arellano & Bover (1995)

and Blundell & Bond (1998) developed this estimator to handle situations where the dependent variable is persistent and potentially affected by its own past values, while also addressing the endogeneity of explanatory variables.

The validity of lagged-level instruments in this class of models has been examined extensively in the methodological literature. Bond, Hoeffler & Temple (2001) provide a careful assessment of instrument strength and the performance of System GMM relative to alternative estimators in empirical growth models, and their recommendations inform the instrument selection and diagnostic testing strategy adopted in this study.

The System GMM estimator has become the methodological standard for cross-country inequality analysis, yielding a rich body of empirical evidence. The Asian Development Bank (2015), covering 33 Asian economies from 1990 to 2013, found strong support for the Kuznets hypothesis while confirming that inflation and unemployment increase inequality and education reduces it. Son & Kim (2016), examining a broad sample of developed and developing countries from 1960 to 2010, documented a significant negative effect of inequality on growth, particularly in developing economies. Cingano (2014), in an influential OECD study spanning 1970 to 2010, estimated that a 1-point increase in the Gini coefficient reduces GDP growth by 1.1 percentage points over five years and 4.5 percentage points in the long run.

Non-linear effects have received growing attention. Chu & Hoang (2020), in a sample of 88 countries from 2002 to 2017, identified a U-shaped relationship between economic complexity and income inequality, suggesting that equalizing effects emerge only after countries surpass a threshold of economic sophistication. Evidence from developing country panels similarly documents non-linear inflation-inequality relationships, with some studies identifying a turning point at exceptionally high inflation rates exceeding 100 percent (see Siami-Namini & Hudson, 2019). Siami-Namini & Hudson (2019) similarly document a Kuznets-like relationship between inflation and inequality across a panel dataset.

Institutional and structural factors have also been systematically examined. Kunawotor et al. (2020), focusing on 24 African countries from 1990 to 2017, demonstrated that corruption control and rule of law significantly reduce inequality. Chletsos & Sintos (2025), in a 104-country study covering 2001 to 2023 using System GMM and panel quantile regression, found that entrepreneurship—and female entrepreneurship in particular—exerts a meaningful equalizing effect. Jamil et al. (2023), analyzing 73 developing countries from 2004 to 2019, highlighted that financial inclusion interacts significantly with aging population structures to shape inequality outcomes. Recent cross-country evidence further highlights that human capital accumulation can moderate the inflation-inequality nexus by buffering the distributional impact of price instability.

Financial development and trade constitute two of the most frequently studied channels. Liang (2006) applied System GMM to urban China and found that financial development significantly shapes income inequality. Naceur & Zhang (2016), using IMF panel data, confirmed that financial development can simultaneously reduce inequality and poverty. Asteriou et al. (2014), covering EU-27 countries from 1995 to 2009, found that trade openness has an equalizing effect while FDI and capital flows increase inequality. Calderón & Chong (2001), employing difference GMM over 1960 to 1995, established that a 10 percent exchange rate depreciation reduces inequality by approximately 0.9 points. Lee & Vu (2020) further showed that economic complexity reduces inequality, with human capital mediating this effect indirectly.

More recent contributions have extended the frontier of this literature. More recent System GMM applications across large multi-country panels have further documented U-shaped relationships between economic complexity and inequality, with shadow economy dynamics adding additional non-linearity. Tsaurai (2020), studying transition economies from 2003 to 2016 using dynamic GMM, found that economic growth reduces inequality while FDI increases it. Ostry, Berg & Tsangarides (2014) established that high inequality threatens sustainable growth, while Halter, Oechslin & Zweimüller (2014) showed that the inequality-growth relationship is contingent on the country's income level and time horizon. UNCTAD (2023) further confirmed that wealth inequality is more concentrated than income inequality across a global panel. Brueckner & Lederman (2018) demonstrated that the

inequality-growth relationship depends crucially on initial income levels, with IV-GMM providing robust identification.

I.III. Evidence from Türkiye and Comparative Studies

Research on Türkiye's income inequality has grown substantially in recent years, though System GMM applications remain limited. Özdemir (2022) represents a notable exception, using System GMM to analyze Türkiye alongside EU countries and finding that financialization significantly increases inequality in Türkiye. Peçe et al. (2016) examined the relationship between income distribution and economic growth in Türkiye using cointegration techniques, documenting a negative relationship between the Gini coefficient and GDP per capita.

Comparative studies including Türkiye often employ panel data methods but rarely utilize System GMM. Şengür (2020) examined 10 transition economies including Türkiye using static panel models and confirmed the Kuznets hypothesis. Gülmez & Altıntaş (2015) analyzed Türkiye separately using VECM and surprisingly found that both inflation and trade openness reduce inequality—a finding that contradicts much of the international evidence and warrants further investigation with more sophisticated econometric techniques.

The body of comparative and Turkish-specific research provides important context for this study. Naimoğlu (2023) employs ARDL bounds testing for Türkiye and confirms significant short- and long-run causal relationships between inflation, unemployment, financial development, and income inequality. Dişbudak & Süslü (2007) document, through econometric analysis, that macroeconomic factors are primary determinants of personal income distribution in Türkiye, a finding further elaborated by Güder & Kurt (2018), who extend this inquiry to BRIC-T countries using panel data methods.

Emek (2022), studying 19 developing countries from 1990 to 2017 with Driscoll-Kraay estimators, finds that inflation increases the Gini coefficient while economic growth reduces it. Öztürk et al. (2022) investigate the relationship between financial development and income inequality for Türkiye and 14 comparable economies from 2002 to 2018. Filiztekin & Çelik (2010) document significant regional income inequality within Türkiye, highlighting that spatial dimensions of inequality may be obscured by aggregate national Gini measures. Yaşar (2022), using panel ARDL for 15 OECD countries including Türkiye from 2000 to 2018, finds that public debt levels significantly affect income inequality.

Studies on broader country groupings that include Türkiye also provide valuable benchmarks. Narin & Kutluay (2013) analyze the evolving global economic order among BRIC, 3G, and N-11 country groups, situating Türkiye within a coherent peer classification that informs the country group selection in the present study. İzgi & Alyu (2018) examine poverty and income distribution for OECD and EU member states using panel data, while Eroğlu et al. (2017) confirm, for 21 OECD countries including Türkiye, that social assistance expenditures are more effective than education spending in improving income distribution.

This brief literature review reveals both the promise and limitations of existing research. While System GMM has been extensively applied to inequality analysis in developed and Asian economies, its application to emerging markets more broadly -and Türkiye specifically- remains limited. Furthermore, most existing studies focus on linear relationships, with insufficient attention to potential non-linearities and threshold effects. This study addresses these gaps by applying System GMM to a comprehensive panel of 20 emerging economies with particular attention to Türkiye's unique characteristics.

II. DATA AND METHODOLOGY

II.I. Data Sources and Sample Selection

This analysis employs an unbalanced panel dataset covering 20 emerging market economies over the period 2000-2024. The sample selection was guided by three criteria: (1) classification as an emerging or developing economy by the World Bank, (2) availability of reliable Gini coefficient data for a substantial portion of the sample period, and (3) sufficient macroeconomic data coverage in the World Development Indicators database.

The final sample includes: Türkiye, Poland, Hungary, Romania, Bulgaria (European emerging markets); Mexico, Brazil, Chile, Colombia, Argentina, Peru, Costa Rica (Latin America); Indonesia, Philippines,

Thailand, Malaysia, China, India (Asia); Russia (Eurasia); and South Africa (Africa). This diverse sample provides substantial heterogeneity in economic development levels, institutional quality, and macroeconomic stability, enhancing the external validity of these findings.

Income inequality data, measured by the Gini coefficient, are primarily sourced from the World Bank's World Development Indicators (WDI) database. For countries with incomplete WDI coverage, this is supplemented with data from the OECD Income Distribution Database (for OECD member countries) and the Standardized World Income Inequality Database (SWIID) developed by Solt (2020). The SWIID data are used only for gap-filling and represent less than 15 percent of Gini observations. All macroeconomic variables are obtained from the World Bank WDI database, ensuring consistency and comparability across countries.

II.II. Variable Definitions

Dependent variable is the Gini coefficient of income inequality, ranging from 0 (perfect equality) to 100 (perfect inequality). The focus is on disposable income Gini where available, as it better reflects the redistributive impact of fiscal policy.

Key explanatory variables include: (1) GDP per capita (constant 2015 US dollars) and its square to test the Kuznets hypothesis; (2) GDP growth rate (annual percentage) to capture short-run cyclical effects; (3) Inflation rate (annual percentage change in consumer prices) and its square to allow for non-linear effects; (4) Unemployment rate (percentage of total labor force); (5) Trade openness (sum of exports and imports as percentage of GDP); (6) Government expenditure (general government final consumption as percentage of GDP); (7) Financial development (domestic credit to private sector as percentage of GDP); (8) Foreign direct investment (net inflows as percentage of GDP); (9) Population growth rate; and (10) Urbanization rate (urban population as percentage of total).

II.III. System GMM Methodology

The two-step System GMM estimator developed by Arellano & Bover (1995) and, Blundell & Bond (1998) is employed. This estimator addresses three critical econometric challenges in this context: First, income inequality exhibits high persistence, making the lagged dependent variable an important explanatory factor. Second, many macroeconomic variables are potentially endogenous to inequality through various feedback mechanisms. Third, unobserved country-specific heterogeneity may correlate with both inequality and its determinants.

The System GMM estimator combines equations in first differences with equations in levels, using lagged levels as instruments for the differenced equations and lagged differences as instruments for the level equations. This dual approach is particularly suitable for persistent variables like the Gini coefficient, where the first-difference GMM estimator (Arellano & Bond, 1991) may suffer from weak instrument problems.

This baseline dynamic panel model takes the following form:

$$\text{Gini}_{it} = \alpha + \beta \text{Gini}_{i,t-1} + \gamma X_{it} + \mu_i + \eta_t + \varepsilon_{it}$$

where Gini_{it} is the Gini coefficient for country i in year t , $\text{Gini}_{i,t-1}$ is its lagged value, X_{it} represents the vector of explanatory variables, μ_i captures country-specific fixed effects, η_t represents time fixed effects, and ε_{it} is the idiosyncratic error term.

The lagged Gini coefficient, GDP per capita, inflation, and financial development are treated as potentially endogenous, using their second and further lags as instruments. Unemployment, trade openness, government expenditure, and FDI are treated as predetermined or weakly exogenous. To limit instrument proliferation-a common problem in System GMM that can lead to biased estimates and weak Hansen tests- it is employed the collapse option in Stata's `xtabond2` command (Roodman, 2009) and restrict instruments to lags 2-4 for endogenous variables.

II.IV. Specification Tests and Robustness

The validity of System GMM estimates relies on two key assumptions: (1) the instruments are valid, and (2) there is no second-order serial correlation in the idiosyncratic errors. Three standard diagnostic

tests are employed. The Hansen J-test of over-identifying restrictions tests the joint validity of instruments, with the null hypothesis that instruments are valid (p-value > 0.10 desired). The Arellano-Bond test for AR(1) in first differences typically shows negative first-order serial correlation (rejection expected), while the AR(2) test should not reject the null of no second-order correlation (p-value > 0.10 desired).

Several robustness checks are implemented. First, the lag structure of instruments is varied between 2-3 and 2-4 lags. Second, difference GMM is used for comparison. Third, time fixed effects are included to control for global shocks. Fourth, separate estimates are computed for different regional subsamples to test the stability of relationships across contexts. Fifth, a two-step estimator with Windmeijer (2005) finite-sample correction for standard errors is employed to improve efficiency while maintaining robust inference.

II.V. Descriptive Statistics

Table 1 presents summary statistics for main variables. The Gini coefficient averages 41.7 across the sample, with substantial variation ranging from 25.5 (most equal, typically European countries) to 64.8 (most unequal, South Africa). This variation provides sample identifying power for this econometric analysis. The average GDP per capita is \$7,826, reflecting the middle-income nature of this sample. Inflation averages 7.0 percent but exhibits high volatility, with some observations exceeding 200 percent (Venezuela-type hyperinflation excluded). Unemployment averages 7.9 percent, trade openness 71.3 percent of GDP, and government expenditure 14.9 percent of GDP.

Table 3 shows GINI coverage by country. Most countries have data coverage above 70 percent, though India (16%), South Africa (20%), Malaysia (32%), Philippines (36%), and Chile (40%) fall below the 50 percent threshold. Sensitivity analysis excluding these countries confirms that results are robust to their inclusion. Table 2 presents pairwise correlations, revealing that trade openness exhibits the strongest negative correlation with inequality (-0.45), while population growth shows the strongest positive correlation (0.57). These preliminary patterns are generally consistent with theoretical predictions and motivate this multivariate analysis.

Table 1.: Descriptive Statistics

Variable	N	Mean	Std. Dev	Min	Max
Gini coefficient	360	41.7	8.13	25.5	64.8
GDP per capita (\$)	500	7,826	3,732	757	18,000
GDP growth (%)	500	3.84	3.67	-10.93	14.15
Inflation (%)	482	7.01	16.28	-1.61	219.88
Unemployment (%)	468	7.87	4.95	0.25	29.88
Trade openness (% GDP)	500	71.32	39.24	21.85	220.41
Government expenditure (% GDP)	499	14.91	3.42	6.53	23.04
FDI (% GDP)	500	3.56	7.68	-40.11	105.64
Domestic credit (% GDP)	459	45.23	28.91	9.12	158.42
Population growth (%)	500	0.73	0.83	-2.17	2.42
Urban population (%)	500	66.63	15.99	27.65	92.27

Table 2.: Correlation Matrix

	(1) Gini	(2) GDPPC	(3) Growth	(4) Inflation	(5) Unemployment	(6) Trade	(7) GovExp	(8) FDI	(9) PopGrowth	(10) Urban
(1) Gini	1									
(2) GDPPC	-0.12	1								
(3) Growth	-0.24	0.08	1							
(4) Inflation	-0.01	0.02	-0.17	1						
(5) Unemployment	0.33	-0.04	-0.31	0.12	1					
(6) Trade	-0.45	0.38	0.15	-0.08	-0.1	1				
(7) GovExp	-0.14	0.52	-0.05	0.04	0.21	0.22	1			
(8) FDI	-0.1	-0.15	0.23	0.09	-0.06	0.41	-0.08	1		
(9) PopGrowth	0.57	-0.68	-0.02	0.11	-0.19	-0.31	-0.48	0.05	1	
(10) Urban	0.48	0.28	-0.03	-0.1	-0.02	0.35	0.24	-0.07	-0.51	1

II.VI. Missing Data Analysis and Treatment Strategy

Income inequality data exhibit substantial missing observations, a common challenge in cross-country inequality research (Solt, 2020). Table 3 presents Gini coefficient coverage by country for this 2000-2024 sample period. Coverage ranges from 100 percent (Costa Rica, Indonesia, Peru) to 16 percent (India), with five countries falling below the 50 percent threshold: India (16%), South Africa (20%), Malaysia (32%), Philippines (36%), and Chile (40%).

The missing data pattern is not random. Countries with weaker statistical capacity and less frequent household surveys exhibit lower coverage. However, no systematic relationship exists between missingness and inequality levels (correlation = 0.12, $p = 0.61$), suggesting that estimates are unlikely to suffer from severe selection bias.

A three-pronged strategy is adopted to address missing data concerns:

First, this baseline analysis uses all available observations ($N = 333$ -340 depending on specification), maximizing statistical power. The System GMM estimator accommodates unbalanced panels without bias provided that missingness is unrelated to future shocks - a plausible assumption given that most missing observations reflect survey frequency rather than data suppression.

Second, sensitivity analysis is conducted excluding the five countries with coverage below 50 percent (Table 3). This reduces the sample to 15 countries with strong data quality, allowing an assessment of whether the results are driven by countries with poor coverage.

Table 3.: Gini Coefficient Data Coverage by Country

Country	Years with Data	Coverage (%)	Missing Years	First Year	Last Year
Costa Rica	25	100	0	2000	2024
Indonesia	25	100	0	2000	2024
Peru	25	100	0	2000	2024
Argentina	24	96	1	2000	2024
Poland	24	96	1	2000	2024
Romania	24	96	1	2001	2024
Russian Federation	24	96	1	2000	2024
Brazil	22	88	3	2001	2024
Colombia	22	88	3	2001	2024
Türkiye	21	84	4	2002	2024
Bulgaria	20	80	5	2003	2024
Thailand	21	84	4	2000	2023
Hungary	18	72	7	2004	2024
China	16	64	9	2002	2020
Mexico	13	52	12	2004	2024
Philippines	9	36	16	2003	2021
Chile	10	40	15	2003	2022
Malaysia	8	32	17	2004	2019
South Africa	5	20	20	2008	2023
India	4	16	21	2004	2021

Third, whether inequality persistence differs between high and low-coverage countries is examined. If missing data reflect underlying instability, the lagged Gini coefficient should be less predictive for low-coverage countries. No evidence is found for this pattern (interaction test $p = 0.67$), supporting the pooled estimation approach.

Imputation or interpolation techniques are not employed. While these methods can increase sample size, they introduce model dependence and may artificially reduce standard errors (Little & Rubin, 2002). Given the already substantial sample size, conservative inference based on observed data is preferred.

III. EMPRICAL RESULTS

III.I. Baseline System GMM Estimates

Table 4 presents the baseline System GMM results across four model specifications. All models pass the Hansen test of over-identifying restrictions ($p > 0.10$), indicating that instruments are valid. The Arellano-Bond AR(1) test appropriately rejects the null of no first-order autocorrelation, while the AR(2) test fails to reject ($p > 0.10$), confirming no problematic second-order serial correlation. The number of instruments in each specification remains well below the number of countries, avoiding instrument proliferation concerns.

The lagged Gini coefficient exhibits high and significant persistence across all specifications (0.76-0.78), confirming the importance of modeling inequality dynamics. This persistence suggests that reducing inequality requires sustained policy efforts, as current inequality strongly predicts future levels.

Model 1 presents this baseline specification. The coefficients on GDP per capita and its square provide modest and specification-sensitive evidence for the Kuznets hypothesis. The positive linear coefficient (0.0012, $p < 0.10$) and negative quadratic coefficient (-0.0000, $p < 0.05$) formally suggest an inverted-U

relationship. However, several considerations warrant caution in interpretation. First, the linear term achieves only marginal significance ($p < 0.10$), and its magnitude is economically small. Second, the implied turning point of approximately \$12,000 (constant 2015 USD) lies beyond the income levels of 12 out of 20 sample countries (60%), limiting the empirical support for the declining portion of the Kuznets curve. Third, when low-coverage countries (Table 6, Column 2) is excluded, the quadratic term loses significance entirely, suggesting that the result may be driven by countries with weaker data quality. These findings align with recent literature questioning the universal applicability of the Kuznets hypothesis (Halter et al., 2014; Brueckner & Lederman, 2018). The inverted-U relationship, if it exists, appears context-specific and conditional on institutional and structural factors not captured in this parsimonious specification. Policymakers should not assume that inequality will automatically decline with development; active redistributive policies remain necessary throughout the development process. (As a robustness check, it is also estimated specifications with cubic terms, following Forbes (2000). The cubic term was statistically insignificant ($p = 0.74$), providing no evidence for an N-shaped relationship. Heterogeneity in the Kuznets relationship is also tested by interacting GDPPC with regional dummies; none of the interactions were significant, though power is limited given this sample size.)

Unemployment shows a strong and highly significant positive effect (0.298, $p < 0.01$). A one percentage point increase in unemployment raises the Gini coefficient by approximately 0.3 points. This substantial effect reflects both the direct income loss for the unemployed and broader effects on wage bargaining power and labor market precarity.

Trade openness exhibits a robust negative coefficient (-0.151, $p < 0.01$), indicating that greater integration into global markets reduces income inequality. These finding challenges protectionist arguments and suggests that the gains from trade are broadly distributed in this sample of emerging economies. The magnitude implies that a 10-percentage point increase in trade-to-GDP ratio reduces the Gini coefficient by approximately 1.5 points—an economically meaningful effect.

Inflation shows a small positive but statistically insignificant coefficient in the baseline specification. This lack of significance may mask non-linearities, which is explored in Model 3.

III.II. Extended Model with Government Expenditure

Model 2 adds government expenditure as an additional explanatory variable. The coefficient is negative and marginally significant (-0.087, $p < 0.10$), suggesting modest equalizing effects of public spending. However, this aggregate measure masks important compositional effects—social transfers and education spending likely have stronger equalizing effects than defense or general administration spending. The limited significance underscores the importance of analyzing specific expenditure categories rather than aggregate government size.

The inclusion of government expenditure leaves these other coefficients largely unchanged, confirming the robustness of this baseline results. The unemployment effect remains strong (0.284, $p < 0.01$), trade openness continues to show significant negative effects (-0.142, $p < 0.01$), and the Kuznets coefficients maintain similar magnitudes and significance levels.

III.III. Non-linear Inflation Effects

Model 3 tests for non-linear effects of inflation by including both inflation and its square. The results reveal a U-shaped relationship: the linear term is negative and marginally significant (-0.041, $p < 0.10$), while the quadratic term is positive and highly significant (0.0018, $p < 0.01$). Calculating the inflection point suggests that inflation begins to significantly increase inequality once it exceeds approximately 11 percent annually. Below this threshold, moderate inflation may actually reduce inequality, possibly through its effect on real debt burdens and nominal wage rigidities. Above this threshold, the disruptive effects of high inflation—including wealth redistribution toward asset holders and greater economic uncertainty—dominate.

This non-linear finding has important policy implications, particularly for emerging economies that periodically experience high inflation episodes. It suggests that moderate inflation (5-10 percent) may not be particularly harmful for income distribution, while high inflation (>20 percent) significantly

increases inequality. Türkiye's experience with inflation rates above 50 percent in several years of this sample period highlights the relevance of this finding.

Table 4.: System GMM Estimation Results

Variable	Model 1	Model 2	Model 3	Model 4
L.GINI	0.783***	0.761***	0.772***	0.769***
	(0.089)	(0.092)	(0.091)	(0.093)
GDP per capita	0.0012*	0.0014*	0.0013*	0.0011
	(0.0007)	(0.0008)	(0.0007)	(0.0008)
(GDP per capita) ²	-0.0000**	-0.0000*	-0.0000*	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Inflation	0.023	0.019	-0.041*	0.021
	(0.018)	(0.019)	(0.024)	(0.019)
Inflation ²	—	—	0.0018***	—
			(0.0006)	
Unemployment	0.298***	0.284***	0.291***	0.276***
	(0.074)	(0.079)	(0.076)	(0.078)
Trade openness	-0.151***	-0.142***	-0.148***	-0.139***
	(0.038)	(0.041)	(0.039)	(0.040)
Government expenditure	—	-0.087*	—	-0.079
		(0.046)		(0.048)
Observations	340	335	338	332
Countries	20	20	20	20
Hansen p-value	0.284	0.312	0.267	0.298
AR(1) p-value	0.002	0.003	0.002	0.003
AR(2) p-value	0.143	0.167	0.152	0.159
Number of instruments	14	16	15	17

III.IV. Regional Heterogeneity

Model 4 includes regional dummy variables to capture systematic differences across regions. While the full results are not tabulated for brevity, Latin American countries are found to exhibit Gini coefficients approximately 8-10 points higher than other regions (the omitted category includes Europe and Asia), even after controlling for macroeconomic fundamentals. This regional effect likely reflects historical, institutional, and structural factors including land concentration, colonial legacies, and weak redistributive institutions. African countries (represented only by South Africa in this sample) show even higher inequality levels, while European emerging economies exhibit lower baseline inequality.

Importantly, the coefficients on these key macroeconomic variables remain stable across specifications, suggesting that the relationships identified hold broadly across this diverse sample of emerging economies. This consistency enhances confidence in the external validity of these findings.

III.V. Türkiye-Specific Analysis

Two sets of Türkiye-specific analyses are conducted to examine whether Türkiye exhibits unique inequality dynamics relative to peer emerging markets. Türkiye experienced highly volatile inflation during this sample period, with annual rates ranging from 6.5 percent (2011) to 85.5 percent (2022), and standard deviation of 19.4 percent substantially higher than the sample average of 8.2 percent. It is hypothesized that inflation volatility may amplify inequality beyond the level effect captured in the baseline models. To test this, a rolling three-year inflation volatility measure is constructed and an augmented specification is estimated including: a Türkiye dummy, an interaction between the Türkiye dummy and inflation, and an interaction between the Türkiye dummy and inflation volatility. Table 5 presents these results. Column 1 reproduces this baseline for comparison. Column 2 adds the Türkiye dummy and Türkiye×Inflation interaction. Column 3 further adds the Türkiye×Inflation Volatility interaction.

The results reveal important Türkiye-specific patterns. First, after controlling for macroeconomic fundamentals, Türkiye's baseline inequality level does not differ significantly from peer countries (Türkiye dummy coefficient = 1.23, $p = 0.31$). This suggests that Türkiye's relatively high observed inequality primarily reflects its macroeconomic volatility rather than unique structural features. Second, the Türkiye×Inflation interaction is positive and significant (0.035, $p < 0.05$), indicating that inflation's inequality-increasing effect is approximately 50 percent stronger in Türkiye than in other sample countries (baseline inflation effect = 0.023). This amplification likely reflects Türkiye's history of high and volatile inflation, which has eroded trust in the lira, encouraged dollarization, and created greater uncertainty about real incomes. Third, the Türkiye×Inflation Volatility interaction is positive and highly significant (0.041, $p < 0.01$). A one-standard-deviation increase in inflation volatility raises Gini by approximately 0.79 points in Türkiye—a substantial effect. This finding suggests that inflation stability, not just low average inflation, is crucial for inequality reduction in Türkiye. Türkiye is compared with peer upper-middle-income countries in the sample: Mexico, Brazil, Romania, and Bulgaria.

Table 5, Column 4 restricts the sample to these five countries and re-estimates Model 1. In Türkiye, a one percentage point increase in unemployment raises Gini by 0.41 points in the peer sample versus 0.30 points in the full sample, suggesting that Türkiye's labor market institutions may provide less protection against unemployment shocks. The trade openness coefficient is virtually identical (-0.15 vs. -0.14), suggesting that trade's equalizing effect operates similarly across upper-middle-income emerging markets. The lagged Gini coefficient is 0.82 in the peer sample versus 0.78 in the full sample, though this difference is not statistically significant. Both the level and volatility of inflation significantly increase inequality in Türkiye. Achieving and maintaining single-digit inflation should be the top priority, consistent with Türkiye's inflation-targeting framework adopted in 2006 (though frequently interrupted).

Table 5.: Estimation Results for Türkiye

Variable	(1) Baseline	(2) Türkiye×Inflation	(3) Volatility	(4) Peer Group
L.GINI	0.783***	0.779***	0.771***	0.819***
	(0.089)	(0.091)	(0.093)	(0.118)
GDP per capita	0.0012*	0.0012*	0.0011	0.0014*
	(0.0007)	(0.0007)	(0.0007)	(0.0008)
(GDP per capita) ²	-0.0000**	-0.0000**	-0.0000**	-0.0000*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Inflation	0.023	0.021	0.019	0.025
	(0.018)	(0.019)	(0.019)	(0.021)
Unemployment	0.298***	0.295***	0.289***	0.408***
	(0.074)	(0.075)	(0.076)	(0.102)
Trade openness	-0.151***	-0.149***	-0.146***	-0.138**
	(0.038)	(0.039)	(0.040)	(0.055)
Türkiye dummy	—	1.234	0.987	—
		(1.142)	(1.189)	
Türkiye × Inflation	—	0.035**	0.033**	—
		(0.017)	(0.016)	
Türkiye × Inflation Volatility	—	—	0.041***	—
			(0.013)	
Observations	340	340	340	118
Countries	20	20	20	5
Sample	All	All	All	TR,MX,BR,RO,BG
Hansen p-value	0.284	0.271	0.259	0.308
AR(1) p-value	0.002	0.002	0.003	0.004
AR(2) p-value	0.143	0.149	0.155	0.172
Number of Instruments	14	16	17	14

The higher unemployment sensitivity suggests that Türkiye could benefit from enhanced unemployment insurance, job matching services, and active labor market policies to cushion the distributional impact of joblessness. The strong negative trade-inequality relationship applies to Türkiye as well as peer countries, suggesting that trade openness should be maintained even during periods of macroeconomic stress. The high inequality persistence (0.78) means that reducing inequality requires sustained, multi-year policy commitment. Temporary or inconsistent interventions will have limited lasting impact. The critical role of inflation stability in Türkiye contrasts with some other emerging markets where structural factors (e.g., land concentration in Latin America) dominate macroeconomic variables. For Türkiye, sound macroeconomic management—particularly price stability—appears to be the most direct path toward reducing inequality.

III.VI. Robustness Checks

Extensive robustness checks are conducted to validate the findings, paying particular attention to data quality concerns and specification sensitivity. Table 6 presents the core robustness check: sensitivity to countries with low Gini coverage. Column 1 reproduces this baseline Model 1 for reference. Column 2 excludes the five countries with coverage below 50 percent (India, South Africa, Malaysia, Philippines, Chile), reducing the sample to 15 countries with strong data quality. Column 3 further restricts the sample to countries with at least 70 percent coverage (12 countries). The results are largely robust to sample restrictions. The unemployment coefficient remains large, positive, and highly significant across all columns (0.298, 0.312, 0.285), varying by less than 10 percent. Trade openness maintains strong negative effects (-0.151, -0.138, -0.147). The inflation coefficient, insignificant in the linear specification, shows similar patterns across samples.

However, the Kuznets hypothesis coefficients are more sensitive. In the high-quality subsample (Column 2), the GDPPC² term loses significance ($p = 0.14$), while in the very-high-quality subsample (Column 3), it regains marginal significance ($p = 0.09$). This instability suggests that the Kuznets finding, already modest in this baseline, should be interpreted with particular caution.

Importantly, all specifications pass diagnostic tests. Hansen p -values range from 0.22 to 0.31, well above the 0.10 threshold, and AR(2) tests consistently fail to reject the null of no second-order correlation. The number of instruments remains comfortably below the number of groups in all cases.

Table 6.: Robustness Checks – Missing Data Sensitivity

Variable	(1) Baseline All Countries	(2) High Coverage 15 Countries	(3) Very High Coverage 12 Countries
L.GINI	0.783***	0.791***	0.776***
	(0.089)	(0.095)	(0.102)
GDP per capita	0.0012*	0.0009	0.0011*
	(0.0007)	(0.0008)	(0.0007)
(GDP per capita) ²	-0.0000**	-0.0000	-0.0000*
	(0.0000)	(0.0000)	(0.0000)
Inflation	0.023	0.019	0.025
	(0.018)	(0.020)	(0.019)
Unemployment	0.298***	0.312***	0.285***
	(0.074)	(0.081)	(0.079)
Trade openness	-0.151***	-0.138***	-0.147***
	(0.038)	(0.042)	(0.040)
Observations	340	298	268
Countries	20	15	12
Excluded Countries	None	IN, ZA, MY, PH, CL	+ MX, HU, CN
Hansen p-value	0.284	0.267	0.312
AR(1) p-value	0.002	0.003	0.002
AR(2) p-value	0.143	0.158	0.167
Number of instruments	14	14	13

Table 7 compares System GMM with alternative estimators and specifications. Column 1 reproduces baseline Model 1. Column 2 reports difference GMM (Arellano-Bond, 1991), which uses only lagged levels as instruments for first-differenced equations. Column 3 shows System GMM with stricter lag structure (lags 2-3 instead of 2-4). Column 4 presents one-step System GMM instead of two-step.

The key coefficients remain stable across estimators. Difference GMM yields qualitatively identical results but with larger standard errors, reflecting the well-known efficiency loss of this estimator for persistent series (Blundell & Bond, 1998). The stricter lag structure produces nearly identical point estimates with slightly wider confidence intervals—exactly it is what expected from reduced instrument count. The one-step estimator yields similar coefficients but wider standard errors, consistent with the efficiency advantage of two-step GMM after finite-sample correction (Windmeijer, 2005).

One notable difference: the Hansen test for difference GMM shows marginal p-value (0.09), just below the conventional 0.10 threshold. While this does not necessarily invalidate the estimates, it does support this preference for System GMM, which passes the Hansen test comfortably ($p = 0.28$).

Table 7.: Robustness Check – Alternative GMM Specifications

Variable	(1) System GMM (Baseline)	(2) Difference GMM (AB-1991)	(3) Strict Lags (Lags 2-3)	(4) One-Step System GMM
L.GINI	0.783***	0.768***	0.779***	0.781***
	(0.089)	(0.124)	(0.097)	(0.104)
GDP per capita	0.0012*	0.0011	0.0013*	0.0012
	(0.0007)	(0.0009)	(0.0007)	(0.0008)
(GDP per capita) ²	-0.0000**	-0.0000*	-0.0000**	-0.0000*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Inflation	0.023	0.026	0.021	0.024
	(0.018)	(0.022)	(0.019)	(0.021)
Unemployment	0.298***	0.291***	0.305***	0.297***
	(0.074)	(0.095)	(0.078)	(0.087)
Trade openness	-0.151***	-0.148***	-0.149***	-0.153***
	(0.038)	(0.046)	(0.040)	(0.044)
Observations	340	340	340	340
Countries	20	20	20	20
Hansen p-value	0.284	0.090	0.297	0.286
AR(1) p-value	0.002	0.001	0.002	0.002
AR(2) p-value	0.143	0.156	0.148	0.142
Number of Instruments	14	12	11	14

The sample is split into pre-crisis (2000-2012) and post-crisis (2013-2024) periods to test coefficient stability. Results (not tabulated) show that unemployment and trade coefficients are stable across periods. The inflation non-linearity appears stronger in the post-crisis period, possibly reflecting the more heterogeneous inflation experiences after 2013. The Kuznets coefficients are insignificant in both subperiods separately, though this may reflect reduced power in smaller samples.

Robustness to different instrument sets is tested: (i) lags 2-3 only, (ii) lags 2-5, and (iii) lags 3-4. Results (available upon request) show that coefficients vary by less than 10 percent across specifications, and all diagnostic tests remain satisfied. The Hansen test p-values range from 0.19 to 0.34, providing no evidence of invalid instruments. South Africa has markedly higher inequality (Gini = 62.4) than other sample countries. Results are re-estimated excluding South Africa and it is found that results are virtually unchanged (coefficient differences < 5 percent), suggesting these findings are not driven by this outlier.

These extensive robustness checks confirm the stability of these main findings. Trade openness and unemployment effects are robust across all reasonable specification choices and sample restrictions. The Kuznets hypothesis finding is more fragile, supporting this interpretation of "modest evidence" in Section III.I. The inflation non-linearity is robust to GMM specifications and sample restrictions. Overall, diagnostic tests consistently support instrument validity and correct specification.

CONCLUSION

This study examines the macroeconomic determinants of income inequality across 20 emerging market economies spanning 2000-2024, employing the two-step System GMM estimator to address endogeneity, dynamics, and unobserved heterogeneity. This comprehensive empirical strategy -testing for non-linearities, conducting extensive robustness checks, and analyzing country-specific patterns- yields several important contributions to the inequality literature. This most robust finding concerns trade openness, which significantly and consistently reduces income inequality. A 10-percentage point increase in the trade-to-GDP ratio reduces the Gini coefficient by approximately 1.5 points- economically meaningful and statistically robust across all specifications and sample restrictions. This result challenges protectionist policy narratives and suggests that emerging economies benefit from globalization through efficiency gains, technology transfer, and competition effects that limit rent extraction. The finding aligns with recent cross-country evidence (Jaumotte et al., 2013) while providing more rigorous identification through System GMM. Unemployment emerges as a powerful driver of inequality, with each percentage point increasing the Gini coefficient by 0.3 points. This substantial effect -surviving all robustness checks -underscores that labor market outcomes fundamentally shape distributional outcomes. The finding confirms theoretical predictions (Blanchflower & Oswald, 1995) while providing policy-relevant quantification: moving from 5% to 10% unemployment increases inequality by 1.5 Gini points, comparable to moving from Poland's inequality level to Mexico's. This evidence regarding the Kuznets hypothesis is more nuanced. An inverted-U relationship is found with a turning point around \$12,000 GDP per capita, but this result shows some specification-sensitivity. This measured interpretation contributes to recent literature questioning the hypothesis's universal applicability (Piketty, 2014; Milanovic, 2016). Modern inequality dynamics -driven by skill-biased technological change, financialization, and globalization- differ from the historical agricultural-industrial transitions that motivated Kuznets's original formulation. These findings suggest that while development trajectories may exhibit Kuznets-type patterns, they are neither automatic nor universal. A key methodological contribution is this identification of inflation's non-linear effect on inequality. Previous studies using linear specifications often found weak or insignificant results, creating an empirical puzzle given strong theoretical prediction. This quadratic specification reveals a U-shaped relationship with a threshold around 11% annually: moderate inflation (5-10%) appears distributionally neutral or mildly beneficial, while high inflation substantially increases inequality. This finding reconciles theory with evidence and provides clear policy guidance. The Türkiye-specific analysis reveals economically important heterogeneity. Inflation's inequality effect operates approximately 50% more strongly in Türkiye than in peer countries (interaction coefficient 0.035, $p < 0.05$), with inflation volatility creating additional distributional damage (coefficient 0.041, $p < 0.01$). These findings likely reflect institutional factors: Türkiye's experience with high and volatile inflation in the 1990s-2000s created distributional mechanisms— incomplete wage and transfer indexation, dollarization pressures, and weakened credibility of nominal anchors—that amplify inflation's inequality effects. Importantly,

Türkiye's baseline inequality level (after controlling for fundamentals) does not differ significantly from comparable emerging markets (Türkiye dummy coefficient 1.23, $p=0.31$). This suggests that Türkiye's higher observed inequality primarily reflects macroeconomic volatility—particularly inflation—rather than fundamental structural or institutional differences. This is encouraging from a policy perspective: achieving inflation stability could substantially reduce Türkiye's inequality relative to peers.

The policy implications are clear and actionable. Emerging market policymakers seeking to reduce inequality should prioritize: (1) employment creation through countercyclical macroeconomic management and labor market reforms; (2) trade openness paired with adjustment assistance for displaced workers; (3) single-digit inflation with low volatility; (4) well-targeted government expenditure emphasizing progressive social transfers; and (5) inclusive financial development expanding credit access beyond large firms. For Türkiye specifically, achieving inflation stability emerges as the highest-priority inequality-reduction policy, given the country's disproportionate sensitivity to price instability. The finding that Türkiye's baseline inequality (after controlling for fundamentals) does not differ from peers is encouraging -it suggests that macroeconomic stabilization alone could substantially reduce Türkiye's inequality gap. The high persistence of inequality documented -with lagged Gini coefficients of 0.76-0.78- carries both challenges and opportunities. Current inequality strongly predicts future inequality, meaning that temporary policy interventions will have limited lasting impact. This persistence demands sustained, multi-year policy commitment rather than episodic or politically expedient measures. However, this same persistence means that successful inequality reduction creates self-reinforcing dynamics. Countries that sustain low unemployment, maintain trade openness, and achieve price stability will see inequality reductions compound over time. These findings speak to broader debates about growth and distribution in developing economies. The weak support for automatic Kuznets-type inequality reduction suggests that policymakers cannot rely on development itself to reduce inequality -active policy intervention is necessary throughout the development process. The strong effects of unemployment and inflation highlight that macroeconomic stability is not merely a growth policy but also a distributional policy. The equalizing effect of trade openness in emerging markets -contrasting with mixed effects in advanced economies -suggests that globalization's distributional consequences depend on country context. Income inequality poses one of the central challenges for emerging market economies in the 21st century. This analysis demonstrates that macroeconomic policies -particularly regarding employment, trade, and inflation -profoundly shape distributional outcomes. Unlike structural determinants such as geography or deep historical factors, macroeconomic policies are controllable by policymakers, offering concrete levers for inequality reduction. The key insight for policy is that reducing inequality does not require choosing between growth and equity. Trade openness promotes both efficiency and equality. Macroeconomic stability—low unemployment, moderate inflation -supports both growth and distributional objectives. Well-designed policies can achieve inclusive growth where the benefits of development are broadly shared. For Türkiye and similarly situated emerging markets, the message is clear: macroeconomic stability, particularly price stability, is not merely a technical central bank objective but a fundamental tool for shared prosperity. Combined with pro-employment policies, trade openness, and well-targeted fiscal expenditure, inflation stability can significantly reduce inequality while supporting growth -a rare policy win-win. As emerging economies navigate the challenges of the 2020s -technological disruption, climate transition, demographic shifts, and evolving global trade patterns -managing inequality alongside growth will require sustained policy attention. These findings provide empirical guidance for these efforts, identifying which macroeconomic levers most powerfully shape distributional outcomes and deserve priority in constrained policy environments. The persistence of inequality documented underscores both the challenge and the opportunity: current policy choices will shape inequality for years to come, but sustained commitment to sound macroeconomic management can achieve substantial and lasting inequality reduction. This is the promise and the challenge for emerging market economies in the decades ahead.

One methodological limitation of the present analysis concerns the treatment of non-linearities. While squared terms are employed to identify turning points in the inflation-inequality and income-inequality relationships, threshold regression models and their extensions (Hansen, 1999; Seo & Shin, 2016) would arguably provide a more theoretically rigorous treatment of regime changes. Such models allow the threshold value itself to be estimated endogenously rather than inferred from the derivative of a quadratic

specification. The sample size of 20 countries, while adequate for System GMM, constrains the degrees of freedom available for threshold panel estimation—particularly when country-specific thresholds are permitted. Future research employing larger cross-country panels or longer time series may profitably apply panel threshold GMM frameworks to revisit these non-linear relationships, yielding more precise turning-point estimates and allowing formal tests of regime-specific coefficient heterogeneity. Such an extension would directly complement the findings reported here and could provide more definitive guidance on the inflation and income thresholds that trigger distributional regime shifts in emerging market economies.

Ethics Statement	<i>The author declares that all ethical principles and rules were strictly observed throughout every stage of the preparation of this study. In case of any violation, ÖHÜİBF Journal is under no responsibility, and all responsibility rests solely with the author.</i>
Authors' Contributions	<i>The author has contributed to all stages of the manuscript independently.</i>
Conflict of Interest	<i>The author has no conflict of interest to declare. There is no financial interest to report. The author certifies that the submission is original work and is not under review at any other publication.</i>
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REFERENCES

- Alesina, A., & Perotti, R. (1994). The political economy of growth: A critical survey of the recent literature. *The World Bank Economic Review*, 8(3), 351-371.
- Alves, J., Baptista, F., & Coelho, J. C. (2024). The impact of labor share on economic growth: A panel data analysis for European Union. REM Working Paper 0319-2024, Research in Economics and Mathematics, ISEG - Lisbon School of Economics and Management.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58(2), 277-297.
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51.
- Asian Development Bank. (2015). Inequality in Asia and the Pacific: Trends, drivers, and policy implications. ADB Economics Working Paper Series No. 426.
- Asteriou, D., Dimelis, S., & Moudatsou, A. (2014). Globalization and income inequality: A panel data econometric approach for the EU27 countries. *Economic Modelling*, 36, 592-599.
- Baltagi, B. H. (2021). *Econometric analysis of panel data* (6th ed.). Springer.
- Banerjee, A. V., & Newman, A. F. (1993). Occupational choice and the process of development. *Journal of Political Economy*, 101(2), 274-298.
- Barro, R. J. (2000). Inequality and growth in a panel of countries. *Journal of Economic Growth*, 5(1), 5-32.
- Benabou, R. (1996). Inequality and growth. *NBER Macroeconomics Annual*, 11, 11-74.
- Blanchflower, D. G., & Oswald, A. J. (1995). An introduction to the wage curve. *Journal of Economic Perspectives*, 9(3), 153-167.

- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143.
- Bond, S. R., Hoeffler, A., & Temple, J. R. (2001). GMM estimation of empirical growth models. CEPR Discussion Paper No. 3048.
- Brueckner, M., & Lederman, D. (2018). Inequality and economic growth: The role of initial income. *Journal of Economic Growth*, 23(3), 341-366.
- Bucevska, V. (2019). Determinants of income inequality in EU candidate countries: A panel analysis. *Economic Themes*, 57(4), 397-413.
- Bun, M. J., & Windmeijer, F. (2010). The weak instrument problem of the system GMM estimator in dynamic panel data models. *The Econometrics Journal*, 13(1), 95-126.
- Calderón, C., & Chong, A. (2001). External sector and income inequality in interdependent economies using a dynamic panel data approach. *Economics Letters*, 71(2), 225-231.
- Çelik, D., & Erkişi, K. (2022). Gelişmiş ülkelerde enflasyonun gelir dağılımı üzerine olan etkisinin panel veri analizi ile incelenmesi. *Doğuş Üniversitesi Dergisi*, 23(2), 53-68. <https://doi.org/10.31671/doujournal.1076434>
- Chisadza, C., & Biyase, M. (2023). Financial development and income inequality: Evidence from advanced, emerging and developing economies. *Annals of Financial Economics*, 18(1), 1-27. <https://doi.org/10.1142/S2010495223500021>
- Chletsos, M., & Sintos, A. (2025). Entrepreneurship and income inequality: A quantile approach from global panel data. *Applied Economics*. Advance online publication. <https://doi.org/10.1080/00036846.2025.2480222>
- Chu, L. K., & Hoang, D. P. (2020). How does economic complexity influence income inequality? New evidence from international data. *Economic Analysis and Policy*, 68, 44-57.
- Cingano, F. (2014). Trends in income inequality and its impact on economic growth. OECD Social, Employment and Migration Working Papers No. 163. OECD Publishing.
- Dişbudak, C., & Süslü, B. (2007). Türkiye'de kişisel gelir dağılımını belirleyen makroekonomik faktörler. *Ekonomik Yaklaşım*, 18(65), 1-23.
- Dumlu, U., & Ayaydın, Ö. (2008). Ekonometrik modellerle Türkiye için 2006 yılı Gini katsayısı tahmini. *Ege Akademik Bakış*, 8(1), 373-393.
- Easterly, W., & Fischer, S. (2001). Inflation and the poor. *Journal of Money, Credit and Banking*, 33(2), 160-178.
- Elveren, A. Y. (2013). Gelir dağılımı çalışmaları için bir alternatif: Texas Üniversitesi Eşitsizlik Projesi veri setleri. *Anadolu Üniversitesi Sosyal Bilimler Dergisi*, 13(3), 1-18.
- Emek, Ö. F. (2022). Gelişmekte olan ülkelerde gelir dağılımına etki eden faktörler. *Journal of Erciyes Academy*, 9(1), 85-107.
- Erkal, G., Akıncı, M., & Yılmaz, Ö. (2015). Yoksulluk, gelir eşitsizliği ve ekonomik büyüme ilişkisi: Seçilmiş Doğu Avrupa ve Latin Amerika ülkeleri için ampirik bir analiz. *TİSK Akademi*, 10(19), 66-86.
- Eroğlu, N., Altaş, D., Ün, T., & Ulu, M. İ. (2017). OECD ülkelerinde sosyal yardım harcamalarının gelir dağılımına etkisi: Panel veri analizi. *Uluslararası Ekonomik Araştırmalar Dergisi*, 3(3), 335-354.
- European Commission. (2024). Eurostat database on income and living conditions (EU-SILC). <https://ec.europa.eu/eurostat>
- Filiztekin, A., & Çelik, M. A. (2010). Türkiye'de bölgesel gelir eşitsizliği. *Megaron*, 5(3), 116-127.
- Forbes, K. J. (2000). A reassessment of the relationship between inequality and growth. *American Economic Review*, 90(4), 869-887.

- Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *Review of Economic Studies*, 60(1), 35-52.
- Goldberg, P. K., & Pavcnik, N. (2007). Distributional effects of globalization in developing countries. *Journal of Economic Literature*, 45(1), 39-82.
- Güder, F., & Kurt, S. (2018). Makroekonomik değişkenlerin gelir adaletsizliği üzerine etkileri: BRIC-T ülkeleri için panel veri analizi. *International Journal of Social Sciences and Education Research*, 4(3), 464-482.
- Gülcan, E., & Yeşilkaya, F. (2024). Gelir eşitsizliği ve yoksulluğun suçluluk oranına etkisine yönelik bir araştırma. *Çalışma ve Toplum*, 1(80), 127-158. <https://doi.org/10.54752/ct.1421769>
- Gülmez, A., & Altıntaş, N. (2015). Türkiye'de ticari açıklık ve enflasyonun gelir dağılımına etkisi: Ekonometrik bir analiz. *Kafkas Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 6(9), 31-44.
- Halter, D., Oechlin, M., & Zweimüller, J. (2014). Inequality and growth: The neglected time dimension. *Journal of Economic Growth*, 19(1), 81-104.
- Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. *Journal of Econometrics*, 93(2), 345-368.
- International Labour Organization. (2024). ILOSTAT database. <https://ilostat.ilo.org>
- International Monetary Fund. (2024). World Economic Outlook database. <https://www.imf.org/en/Publications/WEO>
- İzgi, B. B., & Alyu, E. (2018). Yoksulluk ve gelir dağılımı eşitsizliği: OECD ve AB ülkeleri panel veri analizi. *Gaziantep University Journal of Social Sciences*, 17(3), 987-996.
- Jamil, A. R. M., Law, S. H., Khair-Afham, M. S., & Trinugroho, I. (2023). Financial inclusion and income inequality in developing countries: The role of aging populations. *Research in International Business and Finance*, 65, 101962.
- Jaumotte, F., Lall, S., & Papageorgiou, C. (2013). Rising income inequality: Technology, or trade and financial globalization? *IMF Economic Review*, 61(2), 271-309.
- Kim, D. H., & Lin, S. C. (2023). Income inequality, inflation and financial development. *Journal of Empirical Finance*, 72, 468-487.
- Kunawotor, M. E., Bokpin, G. A., & Barnor, C. (2020). Drivers of income inequality in Africa: Does institutional quality matter? *African Development Review*, 32(4), 718-729.
- Kuznets, S. (1955). Economic growth and income inequality. *American Economic Review*, 45(1), 1-28.
- Lee, C. C., & Vu, H. T. T. (2020). Economic complexity, human capital and income inequality: A cross-country analysis. *Japanese Economic Review*, 71(4), 695-718.
- Li, H., & Zou, H. F. (1998). Income inequality is not harmful for growth: Theory and evidence. *Review of Development Economics*, 2(3), 318-334.
- Liang, Z. (2006). Financial development and income distribution: A system GMM panel analysis with application to urban China. *Journal of Economic Development*, 31(2), 1-21.
- Little, R. J. A., & Rubin, D. B. (2002). *Statistical analysis with missing data* (2nd ed.). Wiley.
- Marques, A. C., Soukiazis, E., & Cerqueira, P. A. (2024). Social expenditure composition and inequality: A dynamic panel threshold analysis for OECD countries. *Economic Modelling*, 133, Article 106676. <https://doi.org/10.1016/j.econmod.2024.106676>
- Milanovic, B. (2016). *Global inequality: A new approach for the age of globalization*. Harvard University Press.
- Naceur, S. B., & Zhang, R. (2016). Financial development, inequality and poverty: Some international evidence. *IMF Working Paper WP/16/32*.

- Naimoğlu, M. (2023). The relationship of inflation, unemployment, financial development and income inequality in Türkiye. *Sakarya İktisat Dergisi*, 12(4), 441-462. <https://doi.org/10.16953/deusosbil.1354452>
- Narin, M., & Kutluay, D. (2013). Değişen küresel ekonomik düzen: BRIC, 3G ve N-11 ülkeleri. *Ankara Sanayi Odası Dosya Dergisi*, 30-50.
- Nguyen, T. C., Castro, V., & Wood, J. (2022). A new comprehensive database of financial crises: Identification, frequency, and duration. *Economic Modelling*, 108, 105770.
- OECD. (2024). Income distribution database (IDD). <https://www.oecd.org/social/income-distribution-database.htm>
- OECD. (2024). OECD.Stat. <https://stats.oecd.org>
- Ostry, J. D., Berg, A., & Tsangarides, C. G. (2014). Redistribution, inequality, and growth. IMF Staff Discussion Note SDN/14/02. International Monetary Fund.
- Özdemir, D., Emsen, Ö. S., Gencer, A. H., & Kılıç, C. H. (2011). Ekonomik büyüme ve gelir dağılımı ilişkileri: Geçiş ekonomileri deneyimi. *International Conference on Eurasian Economies 2011*, 440-447.
- Özdemir, O. (2019). Gelir eşitsizliği ve finansallaşma arasındaki ilişkinin panel veri analizi: Farklı gelir grupları üzerine bir uygulama. *İnsan ve Toplum Bilimleri Araştırmaları Dergisi*, 8(4), 2837-2875.
- Özdemir, O. (2021). Artan Gelir Eşitsizliği ve Adaletsizliği Sürecinde Göç Olgusu: Gelişmiş ve Gelişmekte Olan Ülkeler Özelinde Dinamik Panel Veri Analizi. (Eds. Volkan Öngel vd.) *Sosyal Bilimlerde Göç*. Ankara: Gazi Kitabevi. pp. 339-387
- Özdemir, O. (2022). Finansallaşma ve gelir eşitsizliği: Türkiye ve Avrupa Birliği üzerine dinamik panel veri analizi. *Journal of TESAM Academy*, 9(2), 443-462.
- Öztürk, N., Barışık, S., & Darıcı, H. K. (2022). Relationship between financial development and income inequality for Türkiye and selected countries with similar economy. *Journal of Contemporary Issues in Economics & Administrative Sciences*, 9(Special Issue),
- Park, C. Y., & Mercado, R. V. (2015). Financial inclusion, poverty, and income inequality in developing Asia. ADB Economics Working Paper Series No. 426.
- Peçe, M. A., Ceyhan, M. S., & Akpolat, A. (2016). Türkiye'de gelir dağılımının ekonomik büyümeye etkisi üzerine ekonometrik bir analiz. *Uluslararası Kültürel ve Sosyal Araştırmalar Dergisi*, 2(1), 135-148.
- Perotti, R. (1996). Growth, income distribution, and democracy: What the data say. *Journal of Economic Growth*, 1(2), 149-187.
- Piketty, T. (2014). *Capital in the twenty-first century*. Harvard University Press.
- Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal*, 9(1), 86-136.
- Şengür, M. (2020). Ekonomik büyüme ve gelir eşitsizliği ilişkisi: Geçiş ekonomileri örneği. *Bingöl Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 10(20), 365-382.
- Seo, M. H., & Shin, Y. (2016). Dynamic panels with threshold effect and endogeneity. *Journal of Econometrics*, 195(2), 169-186.
- Siarni-Namini, S., & Hudson, D. (2019). Inflation and income inequality in developed and developing countries. *Journal of Economic Studies*, 46(3), 611-632.
- Solt, F. (2020). Measuring income inequality across countries and over time: The Standardized World Income Inequality Database (SWIID). *Social Science Quarterly*, 101(3), 1183-1199. SWIID Version 9.5. <https://fsolt.org/swiid/>
- Son, H. H., & Kim, N. (2016). Economic growth and income inequality: Evidence from dynamic panel investigation. *Global Economic Review*, 45(4), 331-358.

- Stock, J. H., & Yogo, M. (2005). Testing for weak instruments in linear IV regression. In D. W. K. Andrews & J. H. Stock (Eds.), *Identification and inference for econometric models: Essays in honor of Thomas Rothenberg* (pp. 80-108). Cambridge University Press.
- Takım, A., Ersungur, M. Ş., Dikmen, A. T., & Aksu, L. E. (2020). Türkiye'de ekonomik büyüme ile gelir dağılımı arasındaki ilişki. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 34(1), 234-248.
- TCMB. (2024). Elektronik Veri Dağıtım Sistemi (EVDS). <https://evds2.tcmb.gov.tr>
- The World Bank. (2024). World Development Indicators. <https://databank.worldbank.org/source/world-development-indicators>
- Tsaurai, K. (2020). An empirical study of the determinants of income inequality in transitional economies using panel data analysis methods. *Academy of Accounting and Financial Studies Journal*, 24(6), 1-15.
- TÜİK. (2024). Gelir ve yaşam koşulları araştırması metodolojisi. Türkiye İstatistik Kurumu.
- United Nations Conference on Trade and Development. (2023). Wealth distribution, income inequality and financial inclusion: A panel data analysis. UNCTAD Research Paper No. 4
- University of Texas Inequality Project. (2024). Estimated Household Income Inequality (EHII). <https://utip.gov.utexas.edu/data.html>
- UNU-WIDER. (2024). World Income Inequality Database (WIID). <https://www.wider.unu.edu/database/wiid>
- Üzümcü, A., & Korkat, M. (2014). Türkiye'de gelir dağılımı adaletsizliği ve yoksullukla mücadelede sosyal yardımların gelişimi (2003-2012). *Kafkas Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 5(8), 135-166.
- Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics*, 126(1), 25-51.
- Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). MIT Press.
- World Bank. (2022). *Poverty and shared prosperity 2022: Correcting course*. World Bank Group.
- Yaşar, S. (2022). Gelir dağılımı ile kamu borçları arasındaki ilişki: OECD ülkeleri için panel ARDL analizi. *MANAS Sosyal Araştırmalar Dergisi*, 11(3), 1099-1110.
- Yıldız, F. (2020). Türkiye'de gelir eşitsizliği suç ilişkisi panel veri analizi yaklaşımı. *İnsan & Toplum*, 10(4), 111-143.
- Zandi, G., Haseeb, M., Abidin, I. S. Z., Khaw, K. L. J., & Jermisittiparsert, K. (2019). Macroeconomic determinants of income inequality: Evidence from developing countries. *Journal of Reviews on Global Economics*, 8, 869-882.