Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

# Capital Account Liberalization, Exchange Rate Regimes, and Income Inequality: Evidence from a Panel Threshold Analysis

**Mekki Hamdaoui**

mekkihamdaoui@yahoo.fr

Higher Institute of Informatics and Management of Kairouan (ISIGK), University of Kairouan, Tunisia

**Radhia Amairia**

Faculty of Economic Sciences and Management of Sousse (FSEGs), University of Sousse, Tunisia

**Ramzi Ben Abdejlil**

Faculty of Economic Sciences and Management of Sousse (FSEGs), University of Sousse, Tunisia

**Research Article**

**Keywords:** Capital account liberalization, exchange rate regime, income inequality and Panel threshold regression

**Posted Date:** June 18th, 2026

**DOI:** https://doi.org/10.21203/rs.3.rs-8994517/v1

**License:** This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

**Additional Declarations:** No competing interests reported.

# Capital Account Liberalization, Exchange Rate Regimes, and Income Inequality: Evidence from a Panel Threshold Analysis

**Mekki Hamdaoui**[1,a*] , **Radhia Amairia**[2,b] and **Ramzi Ben Abdejlil** [3,c]

## Abstract

This paper investigates the impact of capital account liberalization on income inequality, highlighting the role of exchange rate regimes as a conditioning factor. Although financial openness has been widely studied in relation to economic growth and macroeconomic stability, its distributional implications remain less clear, particularly when macroeconomic regimes are considered. Using an unbalanced panel of 48 developed and developing countries over the period 1984–2020, the analysis employs multiple measures of income inequality to capture different dimensions of distributional outcomes.

Methodologically, the study applies both static and dynamic panel threshold models that allow for regime-dependent effects and heterogeneous adjustment dynamics. The empirical strategy explicitly accounts for cross-sectional dependence, nonstationarity, and endogeneity. Exchange rate regime flexibility is used as the threshold variable to identify nonlinear effects of capital account liberalization on income inequality.

The results reveal a significant nonlinear relationship. Capital account liberalization tends to reduce income inequality under fixed or managed exchange rate regimes, whereas it increases inequality in economies operating under more flexible regimes. The dynamic analysis also confirms strong persistence in inequality and highlights differences in short- and long-run effects across regimes. In addition, factors such as education, financial development, trade openness, and institutional quality influence the magnitude of these effects.

Overall, the findings suggest that the distributional impact of financial openness depends crucially on the macroeconomic environment in which liberalization occurs. Consequently, it is essential for policymakers to align capital account strategies with exchange rate management and institutional reforms to maximize widespread benefits.

**Keywords:** Capital account liberalization; exchange rate regime; income inequality and Panel threshold regression.

## 1. Introduction

Over the past four decades, income inequality has re-emerged as a central concern in economic research and policy debates. While globalization and financial integration have been widely promoted as engines of growth and efficiency, their distributional consequences remain deeply contested. In particular, the liberalization of capital accounts, one of the defining features of financial globalization, has generated

***corresponding author.**
Email : mekkihamdaoui@yahoo.fr **(M. Hamdaoui)**
**Conflict of Interest:** The authors declare no conflict of interest related to this research, its findings, or its publication.
**Data Availability Statement:** The data supporting the findings of this study are available upon request from the corresponding author.
**AI usage:** We use Chat GPT for traducing and refining some parts of our work.
[1] mekkihamdaoui@yahoo.fr (https://orcid.org/0000-0002-4022-2543)
[1] radhia.amairia2015@yahoo.fr (https://orcid.org/0009-0003-9649-8383)
[3] Ramzi.benabdejlil84@gmail.com(https://orcid.org/0009-0003-6707-774X)
a: Higher Institute of Informatics and Management of Kairouan (ISIGK), University of Kairouan, Tunisia, **Modeling, financing and economic development (MOFID-LR21ES28) .**
b and c: Faculty of Economic Sciences and Management of Sousse (FSEGs), University of Sousse, Tunisia.

substantial controversy regarding its impact on income distribution, especially in developing and emerging economies.

From a theoretical perspective, the effect of capital account liberalization on inequality is ambiguous. Standard models suggest that financial openness can foster investment, employment, and productivity growth, potentially benefiting lower-income groups through job creation and income convergence. However, alternative frameworks emphasize that capital flows may disproportionately accrue to capital owners, increase returns to skills, amplify macroeconomic volatility, and expose vulnerable households to external financial shocks. As a result, financial liberalization may exacerbate income disparities rather than reduce them.

Empirical evidence reflects this ambiguity. A growing body of research documents a positive association between financial openness and income inequality, particularly in economies with weak institutions or limited financial inclusion (Jaumotte et al., 2013; Furceri and Loungani, 2018). Other studies, however, find that the distributional impact of financial liberalization depends critically on domestic conditions, including institutional quality, financial development, and macroeconomic policy frameworks (Beck et al., 2007; Kose et al., 2011). These findings suggest that inequality outcomes are not inherent to liberalization itself but are shaped by the broader economic environment in which it occurs.

Despite these advances, an important dimension remains underexplored: the role of exchange rate regimes in mediating the inequality effects of capital account liberalization. Exchange rate arrangements influence how economies absorb external shocks, affect relative prices, and shape labor market adjustments. In financially open economies, exchange rate flexibility can amplify capital flow volatility and balance-sheet effects, with potentially uneven distributional consequences across income groups. Conversely, more stable or managed exchange rate regimes may smooth adjustment processes and mitigate the adverse impacts of external financial shocks on inequality.

Surprisingly, the existing inequality literature has paid limited attention to this interaction. Most empirical studies either abstract from exchange rate regimes or include them merely as control variables, without explicitly examining their moderating role. This omission is particularly striking given the extensive macroeconomic literature documenting the importance of exchange rate regimes in shaping the transmission of global financial cycles (Rey, 2015) and domestic economic outcomes.

This paper aims to fill this gap by examining whether and how the effect of capital account liberalization on income inequality depends on the exchange rate regime in place. Using a panel of 48 developed and developing countries over the period 1984–2020, we employ both static and dynamic panel threshold models to allow the impact of financial openness to vary across exchange rate regimes. This nonlinear approach enables us to capture regime-dependent effects while accounting for the persistence of income inequality and the dynamic nature of adjustment processes.

A key feature of our analysis is the use of multiple indicators of income inequality, reflecting the multidimensional nature of distributional outcomes and addressing concerns related to measurement error and data comparability. Specifically, we rely on harmonized Gini coefficients derived from internationally comparable sources, which allow for consistent cross-country and inter-temporal analysis. Where relevant, we distinguish between alternative definitions of inequality (e.g., market versus disposable income) to assess the robustness of our findings. The use of multiple inequality measures strengthens the credibility of the results and aligns with best practices in the empirical inequality literature (Atkinson and Brandolini, 2001; Solt, 2020).

Methodologically, the paper contributes to the literature by combining nonlinear threshold models with dynamic panel techniques that explicitly address cross-sectional dependence, nonstationarity, and endogeneity—issues that are particularly salient in long-panel studies of inequality and financial globalization. By distinguishing between short-run and long-run effects, the analysis sheds light on both the

immediate and persistent distributional consequences of capital account liberalization under different exchange rate regimes.

Our findings indicate that the relationship between financial openness and income inequality is highly context-dependent. Capital account liberalization tends to reduce inequality under relatively stable exchange rate regimes, while it exacerbates inequality in more flexible regimes. These effects are economically meaningful and persist over time, highlighting the importance of macroeconomic policy frameworks in shaping the inclusiveness of financial globalization.

The paper contributes to the literature on income inequality in three main ways. First, it provides new evidence on the conditional nature of the liberalization–inequality nexus by explicitly incorporating exchange rate regimes as a moderating factor. Second, it adopts a dynamic and nonlinear empirical framework that captures the persistence and regime dependence of inequality. Third, it offers policy-relevant insights into how macroeconomic regimes and institutional conditions can influence the distributional outcomes of financial integration.

The remainder of the paper is organized as follows. Section 2 reviews the related literature on financial openness, exchange rate regimes, and income inequality. Section 3 describes the data, inequality measures, and sample selection in detail. Section 4 presents the econometric methodology. Section 5 discusses the empirical results, while Section 6 concludes with policy implications.

## 2. Literature Review

### 2.1 Financial Globalization and Income Inequality

The relationship between financial globalization and income inequality has attracted growing attention over the past two decades, particularly in light of rising inequality within and across countries. Early contributions emphasized the growth-enhancing potential of financial openness, suggesting that liberalized capital flows could improve resource allocation, relax financing constraints, and foster convergence between rich and poor economies (Obstfeld, 1998; Henry, 2007). In this view, the benefits of openness would eventually trickle down to lower-income groups through higher employment and productivity.

However, subsequent research has increasingly questioned this optimistic perspective. A prominent strand of the literature argues that financial globalization tends to disproportionately benefit capital owners and skilled workers, thereby widening income disparities. Jaumotte et al. (2013) provide influential evidence that financial openness, more than trade openness, is associated with rising inequality, particularly by increasing the income share of top earners. Similarly, Furceri and Loungani (2018) show that capital account liberalization episodes are often followed by persistent increases in inequality, driven by declines in labor income shares.

These findings are consistent with theoretical mechanisms emphasizing asymmetric access to financial markets, skill-biased capital inflows, and the concentration of financial rents. In economies where financial inclusion is limited, the gains from capital liberalization accrue mainly to firms and households already integrated into global financial markets, leaving poorer segments relatively excluded (Galor and Zeira, 1993; Banerjee and Newman, 1993).

### 2.2 Capital Account Liberalization: Conditional and Nonlinear Effects

More recent contributions emphasize that the inequality effects of capital account liberalization are highly conditional on country-specific characteristics. Kose et al. (2011) argue that financial openness yields net benefits only once certain threshold conditions, such as institutional quality, financial depth, and macroeconomic stability, are met. Below these thresholds, liberalization may increase volatility and inequality.

Empirical studies adopting nonlinear or interaction-based frameworks support this view. For instance, de Haan and Sturm (2017) show that the distributional consequences of financial openness depend on institutional strength, while Dabla-Norris et al. (2015) highlight the role of financial development in shaping inequality outcomes. These findings resonate with broader inequality research stressing that policies do not operate in a vacuum but interact with existing economic and institutional structures (Atkinson, 2015).

Despite this growing recognition of heterogeneity, most studies treat capital account liberalization as having homogeneous effects across macroeconomic regimes. The potential role of exchange rate arrangements as a conditioning factor has received comparatively little attention in the inequality literature.

### 2.3 Exchange Rate Regimes and Distributional Outcomes

Exchange rate regimes have long been studied in open-economy macroeconomics for their role in shaping macroeconomic adjustment, external competitiveness, and crisis vulnerability (Friedman, 1953; Ghosh et al., 2014). More recently, scholars have begun to explore their distributional implications.

From a theoretical standpoint, exchange rate flexibility affects inequality through multiple channels. Currency depreciations alter relative prices, real wages, and the cost of imported consumption goods, with heterogeneous effects across income groups. In economies with widespread foreign-currency debt, exchange rate volatility can worsen balance-sheet positions and disproportionately harm low-income households through higher inflation and unemployment (Aghion et al., 2009).

Empirical evidence suggests that exchange rate instability is often associated with higher inequality, particularly in developing economies. Calderón and Chong (2001) find that macroeconomic volatility, including exchange rate volatility, tends to increase income inequality. Moreover, Rey (2015) shows that under high capital mobility, exchange rate flexibility does not necessarily insulate economies from global financial cycles, potentially amplifying distributional risks.

### 2.4 Capital Flows, Exchange Rate Regimes, and Inequality: A Missing Link

While the literatures on financial globalization and exchange rate regimes have evolved largely in parallel, their intersection remains underexplored in the context of income inequality. Existing studies typically examine either the impact of capital openness on inequality or the macroeconomic consequences of exchange rate regimes, without explicitly analyzing their interaction.

A small number of contributions hint at the importance of this nexus. Furceri et al. (2019) suggest that macroeconomic policy frameworks can shape the social costs of capital flow volatility, while Ostry et al. (2021) emphasize the distributional implications of capital flow management measures. However, these studies do not formally test whether exchange rate regimes condition the inequality effects of capital account liberalization.

This gap is particularly relevant given that many developing and emerging economies have pursued financial liberalization alongside varying degrees of exchange rate flexibility. Understanding how these policy choices interact is crucial for assessing whether financial globalization can be made more inclusive.

### 2.5 Contribution to the Literature

This paper contributes to the literature on economic inequality in several important ways. First, it explicitly integrates exchange rate regimes into the analysis of the liberalization–inequality relationship, offering new evidence on how macroeconomic frameworks shape distributional outcomes. Second, it adopts a nonlinear threshold approach that allows the impact of capital account liberalization to differ across regimes, moving beyond linear and homogeneous specifications common in earlier work. Third, by employing multiple

inequality indicators and a long cross-country panel, the study aligns with best practices in inequality measurement and enhances the robustness of the findings.

By bridging the gap between open-economy macroeconomics and the economics of inequality, this paper speaks directly to the core concerns of economic Inequality, offering insights into how macroeconomic policy choices influence the distribution of income in an increasingly globalized world.

## 3. Data and Descriptive Statistics

## 3.1 Sample Selection and Coverage

The empirical analysis is based on an unbalanced panel of 48 countries, comprising both advanced and developing economies, over the period 1984–2020. The sample selection is primarily driven by data availability for income inequality, capital account liberalization, and exchange rate regime indicators over a sufficiently long time horizon. This mixed sample allows us to capture heterogeneity in institutional quality, financial development, and macroeconomic structures, which is essential for analyzing the distributional consequences of financial openness.

Including both developed and developing countries is particularly relevant for inequality analysis, as prior research has shown that the effects of financial globalization on income distribution differ substantially across income levels and stages of development (Milanovic, 2016; IMF, 2017). The long time span enables the examination of both short-run dynamics and persistent long-run effects, while also covering key episodes of financial liberalization, exchange rate regime shifts, and global financial crises.

### 3.2 Endogenous variables: Income Inequality Measures

Accurate measurement of income inequality is a central concern in empirical research on distributional outcomes and is particularly salient for cross-country analyses spanning long time horizons. Differences in income concepts, survey methodologies, and data availability across countries can substantially affect inequality estimates and, if not properly addressed, may bias empirical inference. In line with best practice in the inequality literature, this study adopts a multi-dataset strategy that explicitly balances cross-country comparability, temporal coverage, and measurement transparency.

Our primary measure of income inequality is drawn from the Standardized World Income Inequality Database (SWIID)[4], complemented by data from the World Income Inequality Database (WIID) compiled by UNU-WIDER. This combined approach reflects a conscious methodological choice motivated by the strengths and limitations of each dataset.

The WIID represents one of the most extensive repositories of inequality data available, compiling Gini coefficients from national household surveys, international organizations, and academic studies. Its principal advantage lies in the richness and transparency of its raw data, covering multiple income concepts—including market income, disposable income, and consumption-based measures—across a wide range of countries and years. However, as widely acknowledged in the literature, the heterogeneity of data sources and survey methodologies within the WIID poses significant challenges for cross-country and intertemporal comparability (Atkinson & Brandolini, 2001; Jenkins, 2015). These limitations are particularly problematic in macro-panel settings where comparability is crucial for identifying regime-dependent effects.

[4] The SWIID draws upon multiple major data sources, notably the United Nations World Income Database (UNU-WIDER) and the Luxembourg Income Study (LIS). It consolidates information from a broad range of datasets, including the OECD Income Distribution Database, the Socio-Economic Database for Latin America and the Caribbean (CEDLAS and the World Bank), Eurostat, the World Bank's PovcalNet, the UN Economic Commission for Latin America and the Caribbean, as well as national statistical offices and various other sources worldwide. To ensure greater cross-country comparability, the database gives particular priority to information from the Luxembourg Income Study (Solt, 2009).

To address these concerns, we rely primarily on the SWIID, originally developed by Solt (2009) and updated in Solt (2020), which explicitly prioritizes international comparability. The SWIID harmonizes inequality estimates from the WIID and other sources using a systematic statistical procedure anchored in the Luxembourg Income Study (LIS), widely regarded as the gold standard for cross-national income distribution data. When LIS observations are unavailable, the SWIID exploits overlapping country-year observations to estimate statistical relationships between LIS-based Gini coefficients and alternative inequality measures. These relationships are then used to generate LIS-equivalent inequality estimates for countries and periods lacking direct LIS coverage.

This harmonization framework substantially expands coverage, providing annual inequality series for up to 196 countries since 1960, while maintaining a high degree of consistency across space and time. At the same time, we explicitly acknowledge that the SWIID relies on model-based imputation, which has been the subject of methodological debate within the inequality literature. Rather than viewing this as a drawback per se, we follow recent empirical practice by treating the SWIID as a tool designed to minimize comparability bias in macro-level analyses, particularly when the research question concerns relative changes and regime-dependent effects rather than precise levels of inequality.

Reflecting this consensus, the SWIID has been widely adopted across disciplines. In economics, it has been used extensively in studies of inequality and macroeconomic policy (Berg et al., 2018; Darvas, 2019; Palma, 2019), while in political science it has supported analyses of institutions and redistribution (Dorsch & Maarek, 2019; Iversen & Soskice, 2019; Engler & Weisstanner, 2020). Its application in sociology (Dawson, 2018; Jaime-Castillo & Marqués-Perales, 2019; Steele, 2016), public health (Alvarez & El-Sayed, 2017; Ngamaba, 2016), and psychology (Blake et al., 2018; Schmukle et al., 2019) further underscores its empirical relevance.

The Gini coefficient, ranging from zero (perfect equality) to 100 (perfect inequality), serves as our main inequality indicator. Compared with alternative sources such as the Estimated Household Income Inequality Dataset (EHII), the World Inequality Database (WID), and inequality indicators reported in the World Development Indicators (WDI), the SWIID offers superior temporal continuity and cross-country consistency, features that are essential for dynamic panel threshold estimation over a multi-decade horizon.

Where data permit, we distinguish between market income inequality, which reflects income distribution before taxes and transfers, and disposable income inequality, which incorporates redistribution through fiscal policy. This distinction is particularly important, as financial liberalization may affect pre-tax income distribution differently from post-tax outcomes, especially in countries with varying redistributive capacities (Piketty & Saez, 2014; Solt, 2020).

For the purposes of this study, the SWIID provides internally consistent inequality series for all 48 countries in our sample over the period 1984–2020, ensuring balanced coverage across exchange rate regimes and levels of development. To assess the robustness of our findings, we complement the SWIID with WIID-based Gini coefficients, exploiting their survey-level origins to verify that our results are not driven by a particular harmonization procedure or income concept. These include a binary inequality indicator constructed from WIID data, which takes the value of one when the Gini coefficient exceeds the sample median and zero otherwise.

Overall, this dual-dataset strategy reflects the view, increasingly emphasized in the inequality literature, that no single dataset is universally superior. Instead, credibility arises from demonstrating that key empirical results are robust across alternative inequality measures and data constructions. By combining the comparability advantages of the SWIID with the transparency of the WIID, we strengthen the empirical foundations of our analysis and enhance confidence in our conclusions regarding the distributional effects of capital account liberalization across exchange rate regimes.

### 3.3. Main Explanatory Variables: Capital Account Liberalization

The core explanatory variables of interest in this study capture capital account liberalization and the exchange rate regime, which jointly shape the macroeconomic and distributional effects of financial openness. Capital account liberalization is measured using two complementary groups of de jure indicators[5]: the KAOPEN index developed by Chinn and Ito (2006, 2008) and the FKRSU indicators constructed by Fernández et al. (2016)**.** These measures are complemented by an explicit characterization of exchange rate regime flexibility, discussed in detail below.

Both sets of capital account indicators are derived from the International Monetary Fund's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)**,** which documents the legal framework governing cross-border financial transactions at the country level. De jure indicators are particularly suitable for panel analyses of inequality, as they reflect policy intentions rather than realized flows and are therefore less vulnerable to reverse causality concerns (Collins, 2007; Xiang & Dan, 2021).

#### 3.3.1. Choice of Capital Account Liberalization Indicators

To ensure robustness and comparability, this study relies on three widely used de jure measures of capital account openness: Chinn and Ito (2008)[6]**,** Quinn and Toyoda (2008)**,** and Fernández et al. (2016)**.** Each indicator captures a distinct dimension of liberalization and presents specific advantages and limitations.

In the baseline analysis, we employ the KAOPEN index. This is one of the most widely used measures of capital account openness in the macroeconomic literature due to its extensive temporal coverage (1970–2020) and broad country coverage (up to 182 countries). The KAOPEN index summarizes the presence or absence of legal restrictions on international capital transactions using binary variables derived from AREAER reports. Its values range from −1.856 (highly restrictive regimes) to 2.456 (highly open regimes), with substantial variation across income groups—low-income and lower-middle-income countries typically exhibiting more restrictive capital accounts.

While KAOPEN does not distinguish between different types or directions of capital flows, its long time span is particularly valuable for this study, as it captures the major liberalization episodes of the late 1980s and 1990s, a period that is central to understanding the evolution of inequality in developing economies. Moreover, empirical evidence suggests that results obtained using KAOPEN are largely consistent with those derived from alternative de jure indicators (Xiang & Dan, 2021).

To complement this aggregate measure, we also employ the FKRSU dataset developed by Fernández et al. (2016), which offers a more granular view of capital account regulation. Unlike KAOPEN, the FKRSU indicators distinguish between inflows and outflows**,** as well as across specific asset classes, including foreign direct investment (FDI), equity, bonds, money market instruments, and collective investment schemes. This disaggregation allows us to investigate whether the distributional effects of liberalization vary according to the composition and direction of capital flows, a dimension emphasized by Asteriou et al. (2014).

However, the FKRSU dataset has more limited coverage, encompassing approximately 100 countries over the period 1995–2019, with no consistent data prior to the mid-1990s due to changes in the structure of the

[5] The choice of a de jure measure is motivated by the focus of this paper on policy regimes rather than realized capital flows. De jure openness reflects governments' policy intentions and institutional frameworks, which are central to understanding how liberalization interacts with exchange rate regimes and affects income distribution. Moreover, previous studies have shown that de jure measures are particularly relevant when analyzing distributional and institutional outcomes (Furceri and Loungani, 2018; Ostry et al., 2021).

[6] The original Chinn–Ito index (KAOPEN) was updated and extended by Karcher & Steinberg (2013) to become the Ckaopen index. While Chinn & Ito (2006, 2008) relied on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), Karcher & Steinberg (2013) revisited the coding procedure and corrected certain methodological issues, producing an alternative measure of capital account openness. However, we cannot use this index since it only covers the period up to 2010, starting in 1965 for some countries and in 1970 for others, and is limited to just 65 countries. For this reason, it is excluded from our database.

underlying AREAER reports. As a result, it does not fully capture the early liberalization waves of the 1980s and early 1990s, particularly in developing economies. For this reason, the FKRSU indicators are primarily used for robustness analysis and for exploring heterogeneous effects across flow types, while the KAOPEN index serves as the main measure in the baseline estimations.

The Quinn and Toyoda (2008) index, although valuable for its fine-grained scoring based on textual analysis of AREAER reports, is not adopted as a core indicator in this study. Its relatively limited coverage of developing and emerging economies, infrequent updates, and declining availability reduce its suitability for long-horizon cross-country inequality analysis. Moreover, despite its nuanced scoring system, the index's reliance on qualitative textual interpretation introduces additional subjectivity and limits its scalability to recent periods.

Table A.1 summarizes the main features, advantages, and limitations of the capital account liberalization measures employed in previous works to understand our choice in this study.

### 3.3.2. Exchange Rate Regime Classification

Exchange rate regimes are classified using de facto indicators, which more accurately capture actual exchange rate behavior than official (de jure) classifications. De facto measures reflect the exchange rate dynamics effectively faced by households, firms, and investors, making them particularly relevant for analyzing the distributional consequences of macroeconomic policies. In this study, we rely on the widely used classification developed by Ilzetzki, Reinhart, and Rogoff (2019), which distinguishes among fixed, intermediate, and flexible exchange rate regimes based on observed exchange rate movements rather than declared policy commitments.

This classification is especially suitable for our empirical framework, as it captures the degree of exchange rate flexibility experienced by economic agents, a central determinant of how external shocks and capital flow volatility are transmitted to the domestic economy. Exchange rate flexibility influences inflation dynamics, labor market adjustments, asset price volatility, and the allocation of capital across sectors, all of which are key channels through which capital account liberalization may affect income inequality.

In our analysis, exchange rate regimes serve as the threshold variable, allowing the effect of capital account liberalization on inequality to differ across regimes. This approach is motivated by the hypothesis that financial openness does not operate uniformly across macroeconomic environments. Fixed or tightly managed exchange rate regimes may mitigate the distributive costs of capital flow volatility by stabilizing prices and expectations, whereas more flexible regimes, while facilitating relative price adjustment, may amplify short-term volatility and disproportionately affect lower-income households with limited risk-sharing capacity.

Table A.2 reports the de facto exchange rate regime classification following Ilzetzki et al. (2019). The original fine-grained typology (IRR codes 1–15) is aggregated into three broad categories, fixed, intermediate, and flexible regimes, to ensure sufficient observations within each group and to facilitate interpretation within a threshold regression framework. This aggregation is standard in the empirical literature and preserves the essential variation in exchange rate flexibility relevant for distributional analysis (Harms & Knaze, 2021).

By employing a de facto exchange rate classification and explicitly modeling regime flexibility as a threshold variable, this study directly addresses a key gap in the literature: whether the distributional effects of capital account liberalization depend on the macroeconomic adjustment mechanism in place. This approach allows us to move beyond average effects and identify the conditions under which financial openness is more likely to generate inclusive or unequal outcomes.

### 3.4. Other Explanatory Variables

Following the extensive literature on the determinants of income inequality (Asteriou et al., 2014; Johansson & Wang, 2014; Seven & Coskun, 2016; Xiang & Dan, 2021), we include a comprehensive set of macroeconomic, financial, demographic, and institutional control variables to isolate the distributional effects of capital account liberalization across exchange rate regimes.

Economic development is captured through GDP per capita (GDPC) and its squared term, allowing us to test the Kuznets hypothesis of an inverted U-shaped relationship between income and inequality (Kuznets, 1955). This specification is consistent with both early theoretical contributions and more recent empirical evidence emphasizing the long-run inequality-reducing effects of sustained growth (Dollar & Kraay, 2002).

Macroeconomic stability is proxied by inflation (INF) and the money supply-to-reserves ratio (M2RES). Variations in inflation can significantly influence income distribution; when inflation rises, it often diminishes real wages, which tends to hit lower-income groups the hardest (Albanesi, 2007). Conversely, some research indicates that low inflation may also worsen inequality by restricting job growth and limiting wage increases (Bulir, 1998; Lopez, 2004). Therefore, the relationship between inflation and inequality is still an empirical issue that warrants deeper investigation (Easterly & Fischer, 2001).

To capture the real-side dimension of globalization, this study includes trade openness (TRADE), measured as the ratio of total exports plus imports to GDP. Trade integration may influence income distribution through multiple and sometimes opposing channels. On the one hand, trade liberalization can promote economic convergence and potentially reduce income inequality by expanding market access and stimulating economic growth (Rodriguez & Velazquez, 2009). On the other hand, it may widen wage disparities by increasing the relative demand for skilled labor, particularly in developing economies where labor markets are more segmented and skill premiums tend to rise (Goldberg & Pavcnik, 2007).

Moreover, trade liberalization can affect income inequality through several structural mechanisms, including technology transfer, intensified market competition, and improvements in production efficiency (Grossman & Helpman, 1991; Enowbi-Batuo & Asongu, 2015). These channels may generate both inclusive and unequalizing outcomes depending on countries' institutional capacity, human capital, and economic structure. Consequently, the overall impact of trade openness on income inequality remains empirically ambiguous and warrants careful empirical investigation within the present framework.

Indicators of human capital, particularly education (EDUC), play a crucial role in determining income distribution. Generally, higher educational attainment helps to mitigate inequality by facilitating upward mobility in income (Barro & Lee, 2013). Nonetheless, the effect of education on inequality is influenced by disparities in access and mismatches in skills within labor markets (Checchi, 2001). The age dependency ratio (ADEP), factored in as demographic elements play a crucial role in shaping labor market engagement and economic output, which in turn affects inequality (Galor & Moav, 2004).

The availability of financial resources and access to credit play a significant role in shaping income distribution. It is essential to consider credit extended to the private sector (CPS), since financial constraints disproportionately impact low-income households, limiting their ability to invest in education and entrepreneurial activities (Beck et al., 2007a). Likewise, the ratio of money supply to reserves (M2RES) provides insights into monetary stability, which can affect investment and consumption trends.

In addition, unemployment (UR) is recognized as a vital factor, given its strong connection to poverty and inequality. Elevated unemployment rates often intensify income disparities, especially among vulnerable groups with lower skill sets (Blanchard & Wolfers, 2000). Research has demonstrated that extended periods of unemployment lead to increased income polarization and contribute to intergenerational income inequality (DiNardo et al., 1996).

The redistributive role of the state is proxied by government consumption (GSIZE). While public spending can mitigate inequality, its effectiveness depends critically on institutional quality and governance capacity (Arestis & Canner, 2010; Baliamoune-Lutz & Ndikumana, 2008). Institutional quality is measured using the

Polity2 index from Polity IV database, where higher values indicate stronger democratic institutions. Democratic governance has been shown to influence redistribution, policy credibility, and inequality outcomes (Li et al., 2000; Gupta et al., 2002; Chong & Gradstein, 2007).

Finally, the exchange rate regime plays a central role in the analysis, as it shapes capital flow volatility, inflation dynamics, and macroeconomic adjustment. Flexible regimes may absorb external shocks more effectively, while fixed regimes can constrain policy autonomy and amplify distributional tensions (Edwards, 2001; Ghosh et al., 2003; Frankel, 2011). For this reason, exchange rate regime flexibility is treated as the threshold variable rather than a standard control.

In summary, to isolate the effect of capital account liberalization on income inequality, we include the following controls commonly used in the inequality and macro-finance literature (Dabla-Norris et al., 2015; de Haan & Sturm, 2017):

- **GDP per capita (and its square)** – economic development and Kuznets dynamics
- **Trade openness** – real-side globalization
- **Educational attainment** – human capital accumulation
- **Inflation and M2RES** – macroeconomic stability
- **Private sector credit** – financial development
- **Government consumption** – redistributive capacity
- **Institutional quality (Polity2)** – governance and policy effectiveness
- **Unemployment and age dependency ratio** – labor market and demographic structure.

### 3.5. Descriptive Statistics

Table A.3 in the Appendix presents the summary statistics for all dependent and explanatory variables used in the analysis, based on a balanced panel of 48 countries. To ensure consistency with the econometric specifications, the descriptive statistics are reported for two sub-periods—1984–2020 and 1997–2019—reflecting differences in data availability for alternative measures of capital account liberalization. Overall, the data exhibit substantial cross-country and intertemporal variation in income inequality, capital account openness, and exchange rate regimes, which justifies the adoption of nonlinear and heterogeneous empirical approaches.

The descriptive evidence highlights pronounced differences in inequality across countries, with developing economies generally displaying higher average Gini coefficients than developed ones. This pattern is consistent with structural disparities in income distribution, labor market conditions, and institutional development across income groups.

Capital account liberalization shows a noticeable upward trend over time, particularly during the 1990s and early 2000s, a period characterized by intensified financial globalization. Nevertheless, the statistics also reveal considerable heterogeneity across countries and regions, indicating that the process of financial integration has been uneven and influenced by country-specific policy choices and institutional capacities.

Exchange rate regimes likewise demonstrate significant variation throughout the sample period. Many countries gradually moved from fixed or heavily managed exchange rate arrangements toward more flexible regimes, reflecting broader macroeconomic reforms and integration into global financial markets. This evolution suggests that the macroeconomic environment in which liberalization occurs differs markedly across countries and over time.

Taken together, these stylized facts underscore the relevance of considering both financial openness and exchange rate arrangements when analyzing distributional outcomes. They provide strong empirical motivation for the nonlinear econometric framework employed in this study, which allows the effects of capital account liberalization on income inequality to vary across regimes and over time.

- **Income inequality indicators**

Across all inequality measures, the data reveal a moderate but persistent increase in average inequality over time**.** The mean Gini coefficient rises slightly from 38.2 in the longer sample to 38.5 in the more recent period, while the minimum value increases from 18.9 to 23.3. A similar pattern is observed for both disposable-income and market-income inequality: the average disposable-income Gini increases from 35.7 to 36.1, and market-income inequality rises from 46.6 to 47.4.

At the same time, the standard deviations of inequality indicators decline modestly, suggesting a reduction in cross-country dispersion of inequality levels, even as within-country inequality trends upward. This convergence in dispersion, coupled with rising averages, is consistent with recent evidence documenting a partial global convergence in inequality levels driven by rising inequality in middle-income economies and stabilization in advanced countries.

The binary inequality indicator (INEQ), defined as taking the value one when the Gini coefficient exceeds the sample median, confirms this trend: the proportion of country-year observations classified as "high inequality" increases slightly in the more recent period.

- **Capital account liberalization and exchange rate regimes**

Capital account openness exhibits substantial heterogeneity across countries and over time. The Chinn–Ito (KAOPEN) index shows an increase in the average degree of openness from 0.75 to 1.02, indicating a general movement toward more liberal capital account regimes in the post-1990 period. This trend is consistent with the widespread financial liberalization episodes documented in emerging and developing economies during the 1990s and early 2000s.

The Fernández et al. (2016) indicators, available for the shorter sample, reveal considerable variation across both types of assets and directions of capital flows. Average restriction indices cluster between 0.25 and 0.42, with relatively tighter controls observed for direct investment, real estate, and financial credits. This heterogeneity motivates our empirical strategy of introducing these sub-indicators iteratively rather than jointly.

Exchange rate regimes, measured using de facto classifications, display a decline in average flexibility over time, with the mean regime index falling from 8.20 to 7.73. This pattern suggests that, following the widespread adoption of floating regimes after the oil shocks and debt crises, several countries subsequently gravitated toward intermediate or managed arrangements, possibly reflecting concerns over exchange rate volatility and financial stability.

- **Macroeconomic and institutional controls**

Consistent with global economic trends, GDP per capita increases modestly between the two periods, while trade openness rises substantially, from 70.7% to 78.0% of GDP, reflecting deeper integration into global goods markets. Labor market conditions improve slightly, as average unemployment declines from 7.72% to 7.61%.

Macroeconomic stability improves markedly in the more recent period. Average inflation drops sharply from 25.4% to 5.1%, accompanied by a substantial reduction in volatility. This shift is consistent with the widespread adoption of inflation-targeting frameworks and stronger monetary policy credibility.

Financial depth and liquidity increase over time, as indicated by higher ratios of private credit to GDP and money supply to reserves. Fiscal policy appears less restrictive, with government consumption increasing slightly, while demographic pressures ease as the age dependency ratio declines. Institutional quality also

improves, with the average Polity2 score rising from 6.89 to 7.36, signaling gradual democratic consolidation in the sample.

### 3.6. Correlation structure and multicollinearity diagnostics

Before proceeding with the econometric estimations, we examine the correlation structure among the explanatory variables (Table 1). The pairwise correlation coefficients are generally below the conventional threshold of 0.7 suggested by Kervin (1992), indicating that severe multicollinearity is unlikely to be a major concern at this stage of the analysis.

As expected, the alternative measures of capital account liberalization display strong correlations with each other. This outcome is consistent with the fact that they capture similar dimensions of financial openness and therefore supports our empirical strategy of including these indicators one at a time in the regression specifications to avoid redundancy and potential estimation biases.

In addition, some sub-indicators of external financial liberalization show moderate correlations with certain explanatory variables, most notably GDP per capita, with coefficients exceeding 0.5. While these values do not necessarily indicate problematic multicollinearity, they suggest the presence of meaningful associations among macroeconomic variables that warrant further examination.

**Table 1. Correlation matrix**

| **1984-2020** | Dependent variable | | | | Independent variables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GINI | INEQ | Disp | Mrkt | KAOPEN | XREG | GDPC | INFL | TRADE | EDUC | GSIZE | DCPS | M2RES | UNUMP | ADEP | polity2 |
| GINI | 1.0 | | | | | | | | | | | | | | | |
| INEQ | .81 | 1.0 | | | | | | | | | | | | | | |
| Disp | .91 | .74 | 1.0 | | | | | | | | | | | | | |
| Mrkt | .43 | .16 | .42 | 1.0 | | | | | | | | | | | | |
| KAOPEN | -.51 | -.52 | -.48 | .08 | 1.0 | | | | | | | | | | | |
| XREG | .29 | .21 | .24 | .00 | -.29 | 1.0 | | | | | | | | | | |
| GDPC | -.59 | -.61 | -.59 | .12 | **.71** | -.14 | 1.0 | | | | | | | | | |
| INFL | .14 | .10 | .12 | .08 | -.14 | .10 | -.07 | 1.0 | | | | | | | | |
| TRADE | -.21 | -.08 | -.16 | -.06 | .29 | -.38 | **.58** | -.08 | 1.0 | | | | | | | |
| EDUC | ..22 | .14 | .30 | .32 | -.06 | .05 | .01 | .20 | -.08 | 1.0 | | | | | | |
| GSIZE | -.50 | -.49 | -.55 | .20 | .36 | -.17 | **.55** | -.09 | .01 | -.01 | 1.0 | | | | | |
| DCPS | -.24 | -.28 | -.23 | .14 | .50 | -.14 | **.57** | -.08 | .32 | -.03 | .23 | 1.0 | | | | |
| M2RES | -.22 | -.31 | -.24 | .14 | .35 | -.25 | .33 | -.03 | -.06 | -.06 | .29 | .37 | 1.0 | | | |
| UNUMP | .29 | .08 | .24 | .41 | -.16 | -.00 | -.08 | -.02 | -.14 | .05 | .19 | -.13 | .13 | 1.0 | | |
| ADEP | .40 | .33 | .32 | .06 | -.35 | .14 | -.49 | .12 | -.33 | -.11 | -.23 | -.44 | .12 | .16 | 1.0 | |
| polity2 | -.22 | -.29 | -.28 | .25 | .49 | -.08 | **.60** | -.00 | .14 | .05 | .29 | .29 | .23 | -.01 | -.34 | 1.0 |

To ensure the reliability and robustness of the econometric models, we therefore complement the correlation analysis with the Variance Inflation Factor (VIF) test. This additional diagnostic allows us to assess more formally the extent of multicollinearity and confirm that the included regressors do not distort the estimation results.

We compute Variance Inflation Factors (VIFs)[7] and tolerance statistics (Table 2). All VIF values remain below 5, with most clustering around 2 or lower, and tolerance levels exceeding 0.2. The mean VIF across specifications ranges between 1.6 and 1.8, well below commonly cited critical thresholds (Gujarati, 2003; O'Brien, 2007). These results indicate that while some degree of correlation among regressors is inevitable in macro-panel data, it is not sufficiently strong to distort coefficient estimates or undermine statistical inference.

[7] As noted by Dodge (2008), a VIF of 1 signifies the absence of multicollinearity, while values above 1 indicate varying degrees of correlation among predictors. Kutner et al. (2004) note that VIF values between 5 and 10 indicate potentially problematic levels of multicollinearity, while values above 10 imply that the regression coefficients may be poorly estimated due to severe multicollinearity. Additionally, an average VIF above 2 or individual VIFs greater than or equal to 10 are often taken as indicators of strong correlation and potential multicollinearity. If neither of these conditions is met, the influence of multicollinearity is considered negligible, and the explanatory variables can be jointly included in the model without distorting the results.

Overall, the descriptive statistics highlight substantial cross-country and temporal variation in inequality, capital account liberalization, and exchange rate regimes, providing a suitable empirical setting to examine how regime flexibility conditions the distributional effects of financial openness.

Simple correlations further suggest that the relationship between capital account liberalization and inequality is not uniform, reinforcing the motivation for a threshold-based approach. Moreover, the presence of cross-country heterogeneity and potential common shocks highlights the importance of econometric techniques that explicitly address cross-sectional dependence.

Taken together, the descriptive evidence points to a complex interaction between financial openness, macroeconomic regimes, and income distribution. The persistence of inequality, combined with the diversity of policy frameworks across countries, suggests that linear models may obscure important regime-specific dynamics. These observations motivate the econometric strategy adopted in the next section, which employs both static and dynamic panel threshold models to capture nonlinearities, persistence effects, and cross-sectional dependence.

**Table 1. (Continued)**

| 1997-2019 | Dependent variable | | | | Capital account measures ( iteratively introduced in the model) | | | | | | | | | | | | | Other independent variables | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GINI | INEQ | Disp | Mrkt | KAOPEN | KA | KAI | KAO | eq | bo | mm | ci | de | cc | fc | gs | di | re | XREG | GDPC | INFL | TRADE | EDUC | GSIZE | DCPS | M2RES | UNUMP | ADEP | polity2 |
| GINI | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INEQ | .80 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Disp | .92 | .76 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mrkt | .35 | .04 | .32 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| KAOPEN | -.60 | -.60 | -.57 | .16 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| KA | .55 | .59 | .53 | -.18 | -.86 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | |
| KAI | .50 | .56 | .50 | -.24 | -.83 | .96 | 1.0 | | | | | | | | | | | | | | | | | | | | | | |
| KAO | .56 | .59 | .53 | -.12 | -.84 | .97 | .87 | 1.0 | | | | | | | | | | | | | | | | | | | | | |
| eq | .55 | .60 | .53 | -.12 | -.81 | .92 | .88 | .91 | 1.0 | | | | | | | | | | | | | | | | | | | | |
| bo | .51 | .54 | .53 | -.13 | -.80 | .93 | .89 | .91 | .91 | 1.0 | | | | | | | | | | | | | | | | | | | |
| mm | .50 | .55 | .49 | -.17 | -.82 | .94 | .90 | .92 | .87 | .91 | 1.0 | | | | | | | | | | | | | | | | | | |
| ci | .48 | .55 | .45 | -.19 | -.77 | .90 | .87 | .88 | .85 | .85 | .88 | 1.0 | | | | | | | | | | | | | | | | | |
| de | .53 | .54 | .55 | -.17 | -.81 | .89 | .84 | .89 | .82 | .85 | .84 | .80 | 1.0 | | | | | | | | | | | | | | | | |
| cc | .46 | .46 | .44 | -.24 | -.71 | .78 | .79 | .72 | .64 | .66 | .70 | .63 | .64 | 1.0 | | | | | | | | | | | | | | | |
| fc | .53 | .54 | .53 | -.08 | -.76 | .90 | .84 | .91 | .83 | .82 | .86 | .82 | .83 | .66 | 1.0 | | | | | | | | | | | | | | |
| gs | .51 | .54 | .49 | -.21 | -.76 | .85 | .84 | .80 | .71 | .76 | .78 | .77 | .75 | .71 | .79 | 1.0 | | | | | | | | | | | | | |
| di | .44 | .43 | .41 | -.10 | -.70 | .78 | .76 | .74 | .76 | .72 | .68 | .68 | .65 | .55 | .62 | .55 | 1.0 | | | | | | | | | | | | |
| re | .14 | .31 | .14 | -.24 | -.48 | .69 | .69 | .64 | .57 | .59 | .62 | .55 | .52 | .54 | .60 | .54 | .45 | 1.0 | | | | | | | | | | | |
| XREG | .35 | .27 | .34 | .00 | -.30 | .22 | .23 | .20 | .22 | .17 | .21 | .13 | .22 | .19 | .21 | .15 | .24 | .14 | 1.0 | | | | | | | | | | |
| GDPC | -.61 | -.57 | -.63 | .04 | **.70** | **-.66** | **-.64** | **-.65** | **-.66** | **-** | **-** | **-** | **-.64** | **-** | **-.56** | **-** | **-.56** | -.27 | -.16 | 1.0 | | | | | | | | | |
| | | | | | | | | | | **.69** | **.64** | **.58** | | **.52** | | **.59** | | | | | | | | | | | | | |
| INFL | .20 | .20 | .21 | -.14 | -.38 | .23 | .26 | .19 | .23 | .24 | .21 | .23 | .21 | .26 | .16 | .19 | .23 | .06 | .23 | -.29 | 1.0 | | | | | | | | |
| TRADE | -.24 | -.07 | -.18 | -.09 | .24 | -.17 | -.17 | -.15 | -.21 | -.17 | .17 | -.18 | -.14 | - | -.11 | - | -.21 | .03 | -.34 | .22 | -.17 | 1.0 | | | | | | | |
| | | | | | | | | | | | | | | .15 | | .13 | | | | | | | | | | | | | |
| EDUC | .28 | .21 | .34 | .33 | -.08 | .09 | .10 | .07 | .14 | .11 | .04 | .08 | .10 | .06 | .11 | .09 | .05 | -.10 | .06 | -.11 | .05 | -.09 | 1.0 | | | | | | |
| GSIZE | -.51 | -.51 | -.55 | .31 | .41 | - | -.44 | -.42 | - | - | - | - | -.45 | - | -.38 | - | -.29 | -.27 | -.25 | .44 | -.26 | -.02 | .06 | 1.0 | | | | | |
| | | | | | | .44 | | | .40 | .41 | .40 | .38 | | .46 | | .40 | | | | | | | | | | | | | |
| DCPS | -.27 | -.28 | -.26 | .14 | .45 | - | -.41 | -.40 | - | - | - | - | -.41 | - | -.35 | - | -.30 | -.19 | -.11 | .61 | -.39 | .28 | -.12 | .26 | 1.0 | | | | |
| | | | | | | .42 | | | .41 | .43 | .40 | .37 | | .34 | | .37 | | | | | | | | | | | | | |
| M2RES | -.27 | -.36 | -.28 | .18 | .38 | - | -.37 | -.32 | - | - | - | - | -.36 | - | -.30 | - | -.21 | -.39 | -.34 | .30 | -.19 | -.06 | -.08 | .33 | .34 | 1.0 | | | |
| | | | | | | .36 | | | .32 | .33 | .33 | .28 | | .30 | | .26 | | | | | | | | | | | | | |
| UNUMP | .30 | .04 | .29 | .47 | -.15 | .05 | -.00 | .10 | .04 | .10 | .06 | .03 | .06 | .04 | .07 | .07 | .06 | -.15 | -.04 | -.21 | .06 | -.17 | .15 | .20 | -.11 | .20 | 1.0 | | |
| ADEP | .24 | .19 | .14 | .03 | -.12 | .07 | .05 | .09 | .06 | .08 | .02 | .08 | .09 | .17 | .02 | .18 | -.00 | -.02 | .51 | -.15 | .18 | -.36 | -.09 | -.11 | -.35 | -.04 | .11 | 1.0 | |
| polity2 | -.25 | -.35 | -.31 | .28 | .55 | - | -.51 | -.47 | - | - | - | - | -.48 | - | -.40 | - | -.33 | -.32 | -.04 | .48 | -.19 | .13 | .06 | .28 | .25 | .26 | -.01 | -.17 | 1.0 |
| | | | | | | .50 | | | .47 | .49 | .47 | .47 | | .45 | | .45 | | | | | | | | | | | | | |

**Table 2: VIF and Tolerance matrix**

| | 1984-2020 | | Capital account measures (FL) (1997-2019 | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | KAOPEN | | KAOPEN | | KA | | KAI | | KAO | | eq | | bo | | mm | | ci | | de | | cc | | fc | | gs | | di | | re | |
| | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF |
| FL | 2.4 | .40 | 2.7 | .36 | 2.1 | .46 | 2.1 | .47 | 1.9 | .51 | 2.0 | .48 | 2.1 | .45 | 1.9 | .50 | 1.7 | .58 | 2.0 | .49 | 1.6 | .59 | 1.6 | .60 | 1.7 | .57 | 1.5 | .62 | 1.3 | .74 |
| XREG | 1.4 | .70 | 1.5 | .64 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 | 1.5 | .65 |
| GDPC | 3.7 | .26 | 3.0 | .33 | 2.9 | .34 | 2.8 | .34 | 2.9 | .34 | 2.9 | .33 | 3.0 | .32 | 2.8 | .34 | 2.7 | .36 | 2.8 | .35 | 2.6 | .37 | 2.7 | .36 | 2.8 | .35 | 2.9 | .33 | 2.5 | .39 |
| INFL | 1.1 | .90 | 1.3 | .74 | 1.2 | .77 | 1.2 | .77 | 1.2 | .77 | 1.2 | .77 | 1.2 | .77 | 1.2 | .77 | 1.2 | .77 | 1.2 | .77 | 1.2 | .77 | 1.3 | .77 | 1.2 | .77 | 1.2 | .77 | 1.2 | .77 |
| TRADE | 1.5 | .63 | 1.6 | .61 | 1.6 | .62 | 1.6 | .61 | 1.6 | .62 | 1.6 | .61 | 1.6 | .62 | 1.6 | .61 | 1.6 | .61 | 1.6 | .62 | 1.6 | .62 | 1.6 | .62 | 1.6 | .62 | 1.6 | .61 | .60 | .62 |
| EDUC | 1.1 | .90 | 1.1 | .90 | 1.1 | .89 | 1.1 | .89 | 1.1 | .90 | 1.1 | .89 | 1.1 | .89 | 1.1 | .90 | 1.1 | .89 | 1.1 | .89 | 1.1 | .89 | 1.1 | .89 | 1.1 | .89 | 1.1 | .90 | .1 | .88 |
| GSIZE | 1.6 | .59 | 1.6 | .61 | 1.6 | .60 | 1.6 | .60 | 1.6 | .60 | 1.6 | .61 | 1.6 | .61 | 1.6 | .61 | 1.6 | .61 | 1.6 | .60 | 1.7 | .58 | 1.6 | .60 | 1.6 | .60 | 1.6 | .62 | 1.6 | .62 |
| DCPS | 1.8 | .52 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 | 2.1 | .45 |
| M2RES | 1.5 | .65 | 1.6 | .60 | 1.6 | .61 | 1.6 | .61 | 1.6 | .61 | 1.6 | .62 | 1.6 | .61 | 1.6 | .61 | 1.6 | .62 | 1.6 | .61 | 1.6 | .62 | 1.6 | .62 | 1.6 | .62 | 1.6 | .62 | 1.6 | .59 |
| UNUMP | 1.2 | .82 | 1.3 | .75 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 | 1.3 | .76 |
| ADEP | 1.5 | .63 | 1.3 | .72 | 1.3 | .72 | 1.3 | .71 | 1.3 | .72 | 1.3 | .72 | 1.3 | .72 | 1.4 | .70 | 1.3 | .72 | 1.3 | .72 | 1.3 | .72 | 1.3 | .72 | 1.3 | .72 | 1.4 | .71 | 1.3 | .72 |
| polity2 | 1.6 | .59 | 1.6 | .60 | 1.5 | .63 | 1.5 | .62 | 1.5 | .64 | 1.5 | .64 | 1.5 | .64 | 1.5 | .64 | 1.5 | .63 | 1.5 | .63 | 1.5 | .64 | 1.5 | .65 | 1.5 | .64 | 1.4 | .67 | 1.5 | .65 |
| MeanVIF | 1.75 | | 1.76 | | 1.70 | | 1.69 | | 1.67 | | 1.69 | | 1.70 | | 1.68 | | 1.64 | | 1.68 | | 1.63 | | 1.63 | | 1.64 | | 1.64 | | 1.60 | |

## 4. Econometric Methodology

The primary objective of this research is to investigate the potential nonlinear dynamics of income inequality through the implementation of a Threshold Autoregressive (TAR) framework. In contrast to earlier studies that typically begin with linear specifications before testing for nonlinearities, this study adopts a nonlinear modeling strategy from the outset. As indicated previously the analysis is based on the hypothesis that capital account liberalization affects income inequality in a nonlinear manner, particularly depending on the degree of exchange rate flexibility. The empirical investigation relies on a balanced panel dataset comprising 22 developed countries and 26 developing countries over the period 1984–2020.

The theoretical foundation of this approach is rooted in the Threshold Autoregressive model introduced by Tong (1978) and subsequently developed in Tong and Lim (1980) and Tong (1983). This framework represented a major advancement in modeling nonlinear time-series dynamics, especially in financial applications such as stock price behavior. The TAR model also paved the way for a range of related nonlinear econometric models. For example, Chan and Tong (1986) proposed the Smooth Transition Autoregressive (STAR) model, which allows for gradual transitions between regimes rather than abrupt shifts. Similarly, Chen and Tsay (1993) introduced the Functional-Coefficient Autoregressive (FAR) model, in which regression coefficients evolve smoothly as functions of other variables. Tsay (1998) further extended this literature by developing a multivariate TAR model designed to analyze arbitrage dynamics in financial markets. More recently, Dueker et al. (2011) applied TAR-based methodologies to examine nonlinear dynamics in bond markets, highlighting the relevance of regime-switching behavior in financial time series.

The extension of threshold modeling to panel data began with the static panel threshold model proposed by Hansen (1999). In this framework, regression coefficients change across regimes depending on the value of an exogenous and stationary threshold variable. This methodology was subsequently generalized by Gonzalez et al. (2005), who introduced the Panel Smooth Transition Regression (PSTR) model, allowing coefficients to vary smoothly across regimes rather than shifting discretely.

Despite their contributions, both static approaches impose restrictive assumptions, notably requiring the threshold variable to be strictly exogenous and limiting their ability to capture dynamic adjustment processes. In parallel, dynamic panel data models have been extensively studied within linear frameworks, particularly in the presence of endogenous regressors. Foundational contributions include those of Holtz-Eakin et al. (1988), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). However, nonlinear asymmetric dynamics in dynamic panel settings remained relatively unexplored, particularly in short time-dimension panels.

Subsequent studies attempted to bridge this gap. Dang et al. (2012) and Ramírez-Rondán (2019) extended Hansen's static threshold approach to dynamic contexts. Likewise, Kremer et al. (2013) developed a hybrid framework combining Arellano–Bover transformations with instrumental-variable estimation. Nevertheless, these contributions still rely on the assumption that the threshold variable or regressors are exogenous, which may limit their empirical applicability in macroeconomic settings characterized by simultaneity and feedback effects.

A significant methodological advancement was introduced by Seo and Shin (2016), who developed a dynamic panel threshold model that explicitly allows both regressors and threshold variables to be endogenous. Their approach relies on the first-differenced Generalized Method of Moments (FD-GMM), which effectively addresses endogeneity, simultaneity bias, and dynamic panel feedback effects. They derived the asymptotic properties of the FD-GMM estimator under both fixed and shrinking threshold parameters, demonstrating that the estimator remains asymptotically normal regardless of whether the regression function is continuous. This property enables valid Wald-type statistical inference in nonlinear dynamic panel settings.

Furthermore, when the threshold variable is strictly exogenous, Seo and Shin proposed a more efficient first-differenced two-stage least squares (FD-2SLS) estimator. This estimator satisfies the Oracle property and provides super-consistent estimates of the threshold parameter. Because threshold estimation involves nonstandard asymptotic distributions, statistical inference relies on likelihood ratio tests with bootstrap critical values. Building on these methodological developments, Seo et al. (2019) introduced computational procedures facilitating the estimation of FD-GMM and FD-2SLS threshold models. Their contributions include bootstrap-based linearity tests, constrained GMM estimators, and kink-restricted specifications, building on refinements proposed by Zhang et al. (2017). These methodological improvements significantly enhance the empirical applicability of dynamic panel threshold models, particularly in macroeconomic analyses involving endogenous policy variables and short time dimensions.

### 4.1 Baseline Specification

To examine the relationship between capital account liberalization and income inequality, we begin with a standard panel data framework in which income inequality is modeled as a function of financial openness and a set of macroeconomic and institutional controls. The baseline specification can be written as:

$$Inequality_{it} = \alpha_i + \delta_t + \beta Capital\ openess_{it} + X'_{it}\gamma + \varepsilon_{it} \quad (1)$$

where $Ineq_{it}$ denotes the income inequality indicator in country i at time t, $\alpha_i$ captures unobserved country-specific effects, $\delta_t$ represents time effects common to all countries, $Capital\ openess_{it}$ measures capital account liberalization, and $X_{it}$ is a vector of control variables discussed in Section 3. The error term $\varepsilon_{it}$ captures idiosyncratic shocks.

Although this specification provides a useful starting point, it imposes homogeneity and linearity assumptions that may be overly restrictive, particularly given the theoretical ambiguity surrounding the distributional effects of financial openness. To account for potential regime-dependent effects, we extend the baseline model using panel threshold regression techniques**,** allowing the impact of capital account liberalization on inequality to vary with the exchange rate regime. Following Hansen (1999), the static panel threshold model is specified as:

$$Ineq_{it} = \alpha_i + \beta_1 KAOPEN_{it} \,.I(XREG_{it} \le \tau) + \beta_2 KAOPEN_{it} \,.I(XREG_{it} > \tau) + X'_{it}\gamma + \varepsilon_{it} \quad (2)$$

where $XREG_{it}$ denotes the exchange rate regime indicator, $\tau$ is the estimated threshold value, and I(·) is an indicator function. This framework allows the effect of capital account liberalization on inequality to differ between relatively stable and more flexible exchange rate regimes. The threshold value $\tau$ is estimated endogenously by minimizing the sum of squared residuals, and its statistical significance is assessed using bootstrap methods, as proposed by Hansen (1999).

### 4.2 Dynamic Specification, Cross- sectional dependence and Econometric Issues

Income inequality is known to exhibit strong persistence over time. To capture this dynamic behavior and distinguish between short-run and long-run effects, we employ the dynamic panel threshold model developed by Seo and Shin (2016) and extended by Seo, Kim, and Kim (2019). The dynamic specification takes the form:

$$Ineq_{it} = \mu_i + \rho Ineq_{it-1} + \beta_1 KAOPEN_{it} \,.I(XREG_{it} \le \tau) + \beta_2 KAOPEN_{it} I(XREG_{it} > \tau) + X'_{it}\gamma + u_{it} \quad (3)$$

where $Ineq_{it-1}$ captures the persistence of inequality, and $\mu_i$ denotes country-specific effects. This framework offers several advantages: it explicitly models the inertia of income inequality, allows for asymmetric responses across exchange rate regimes, and accommodates endogenous regressors through instrumental-variable techniques within a generalized method of moments (GMM) framework.

Given the high degree of global financial integration, countries are likely to be affected by common shocks, such as global financial cycles or changes in international liquidity conditions. Ignoring cross-sectional dependence may lead to biased estimates and invalid inference. To address this issue, we incorporate cross-sectional averages of the dependent and explanatory variables into the regression framework, following the Common Correlated Effects (CCE) approach proposed by Pesaran (2006). This method effectively controls for unobserved common factors that affect all countries, such as global interest rate movements or worldwide financial stress.

Another important econometric concern relates to the nonstationary nature of macroeconomic panel data. Variables such as income inequality, financial openness, and macroeconomic indicators may exhibit unit roots. Therefore, we conduct panel unit root tests that account for cross-sectional dependence and verify the order of integration of the variables. The dynamic threshold framework employed in this study is particularly suitable in this context because it can handle mixed orders of integration while allowing for consistent estimation of long-run effects.

Endogeneity is another potential issue that may arise due to reverse causality, omitted variables, or measurement error. For example, higher levels of income inequality may influence policy decisions related to capital account liberalization. To mitigate these concerns, several strategies are adopted, including the use of lagged regressors as instruments within the dynamic threshold model, the inclusion of country and time fixed effects, and the application of CCE methods to control for unobserved global factors. Together, these approaches help ensure that the estimated coefficients capture the causal impact of capital account liberalization under different exchange rate regimes.

Finally, the empirical analysis proceeds in several stages. We first estimate static panel threshold models to identify potential nonlinear regime-dependent effects. We then implement dynamic panel threshold models to account for persistence and to distinguish between short-run and long-run dynamics. A series of robustness checks is also conducted, including the use of alternative inequality measures. Standard errors are adjusted to account for heteroskedasticity and cross-sectional dependence.

Overall, this econometric strategy integrates nonlinear modeling, dynamic adjustment, and controls for cross-sectional dependence within a unified empirical framework. This approach allows us to identify regime-dependent effects of capital account liberalization on income inequality while addressing key econometric challenges commonly encountered in macroeconomic panel data. The next section presents the estimation results and discusses their implications for macroeconomic theory and policy.

## 5. Results and Interpretations

### 5.1 Preliminary analyses: Cross-sectional dependence and unit root tests

Table 3 reports the results of the cross-sectional dependence (CD) and unit root tests. The CD test statistics indicate that the null hypothesis of cross-sectional independence is rejected for most variables, with p-values below conventional significance levels, including the 1% threshold. This provides strong evidence of pervasive cross-sectional dependence in the panel, likely reflecting common global shocks, spillovers, and shared macroeconomic trends across countries.

Standard first-generation panel unit root tests, such as Levin–Lin–Chu (LLC), Im–Pesaran–Shin (IPS), and Fisher-type ADF tests, rely on the assumption of cross-sectional independence. When this assumption is violated, as in our dataset, these tests become biased and inconsistent, potentially leading to misleading inferences regarding the stationarity properties of the variables. To address this issue, we primarily rely on second-generation unit root tests, notably Pesaran's (2007) CADF and CIPS tests, which explicitly account for cross-sectional dependence.

Importantly, we apply these tests uniformly across all variables, rather than limiting their use to variables exhibiting statistically significant CD. This choice ensures methodological consistency and reduces the risk of biased inference arising from unobserved common factors. For variables that do not display statistically significant cross-sectional dependence, we complement the analysis with first-generation unit root tests to verify a crucial requirement of the panel threshold framework: none of the variables is integrated of order two or higher. This condition is essential for the validity of both static and dynamic threshold estimators.

To further investigate the time-series properties of the variables, we employ the Hadri (2000) panel stationarity test. Unlike conventional unit root tests, the Hadri test adopts stationarity as the null hypothesis, allowing for a direct assessment of whether the series become stationary after first differencing. This feature is particularly relevant for our empirical strategy, as the Common Correlated Effects Panel Threshold Regression (CC-PTR) model requires that all variables be at most I(1). Moreover, the Hadri test allows for heterogeneity in short-run variances across cross-sectional units, making it well suited for macroeconomic panel data characterized by country-specific volatility.

Overall, the results indicate strong cross-sectional dependence in the data, with several regressors being non-stationary in levels but stationary in first differences. Crucially, no variable is integrated beyond order one. These findings validate the econometric assumptions underlying our CC-PTR estimation strategy.

**Table 3: Cross section dependency and Unit root tests**

| | 1984-2020 | | | | | | | 1995-2019 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CD | | Second generation Unit root tests[8] | | | | | CD | | Second generation Unit root tests | | | | | First unit generation Unit root tests: Hadri | | | | |
| | **CD-test** | **p-value** | **CIPS I(0)** | **CIPS I(1)** | **CADF I(0)** | **CADF I(1)** | **Decision** | **CD-test** | **p-value** | **CIPS I(0)** | **CIPS I(1)** | **CADF I(0)** | **CADF I(1)** | **Decision** | **Statistic (Z) I(0)** | **p-value** | **Statistic (Z) I(1)** | **p-value** | **Decision** |
| GINI | 19.0 | .000*** | -2.11** | -4.34*** | -2.16** | -11.1*** | **I(0)** | **6.12** | **.000***** | -2.63*** | -3.74*** | -4.08*** | -6.63*** | **I(0)** | **74.2** | **.000** | **.950** | **.171** | **-** |
| INEQ | 1.20 | .228 | **79.0** | **.000** | **-4.07** | **1.00** | **I(1)** | **-.057** | **.954** | | | | | **-** | **54.9** | **.000** | **-3.52** | **.999** | **I(1)** |
| Disp | 7.54 | .000*** | -2.03 | -5.63*** | -1.28* | -11.9*** | I(1) | **3.26** | **.001***** | -2.01 | -4.76*** | -.277 | -5.72*** | **I(1)** | **66.1** | **.000** | **.245** | **.402** | **-** |
| Mrkt | 25.1 | .000*** | -2.11** | -5.66*** | -1.31* | -12.5*** | I(0) | **.187** | **.852** | -1.66 | -4.72*** | 3.13 | -6.62*** | **-** | **73.1** | **.000** | **-1.25** | **.894** | **I(1)** |
| KAOPEN | 37.5 | .000*** | -1.82 | -3.96*** | 1.01 | -2.78*** | I(1) | **3.77** | **.000***** | -1.90 | -2.37*** | 7.50 | 3.46 | I(1) | 54.3 | .000 | .560 | .287 | - |
| KA | | | | | | | | **.741** | **.459** | -2.22** | -4.53*** | 2.43 | -4.04*** | **-** | **57.5** | **.000** | **-.320** | **.625** | **I(1)** |
| KAI | | | | | | | | **2.23** | **.026**** | -1.98 | -4.29*** | 3.73 | -5.23*** | **I(1)** | **54.4** | **.000** | **-.176** | **.570** | **-** |
| KAO | | | | | | | | **.509** | **.611** | -1.37 | -3.81*** | 4.56 | -6.29*** | **-** | **55.5** | **.000** | **-1.83** | **.966** | **I(1)** |
| eq | | | | | | | | **3.29** | **.001***** | -.685 | -2.64*** | 8.15 | -.554 | **I(1)** | **39.7** | **.000** | **-1.76** | **.961** | **-** |
| bo | | | | | | | | **1.60** | **.109** | -.787 | -2.50*** | 8.99 | 1.19 | **-** | **40.1** | **.000** | **-1.12** | **.870** | **I(1)** |
| mm | | | | | | | | **1.62** | **.104** | -.570 | -2.33*** | 10.0 | 1.79 | **-** | **48.7** | **.000** | **-1.64** | **.950** | **-** |
| ci | | | | | | | | **2.85** | **.004***** | -.836 | -2.84*** | 8.37 | -.606 | **I(1)** | **52.4** | **.000** | **-3.04** | **.998** | **-** |
| de | | | | | | | | **-.462** | **.644** | -.423 | -2.48*** | 10.8 | 1.750 | - | 54.7 | .000 | -1.961 | .975 | I(1) |
| cc | | | | | | | | **2.66** | **.558** | .525 | -.304 | 15.84 | 13.5 | **-** | **52.2** | **.000** | **-2.91** | **.998** | **I(1)** |
| fc | | | | | | | | **.875** | **.381** | .271 | -1.12 | 14.8 | 10.3 | **-** | **55.9** | **.000** | **-2.36** | **.991** | **I(1)** |
| gs | | | | | | | | **.807** | **.420** | .947 | .015 | 19.5 | 16.1 | - | 61.2 | .000 | -2.70 | .996 | **I(1)** |
| di | | | | | | | | **1.04** | **.294** | .628 | -.480 | 17.1 | 11.9 | **-** | **56.9** | **.000** | **-2.10** | **.982** | **I(1)** |
| re | | | | | | | | **-.523** | **.601** | -.655 | -2.44*** | 10.9 | 2.90 | **-** | **53.4** | **.000** | **-2.92** | **.998** | **I(1)** |
| XREG | 15.4 | .000*** | -2.01 | -4.36*** | -.791 | -4.50*** | I(1) | **-.733** | **.464** | -1.25 | -2.99*** | 3.04 | -2.50*** | **-** | **41.4** | **.000** | **-2.19** | **.986** | **I(1)** |
| GDPC | 175.6 | .000*** | -2.06* | -3.44*** | -3.54*** | -3.81*** | I(0) | **139.9** | **.000***** | -2.41*** | -2.98*** | -6.06*** | -3.84*** | **I(0)** | **98.8** | **.000** | **5.16** | **.000** | **-** |
| INFL | 68.2 | .000*** | -3.76*** | -5.72*** | -6.15*** | -17.9*** | I(0) | **25.7** | **.000***** | -3.53*** | -5.46*** | -8.34*** | -20.1*** | I(0) | 39.1 | .000 | -2.17 | .9853 | - |
| TRADE | 89.5 | .000*** | -1.98 | -4.61*** | -1.15 | -7.91*** | I(0) | **48.9** | **.000***** | -1.64 | -3.63*** | -.461 | -8.38*** | I(1) | 80.6 | .000 | .780 | .217 | - |
| EDUC | -2.16 | .030** | -2.19** | -4.83*** | -2.42*** | -9.43*** | I(0) | **.310** | **.757** | -2.00 | -3.86*** | -.910 | -9.61*** | - | 69.8 | .000 | -2.45 | .993 | I(1) |
| GSIZE | 36.1 | .000*** | -2.08* | -4.57 *** | -1.86 ** | -6.68*** | I(0) | **30.4** | **.000***** | -1.60 | -3.92*** | -.881 | -8.15*** | **I(1)** | **49.6** | **.000** | **-1.81** | **.965** | **-** |
| DCPS | 51.3 | .000*** | -1.89 | -4.19*** | -.908 | -6.12*** | I(0) | **31.3** | **.000***** | -1.80 | -3.40*** | -1.22 | -7.63*** | **I(1)** | **65.2** | **.000** | **8.71** | **.000** | **-** |
| M2RES | 4.38 | .000*** | -2.47*** | -5.38*** | -2.54*** | -13.2*** | I(0) | **2.94** | **.003***** | -2.35*** | -4.34*** | -4.64*** | -12.1*** | I(0) | **76.6** | **.000** | **2.87** | **.002** | **-** |
| UNUMP | 11.2 | .000*** | -1.92 | -4.29*** | -2.10** | -8.48*** | I(1) | **14.7** | **.000***** | -2.15*** | -3.29*** | -2.74*** | -6.60*** | I(0) | **47.1** | **.000** | **2.51** | **.006** | **-** |
| ADEP | 52.5 | .000*** | -2.13** | -4.83*** | -2.03 ** | -6.58*** | I(0) | **39.9** | **.000***** | -2.08* | -2.13 ** | -.886 | -3.18** | I(0) | **88.6** | **.000** | **79.5** | **.000** | **-** |
| polity2 | 10.2 | .000*** | -.245 | -2.10 ** | 13.8 | 8.76 | I(0) | **1.82** | .134**.** | .815 | -.552 | 17.5 | 12.5 | **-** | **54.6** | **.000** | **-.565** | **.714** | **I(1)** |

CD corresponds to pesaran 2004 cross dependency where the null hypothesis corresponds to no cross sectional dependence (i.e., residuals are independent across units). ; CIPS is peasaran panel unit root test (Pesaran, Smith and Yamagoto , 2008)[9]; CADF is augmented dickey fuller test in the presence of cross sectional dependency ( pesaran , 2007) where the value presented are Z[t-bar][10].

[8] Only results of first unit test are presented for inequality since it is not cross depend.

9 Critical values for this test at 10%; 5% and 1% are -2.05; -2.11 and -2.23, respectively.

[10] Z[t-bar] Critical Values (One-sided left-tailed test) for significance level of 10%; 5% and 1% are–1.28 ; –1.645 and –2.33, respectively.

### 5.2 Threshold Framework and Evidence from Static Panel Models

The relationship between capital account liberalization and income inequality has attracted considerable scholarly attention, particularly in recent years. However, the role of exchange rate regimes as a conditioning factor remains largely underexplored. Advances in nonlinear panel econometrics, especially panel threshold regression models introduced by Hansen (1999), provide a suitable framework to examine such interactions. These models allow the effect of an explanatory variable to change once a threshold variable crosses a critical value.

Empirical studies provide mixed evidence regarding the inequality effects of financial openness. Using data for 149 countries over the period 1970–2010, Furceri and Loungani (2015) find that capital account liberalization tends to increase income inequality in the short to medium run, particularly in countries with weaker financial systems and institutional frameworks. Similarly, Radhianshah and Kurnia (2021), applying a system-GMM approach to 28 European countries, report a positive relationship between financial openness and inequality and emphasize the importance of institutional quality and financial depth as conditioning variables. In the African context, Abouelkhair and Tamsamani (2022) show that intermediate exchange rate regimes are generally more conducive to economic growth, while capital account openness may be less compatible with such regimes.

Building on this literature, our study explicitly examines exchange rate regime flexibility as a threshold variable governing the relationship between capital account liberalization and income inequality. This represents a key contribution, as existing studies rarely integrate exchange rate regimes into nonlinear inequality–openness frameworks. This framework allows the marginal effect of capital openness to differ across regimes defined by exchange rate flexibility. As previously indicated the static panel threshold regression (PTR) model is specified as:

$$y_{it} = \mu_i + \alpha_i x_{it} + \beta_1' z_{it} I(q_{it} \leq \gamma) + \beta_2' z_{it} I(q_{it} > \gamma) + \varepsilon_{it} \quad (4)$$

Where $y_{it}$ denotes income inequality, $z_{it}$ measures capital account liberalization, $q_{it}$ is the threshold variable capturing exchange rate regime flexibility, and $x_{it}$ is a vector of control variables. The indicator function I(·) splits the sample into two regimes depending on whether the threshold variable is below or above the estimated threshold $\gamma$ (Wang and Shao, 2019).

In line with recent contributions (Wang and Wang, 2021; Lobont et al., 2022), the final specification of the single-threshold model can be written as:

$$INEQUALITY_{it} = \begin{cases} \mu_i + \beta_1' KAOPEN_{it} + \alpha_i x_{it} + \varepsilon_{it}, if XREG_{it} \leq \gamma \\ \mu_i + \beta_2' KAOPEN_{it} + \alpha_i x_{it} + \varepsilon_{it}, if\ XREG_{it} > \gamma \end{cases} \quad (5)$$

While the PTR framework is useful for identifying regime-dependent effects, it relies on important econometric assumptions. In particular, regressors are typically required to be stationary or, if non-stationary, cointegrated (Hansen, 1999; Wang, 2015). Estimating PTR models with non-stationary variables in the absence of cointegration may lead to spurious results and unreliable inference. Moreover, differencing integrated variables removes valuable long-run information and reduces variability in slowly evolving variables such as exchange rate regimes and financial openness.

To overcome these limitations, we adopt the Common Correlated Effects Panel Threshold Regression (CC-PTR) approach, which builds on Pesaran's (2006) CCE estimator and its extension to threshold models by Juodis et al. (2021). This framework is robust to cross-sectional dependence, unobserved common factors, and the presence of I(1) regressors, without requiring differencing or cointegration testing. The CC-PTR

model augments the standard PTR specification with cross-sectional averages of the dependent and independent variables[11]:

$$Inequality_{it} = \mu_i + \alpha_i x_{it} + \beta_1' z_{it} I(q_{it} \leq \gamma) + \beta_2' z_{it} I(q_{it} > \gamma) + \theta_1' \overline{x}_t + \theta_2' \overline{y}_t + \varepsilon_{it} \quad (6)$$

Where $\overline{X_t}$ and $\overline{y_t}$are the cross-sectional averages, included to proxy unobserved common shocks and shared no stationary trends. Including cross-sectional averages filters out global shocks and shared trends, corrects for cross-sectional dependence, and permits estimation in levels even when regressors are I(1).

The empirical results from the static threshold models provide strong evidence of nonlinearities in the relationship between capital account liberalization and income inequality. Bootstrap tests reject the null hypothesis of linearity, confirming the presence of statistically significant threshold effects in the exchange rate regime indicator. The estimated threshold separates countries operating under relatively stable or managed exchange rate regimes from those with more flexible arrangements.

Below the threshold, capital account liberalization is associated with a reduction in income inequality. This effect is statistically significant and economically meaningful, suggesting that in more stable exchange rate environments financial openness may promote investment, employment creation, and broader access to credit. Above the threshold, corresponding to more flexible exchange rate regimes, the effect becomes positive and significant, indicating that capital account openness tends to exacerbate income inequality. This pattern is consistent with the view that exchange rate volatility increases financial risks and disproportionately benefits agents with better access to international financial markets.

The CC-static threshold results reported in Table 4 show that the relationship between capital account liberalization and inequality is nonlinear and regime-dependent. In most specifications, capital account openness reduces inequality under relatively rigid exchange rate regimes but increases it under highly flexible regimes. This pattern is consistent across different inequality measures, time periods, and indicators of financial openness.

The control variables also display economically meaningful patterns. GDP per capita is generally positive and significant, suggesting that higher income levels are associated with greater inequality during certain stages of development. Inflation, trade openness, domestic credit, unemployment, age dependency, and democracy tend to increase inequality, whereas government size and monetary buffers often mitigate it.

[11] The effect of capital account liberalization on inequality is nonlinear and depends on whether exchange rate flexibility is below or above the threshold $\gamma$ (the threshold level of exchange rate flexibility where the impact of openness shifts); When exchange rate flexibility is low ($q_{it} \leq \gamma$), the effect is measured by $\beta_1$. This tells us how capital openness affects inequality under rigid/fixed exchange rate regimes. When exchange rate flexibility is high ( $q_{it} > \gamma$), the effect is measured by $\beta_2$ telling us how capital openness affects inequality under flexible exchange rate regimes**.** Control variables $x_{it}$ have linear effects on inequality, captured by $\alpha_i$. The model corrects for unobserved country-specific factors ($\mu_i$). $\theta_1$ and $\theta_2$ help filter out unobserved global shocks**,** such as worldwide financial liberalization or inequality cycles.

**Table 4: Static panel threshold estimates (CC-PTR)**

| | 1984-2020 | | | | 1995-2019 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kaopen | | | | Kaopen | | | | KA | | | | KAI | | | | KAO | | | |
| | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt |
| KAOPEN_b | -.830*** | -.072*** | -1.88*** | -.004 | -.723*** | .018** | -.469*** | .440** | | | | | | | | | | | | |
| | (.000) | (.000) | (.000) | (.949) | (.000) | (.020) | (.000) | (.023) | | | | | | | | | | | | |
| KAOPEN_d | -.107* | 001 | . -.084 | 3.03*** | -.164** | -.981*** | .328*** | .092 | | | | | | | | | | | | |
| | (.095) | (.841) | (.240) | (.000) | (.040) | (.000) | (.002) | (.323) | | | | | | | | | | | | |
| KA_b | | | | | | | | | -.111 | -.066* | 1.34*** | 3.32*** | | | | | | | | |
| | | | | | | | | | (.780) | (.080) | (.002) | (.000) | | | | | | | | |
| KA_d | | | | | | | | | 3.53*** | .881*** | -.968* | -1.04** | | | | | | | | |
| | | | | | | | | | (.000) | (.000) | (.051) | (.024) | | | | | | | | |
| KAI_b | | | | | | | | | | | | | -.812** | -.116*** | 1.04*** | 2.30*** | | | | |
| | | | | | | | | | | | | | (.039) | (.002) | (.015) | (.002) | | | | |
| KAI_d | | | | | | | | | | | | | 2.03*** | .891*** | -1.33*** | -1.68*** | | | | |
| | | | | | | | | | | | | | (.000) | (.000) | (.006) | (.000) | | | | |
| KAO_b | | | | | | | | | | | | | | | | | .438 | -.006 | 1.43*** | 3.45*** |
| | | | | | | | | | | | | | | | | | (.174) | (.828) | (.000) | (.000) |
| KAO_d | | | | | | | | | | | | | | | | | 4.53*** | .875*** | -.542 | -.407 |
| | | | | | | | | | | | | | | | | | (.000) | (.000) | (.179) | (.292) |
| XREG | -.173*** | -.010*** | -.317*** | -.156*** | -.115*** | -.009*** | -.245*** | -.094*** | -.113*** | -.010*** | -.046 | -.056*** | -.118*** | -.010*** | -.054 | -.079** | -.113*** | -.009*** | -.052 | -.045 |
| | (.000) | (.000) | (.000) | (.000) | (.000) | (.000) | (.000) | (.005) | (.000) | (.000) | (.192) | (.080) | (.000) | (.000) | (.115) | (.012) | (.000) | (.000) | (.135) | (.160) |
| GDPC | 2.16*** | .219*** | .487 | 1.83*** | .917* | .073*** | 1.49*** | 3.43*** | 1.39*** | .072 | 1.86*** | 2.03*** | 1.48*** | .061 | 1.67*** | 1.93*** | 1.50*** | .086* | 1.97*** | 2.38*** |
| | (.000) | (.000) | (.195) | (.000) | (.051) | (.100) | (.002) | (.000) | (.003) | (.110) | (.000) | (.000) | (.002) | (.173) | (.001) | (.001) | (.001) | (.054) | (.000) | (.000) |
| INFL | .001*** | .004** | .006** | .003 | .024*** | .001*** | -.002 | .006 | .014** | .001*** | -.001 | .002 | .019*** | .001*** | -.006 | .003 | .011** | .001*** | -.001 | .002 |
| | (.000) | (.035) | (.028) | (.229) | (.000) | (.002) | (.727) | (.315) | (.016) | (.002) | (.814) | (.671) | (.001) | (.002) | (.920) | (.568) | (.047) | (.004) | (.748) | (.690) |
| TRADE | .008*** | .006** | .019*** | .002 | -.002 | -.005 | .018*** | .004 | -.004 | .001 | .016*** | .002 | -.005* | -.002 | .016*** | .001 | -.004 | .004 | .017*** | .0028 |
| | (.003) | (.025) | (.000) | (.436) | (.437) | (.872) | (.000) | (.294) | (.151) | (.964) | (.000) | (.573) | (.081) | (.940) | (.000) | (.666) | (.136) | (.895) | (.000) | (.449) |
| EDUC | .028*** | -.001** | .042*** | -.004 | .084*** | .002*** | .082*** | .031*** | .084*** | .002** | .090*** | .040*** | .087*** | .002** | .092*** | .038*** | .083*** | .002** | .089*** | .039*** |
| | (.000) | (.032) | (.000) | (.597) | (.000) | (.007) | (.000) | (.003) | (.000) | (.011) | (.000) | (.000) | (.000) | (.013) | (.000) | (.000) | (.000) | (.014) | (.000) | (.000) |
| GSIZE | .004 | -.008*** | -.059* | -.186*** | -.095** | -.001 | -.041 | -.060 | -.104*** | -.003 | -.074* | -.068 | -.092** | -.002 | -.079* | -.060 | -.108*** | -.003 | -.066 | -.070 |
| | (.863) | (.001) | (.067) | (.000) | (.014) | (.617) | (.314) | (.177) | (.007) | (.386) | (.070) | (.123) | (.017) | (.481) | (.056) | (.173) | (.005) | (.345) | (.104) | (.109) |
| DCPS | .005** | .001 | .023*** | .020*** | .008*** | -.002 | .008*** | .008** | .006** | -.002 | .010*** | .008*** | .005** | -.002 | .009*** | .007** | .007*** | -.002 | .010*** | .010*** |
| | (.039) | (.552) | (.000) | (.000) | (.003) | (.283) | (.006) | (.015) | (.014) | (.342) | (.001) | (.006) | (.042) | (.296) | (.001) | (.024) | (.007) | (.456) | (.000) | (.001) |
| M2RES | -.008 | .002 | -.016*** | -.015*** | -.015*** | -.005 | -.014** | -.002 | -.022*** | -.004 | -.015*** | -.002 | -.020*** | -.004 | -.014** | .001 | -.022*** | -.005 | -.016*** | -.003 |
| | (.103) | (.546) | (.005) | (.002) | (.005) | (.308) | (.012) | (.967) | (.000) | (.392) | (.006) | (.737) | (.000) | (.444) | (.011) | (.983) | (.000) | (.318) | (.004) | (.555) |
| UNUMP | .173*** | .008*** | .048** | .221*** | .161*** | .005*** | .107*** | .243*** | .167*** | .005*** | .113*** | .202*** | .168*** | .005*** | .110*** | .203*** | .160*** | .005*** | .110*** | .203*** |
| | (.000) | (.000) | (.029) | (.000) | (.000) | (.005) | (.000) | (.000) | (.000) | (.004) | (.000) | (.000) | (.000) | (.009) | (.000) | (.000) | (.000) | (.003) | (.000) | (.000) |
| ADEP | .183*** | .004*** | .158*** | .229*** | .165*** | .008 | .129*** | .225*** | .160*** | .009 | .137*** | .219*** | .166*** | .009 | .135*** | .220*** | .160*** | .001 | .140*** | .220*** |
| | (.000) | (.000) | (.000) | (.000) | (.000) | (.558) | (.000) | (.000) | (.000) | (.475) | (.000) | (.000) | (.000) | (.507) | (.000) | (.000) | (.000) | (.402) | (.000) | (.000) |
| polity2 (democracy) | .589*** | .081*** | 1.25*** | 1.06*** | -.058 | .181*** | .343 | .140 | .317 | .181*** | .482** | .233 | .179 | .173*** | .412* | .091 | .319 | .186*** | .533** | .296 |
| | (.003) | (.000) | (.000) | (.000) | (.790) | (.000) | (.141) | (.578) | (.160 | (.000) | (.040) | (.353) | (.428) | (.000) | (.083) | (.719) | (.150) | (.000) | (.022) | (.234) |
| Threshold estimator | 3.0 | 4.0* | 3.0*** | 14*** | 3.0 | 14* | 10** | 4.0 | 13 | 14* | 10* | 3.0** | 12 | 14* | 10 | 3.0 | 13* | 14** | 10 | 3.0** |
| | (.153) | (.073) | (.000) | (.006) | (.450) | (.096) | (.010) | (.930) | (.156) | (.063) | (.090) | (.036) | (.240) | (.070) | (.140) | (.150) | (.056) | (.033) | (.120) | (.016) |
| Obs | 1776 | | | | 1200 | | | | | | | | | | | | | | | |

**Table 4 (Continued 1)**

| | 1995-2019 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Eq | | | | bo | | | | mm | | | | **ci** | | | |
| | | | | | | | | | | | | | | | | |

| | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eq_b | -.039 | .070** | 1.12*** | 3.83*** | | | | | | | | | | | | | | | | |
| | (.899) | (.020) | (.001) | (.000) | | | | | | | | | | | | | | | | |
| Eq_d | 3.27*** | .830*** | -1.35*** | .232 | | | | | | | | | | | | | | | | |
| | (.000) | (.000) | (.001) | (.523) | | | | | | | | | | | | | | | | |
| Bo_b | | | | | 1.41 | -.028 | 1.22*** | 2.19*** | | | | | | | | | | | | |
| | | | | | (.004) | (.364) | (.000) | (.000) | | | | | | | | | | | | |
| Bo_d | | | | | -1.22*** | -.239*** | -1.22*** | -.529 | | | | | | | | | | | | |
| | | | | | (.000) | (.000) | (.001) | (.132) | | | | | | | | | | | | |
| mm_b | | | | | | | | | 2.47*** | -.017 | .610* | 3.74*** | | | | | | | | |
| | | | | | | | | | (.000) | (.516) | (.053) | (.000) | | | | | | | | |
| mmçd | | | | | | | | | -.373 | .754*** | -1.52*** | -.749** | | | | | | | | |
| | | | | | | | | | (.186) | (.000) | (.000) | (.020) | | | | | | | | |
| Ci_b | | | | | | | | | | | | | -.367 | -.066*** | 1.07*** | 3.01*** | | | | |
| | | | | | | | | | | | | | (.173) | (.009) | (.001) | (.000) | | | | |
| Ci_d | | | | | | | | | | | | | 2.37*** | .797*** | -.023 | -.440 | | | | |
| | | | | | | | | | | | | | (.000) | (.000) | (.947) | (.157) | | | | |
| De_b | | | | | | | | | | | | | | | | | -.172 | -.049** | .847*** | 2.91*** |
| | | | | | | | | | | | | | | | | | (.442) | (.022) | (.002) | (.000) |
| De_d | | | | | | | | | | | | | | | | | 2.38*** | .747*** | -.812*** | -.863*** |
| | | | | | | | | | | | | | | | | | (.000) | (.000) | (.007) | (.001) |
| XREG | -.113*** | -.009*** | -.033 | -.060* | -.023 | .003 | -.025 | -.075** | -.020 | -.009*** | -.054 | -.053* | -.114*** | -.010*** | -.106*** | -.061* | -.106*** | -.010*** | -.075** | -.073** |
| | (.000) | (.001) | (.333) | (.058) | (.388) | (.261) | (.457) | (.018) | (.452) | (.000) | (.102) | (.091) | (.000) | (.000) | (.002) | (.057) | (.000) | (.000) | (.026) | (.021) |
| GDPC | 1.34*** | .091** | 1.85*** | 2.27*** | .172 | .094** | 1.84*** | 2.60*** | .174 | .083* | 1.69*** | 1.92*** | 1.58*** | .060 | 1.77*** | 2.31*** | 1.52*** | .073 | 1.71*** | 1.96*** |
| | (.003) | (.039) | (.000) | (.000) | (.720) | (.035) | (.000) | (.000) | (.724) | (.062) | (.001) | (.001) | (.001) | (.185) | (.000) | (.000) | (.001) | (.100) | (.001) | (.001) |
| INFL | .015*** | .001*** | -.003 | .001 | .023*** | .001** | -.002 | .002 | .022*** | .001*** | -.001 | .009 | .019*** | .001*** | -.001 | .002 | .018*** | .001*** | -.001 | .005 |
| | (.009) | (.006) | (.589) | (.769) | (.000) | (.025) | (.648) | (.660) | (.000) | (.004) | (.793) | (.880) | (.001) | (.003) | (.848) | (.689) | (.001) | (.002) | (.970) | (.425) |
| TRADE | -.004 | .007 | .018*** | .003 | -.004 | .003 | .017*** | .003 | -.004 | .002 | .016*** | .002 | -.005* | -.001 | .016*** | .003 | -.005* | 2.e-6 | .017*** | .001 |
| | (.141) | (.808) | (.000) | (.302) | (.202) | (.262) | (.000) | (.319) | (.170) | (.927) | (.000) | (.491) | (.096) | (.961) | (.000) | (.304) | (.091) | (.994) | (.000) | (.635) |
| EDUC | .084*** | .002** | .085*** | .039*** | .097*** | .002** | .092*** | .039*** | .093*** | .002** | .091*** | .039*** | .088*** | .002*** | .093*** | .040*** | .088*** | .002*** | .088*** | .041*** |
| | (.000) | (.020) | (.000) | (.000) | (.000) | (.013) | (.000) | (.000) | (.000) | (.016) | (.000) | (.000) | (.000) | (.009) | (.000) | (.000) | (.000 ) | (.008) | (.000) | (.000) |
| GSIZE | -.10*** | -.004 | -.063 | -.078* | -.084** | -.008 | -.073* | -.069 | -.084** | -.003 | -.075* | -.068 | -.099** | -.003 | -.063 | -.065 | -.100** | -.004 | -.064 | -.083* |
| | (.009) | (.276) | (.120) | (.076) | (.028) | (.817) | (.070) | (.117) | (.028) | (.339) | (.067) | (.117) | (.010) | (.391) | (.124) | (.139) | (.010) | (.262) | (.117) | (.058) |
| DCPS | .006** | -.001 | .010*** | .010*** | .007*** | -.002 | .009*** | .009*** | .007*** | -.002 | .009*** | .009*** | .005** | -.002 | .010*** | .009*** | .006** | -.002 | .010*** | .009*** |
| | (.015) | (.622) | (.001) | (.002) | (.005) | (.321) | (.001) | (.003) | (.005) | (.432) | (.002) | (.002) | (.037) | (.396) | (.001) | (.004) | (.020) | (.344) | (.000) | (.004) |
| M2RES | -.021*** | -.006 | -.016*** | -.004 | -.023*** | -.004 | -.015*** | -.002 | -.022*** | -.005 | -.015*** | -.001 | -.020*** | -.004 | -.016*** | -.002 | -.020*** | -.004 | -.016*** | -.006 |
| | (.000) | (.217) | (.006) | (.507) | (.000) | (.410) | (.009) | (.720) | (.000) | (.330) | (.009) | (.763) | (.000) | (.417) | (.005) | (.707) | (.000) | (.414 ) | (.007) | (.919) |
| UNUMP | .162*** | .005*** | .113*** | .205*** | .130*** | .008*** | .117*** | .211*** | .133*** | .005*** | .113*** | .201*** | .172*** | .005*** | .097*** | .199*** | .162*** | .005*** | .102*** | .203*** |
| | (.000) | (.003) | (.000) | (.000) | (.000) | (.000) | (.000) | (.000) | (.000) | (.003) | (.000) | (.000) | (.000) | (.004) | (.000) | (.000) | (.000) | (.004) | (.000) | (.000) |
| ADEP | .158*** | .001 | .136*** | .222*** | .143*** | .008 | .132*** | .221*** | .146*** | .001 | .136*** | .217*** | .167*** | .007 | .141*** | .218*** | .169*** | .007 | .141*** | .218*** |
| | (.000) | (.262) | (.000) | (.000) | (.000) | (.546) | (.000) | (.000) | (.000) | (.445) | (.000) | (.000) | (.000) | (.590) | (.000) | (.000) | (.000) | (.588) | (.000) | (.000) |
| polity2 | .252 | .192*** | .342 | .302 | .013 | .161*** | .425* | .241 | .019 | .185*** | .355 | .237 | .218 | .180*** | .568** | .235 | .295 | .183*** | .463** | .236 |
| (democracy) | (.256) | (.000) | (.144) | (.230) | (.951) | (.000) | (.066) | (.338) | (.928) | (.000) | (.130) | (.340) | (.327) | (.000) | .016) | (.349) | (.187) | (.000) | (.047) | (.344) |
| Threshold | 13.0 | 14.0** | 10.0** | 3.00* | 3.00 | 9.0** | 10** | 3.00 | 3.00 | 14** | 10** | 3.00*** | 12.0 | 14** | 10.0 | 3.00* | 12.0 | 14** | 10.0 | 3.00** |
| estimator | (.106) | (.026) | (.023) | (.086) | (.140) | (.036) | (.020) | (.233) | (.146) | (.040) | (.036) | (.006) | (.130) | (.040) | (.763) | (.053) | (.103) | (.040) | (.176) | (.030) |
| Obs | 1776 | 1200 | | | | | | | | | | | | | | | | | | |

**Table 4 (Continued 2)**

| | 1995-2019 | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cc | | | | fc | | | | gs | | | | di | | | | re | | | |
| | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cc_b | -.720** | -.101*** | -18.0*** | 1.88*** | | | | | | | | | | | | | | |
| | (.038) | (.000) | (.000) | (.002) | | | | | | | | | | | | | | |
| Cc_d | .750*** | .787*** | .240 | -.773*** | | | | | | | | | | | | | | |
| | (.003) | (.000) | (.363) | (.007) | | | | | | | | | | | | | | |
| Fc_b | | | | | .538** | .012 | 1.26**** | 2.88*** | | | | | | | | | | |
| | | | | | (.013) | (.535) | (.000) | (.000) | | | | | | | | | | |
| Fc_d | | | | | 2.63*** | .778*** | -.359 | -.436* | | | | | | | | | | |
| | | | | | (.000) | (.000) | (.174) | (.077) | | | | | | | | | | |
| Gs_b | | | | | | | | | -.756*** | -.147*** | .496*** | 1.61*** | | | | | | |
| | | | | | | | | | (.005) | (.000) | (.109) | (.007) | | | | | | |
| Gs_d | | | | | | | | | 1.46*** | 1.44*** | -1.29*** | -1.81*** | | | | | | |
| | | | | | | | | | (.003) | (.000) | (.000) | (.000) | | | | | | |
| Di_b | | | | | | | | | | | | | 1.60*** | -.040 | 1.05*** | 1.95*** | | |
| | | | | | | | | | | | | | (.000) | (.101) | (.000) | (.000) | | |
| Di_d | | | | | | | | | | | | | -.774*** | .733*** | -.401 | .144 | | |
| | | | | | | | | | | | | | (.006) | (.000) | (.229) | (.657) | | |
| Re_b | | | | | | | | | | | | | | | | | .041 | .070*** |
| | | | | | | | | | | | | | | | | | (.880) | (.008) |
| Re_d | | | | | | | | | | | | | | | | | 3.79*** | .897*** |
| | | | | | | | | | | | | | | | | | (.000) | (.000) |
| XREG | -.130*** | -.009*** | -.222*** | -.070** | -.084*** | -.009*** | -.070** | -.062** | -.091*** | -.009*** | -.098*** | -.090*** | -.018 | -.010*** | -.071** | -.078** | -.100*** | -.009*** |
| | (.000) | (.000) | (.000) | (.032) | (.002) | (.000) | (.033) | (.047) | (.001) | (.000) | (.002) | (.003) | (.495) | (.000) | (.044) | (.015) | (.000) | (.000) |
| GDPC | .767 | .058 | 1.41*** | 2.82*** | 1.56*** | .092** | 1.83*** | 2.42*** | 1.29*** | .048 | 1.68*** | 2.49*** | .295 | .081* | 1.72*** | 2.98*** | 1.36*** | .102** |
| | (.106) | (.193) | (.004) | (.000) | (.001) | (.039) | (.000) | (.000) | (.006) | (.274) | (.001) | (.000) | (.538) | (.068) | (.000) | (.000) | (.003) | (.021) |
| INFL | .024** | .001*** | .003 | .004 | .019*** | .001*** | -.001 | .001 | .023*** | .001*** | .001 | .009 | .025*** | .001*** | -.002 | .003 | .011* | .001*** |
| | (.000) | (.002) | (.564) | (.532) | (.001) | (.004) | (.793) | (.833) | (.000) | (.000) | (.806) | (.153) | (.000) | (.003) | (.702) | (.599) | (.071) | (.008) |
| TRADE | -.002 | .007 | .015*** | .002 | -.003 | .005 | .016*** | .002 | -.005* | -.001 | .014*** | .003 | -.004 | .003 | .016*** | .004 | -.005 | -.001 |
| | (.538) | (.819) | (.000) | (.437) | (.262) | (.872) | (.000) | (.571) | (.094) | (.548) | (.000) | (.933) | (.183) | (.917) | (.000) | (.287) | (.117) | (.964) |
| EDUC | .085*** | .002*** | .093*** | .036*** | .084*** | .002 ** | .088*** | .037*** | .092*** | .003*** | .096*** | .046*** | .092*** | .002** | .091*** | .034*** | .088*** | .002*** |
| | (.000) | (.007) | (.000) | (.000) | (.000) | (.015) | (.000) | (.000) | (.000) | (.000) | (.000) | (.000) | (.000) | (.018) | (.000) | (.001) | (.000) | (.002) |
| GSIZE | -.072* | -.003 | -.052 | -.071 | -.107*** | -.003 | -.073* | -.071 | -.078** | -.001 | -.060 | -.019 | -.096** | -.003 | -.070* | -.075* | -.109*** | -.004 |
| | (.060) | (.319) | (.201) | (.110) | (.005) | (.324) | (.076) | (.105) | (.046) | (.958) | (.144) | (.670) | (.012) | (.330 ) | (.088) | (.089 ) | (.005) | (.238) |
| DCPS | .007*** | -.002 | .007** | .008*** | .008*** | -.001 | .010*** | .010*** | .005* | -.004* | .008*** | .005* | .008*** | -.002 | .010*** | .009*** | .006** | -.001 |
| | (.008) | (.414) | (.011) | (.007) | (.004) | (.524) | (.000) | (.002) | (.057) | (.080 ) | (.005) | (.074) | (.003) | (.451) | (.000) | (.002) | (.014) | (.547) |
| M2RES | -.021*** | -.004 | -.007 | .001 | -.022*** | -.005 | -.016*** | -.002 | -.019*** | -.002 | -.014** | .009 | -.026*** | -.005 | -.014** | -.003 | -.021*** | -.005 |
| | (.000) | (.400) | (.249) | (.868) | (.000) | (.292) | (.004) | (.685) | (.000) | (.677) | (.012) | (.883) | (.000) | (.291) | (.014) | (.574) | (.000) | (.261) |
| UNUMP | .150*** | .005*** | .090*** | .227*** | .166*** | .005*** | .112*** | .211*** | .172*** | .006*** | .113*** | .216*** | .132*** | .005*** | .094*** | .224*** | .163*** | .006*** |
| | (.000) | (.007) | (.000) | (.000) | (.000) | (.003) | (.000) | (.000) | (.000) | (.002) | (.000) | (.000) | (.000) | (.004) | (.000) | (.000) | (.000) | (.002) |
| ADEP | .152*** | .001 | .148*** | .233*** | .165*** | .001 | .137*** | .220*** | .166*** | .001 | .141*** | .233*** | .145*** | .001 | .133*** | .222*** | .159*** | .001 |
| | (.000) | (.391) | (.000) | (.000) | (.000) | (.362) | (.000) | (.000) | (.000) | (.400) | (.000) | (.000) | (.000) | (.333) | (.000) | (.000) | (.000) | (.415) |
| polity2 (democracy) | .025 | .169*** | .556** | .160 | .361 | .188*** | .520** | .240 | .144 | .168*** | .538** | .011 | .089 | .188*** | .537** | .227 | .154 | .188*** |
| | (.907) | (.000) | (.019) | (.533) | (.113) | (.000) | (.027) | (.338) | (.523) | (.000) | (.021) | (.964) | (.682) | (.000) | (.021) | (.369) | (.482) | (.000) |
| Threshold estimator | 7.0 | 14* | 1.0 | 3.00 | 13 | 14* | 10 | 3.0** | 12. | 14* | 10 | 3.0* | 3.0 | 14** | 10 | 3.0 | 13* | 14** |
| | (.223) | (.056) | (.193) | (.266) | (.333) | (.056) | (.120) | (.010) | (.336) | (.056) | (.120) | (.096) | (.106) | (.023) | (.290) | (.426) | (.076) | (.026) |
| Obs | 1200 | | | | | | | | | | | | | | | | | |

| | | | | |
|---|---|---|---|---|
| Cc_b | | | | |
| | | | | |
| Cc_d | | | | |
| | | | | |
| Fc_b | | | | |
| | | | | |
| Fc_d | | | | |
| | | | | |
| Gs_b | | | | |
| | | | | |
| Gs_d | | | | |
| | | | | |
| Di_b | | | | |
| | | | | |
| Di_d | | | | |
| | | | | |
| Re_b | .070*** | -2.48*** | 3.16*** | |
| | (.008) | (.000) | (.000 ) | |
| Re_d | .897*** | .370 | -.673** | |
| | (.000) | (.217) | (.036) | |
| XREG | -.009*** | -.220*** | -.051 | |
| | (.000) | (.000) | (.107) | |
| GDPC | .102** | 1.33*** | 2.06*** | |
| | (.021) | (.007) | (.000) | |
| INFL | .001*** | .001 | .002 | |
| | (.008) | (.778) | (.968) | |
| TRADE | -.001 | .019*** | .001 | |
| | (.964) | (.000) | (.719) | |
| EDUC | .002*** | .098*** | .030*** | |
| | (.002) | (.000) | (.003) | |
| GSIZE | -.004 | -.066 | -.060 | |
| | (.238) | (.109) | (.173) | |
| DCPS | -.001 | .109*** | .005* | |
| | (.547) | (.000) | (.066) | |
| M2RES | -.005 | -.015*** | .007 | |
| | (.261) | (.010) | (.908) | |
| UNUMP | .006*** | .088*** | .221*** | |
| | (.002) | (.000) | (.000) | |
| ADEP | .001 | .138*** | .225*** | |
| | (.415) | (.000) | (.000) | |
| polity2 (democracy) | .188*** | .514** | .251 | |
| | (.000) | (.028) | (.313) | |
| Threshold estimator | 14** | 2.0 | 3.0*** | |
| | (.026) | (.186) | (.006) | |
| Obs | | | | |

## 5.4. Dynamic Panel Threshold Results

The econometric literature has long emphasized that macroeconomic relationships often display nonlinear and asymmetric dynamics. Classical nonlinear approaches, such as Markov-Switching, Smooth Transition, and Threshold Autoregressive (TAR) models, have been widely used to capture regime changes and improve predictive performance relative to linear specifications. However, until recently, these nonlinear mechanisms were rarely examined within a dynamic panel data framework that simultaneously accounts for persistence, unobserved heterogeneity, and endogeneity.

Recent advances by Seo and Shin (2016) and Seo et al. (2019) address these limitations by proposing a dynamic panel threshold model that allows both the slope coefficients and the persistence parameter to vary endogenously across regimes. This framework is particularly well suited to analyzing the interaction between capital account liberalization and income inequality, as both processes are inherently dynamic and likely to depend on macro-institutional conditions such as the exchange rate regime. The baseline specification is[12]:

$$y_{it} = (1, X_{it}')\theta_1 I(q_{it} \leq \gamma) + (1, X_{it}')\theta_2 I(q_{it} > \gamma) + \mu_i + \vartheta_{it} \quad (7)$$

Where $y_{it}$ denotes income inequality, $X_{it}$ is a k x 1 vector of covariates (may include the lagged dependent variable, $y_{it-1}$), $q_{it}$ represents exchange rate flexibility, and $\gamma$ is the estimated threshold. The coefficients $\theta_1$ and $\theta_2$ are regime-specific, $\mu_i$ captures individual fixed effects, and $\vartheta_{it}$ is an idiosyncratic error term assumed to satisfy the martingale difference property[13].

To further explore these relationships and explicitly model inequality persistence and conditioning effects, we estimate the augmented dynamic threshold specification:

$$INEQUALITY_{it} = \left(\alpha_1 INEQUALITY_{it-1} + \sum_j \theta_{1j} X_{jit}\right) I(q_{it} \leq \gamma) + \left(\alpha_2 INEQUALITY_{it-1} + \sum_j \theta_{2j} X_{jit}\right) I(q_{it} > \gamma) + \mu_i + \vartheta_{it} \quad (8)$$

Equation (8) is estimated using the FD-GMM estimator, which addresses the potential endogeneity of both regressors and the threshold variable. This approach improves upon earlier methods (Hansen, 1999; González et al., 2005), which relied primarily on lagged instruments and did not fully accommodate endogenous threshold variables—a limitation emphasized by Dang et al. (2012). Ultimately, statistical inference for this technique relies on Wald tests and bootstrap procedures, ensuring valid inference despite the presence of regime discontinuities.

The dynamic results confirm strong persistence in income inequality, as the lagged dependent variable is positive and highly significant across most specifications. Once dynamics are introduced, both the magnitude and direction of the effects of capital account liberalization vary substantially across exchange rate regimes.

Across the majority of specifications reported in Table 5, the estimated exchange rate threshold is statistically significant, typically at the 1% level, providing strong evidence against linearity. The thresholds

[12] In more details, if we exclude the variable capital account liberalization from the list of control variables (in order to emphasize the behavior of this indicator), following Seo and Shin (2016) and Seo et al. (2019), the empirical model for the threshold effect in the capital account liberalization–inequality nexus can be specified as:

$$INEQUALITY_{it} = \begin{cases} a_1 INEQUALITY_{it-1} + \mu_i + \beta_1' KAOPEN_{it} + \alpha_{1i} x_{it} + \varepsilon_{it}, if XREG_{it} \leq \gamma \\ a_2 INEQUALITY_{it-2} + \mu_i + \beta_2' KAOPEN_{it} + \alpha_{2i} x_{it} + \varepsilon_{it}, if\ XREG_{it} > \gamma \end{cases}$$

[13] A sequence of random variables $\{\vartheta_{it}\}$ is said to be a martingale difference sequence with respect to an information set $\mathcal{F}_{t-1}$ if: $E(\vartheta_{it}|\mathcal{F}_{t-1}) = 0$

Where $\mathcal{F}_{t-1}$ contains all information up to time t−1. This assumption ensures that, after controlling for regressors and fixed effects, the error $\vartheta_{it}$ has no predictable pattern based on past data, which is crucial for valid GMM estimation.

generally lie between values of 2 and 12, depending on the inequality measure, openness indicator, and sample period.

The results reveal important regime-dependent dynamics. Under relatively rigid exchange rate regimes, inequality shocks tend to persist over time, while under more flexible regimes the persistence of inequality is weaker or even reversed. In terms of policy variables, capital account liberalization tends to reduce inequality under certain flexible regimes but may increase it under less flexible arrangements. These patterns are consistent across several inequality indicators and measures of financial openness or restrictions.

Several control variables exhibit stable and interpretable patterns across regimes:

- GDP per capita frequently retains its sign across regimes, although its statistical significance weakens in some specifications. Overall, higher income levels tend to be associated with lower inequality in the dynamic setting.
- Higher levels of education are consistently associated with lower inequality, highlighting the importance of human capital in mediating the effects of globalization.
- Inflation and trade openness display mixed effects, with sign reversals across regimes, indicating that their distributional impact is conditional on macroeconomic structure.
- Government size often reduces inequality in the flexible regime, consistent with redistributive capacity.
- Financial depth (DCPS) and monetary buffers (M2RES) show regime-dependent effects, sometimes reinforcing inequality under rigid regimes while mitigating it under flexible ones.
- Democracy (Polity2) exhibits statistically significant effects in several specifications, though its sign varies, suggesting that political institutions interact with macroeconomic regimes rather than exerting uniform distributional effects.

Indeed, Table 5 reports the dynamic panel threshold results for multiple inequality measures (GINI, INEQ, Disp, Mrkt), several indicators of capital account liberalization and restrictions, and two sample periods (1984–2020 and 1995–2019).

Across the full set of specifications, the estimated exchange rate regime threshold is statistically significant in 56 out of 60 cases**,** typically at the 1% level. Estimated thresholds cluster mainly around values between 2 and 12**,** depending on the inequality measure, the openness indicator, and the sample period. This overwhelming rejection of linearity provides strong evidence that exchange rate regimes constitute a fundamental structural break in the relationship between capital account liberalization and income inequality.

The coefficient on the lagged inequality term is significant in a large share of models, confirming the strong persistence of inequality over time. Importantly, the magnitude and sign of this persistence differ across regimes:

- Below the threshold (more rigid or fixed regimes**)**, lagged inequality is generally positive and statistically significant, indicating that inequality shocks tend to persist and amplify over time.
- Above the threshold (more flexible regimes)**,** the coefficient often becomes negative and significant**,** suggesting that greater exchange rate flexibility can dampen inequality persistence and, in some cases, contribute to its gradual correction.

This regime-dependent persistence highlights that exchange rate flexibility not only affects the level of inequality but also its dynamic adjustment path**.**

The central research question concerns whether the inequality effects of capital account liberalization depend on the exchange rate regime. The dynamic results strongly confirm this hypothesis.

For the full sample (1984-2020), when inequality is measured by INEQ, capital account liberalization (KAOPEN) reduces inequality under flexible exchange rate regimes (XREG above approximately 12), as indicated by negative and statistically significant coefficients above the threshold. In contrast, under less flexible regimes, capital account liberalization either worsens inequality or yields insignificant effects.

Similar patterns emerge for **Disp**, where a rigid exchange rate regime (XREG below roughly 3) is associated with higher inequality following capital account liberalization, while greater flexibility mitigates these adverse effects.

For the later sub-period (1995-2019), the results reveal even sharper asymmetries. Financial restrictions tend to increase inequality under fixed regimes, whereas under more flexible regimes, tighter restrictions are often associated with lower inequality.

For example, when the exchange rate threshold is estimated around **7.05**, the coefficient on KA below the threshold is positive and significant (9.31, $p < 0.05$), indicating that limited openness combined with fixed regimes exacerbates inequality. Above the threshold, the coefficient turns negative and marginally significant (–11.2, $p < 0.10$), implying that greater flexibility allows restrictions to exert an equalizing effect.

The magnitude and significance of these effects vary with the restriction measure used (KA, KAI, KAO, eq, mm, ci, de), but the directional regime switch is remarkably consistent. For instance, when inequality is measured by INEQ and the restriction measure is "eq", the calculated exchange rate threshold is 2, and the signs of effects above and below this threshold differ and are significant. In contrast, when using the "mm" restriction measure, the exchange rate regime threshold is 11. Measures such as INEQ and Mrkt appear particularly informative in capturing these nonlinear dynamics.

A wide range of robustness checks confirms the stability of the main findings. Alternative measures of inequality, different classifications of exchange rate regimes, and alternative model specifications yield qualitatively similar results. The inclusion of cross-sectional averages effectively accounts for common shocks.

Taken together, the dynamic panel threshold results provide compelling evidence that the impact of capital account liberalization on income inequality is fundamentally nonlinear and regime-dependent. Exchange rate regimes not only shape the direction and magnitude of the inequality response but also influence the persistence and adjustment dynamics of inequality over time.

Rather than emphasizing precise numerical threshold values, our objective is to demonstrate the existence and robustness of regime switching across multiple inequality measures, openness indicators, and time periods. Identifying exact thresholds may be more appropriately pursued in future research focusing on a single inequality metric and a narrowly defined institutional context.

These findings help reconcile previously conflicting results in the literature and underscore the importance of adopting nonlinear and dynamic approaches in macroeconomic analysis. They also highlight the importance of policy coordination between exchange rate regimes and capital account policies when assessing the distributional consequences of financial globalization. Future research could build on this work by focusing on narrower institutional contexts to derive policy-relevant thresholds tailored to specific inequality measures, openness indicators, and time periods.

**Table 5: Dynamic panel threshold regression (based on Seao et al 2019)**

| | 1984-2020 | | | | 1995-2019 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kaopen | | | | Kaopen | | | | KA | | | | KAI | | | | KAO | | | |
| | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt |
| Lag_y_b | 1.18*** | .684*** | .941** | .589** | .086 | .650*** | .907*** | .217 | .129 | .556*** | .073 | -.509 | .397 | .659*** | .804* | -.736 | .404 | .563*** | .049 | -.440 |
| | (.000) | (.000) | (.017) | (.013) | (.817) | (.000) | (.006) | (.692) | (.747) | (.000) | (.720) | (.167) | (.270) | (.000) | (.069) | (.160) | (.396) | (.000) | (.827) | (.367) |
| KAOPEN_b | -.359 | .008* | 5.39** | .445 | .016 | .006 | 2.85 | .067 | | | | | | | | | | | | |
| | (.638) | (.090) | (.025) | (.503) | (.994) | (.713) | (.282) | (.976) | | | | | | | | | | | | |
| KA_b | | | | | | | | | -6.45 | -.062** | 4.85 | 9.31** | | | | | | | | |
| | | | | | | | | | (.198) | (.011) | (.245) | (.032) | | | | | | | | |
| KAI_b | | | | | | | | | | | | | 4.59 | .011 | 46.4* | 23.1 | | | | |
| | | | | | | | | | | | | | (.579) | (.852) | (.057) | (.108) | | | | |
| KAO_b | | | | | | | | | | | | | | | | | -1.19 | .044** | 3.58 | 5.89** |
| | | | | | | | | | | | | | | | | | (.589) | (.045) | (.262) | (.046) |
| GDPC | 1.60 | .008 | 3.02 | 5.00 | -1.86 | -.006 | -8.74* | -8.12 | -2.30 | -.027 | -3.37 | 4.30 | -12.0*** | -.058* | -.352 | -2.58 | -7.82** | -.014 | -5.63* | 4.02 |
| | (.526) | (.529) | (.553) | (.208) | (.536) | (.843) | (.058) | (.303) | (.478) | (.358) | (.374) | (.450) | (.000) | (.052) | (.951) | (.730) | (.018) | (.650) | (.069 ) | (.446) |
| INFL_b | -.004 | -3e-6 | .002 | -.001 | .415 | -.002 | -.017 | .136 | .447* | -9.e-6 | -.009 | .137 | .170 | -.002 | -.247 | .287* | .191 | .006** | -.001 | .136* |
| | (.197) | (.354) | (.922) | (.910) | (.101) | (.580) | (.924) | (.186) | (.073) | (.975) | (.980) | (.106) | (.361) | (.949) | (.301) | (.070) | (.269) | (.011) | (.974) | (.099) |
| TRADE_b | .011 | -.002 | -.013 | -.038 | -.058** | .001 | -.013 | .101 | -.074** | .001 | .029 | .032 | -.008 | .005 | .057* | .017 | -.030* | 7.e-6 | .039 | .033 |
| | (.417) | (.158) | (.574) | (.280) | (.021) | (.531) | (.589) | (.273) | (.010) | (.347) | (.431) | (.467) | (.753) | (.113) | (.051) | (.615) | (.058) | (.975) | (.259) | (.373) |
| EDUC_b | .079** | -.004** | .085 | -.093 | -.063 | -.006 | -.672* | .101 | -.146 | -.002*** | .035 | .125 | -.759*** | .002 | -.458 | .005 | -.446 | -.001 | .024 | .103 |
| | (.030) | (.030) | (.829) | (.245) | (.842) | (.597) | (.088) | (.595) | (.593) | (.000) | (.691) | (.218) | (.004) | (.793) | (.243) | (.986) | (.100) | (.125) | (.807) | (.399) |
| GSIZE_b | .129 | -.002** | -.764** | -.021 | -.039 | -.002* | -.600* | .753 | -.039 | .001 | .013 | .917** | .105 | -.004** | .152 | .506 | -.088 | .005 | -.040 | .967** |
| | (.428) | (.029) | (.024) | (.947) | (.877) | (.075) | (.070) | (.149) | (.852) | (.467) | (.949) | (.012) | (.639) | (.048) | (.746) | (.340) | (.655) | (.978) | (.829) | (.011) |
| DCPS_b | .005 | .002** | .009 | .080*** | .041* | -.004* | .047* | -.036 | .054** | -.001 | .023 | -.004 | .040 | -.003 | -.063 | -.004 | .039* | -.001 | .024 | -.005 |
| | (.756) | (.021) | (.821) | (.001) | (.076) | (.065) | (.095) | (.361) | (.028) | (.461) | (.244) | (.872) | (.156) | (.135) | (.054)* | (.889) | (.097) | (.149) | (.311) | (.826) |
| M2RES_b | -.009 | -.002 | .039 | -.127** | .009 | -.002 | .103* | .177* | .004 | -.005 | .008 | -.026 | -.007 | 3.e-6 | .022 | -.030 | .007 | -.001 | .021 | -.027 |
| | (.644) | (.164) | (.366) | (.044) | (.979) | (.677) | (.070) | (.089) | (.907) | (.307) | (.902) | (.656) | (.844) | (.993) | (.734) | (.666) | (.848) | (.953) | (.735) | (.635) |
| UNUMP_b | -.049 | .009 | .184 | .502*** | -.077 | -.001 | -.054 | -.092 | -.084 | -.002** | .169 | .557*** | -.222 | -.004*** | .056 | .513* | -.151 | -.002** | .129 | .538 |
| | (.601) | (.218) | (.301) | (.006) | (.652) | (.215) | (.768) | (.805) | (.572) | (.014) | (.276) | (.009) | (.142) | (.004) | (.872) | (.065) | (.215) | (.027) | (.374) | (.036) |
| ADEP_b | -.116 | .001** | -.085 | .259* | .437 | -.001 | .194 | -.200 | .594** | .001** | -.032 | .310 | .437 | -.004* | -.569 | .826* | .708*** | .002 | -.117 | .277 |
| | (.292) | (.023) | (.779) | (.090) | (.137) | (.542) | (.524) | (.635) | (.033) | (.049) | (.784) | (.266) | (.103) | (.069) | (.155) | (.041) | (.006) | (.109) | (.396) | (.219) |
| polity2_b (democracy) | -4.77* | -.035* | -19.1 | 9.82* | -12.2 | -.061* | 3.02 | 13.2 | -12.5 | -.037 | -5.08 | -1.00 | 37.5** | .033 | 14.5 | 15.8 | 8.36 | -.017 | -3.07 | -2.00 |
| | (.092) | (.084) | (.339) | (.061) | (.292) | (.054) | (.846) | (.158) | (.329) | (.315) | (.220) | (.874) | (.012) | (.356) | (.649) | (.566) | (.434) | (.560) | (.236) | (.739) |
| Threshold estimator | 11*** | 12*** | 3** | 12*** | 2 | 10.0*** | 3.01*** | 10.0*** | 2** | 11.0*** | 10.0*** | 7.05*** | 3.01*** | 10.0*** | 2 | 3.01*** | 3.01** | 10.0*** | 10.0*** | 7.05*** |
| | (.000) | (.000) | (.033) | (.000) | (.357) | (.000) | (.010) | (.001) | (.036) | (.000) | (.001) | (.001) | (.000) | (.006) | (.402) | (.007) | (.010) | (.000) | (.000) | (.006) |
| Lag_y_d | -.643** | -.057 | -.404 | -.416 | .148 | -.101*** | -.790** | 1.22 | .078 | -.005 | .409** | 1.74*** | -.099 | -.126*** | -.448 | 1.71*** | .311 | -.059** | .418** | 1.58** |
| | (.018) | (.110) | (.411) | (.641) | (.723) | (.001) | (.020) | (.171) | (.813) | (.863) | (.047) | (.007) | (.760) | (.001) | (.399) | (.004) | (.476) | (.026) | (.035) | (.036) |
| kaopen_d | 1.66* | -.025** | -5.62** | -6.18** | -.053 | .004 | -2.41 | -1.93 | | | | | | | | | | | | |
| | (.091) | (.017) | (.041) | (.035) | (.980) | (.714) | (.364) | (.454) | | | | | | | | | | | | |
| ka_d | | | | | | | | | 7.02 | .045 | -14.2*** | -11.2* | | | | | | | | |
| | | | | | | | | | (.307) | (.484) | (.003) | (.060) | | | | | | | | |
| kai_d | | | | | | | | | | | | | -6.76 | .067 | -57.9** | -30.4** | | | | |
| | | | | | | | | | | | | | (.399) | (.380) | (.028) | (.022) | | | | |
| kao_d | | | | | | | | | | | | | | | | | -1.21 | -.101** | -9.32** | -7.04 |
| | | | | | | | | | | | | | | | | | (.678) | (.016) | (.023) | (.115) |
| lgdpc_d | -6.24*** | .011 | -7.59 | 6.74 | -3.55 | -.044** | .488 | 4.07 | -3.27 | -.008 | -.725 | -5.21* | 7.04** | -.020 | -3.74 | .490 | 1.20 | -.069*** | .800 | -4.05* |
| | (.008) | (.571) | (.216) | (.165) | (.299) | (.049) | (.926) | (.217) | (.349) | (.810) | (.724) | (.086) | (.049) | (.561) | (.683) | (.951) | (.733) | (.003) | (.710) | (.091) |
| infl_d | .004 | 1.e-6 | -.004 | .008 | -.434* | .001 | .036 | -.245* | -.466* | -.002 | -.007 | -.167** | -.224 | .001 | .263 | -.295* | -.196 | -.019*** | .001 | -.165** |
| | (.272) | (.861) | (.887) | (.944) | (.076) | (.800) | (.842) | (.064) | (.056) | (.963) | (.893) | (.022) | (.209) | (.885) | (.266) | (.060) | (.251) | (.000) | (.975) | (.014) |
| trade_d | -.022 | .001 | .037 | .025 | .079** | -.001 | .031 | -.154 | .098** | .008 | -.080 | -.021 | .028 | -.001 | -.034 | -.008 | .042 | .003 | -.101 | -.025 |
| | (.491) | (.767) | (.330) | (.799) | (.026) | (.658) | (.454) | (.424) | (.017) | (.252) | (.244) | (.821) | (.399) | (.053) | (.520) | (.884) | (.111) | (.955) | (.128) | (.742) |
| educ_d | -.081 | -.004 | .065 | .065 | .195 | -.001 | .770** | -.434 | .267 | -.006 | .014 | -.322*** | .837*** | -.002 | .437 | -.120 | .516* | .002* | .010 | -.313*** |
| | (.441) | (.635) | (.880) | (.795) | (.532) | (.451) | (.045) | (.125) | (.314) | (.744) | (.903) | (.003) | (.002) | (.200) | (.241) | (.848) | (.053) | (.058) | (.940) | (.009) |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| gsize_d | -.295 | -.001 | .085 | -.287 | -.302 | .006 | .578* | -.539 | -.255 | -.005 | -.412 | -1.47*** | -.077 | .006 | .091 | -.550 | -.003 | -.004 | -.364 | -1.51*** |
| | (.325) | (.945) | (.849) | (.567) | (.394) | (.128) | (.088) | (.406) | (.425) | (.413) | (.176) | (.001) | (.827) | (.138) | (.882) | (.460) | (.991) | (.171) | (.229) | (.001) |
| dcps_d | .002 | -.006*** | .065* | -.161** | -.022 | .008** | -.031 | .057 | -.042 | .007* | .027 | .062* | -.060 | .001*** | .057 | .046 | -.036 | .005** | .045 | .057 |
| | (.901) | (.001) | (.099) | (.012) | (.388) | (.016) | (.300) | (.487) | (.166) | (.055) | (.533) | (.064) | (.126) | (.009) | (.241) | (.178) | (.170) | (.037) | (.342) | (.147) |
| m2res_d | .084* | .004 | -.138* | .148 | .036 | .001* | -.233** | -.092 | .072 | .003** | -.046 | .086 | .070 | .002 | -.128 | .146 | .056 | .004 | -.060 | .080 |
| | (.096) | (.318) | (.092) | (.216) | (.486) | (.084) | (.028) | (.530) | (.118) | (.010) | (.647) | (.557) | (.228) | (.850) | (.279) | (.229) | (.348) | (.941) | (.525) | (.574) |
| unump_d | .178 | .003* | .392 | -.852 | .284 | .001 | -.300 | -.029 | .258 | .006* | -.549* | -.190 | .090 | .001 | -.451 | -.213 | .034 | .004* | -.470* | -.142 |
| | (.349) | (.061) | (.187) | (.219) | (.220) | (.498) | (.362) | (.954) | (.203) | (.059) | (.060) | (.698) | (.696) | (.530) | (.505) | (.692) | (.900) | (.079) | (.080) | (.781) |
| adep_d | .346 | -.007 | .200 | -.557 | -.532 | .001 | -.183 | .578 | -.714** | -.006** | .087 | -.037 | -.407 | .005 | .621 | -.930** | -.934*** | -.004* | .202 | .046 |
| | (.131) | (.511) | (.722) | (.232) | (.149) | (.763) | (.685) | (.340) | (.043) | (.025) | (.646) | (.930) | (.281) | (.157) | (.271) | (.043) | (.001) | (.094) | (.395) | (.895) |
| democy_d | 5.49 | .087*** | 17.1 | -7.00 | 10.2 | .077*** | -2.23 | -8.34 | 10.8 | .182*** | 1.14 | 2.29 | -37.0** | -.012 | -16.1 | -18.0 | -9.37 | .057* | -.462 | 3.23 |
| | (.102) | (.001) | (.368) | (.117) | (.385) | (.007) | (.883) | (.320) | (.403) | (.002) | (.757) | (.726) | (.014) | (.776) | (.618) | (.503) | (.382) | (.090) | (.883) | (.568) |
| Obs | 1680 | 1680 | 1680 | 1680 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 |

**Table 5 (Continued 1)**

| | **1995-2019** | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | eq | | | | Bo | | | | mm | | | | **ci** | | | | de | | | |
| | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt |
| Lag_y_b | -.015 | .654*** | .161 | -.680 | .495 | .594*** | 1.09** | -.551 | -.121 | .592*** | .261 | -.617 | 365 | .616*** | .161 | -.552 | .297 | .617*** | -.093 | -.493 |
| | (.966) | (.000) | (.329) | (.229) | (.232) | (.000) | (.015) | (.147) | (.752) | (.000) | (.339) | (.257) | (.323) | (.000 | (.371) | (.193) | (.480) | (.000) | (.644) | (.226) |
| Eq_b | -3.14 | .103** | .499 | 15.5*** | | | | | | | | | | | | | | | | |
| | (.276) | (.026) | (.820) | (.002) | | | | | | | | | | | | | | | | |
| Bo_b | | | | | -.371 | .001 | 7.90 | 9.74** | | | | | | | | | | | | |
| | | | | | (.897) | (.946) | (.148) | (.021) | | | | | | | | | | | | |
| mm_b | | | | | | | | | -.310 | -.031* | 6.23*** | 9.58*** | | | | | | | | |
| | | | | | | | | | (.900) | (.060) | (.008) | (.006) | | | | | | | | |
| Ci_b | | | | | | | | | | | | | -3.41 | .060 | 3.98 | 7.12** | | | | |
| | | | | | | | | | | | | | (.167) | (.280) | (.387) | (.034) | | | | |
| De_b | | | | | | | | | | | | | | | | | -4.44 | -.053** | 6.58** | 15.9*** |
| | | | | | | | | | | | | | | | | | (.236) | (.026) | (.011) | (.003) |
| GDPC | -7.14* | .257*** | -5.25* | 4.87 | -11.0** | .018 | 3.34 | 6.19 | -12.4*** | -.075*** | -9.55** | 1.70 | -5.30* | .089 | -4.97 | 5.14 | -8.49** | .005 | -8.31*** | 5.00 |
| | (.062) | (.000) | (.055) | (.309) | (.010) | (.413) | (.456) | (.259) | (.002) | (.007) | (.025) | (.770) | (.057) | (.161) | (.111) | (.407) | (.032) | (.797) | (.002) | (.300) |
| INFL_b | .260 | .002 | .007 | .482** | .166 | .004** | -.044 | .166** | .197 | .002 | -.226** | .469** | .283* | .008 | -.001 | .153*** | .217 | -.007 | -.002 | .229 |
| | (.102) | (.227) | (.799) | (.039) | (.295) | (.029) | (.799) | (.019) | (.161) | (.297) | (.010) | (.034) | (.082) | (.493) | (.977) | (.008) | (.217) | (.692) | (.965) | (.126) |
| TRADE_b | -.031* | -.004* | .020 | -.017 | -.011 | -.005 | -.010 | .017 | -.023 | .002 | .072 | .007 | -.049*** | -.001 | .036 | .021 | -.040** | .001 | .039** | .066 |
| | (.054) | (.074) | (.205) | (.662) | (.526) | (.767) | (.766) | (.664) | (.190) | (.109) | (.118) | (.981) | (.006) | (.650) | (.303) | (.658) | (.011) | (.523) | (.015) | (.153) |
| EDUC_b | -.276 | -.003 | .007 | -.472 | -.388 | -.007* | -.809 | .116 | -.634* | -.001** | .024 | -.503 | -.441* | .001 | .044 | .176* | -.361 | -.001 | .126** | -.356 |
| | (.555) | (.259) | (.866) | (.414) | (.245) | (.077) | (.172) | (.354) | (.065) | (.030) | (.818) | (.388) | (.070) | (.722) | (.598) | (.083) | (.148) | (.108) | (.002) | (.224) |
| GSIZE_b | -.202 | .006* | .223 | .666 | -.083 | -.002** | -.353 | .534 | -.217 | .003* | -.081 | .861 | -.052 | -.006 | -.039 | .916** | -.343* | -.002 | .158 | .848** |
| | (.427) | (.072) | (.216) | (.172) | (.713) | (.011) | (.443) | (.116) | (.468) | (.053) | (.771) | (.157) | (.777) | (.842) | (.851) | (.023) | (.059) | (.363) | (.434) | (.021) |
| DCPS_b | .044* | -.003 | .009 | -.015 | .035 | -.003 | -.021 | .013 | .063** | -.005 | .001 | -.007 | .046** | .001 | .026 | .007 | .044 | -.003 | .024 | -.069** |
| | (.086) | (.130) | (.560) | (.703) | (.193) | (.847) | (.405) | (.608) | (.036) | (.540) | (.966) | (.829) | (.040) | (.124) | (.277) | (.978) | (.165) | (.147) | (.096) | (.040) |
| M2RES_b | .016 | -.001*** | .060 | -.097 | .033 | -.004* | .030 | -.030 | -.014 | -.002 | .025 | -.065 | -.004 | -.007* | .049 | -.018 | .057 | -.003 | .038 | -.055 |
| | (.760) | (.009) | (.146) | (.215) | (.451) | (.079) | (.650) | (.641) | (.712) | (.367) | (.724) | (.438) | (.991) | (.085) | (.477) | (.763) | (.235) | (.538) | (.454) | (.365) |
| UNUMP_b | -.116 | .009*** | -.094 | .721*** | -.172 | .007 | .020 | .649** | -.186 | -.003*** | -.072 | .606** | -.095 | .005** | .100 | .561** | -.163 | -.003*** | -.016 | .666** |
| | (.247) | (.000) | (.527) | (.008) | (.237) | (.402) | (.926) | (.013) | (.290) | (.000) | (.720) | (.021) | (.436) | (.021) | (.511) | (.013) | (.177) | (.009) | (.900) | (.014) |
| ADEP_b | .649** | -.014*** | .011 | .876** | .796*** | .005 | -.175 | .358* | .605** | .001 | .044 | .824* | .534*** | -.016** | -.093 | .334 | .690*** | -.004** | .102 | -.006 |
| | (.028) | (.009) | (.847) | (.027) | (.005) | (.695) | (.705) | (.089) | (.017) | (.897) | (.883) | (.081) | (.005) | (.012) | (.439) | (.236) | (.007) | (.025) | (.294) | (.978) |
| polity2_b | -.991 | -.862* | -4.85** | -14.5 | 19.1 | .042 | -23.4 | -3.97 | 23.8 | -.051 | 2.52 | -19.4 | 2.44 | -.028 | -3.72 | -2.19 | 4.07 | .057 | -4.52** | -9.72 |
| (democracy) | (.953) | (.095) | (.016) | (.507) | (.231) | (.203) | (.283) | (.511) | (.192) | (.202) | (.433) | (.493) | (.831) | (.965) | (.264) | (.719) | (.733) | (.281) | (.028) | (.493) |
| Threshold estimator | 3.01** | 2*** | 11*** | 3.01*** | 3.01*** | 10*** | 2 | 7.05*** | 3.01*** | 11*** | 8.06** | 3.01** | 3.01*** | 2*** | 10*** | 7.05*** | 3.01* | 7.05** | 11*** | 4.02* |
| | (.013) | (.000) | (.000) | (.004) | (.008) | (.002) | (.110) | (.003) | (.006) | (.000) | (.014) | (.037) | (.001) | (.006) | (.009) | (.001) | (.071) | (.011) | (.000) | (.053) |
| Lag_y_d | .653** | -.142** | -.247 | 1.59** | .372 | -.076** | -.824** | 1.43** | .421 | -.026 | .563* | 1.61** | .052 | -.114* | .268 | 1.89*** | .363 | -.112*** | .152 | 1.09** |
| | (.039) | (.012) | (.291) | (.011) | (.394) | (.020) | (.038) | (.028) | (.226) | (.376) | (.080) | (.012) | (.880) | (.062) | (.223) | (.006) | (.313) | (.000) | (.563) | (.012) |
| eq_d | .397 | -.104* | -1.64 | -16.3*** | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (.896) | (.097) | (.574) | (.002) | | | | | | | | | | | | | | | | |
| bo_d | | | | | -2.91 | .026 | -4.50 | -13.6** | | | | | | | | | | | | |
| | | | | | (.447) | (.516) | (.567) | (.016) | | | | | | | | | | | | |
| mm_d | | | | | | | | | -.893 | .136*** | -8.90*** | -9.10** | | | | | | | | |
| | | | | | | | | | (.770) | (.008) | (.006) | (.045) | | | | | | | | |
| ci_d | | | | | | | | | | | | | 3.79 | -.087* | -8.12* | -9.31* | | | | |
| | | | | | | | | | | | | | (.173) | (.064) | (.086) | (.064) | | | | |
| de_d | | | | | | | | | | | | | | | | | 1.11 | .086*** | -5.89** | -14.6** |
| | | | | | | | | | | | | | | | | | (.784) | (.002) | (.015) | (.032) |
| lgdpc_d | .319 | -.178*** | 4.37** | -5.86 | 3.98 | -.036 | -10.9** | -8.52** | 5.83 | .070** | 4.24 | -4.45 | -.302 | .029 | .724 | -4.63* | 1.33 | .030 | 2.71 | -4.39 |
| | (.938) | (.009) | (.047) | (.404) | (.434) | (.116) | (.027) | (.010) | (.253) | (.043) | (.188) | (.571) | (.934) | (.568) | (.755) | (.073) | (.757) | (.102) | (.186) | (.100) |
| infl_d | -.265* | -.002 | -.036 | -.498** | -.158 | -.008** | .043 | -.175** | -.267* | -.001 | .223*** | -.480** | -.283* | -.001 | -.045 | -.189*** | -.219 | -.002 | -.006 | -.262* |
| | (.091) | (.215) | (.234) | (.033) | (.320) | (.002) | (.805) | (.016) | (.051) | (.237) | (.006) | (.027) | (.079) | (.419) | (.451) | (.001) | (.203) | (.575) | (.925) | (.079) |
| trade_d | .023 | -.001 | -.057 | .039 | .008 | -.005 | .066 | -.033 | .026 | -.001 | -.122* | .015 | .077*** | -.002 | -.087 | -.025 | .035 | -.002 | -.021 | -.002 |
| | (.460) | (.972) | (.288) | (.632) | (.981) | (.403) | (.308) | (.638) | (.356) | (.816) | (.075) | (.782) | (.006) | (.547) | (.164) | (.801) | (.243) | (.509) | (.729) | (.978) |
| educ_d | .334 | .002 | .157* | .320 | .399 | -.001 | .934 | -.333** | .724* | -.002 | -.080 | .356 | .525** | -.002 | -.023 | -.354*** | .435* | .001 | .042 | .447 |
| | (.482) | (.413) | (.057) | (.604) | (.244) | (.305) | (.120) | (.045) | (.033) | (.124) | (.596) | (.562) | (.034) | (.499) | (.858) | (.001) | (.090) | (.107) | (.694) | (.232) |
| gsize_d | .082 | -.009** | -1.41*** | -.891 | .083 | -.002 | .359 | -1.25** | -.026 | -.015*** | .109 | -1.01 | .090 | .001 | -.295 | -1.59*** | 280 | .002 | -.810 | -.830* |
| | (.783) | (.036) | (.009) | (.122) | (.837) | (.921) | (.445) | (.024) | (.937) | (.001) | (.846) | (.208) | (.733) | (.695) | (.306) | (.001) | (.295) | (.668) | (.171) | (.092) |
| | -.029 | .005 | .012 | .038 | -.045 | .003 | .045 | .073* | -.050 | .006** | -.002 | .026 | -.049* | .002 | .006 | .065 | -.029 | .005** | -.008 | .070* |
| | (.259) | (.165) | (.786) | (.392) | (.163) | (.383) | (.116) | (.060) | (.122) | (.034) | (.960) | (.511) | (.050) | (.322) | (.897) | (.083) | (.415) | (.019) | (.882) | (.085) |
| m2res_d | .029 | .001 | -.373** | .182 | .014 | .006 | -.203 | .049 | .066 | .007 | -.137 | .158 | .067 | .001* | -.154 | .129 | -.009 | .006 | -.308* | .064 |
| | (.689) | (.131) | (.021) | (.215) | (.850) | (.522) | (.123) | (.761) | (.295) | (.482) | (.200) | (.351) | (.189) | (.082) | (.171) | (.417) | (.889) | (.326) | (.076) | (.716) |
| unump_d | .013 | -.016*** | -.210 | -.495 | -.088 | -.002 | -.244 | -.221 | .099 | .019 | -.559* | -.654 | -.012 | -.008** | -.564* | -.086 | .053 | .008*** | -.425 | -.272 |
| | (.944) | (.000) | (.428) | (.305) | (.779) | (.320) | (.431) | (.608) | (.713) | (.563) | (.054) | (.149) | (.960) | (.019) | (.074) | (.872) | (.830) | (.004) | (.109) | (.559) |
| adep_d | -883*** | .023*** | -.155 | -.959** | -1.08*** | -.099 | .085 | -.113 | -.694** | -.009 | -.359 | -.929* | -.658*** | .027*** | .131 | -.050 | -.940*** | .007*** | -.264 | .216 |
| | (.008) | (.004) | (.382) | (.035) | (.001) | (.683) | (.890) | (.762) | (.036) | (.778) | (.454) | (.080) | (.007) | (.001) | (.507) | (.903) | (.000) | (.003) | (.308) | (.612) |
| democy_d | -.092 | .922* | 2.93 | 12.9 | -20.7 | .082*** | 22.8 | 7.21 | -23.8 | .137*** | -8.60** | 17.8 | -2.58 | .077 | -.936 | 3.22 | -4.73 | -.091** | 5.10 | 2.29 |
| | (.996) | (.073) | (.535) | (.539) | (.205) | (.002) | (.310) | (.188) | (.196) | (.001) | (.031) | (.509) | (.825) | (.904) | (.788) | (.625) | (.683) | (.040) | (.227) | (.847) |
| Obs | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 |

**Table 5 (Continued 2)**

| | **1995-2019** | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | cc | | | | Fc | | | | gs | | | | di | | | | re | | | |
| | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt | GINI | INEQ | Disp | Mrkt |
| Lag_y_b | .872*** | .544*** | 1.18*** | .115 | .851*** | .728*** | .155 | -.402 | -.073 | .472*** | .323 | -.018 | .699 | .648*** | 1.00*** | -1.04** | .295 | .618*** | .179 | -.298 |
| | (.000) | (.000) | (.006) | (.680) | (.003) | (.000) | (.578) | (.346) | (.838) | (.000) | (.391) | (.947) | (.150) | (.000) | (.006) | (.015) | (.444) | (.000) | (.251) | (.416) |
| cc_b | -3.55** | -.029 | 1.97 | -2.23 | | | | | | | | | | | | | | | | |
| | (.035) | (.267) | (.297) | (.483) | | | | | | | | | | | | | | | | |
| fc_b | | | | | -1.67 | -.013 | 4.33 | 4.74** | | | | | | | | | | | | |
| | | | | | (.316) | (.429) | (.191) | (.037) | | | | | | | | | | | | |
| gs_b | | | | | | | | | -.756 | -.074** | -5.81 | 8.13 | | | | | | | | |
| | | | | | | | | | (.924) | (.023) | (.353) | (.217) | | | | | | | | |
| di_b | | | | | | | | | | | | | -1.38 | -.074** | .186 | 9.48** | | | | |
| | | | | | | | | | | | | | (.649) | (.012) | (.972) | (.044) | | | | |
| re_b | | | | | | | | | | | | | | | | | -4.27 | -.010 | 4.37*** | 7.00** |
| | | | | | | | | | | | | | | | | | (.120) | (.423) | (.001) | (.016) |
| GDPC | .816 | -.092** | -10.3** | -6.84 | -1.17 | -.013 | -3.52 | 3.43 | -11.0** | -.148*** | -11.9** | -.539 | -1.83 | -.051 | -9.66* | 9.66 | -2.32 | -.002 | -3.53 | 1.02 |
| | (.740) | (.013) | (.038) | (.141) | (.627) | (.808) | (.403) | (.516) | (.027) | (.004) | (.019) | (.921) | (.660) | (.210) | (.097) | (.103) | (.540) | (.901) | (.267) | (.849) |
| INFL_b | .011 | -.003 | -.098 | .049 | .262 | -.004 | .021 | .149** | .249 | -.007 | -.154 | 2985 | .266 | .001 | .043 | .866 | .355 | -.002 | -.038 | .134 |
| | (.578) | (.341) | (.665) | (.403) | (.109) | (.220) | (.684) | (.003) | (.172) | (.025) | (.077) | (.005) | (.195) | (.702) | (.838) | (.018) | (.061) | (.120) | (.268) | (.052) |
| TRADE_b | -.007 | .001 | -.003 | .117** | -.036* | 3.e-6 | .044 | .033 | -.052*** | .004 | .097** | .064 | -.048* | .005 | -.008 | -.079* | -.048* | .001 | .016 | .053 |
| | (.562) | (.548) | (.899) | (.013) | (.064) | (.994) | (.244) | (.395) | (.004) | (.105) | (.030) | (.138) | (.068) | (.128) | (.781) | (.054) | (.058) | (.444) | (.362) | (.261) |
| EDUC_b | .082** | -.002*** | -1.02** | .122 | -.342 | -.001 | .110 | .087 | -.892** | -.008 | .168 | .073 | -.495 | -.014* | -.768 | -.153 | -.320 | -.003 | .124** | .103 |
| | (.044) | (.003) | (.033) | (.403) | (.171) | (.580) | (.345) | (.485) | (.015) | (.310) | (.221) | (.648) | (.116) | (.072) | (.105) | (.798) | (.237) | (.948) | (.011) | (.359) |
| GSIZE_b | .026 | .003 | -.989*** | .596** | .304 | -.008** | .330 | .930*** | -.218 | .006 | -.044 | .420 | .251 | -.004** | -.721** | .182 | -.117 | .001 | -.160 | .823*** |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (.861) | (.249) | (.006) | (.035) | (.137) | (.013) | (.196) | (.007) | (.508) | (.202) | (.833) | (.128) | (.461) | (.041) | (.035) | (.686) | (.597) | (.318) | (.481) | (.009) |
| DCPS_b | .006 | .008 | .053** | -.022 | .019 | -.005* | -.019 | -.005 | .082* | .004* | -.003 | -.016 | .032 | -.002 | .048 | .021 | .043 | -.005*** | .030 | -.008 |
| | (.574) | (.594) | (.037) | (.544) | (.317) | (.063) | (.483) | (.816) | (.069) | (.084) | (.927) | (.506) | (.277) | (.113) | (.117) | (.568) | (.136) | (.001) | (.132) | (.791) |
| M2RES_b | .002 | -.006* | .077 | .072 | .010 | .002 | .060 | -.029 | -.065 | .004 | .074 | .022 | -.019 | -.002 | .128 | -.120 | .028 | .003 | -.009 | -.005 |
| | (.945) | (.065) | (.256) | (.211) | (.762) | (.969) | (.352) | (.666) | (.235) | (.946) | (.295) | (.723) | (.688) | (.613) | (.253) | (.147) | (.456) | (.925) | (.833) | (.994) |
| UNUMP_b | -.059 | -.002 | -.167 | .020 | -.121 | -.004* | -.100 | .611** | -.129 | -.002 | -.076 | .381* | -.138 | .001 | -.202 | 1.24*** | -.063 | -.002** | .025 | .460* |
| | (.429) | (.877) | (.475) | (.924) | (.335) | (.098) | (.608) | (.017) | (.507) | (.324) | (.775) | (.071) | (.322) | (.915) | (.437) | (.000) | (.641) | (.014) | (.821) | (.096) |
| ADEP_b | .083 | .003** | -.100 | -.219 | .450** | -.003 | -.172 | .222 | .822*** | .004** | -.143 | -.077 | .421 | -.001 | -.032 | 1.19*** | .354** | -.003* | -.017 | .140 |
| | (.338) | (.037) | (.704) | (.324) | (.024) | (.103) | (.294) | (.231) | (.004) | (.041) | (.544) | (.768) | (.141) | (.590) | (.895) | (.005) | (.026) | (.098) | (.893) | (.441) |
| polity2 _b | -.653 | -.087 | 33.2 | 7.74 | -4.74 | .028 | -4.35 | -2.74 | 18.6 | .050 | 7.04 | -3.42 | -6.81 | -.079 | 7.53 | -31.2 | -.209 | .040 | -4.62** | -.710 |
| (democracy) | (.685) | (.109) | (.106) | (.176) | (.685) | (.719) | (.364) | (.649) | (.253) | (.264) | (.277) | (.490) | (.525) | (.186) | (.666) | (.245) | (.988) | (.140) | (.033) | (.905) |
| Threshold estimator | 12*** | 11.0*** | 3.01*** | 10*** | 3.01*** | 10*** | 10.0*** | 7.05*** | 2 | 11.0*** | 9.07** | 7.05*** | 2 | 10.0*** | 3.01*** | 3.01*** | 3.01* | 7.05*** | 12*** | 7.05*** |
| | (.000) | (.000) | (.002) | (.000) | (.090) | (.000) | (.002) | (.002) | (.201) | (.000) | (.047) | (.002) | (.179) | (.006) | (.010) | (.000) | (.053) | (.000) | (.000) | (.003) |
| Lag_y_d | -.452* | .120*** | -.898* | .756 | -.356 | -.149*** | -.010 | 1.39** | .403 | -.101* | .655* | .881 | -.385 | -.112** | -.703* | 1.90*** | .068 | -.055*** | -.021 | 1.23** |
| | (.079) | (.000) | (.065) | (.122) | (.252) | (.000) | (.972) | (.050) | (.226) | (.071) | (.061) | (.125) | (.389) | (.038) | (.073) | (.000) | (.870) | (.004) | (.954) | (.023) |
| cc_d | 3.27 | .084 | -3.45 | 2.68 | | | | | | | | | | | | | | | | |
| | (.181) | (.122) | (.153) | (.509) | | | | | | | | | | | | | | | | |
| fc_d | | | | | 2.49 | -.047 | -11.0*** | -5.41* | | | | | | | | | | | | |
| | | | | | (.221) | (.186) | (.009) | (.089) | | | | | | | | | | | | |
| gs_d | | | | | | | | | -1.02 | .069*** | -1.67 | -11.1* | | | | | | | | |
| | | | | | | | | | (.897) | (.006) | (.760) | (.073) | | | | | | | | |
| di_d | | | | | | | | | | | | | 3.36 | .080** | 4.03 | -14.9*** | | | | |
| | | | | | | | | | | | | | (.339) | (.014) | (.548) | (.007) | | | | |
| re_d | | | | | | | | | | | | | | | | | 5.32* | -.001 | -13.2* | -6.30** |
| | | | | | | | | | | | | | | | | | (.095) | (.922) | (.051) | (.032) |
| lgdpc_d | -2.10 | .127** | 7.14 | 2.90 | -4.81 | -.059* | -2.22 | -3.91* | 5.32 | .090*** | 7.12*** | -6.29** | -3.77 | -.027 | 1.82 | -11.2 | -3.68 | .008 | -1.89 (.710) | -2.86 |
| | (.486) | (.011) | (.255) | (.180) | (.136) | (.052) | (.452) | (.096) | (.365) | (.002) | (.003) | (.013) | (.338) | (.150) | (.772) | (.169) | (.355) | (.654) | | (.214) |
| infl_d | -.082* | .001 | .117 | -.086 | -.278* | .006 | .021 | -.173*** | -.290* | -.003*** | .188* | -.303*** | -.287 | -.002 | -.018 | -.893** | -.423** | .001 | -.028 | -.160* |
| | (.080) | (.342) | (.605) | (.414) | (.084) | (.519) | (.849) | (.001) | (.098) | (.003) | (.052) | (.008) | (.159) | (.597) | (.931) | (.016) | (.021) | (.952) | (.555) | (.055) |
| trade_d | .044 | .002** | .019 | -.208** | .057* | -.003 | -.112 | -.022 | .061** | .005 | -.191 | -.120 | .075* | -.001 | .038 | .128* | .064 | -.005** | .021 | -.030 |
| | (.498) | (.036) | (.633) | (.039) | (.064) | (.953) | (.313) | (.736) | (.019) | (.487) | (.083) | (.193) | (.070) | (.289) | (.444) | (.053) | (.103) | (.043) | (.854) | (.730) |
| educ_d | .011 | -.004 | 1.14** | -.388** | .383 | .002 | .032 | -.252 | 1.02*** | -.003 | -.276 | -.155 | .581* | .001 | .854* | .201 | .406 | -.004 | .035 | -.298* |
| | (.900) | (.115) | (.014) | (.025) | (.119) | (.319) | (.865) | (.115) | (.002) | (.175) | (.047) | (.544) | (.064) | (.539) | (.051) | (.750) | (.138) | (.718) | (.848) | (.053) |
| gsize_d | -.177 | -.013* | 1.07*** | -.677 | -.434 | .012** | -.392 | -1.35*** | -.275 | -.041*** | .272 | -.507 | -.526 | .006 | .998** | -.518 | .049 | -.008 | -.200 | -1.17*** |
| | (.780) | (.088) | (.007) | (.207) | (.106) | (.027) | (.369) | (.002) | (.574) | (.000) | (.566) | (.254) | (.154) | (.117) | (.016) | (.401) | (.882) | (.774) | (.814) | (.003) |
| dcps_d | -.034 | .004 | -.026 | .087 | -.034 | .001** | .070 | .064* | -.070 | -.001** | -.002 | .135*** | -.031 | .007 | -.028 | .032 | -.048 | .007*** | -.001 | .057 |
| | (.103) | (.919) | (.435) | (.163) | (.186) | (.027) | (.187) | (.060) | (.218) | (.022) | (.972) | (.001) | (.227) | (.142) | (.489) | (.430) | (.130) | (.003) | (.971) | (.141) |
| m2res_d | .122 | .001 | -.245* | -.003 | .027 | .007 | -.059 | .097 | .148 | .002 | -.079 | .006 | .061 | .001 | -.344** | .192 | -.017 | .001 | -.325* | .024 |
| | (.133) | (.383) | (.051) | (.962) | (.563) | (.596) | (.548) | (.518) | (.135) | (.905) | (.440) | (.966) | (.191) | (.472) | (.042) | (.196) | (.736) | (.157) | (.062) | (.872) |
| unump_d | .510** | .003 | 153 | .121 | .030 | .003 | -.443 | -.284 | .248 | .021*** | -.713 | -.358 | .133 | -.004 | -.084 | -.947 | -.016 | .005 | -.540 | -.244 |
| | (.027) | (.584) | (.634) | (.655) | (.890) | (.358) | (.291) | (.443) | (.388) | (.000) | (.020) | (.278) | (.480) | (.226) | (.806) | (.050) | (.942) | (.035) | (.154) | (.562) |
| adep_d | -.137 | -.006* | .292 | .519** | -.566** | .002 | .188 | .150 | -.936*** | .002 | -.036 | .332 | -.497 | .002 | .103 | -1.31** | -.385* | .004 | -.109 | .142 |
| | (.621) | (.082) | (.414) | (.030) | (.013) | (.469) | (.556) | (.649) | (.006) | (.435) | (.920) | (.479) | (.174) | (.519) | (.769) | (.006) | (.057) | (.101) | (.827) | (.635) |
| democy_d | 5.79* | .233** | -31.7 | -10.3* | 3.41 | -.005 | 3.67 | 4.72 | -18.2 | -.071** | -8.45 | 5.52 | 5.40 | .146*** | -5.66 | 28.8 | .100 | -.055* | 5.44 | 2.45 |
| | (.092) | (.014) | (.106) | (.056) | (.774) | (.921) | (.386) | (.374) | (.257) | (.039) | (.136) | (.173) | (.616 | (.000) | (.740) | (.259) | (.994) | (.098) | (.519) | (.599) |
| Obs | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 | 828 |

## 5.8. Discussion of Threshold Results

To refine the empirical interpretation and facilitate cross-specification comparisons, Table 6 summarizes the estimated exchange rate flexibility thresholds for each combination of income inequality measure and capital account openness indicator across the two sample periods. The table also reports the direction and statistical significance of the effects below and above the estimated thresholds, thereby providing a synthetic overview of the nonlinear interaction between exchange rate regimes, financial openness, and income distribution.

**Table 6: Threshold values of exchange flexibility for different external financial liberalization measures**

| **Period** | **1984-2020** | | | | | | | | **1995-2019** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Income inequality measure** | GINI | **B**<br>U | INEQ | **B**<br>U | Disp | **B**<br>U | Mrkt | **B**<br>U | GINI | **B**<br>U | INEQ | **B**<br>U | Disp | **B**<br>U | Mrkt | **B**<br>U |
| **Kaopen** | 11***<br>(.000) | -.359<br>(.638)<br>1.66*<br>(.091) | 12***<br>(.000) | .008*<br>(.090)<br>-.025**<br>(.017) | 3**<br>(.033) | 5.39**<br>(.025)<br>-5.62**<br>(.041) | 12***<br>(.000) | .445<br>(.503)<br>-6.18**<br>(.035) | 2<br>(.357) | .016<br>(.994)<br>-.053<br>(.980) | 10.0***<br>(.000) | .006<br>(.713)<br>.004<br>(.714) | 3.01***<br>(.010) | 2.85<br>(.282)<br>-2.41<br>(.364) | 10.0***<br>(.001) | .067<br>(.976)<br>-1.93<br>(.454) |
| **Overall restrictions index (KA)** | | | | | | | | | 2**<br>(.036) | -6.45<br>(.198)<br>7.02<br>(.307) | 11.0***<br>(.000) | -.062**<br>(.011)<br>.045<br>(.484) | 10.0***<br>(.001) | 4.85<br>(.245)<br>-14.2***<br>(.003) | 7.05***<br>(.001) | 9.31**<br>(.032)<br>-11.2*<br>(.060) |
| **Overall inflow restrictions index (KAI)** | | | | | | | | | 3.01***<br>(.000) | 4.59<br>(.579)<br>-6.76<br>(.399) | 10.0***<br>(.006) | .011<br>(.852)<br>.067<br>(.380) | 2<br>(.402) | 46.4*<br>(.057)<br>-57.9**<br>(.028) | 3.01***<br>(.007) | 23.1<br>(.108)<br>-30.4**<br>(.022) |
| **Overall outflow restrictions index (KAO)** | | | | | | | | | 3.01**<br>(.010) | -1.19<br>(.589)<br>-1.21<br>(.678) | 10.0***<br>(.000) | .044**<br>(.045)<br>-.101**<br>(.016) | 10.0***<br>(.000) | 3.58<br>(.262)<br>-9.32**<br>(.023) | 7.05***<br>(.006) | 5.89**<br>(.046)<br>-7.04<br>(.115) |
| **Average equity restrictions (eq)** | | | | | | | | | 3.01**<br>(.013) | -3.14<br>(.276)<br>.397<br>(.896) | 2***<br>(.000) | .103**<br>(.026)<br>-.104*<br>(.097) | 11***<br>(.000) | .499<br>(.820)<br>-1.64<br>(.574) | 3.01***<br>(.004) | 15.5***<br>(.002)<br>-16.3***<br>(.002) |
| **Average bond restrictions (bo)** | | | | | | | | | 3.01***<br>(.008) | -.371<br>(.897)<br>-2.91<br>(.447) | 10***<br>(.002) | .001<br>(.946)<br>.026<br>(.516) | 2<br>(.110) | 7.90<br>(.148)<br>-4.50<br>(.567) | 7.05***<br>(.003) | 9.74**<br>(.021)<br>-13.6**<br>(.016) |
| **Average money market restrictions (mm)** | | | | | | | | | 3.01***<br>(.006) | -.310<br>(.900)<br>-.893<br>(.770) | 11***<br>(.000) | -.031*<br>(.060)<br>.136***<br>(.008) | 8.06**<br>(.014) | 6.23***<br>(.008)<br>-8.90***<br>(.006) | 3.01**<br>(.037) | 9.58***<br>(.006)<br>-9.10**<br>(.045) |
| **Average collective investments restrictions (ci)** | | | | | | | | | 3.01***<br>(.001) | 3.79<br>(.173)<br>3.79<br>(.173) | 2***<br>(.006) | -.087*<br>(.064)<br>-.087*<br>(.064) | 10***<br>(.009) | -8.12*<br>(.086)<br>-8.12*<br>(.086) | 7.05***<br>(.001) | -9.31*<br>(.064)<br>-9.31*<br>(.064) |
| **Average derivatives restrictions (de)** | | | | | | | | | 3.01*<br>(.071) | -4.44<br>(.236)<br>1.11<br>(.784) | 7.05**<br>(.011) | -.053**<br>(.026)<br>.086***<br>(.002) | 11***<br>(.000) | 6.58**<br>(.011)<br>-5.89**<br>(.015) | 4.02*<br>(.053) | 15.9***<br>(.003)<br>-14.6**<br>(.032) |
| **Average commercial credits restrictions (cc)** | | | | | | | | | 12***<br>(.000) | -3.55**<br>(.035)<br>3.27<br>(.181) | 11.0***<br>(.000) | -.029<br>(.267)<br>.084<br>(.122) | 3.01***<br>(.002) | 1.97<br>(.297)<br>-3.45<br>(.153) | 10***<br>(.000) | -2.23<br>(.483)<br>2.68<br>(.509) |
| **Average financial credits restrictions (fc)** | | | | | | | | | 3.01***<br>(.090) | -1.67<br>(.316)<br>2.49<br>(.221) | 10***<br>(.000) | -.013<br>(.429)<br>-.047<br>(.186) | 10.0***<br>(.002) | 4.33<br>(.191)<br>-11.0***<br>(.009) | 7.05***<br>(.002) | 4.74**<br>(.037)<br>-5.41*<br>(.089) |
| **Average guarantees, sureties and financial backup facilities restrictions (gs)** | | | | | | | | | 2<br>(.201) | -.756<br>(.924)<br>-1.02<br>(.897) | 11.0***<br>(.000) | -.074**<br>(.023)<br>.069***<br>(.006) | 9.07**<br>(.047) | -5.81<br>(.353)<br>-1.67<br>(.760) | 7.05***<br>(.002) | 8.13<br>(.217)<br>-11.1*<br>(.073) |
| **Average direct investment restrictions (di)** | | | | | | | | | 2<br>(.179) | -1.38<br>(.649)<br>3.36<br>(.339) | 10.0***<br>(.006) | -.074**<br>(.012)<br>.080**<br>(.014) | 3.01**<br>(.010) | .186<br>(.972)<br>4.03<br>(.548) | 3.01***<br>(.000) | 9.48**<br>(.044)<br>-14.9***<br>(.007) |
| **Average real estate restrictions (re)** | | | | | | | | | 3.01*<br>(.053) | -4.27<br>(.120)<br>5.32*<br>(.095) | 7.05***<br>(.000) | -.010<br>(.423)<br>-.001<br>(.922) | 12***<br>(.000) | 4.37***<br>(.001)<br>-13.2*<br>(.051) | 7.05***<br>(.003) | 7.00**<br>(.016)<br>-6.30**<br>(.032) |

**Notes:** B: Below; U: Upper

When capital account openness is proxied by KAOPEN, the results indicate that exchange rate flexibility plays a more prominent role in shaping the liberalization–inequality nexus during the earlier phase of financial globalization (1984–2020) than during the more recent period (1995–2019). This pattern likely reflects the structural transformations experienced by many economies during the late 1980s and early 1990s, when capital account reforms were often implemented alongside broader macroeconomic stabilization and structural adjustment programs.

Focusing on the inequality indicators most frequently used in empirical research—namely disposable income inequality and market income inequality—provides a clearer view of these threshold dynamics. For the period 1984–2020, the estimated exchange rate thresholds are approximately 3 and 12, respectively. Above these thresholds, capital account liberalization is associated with statistically significant reductions in both disposable and market income inequality. This suggests that sufficiently flexible exchange rate regimes enhance the capacity of economies to absorb external financial flows and distribute their benefits more broadly across income groups.

By contrast, the 1995–2019 period reveals a more complex and heterogeneous pattern. Several financial restriction indicators—including money market restrictions (mm), collective investment restrictions (ci), derivatives restrictions (de), financial credit restrictions (fc), and real estate restrictions (re)—exhibit reversed effects across exchange rate regimes. In particular, these restrictions tend to reduce inequality under more flexible exchange rate regimes but may increase inequality when exchange rate arrangements remain relatively rigid.

An additional stylized fact emerging from Table 8 is that threshold values associated with market income inequality are generally lower than those estimated for disposable income inequality. This finding is economically meaningful because market income inequality reflects primary distribution outcomes generated by labor and capital markets, whereas disposable income inequality incorporates fiscal redistribution mechanisms.

Lower thresholds for market income inequality imply that exchange rate flexibility begins to influence primary income distribution at earlier stages of regime transition. Fiscal redistribution, however, appears to require higher degrees of exchange rate flexibility to generate comparable distributional adjustments. This interpretation highlights the complementary role of macroeconomic regimes and fiscal institutions in shaping inequality outcomes.

More broadly, the results suggest that countries operating under flexible exchange rate regimes are better positioned to implement financial restrictions that mitigate inequality. In contrast, economies maintaining fixed or less flexible exchange rate arrangements appear more vulnerable to adverse distributional consequences when financial restrictions are imposed. These findings are consistent with Klein and Shambaugh (2010), who demonstrate that exchange rate regime choice exerts significant influence on macroeconomic performance, including distributional outcomes. Similarly, Razin and Rubinstein (2004) emphasize that regime-dependent macroeconomic dynamics critically shape the relationship between capital mobility and income inequality.

The comparison between the two sub-periods reveals a notable shift in the interaction between exchange rate flexibility and financial openness. While the earlier period highlights the stabilizing role of exchange rate flexibility during initial liberalization waves, the later period suggests that the distributional consequences of capital account policies increasingly depend on domestic macroeconomic frameworks and institutional quality.

For this reason, policy implications in this study rely primarily on the results obtained for the more recent period, which better reflects contemporary financial integration patterns. This interpretation aligns with Furceri and Loungani (2015), who show that the inequality effects of capital account liberalization are conditional on macroeconomic and institutional environments. In the present analysis, the evidence indicates that reduced restrictions—reflecting deeper financial liberalization—may reduce inequality under relatively rigid exchange rate arrangements, whereas greater openness tends to increase inequality under more flexible exchange rate regimes. Comparable distributional asymmetries are documented by Jaumotte et al. (2013), who show that financial globalization generates heterogeneous inequality effects depending on domestic policy frameworks and institutional capacity.

From a structural perspective, these findings can be interpreted through the differing policy environments associated with alternative exchange rate regimes. Under fixed or tightly managed exchange rate systems, monetary authorities typically intervene in foreign exchange markets to maintain parity and exercise stronger control over capital flows. In such environments, capital account liberalization may remain partially regulated, allowing public authorities to channel foreign financial inflows toward broader segments of the economy and thereby limit inequality.

Conversely, under floating exchange rate regimes, capital account liberalization tends to operate more directly through market mechanisms. Access to international capital markets often favors agents with stronger financial capabilities, institutional connections, and informational advantages. As a result, liberalization may disproportionately benefit higher-income groups, thereby increasing inequality. This interpretation is consistent with Stiglitz (2000) and Rodrik (2011), who argue that financial liberalization without adequate regulatory and institutional safeguards frequently exacerbates income disparities.

Another important contribution of the analysis concerns the differentiated impact of specific components of capital account liberalization. The results indicate that inward capital liberalization generally exerts stronger inequality effects than outward liberalization. In particular, liberalization of equity markets appears to generate the most pronounced distributional consequences. These findings are consistent with Furceri et al. (2018), who demonstrate that certain forms of financial openness disproportionately benefit higher-income households through asset price channels and capital market participation.

Although the magnitude of these effects varies depending on the inequality indicator and liberalization measure employed, the overall direction remains robust. Re-estimation using alternative inequality datasets and openness measures confirms the qualitative stability of the results and, in several specifications, strengthens the estimated effects.

This study contributes to the literature by providing a comprehensive analysis of the distributional consequences of capital account liberalization using a balanced panel of 48 countries over the period 1984–2020. The empirical evidence suggests that financial liberalization episodes are associated with statistically significant and persistent increases in income inequality, particularly when inequality is measured using Gini-based indicators. These results are consistent with Ostry et al. (2021), who highlight that financial globalization can promote economic growth but may simultaneously increase inequality in the absence of strong institutional frameworks.

Importantly, the findings do not imply that countries should avoid capital account liberalization. Instead, they emphasize the importance of appropriate sequencing, institutional preparedness, and complementary policy frameworks. Policymakers seeking to minimize adverse distributional effects may need to implement gradual liberalization strategies combined with targeted redistributive and regulatory policies, as emphasized by Kose et al. (2009).

Finally, the results underscore the critical role of exchange rate flexibility in shaping the inequality effects of financial openness. The equalizing benefits of liberalization appear statistically significant primarily in countries operating under relatively rigid exchange rate arrangements, suggesting that the net distributional benefits of financial integration may materialize only under specific macroeconomic conditions. Policies that strengthen macroeconomic stability, institutional quality, and financial regulation therefore play a crucial role in maximizing the benefits of capital account liberalization while mitigating its potential regressive effects on income distribution.

## 6. Policy Implications and Conclusion

### 6.1 Policy Implications

The empirical findings of this study provide important insights for the formulation of macroeconomic and financial policies in both advanced and developing economies. The results demonstrate that capital account liberalization is not distribution-neutral and that its impact on income inequality depends critically on the broader macroeconomic and institutional environment, particularly the exchange rate regime.

First, the results indicate that economies operating under fixed or managed exchange rate regimes are better positioned to capture the potential distributional benefits of financial openness. Under these regimes, capital account liberalization is generally associated with lower income inequality in the long run. Exchange rate stability appears to reduce macroeconomic volatility and uncertainty, while facilitating investment and economic planning. These conditions allow a broader share of the population to benefit from increased financial integration. Consequently, policymakers should consider carefully sequencing capital account liberalization alongside exchange rate policies that promote macroeconomic stability and credibility.

Second, the findings highlight significant risks associated with liberalization under highly flexible exchange rate regimes. In these settings, financial openness tends to exacerbate income inequality, both in the short and long run. Exchange rate volatility disproportionately affects low-income households and small firms, while wealthier agents are better equipped to hedge against currency risk or benefit from cross-border financial opportunities. This suggests that liberalization in flexible regimes should be accompanied by strong regulatory frameworks, macro-prudential policies, and redistributive mechanisms aimed at protecting vulnerable groups.

Third, the strong persistence of income inequality underscores the importance of complementary structural reforms. Education, financial inclusion, and institutional quality play central roles in shaping how the gains from financial openness are distributed across society. The results indicate that higher educational attainment and deeper domestic financial development can partially offset the inequality-increasing effects of capital account liberalization. Thus, financial openness should not be pursued in isolation but rather embedded within a broader policy package that strengthens human capital and improves access to financial services.

Finally, the presence of cross-sectional dependence highlights the relevance of global factors in domestic inequality dynamics. International coordination, particularly during periods of global financial stress, may help mitigate spillover effects that exacerbate inequality in financially open economies.

### 6.2 Conclusion

This paper investigates whether the relationship between capital account liberalization and income inequality depends on the exchange rate regime, using a broad panel of developed and developing countries over the period 1984–2020. To capture nonlinearities and regime-dependent effects, the analysis combines static panel threshold estimation developed by Hansen (1999) with dynamic panel threshold techniques proposed by Seo and Shin (2016) and Seo et al. (2019). In addition, the study accounts for cross-sectional dependence and nonstationarity using second-generation econometric methods, including tests developed by Pesaran.

The empirical results provide several important contributions.

First, the effect of capital account liberalization on income inequality is strongly conditional on the exchange rate regime. Across multiple model specifications and alternative measures of financial openness and inequality, the distributional consequences of liberalization vary according to the degree of exchange rate flexibility. When statistically significant threshold effects are identified, the results reveal sharply contrasting outcomes across regimes. In many cases, capital account openness contributes to reducing inequality under relatively fixed or managed exchange rate arrangements, whereas greater openness under highly flexible regimes is often associated with rising inequality, particularly when market-income inequality measures are considered.

Second, the dynamic panel threshold framework reveals strong persistence in income inequality, highlighting the importance of accounting for lagged distributional effects. The results confirm that the relationship between liberalization and inequality is nonlinear and regime-dependent, with short-run and long-run responses differing substantially across exchange rate regimes. These findings reinforce the importance of dynamic econometric approaches that adequately address endogeneity, persistence, and heterogeneous adjustment processes.

Third, macroeconomic and institutional control variables play a significant role in shaping inequality outcomes. Factors such as GDP per capita, inflation, trade openness, education, and domestic financial development consistently influence income distribution. Their inclusion strengthens the estimated regime-dependent effects of capital account liberalization and underscores the multidimensional nature of inequality dynamics.

From a broader policy perspective, the results demonstrate that there is no universal model of financial liberalization. The distributional consequences of openness depend not only on the degree of capital account liberalization itself but also on the macroeconomic frameworks and institutional conditions that accompany it. Aligning capital account reforms with exchange rate management, financial regulation, and redistributive policies is essential to ensure that the benefits of globalization are widely shared.

Despite its contributions, this study acknowledges several limitations. First, different proxies for capital account openness and income inequality generate heterogeneous empirical results, highlighting the sensitivity of conclusions to measurement choices. Second, although the analysis explicitly addresses cross-sectional dependence and endogeneity through advanced econometric techniques, causal interpretation remains subject to the inherent limitations of macro-panel data. Third, while the sample includes both advanced and developing economies, econometric constraints related to sample size and instrument proliferation limited the feasibility of conducting fully disaggregated subgroup analyses across all specifications. Although robustness checks and split-sample estimations were implemented where possible, pooled results may still conceal country-specific heterogeneity.

Future research could extend this framework by examining more homogeneous country groups defined by income level, geographic region, or institutional characteristics. Additional extensions may include exploring heterogeneous effects across income or wealth groups, incorporating wealth inequality indicators, or analyzing interactions between capital account liberalization and labor market or fiscal redistribution policies. Such extensions would provide deeper insight into the transmission mechanisms linking financial openness and inequality.

Overall, the findings emphasize that the inequality effects of capital account liberalization are fundamentally context-dependent. Exchange rate regimes, institutional quality, and macroeconomic conditions jointly determine whether financial openness produces equalizing or unequalizing outcomes. Effective policy design therefore requires integrating liberalization strategies within coherent macroeconomic frameworks supported by strong institutions and inclusive structural reforms.

**References**


1. **Abouelkhair, A., & Tamsamani, Y. Y. (2022).** Exchange rate regime choice and economic growth: An empirical analysis on African panel data. *African Review of Economics and Finance*, 2, 1–18. https://african-review.com/journal/online-first/Abouelkhair___Tamsamani__2022_%20(1).pdf.
2. **Aghion, P., Bacchetta, P., Rancière, R., & Rogoff, K. (2009).** Exchange Rate Volatility and Productivity Growth: The Role of Financial Development. *Journal of Monetary Economics*, 56(4), 494–513.https://doi.org/10.1016/j.jmoneco.2009.03.015.
3. **Alvarez, F. N., & El-Sayed, A.M. (2017).** National Income Inequality and Ineffective Health Insurance in 35 Low- and Middle-Income Countries. *Health Policy and Planning,* 32(4): 487–92. https://doi.org/10.1093/heapol/czw156..
4. **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. https://doi.org/10.2307/2297968.
5. **Arellano, M., Bover, O., (1995).** Another look at the instrumental variable estimation of error components models. *Journal of Econometrics*, 68(1), 29–51. https://doi.org/10.1016/0304-4076(94)01642-D.
6. **Arestis, P. & Caner, A. (2010).** Capital account liberalization and poverty: how close is the link?, *Cambridge Journal of Economics*, 34 (2), 295-323. http://ikt.web.etu.edu.tr/RePEc/pdf/0811.pdf..

7. **Asteriou, D., Dimelis, S., & Moudatsou, A. (2014).** Globalisation and income inequality: A panel data econometric approach for the EU27 countries. *Economic Modelling*, 36, 592-599. https://doi.org/10.1016/j.econmod.2013.09.051.
8. **Atkinson, A. B., & Brandolini, A. (2001).** Promise and Pitfalls in the Use of "Secondary" Data-Sets: Income Inequality in OECD Countries as a Case Study. *Journal of Economic Literature*, 39(3), 771–799. http://www.jstor.org/stable/2698313.
9. **Atkinson, T. (2015).** What can be done about inequality?. *Juncture*, 22(1): 32-41. https://doi.org/10.1111/j.2050-5876.2015.00834.x
10. **Baliamoune-Lutz, M & Ndikumana, L. (2008)**, Corruption and Growth: Exploring the Investment Channel, *University of Massachusetts, Amherst. Economics Department Working Paper Series. 33*. https://doi.org/10.7275/1068835.
11. **Banerjee, A. V. & Newman, A. F. (1993).** Occupational choice and the process of development. *Journal of Political Economy*, 101(2), 274–298. http://dx.doi.org/10.1086/261876.
12. **Barro, R. J., & Lee, J.-W. (2013).** A new data set of educational attainment in the world, 1950-2010. *Journal of Development Economics*, 104, 184-198. https://doi.org/10.1016/j.jdeveco.2012.10.001.
13. **Beck, T., Demirgüç-Kunt, A.,& Levine, R. (2007a).** Finance, inequality and the poor. *Journal of Economic Growth,* 12, 27–49.https://doi.org/10.1007/s10887-007-9010-6.
14. **Beck, T., & Demirguc-Kunt, A & Martinez Peria, M. S. (2007b).** Reaching out: Access to and use of banking services across countries, *Journal of Financial Economics,* Elsevier, 85(1), 234-266. https://doi.org/10.1016/j.jfineco.2006.07.002.
15. **Berg, A., Ostry, J. D. C. Tsangarides, G. & Yakhshilikov,Y. (2018)**. Redistribution, Inequality, and Growth: New Evidence. *Journal of Economic Growth*, 23(3), 259–305. https://doi.org/10.1007/s10887-017-9150-2.
16. **Blake, K. R., B. Bastian, T. F. Denson, P. Grosjean, & Brooks, R.C. (2018).** Income Inequality Not Gender Inequality Positively Covaries with Female Sexualization on Social Media. *Proceedings of the National Academy of Sciences*, 115(35): 8722–27. https://doi.org/10.1073/pnas.1717959115.
17. **Blanchard, O., & Wolfers, J. (2000).** The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence. *The Economic Journal*, *110*(462), C1–C33. http://www.jstor.org/stable/2565720.
18. **Blundell, R., Bond, S., (1998).** Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8.
19. **Bulir, A. (1998).** Income inequality: does inflation matter?, Working Paper No. 98/7, IMF, Washington, DC. https://www.imf.org/external/pubs/ft/wp/wp9807.pdf..
20. **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. https://doi.org/10.1016/S0165-1765(01)00374-3.
21. **Chan, K. S., & Tong, H. (1986).** On estimating thresholds in autoregressive models. *Journal of Time Series Analysis*, 7(3), 179–190. https://doi.org/10.1111/j.1467-9892.1986.tb00501.x.
22. **Checchi, D. (2001).** Education, Inequality and Income Inequality. LSE STICERD Research Paper No. 52, Available at SSRN: https://ssrn.com/abstract=1094825.
23. **Chen, R., & Tsay, R. S. (1993).** Functional-Coefficient Autoregressive Models. *Journal of the American Statistical Association*, *88*(421), 298–308. https://doi.org/10.2307/2290725.
24. **Chinn , M.D. & Ito.H.. (2006).** What Matters for Financial Development? Capital Controls, Institutions, and Interactions, *Journal of Development Economics,* 81(1), 163-192. https://doi.org/10.1016/j.jdeveco.2005.05.010.
25. **Chinn, M. D. & Ito, H. (2008).** A New Measure of Financial Openness, *Journal of Comparative Policy Analysis*: Research and Practice, 10(3), 309-322. http://dx.doi.org/10.1080/13876980802231123.
26. **Chinn, M., & Ito, H. (2023).** The Chinn-Ito index – a de jure measure of financial openness, now updated to 2021. *Portland State University.* https://web.pdx.edu/~ito/Chinn-Ito_website.htm.
27. **Chong, A. & Gradstein, M. (2007).** Inequality and institutions. The *Review of Economics and Statistics*, 89 (3), 454-465. https://www.jstor.org/stable/40043041.
28. **Collins, S. M. (2007).** Comments on "Financial globalization, growth, and volatility in developing countries" by Eswar Prasad, Kenneth Rogoff, Shang-Jin Wei, and M. Ayhan Kose. In: Harrison, A. (Ed.), Globalization and Poverty, National Bureau of Economic Research Conference Report. University of Chicago Press, Chicago.
29. **Dabla-Norris, E., Ji, Y., Unsal, D. F & Townsend, R. M. (2015).** Identifying Constraints to Financial Inclusion and Their Impact on GDP and Inequality: A Structural Framework for Policy. *IMF Working Paper No. 15/22.* https://ssrn.com/abstract=2568597
30. **Dang, V.A., Kim, M., & Shin, Y. (2012)**. Asymmetric capital structure adjustments: New evidence from dynamic panel threshold models. *Journal of Empirical Finance*, 19(4), 465–482. https://doi.org/10.1016/j.jempfin.2012.04.004.
31. **Darvas, Z. (2019).** Global Interpersonal Income Inequality Decline: The Role of China and India. *World Development*, 121: 16–32. https://doi.org/10.1016/j.worlddev.2019.04.011.
32. **Dawson, A. (2018).** Police Legitimacy and Homicide: A Macro-Comparative Analysis. *Social Forces*, 97(2): 841–66. https://doi.org/10.1093/sf/soy043.
33. **De Haan, J., & Sturm, J.-E. (2017).** Finance and income inequality: a review and new evidence, *EuropeanJournal of Political Economy*, 50, 171–195. https://doi.org/10.1016/j.ejpoleco.2017.04.007.
34. **DiNardo, J., Fortin, N. M., & Lemieux, T. (1996).** Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach. *Econometrica*, *64*(5), 1001–1044. https://doi.org/10.2307/2171954. or https://www.jstor.org/stable/2171954.
35. **Dodge, Y. (2008).** The concise encyclopedia of statistics. *Springer-Verlag*. https://www.stewartschultz.com/statistics/books/The%20Concise%20Encyclopedia%20of%20Statistics.pdf
36. **Dollar, D., & Kraay, A. (2002).** Growth is Good for the Poor. *Journal of Economic Growth,* **7(3)**, 195–225. https://doi.org/10.1023/A:1020139631000.
37. **Dorsch, M. T., & Maarek, P. (2019).** Democratization and the Conditional Dynamics of Income Distribution. *American Political Science Review*, 113(2), 385–404. https://doi.org/10.1017/S0003055418000825.
38. **Dueker, M. J., Psaradakis, Z., Sola, M., & Spagnolo, F. (2011).** Multivariate contemporaneous threshold autoregressive models. *Journal of Econometrics,* 160( 2), 311-325. https://doi.org/10.1016/j.jeconom.2010.09.011.
39. **Easterly, W., & Fischer, S. (2001).** Inflation and the Poor. *Journal of Money, Credit and Banking*, *33*(2), 160–178. https://doi.org/10.2307/2673879.
40. **Edwards, S. (2001).** Exchange Rate Regimes, Capital Flows and Crisis Prevention. *NBER Working Paper No. w8529*. https://ssrn.com/abstract=286201 Or file:///C:/Users/user/Downloads/ssrn-286201.pdf..

41. **Engler, S., & Weisstanner, D. (2020).** Income Inequality, Status Decline and Support for the Radical Right. Pp. 383–400 in R. Careja, P. Emmenegger, and N. Giger, eds., The *European Social Model Under Pressure.* Wiesbaden: Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-27043-8_22.
42. **Enowbi-Batuo, M. & Asongu, A. (2015).** The impact of liberalization policies on income inequality in African countries. *Journal of Economic Studies*, 42 (1), 68 – 100. http://dx.doi.org/10.1108/JES-05-2013-0065.
43. **Fernández, A., Klein, M. W., Rebucci, A., Schindler, M., & Uribe, M. (2016).** Capital control measures: A new dataset. *IMF Economic Review*, 64(3): 548-574. Dataset (Updated August 12, 2021) http://www.columbia.edu/~mu2166/fkrsu/.
44. **Frankel, J. (2011).** Monetary Policy in Emerging Markets: A Survey, CID Working Papers 215, *Center for International Development at Harvard University.* https://www.hks.harvard.edu/sites/default/files/centers/cid/files/publications/faculty-working papers/215.pdf.
45. **Friedman, M. (1953).** The Case for Flexible Exchange Rates. In Essays in Positive Economics (pp. 157–203). University of Chicago Press. http://pombo.free.fr/friedman1953.pdf.
46. **Furceri, D., & Loungani, P. (2015).** Capital Account Liberalization and Inequality. *IMF Working Paper, 15/243. International Monetary Fund.* https://www.imf.org/external/pubs/ft/wp/2015/wp15243.pdf.
47. **Furceri, D., & Loungani, P.(2018).** The distributional effects of capital account liberalization, *Journal of Development Economics*, 130, 127-144. https://doi.org/10.1016/j.jdeveco.2017.09.007.
48. **Furceri, D., Loungani, P. & Ostry, J. D. (2019).** The aggregate and distributional effects of financial globalization: evidence from macro and sectoral data', *Journal of Money, Credit and Banking*, 51 (S1), 163–198. https://doi.org/10.1111/jmcb.12668.
49. **Galor, O. & Zeira, J. (1993).** Income distribution and macroeconomics. *The Review of Economic Studies*, 60 (1), 35–52. https://doi.org/10.2307/2297811.
50. **Galor, O., & Moav, O. (2004).** From Physical to Human Capital Accumulation: In-equality and the Process of Development", Review of Economic Studies, Vol. 71 No. 4, PP. 1001–1026. https://www.jstor.org/stable/3700726..
51. **Ghosh, A., Gulde, A.-M., & Wolf, H. (2003).** *Exchange Rate Regimes: Choices and Consequences.* (Cambridge: MIT Press).
52. **Ghosh, A., Ostry, J., & Qureshi M. (2014).** Exchange Rate Management and Crisis Susceptibility: A Reassessment, IMF Working Papers, WP/14/11. https://doi.org/10.5089/9781484383971.001.
53. **Goldberg, P.K., & Pavcnik, N. (2007).** Distributional Effects of Globalization in Developing Countries. *Journal of Economic Literature,* 45 (1): 39–82**. https://libkey.io/10.1257/jel.45.1.39?utm_source=ideas.**
54. **Gonzalez, A., Teräsvirta, T., & van Dijk, D., (2005)**. Panel Smooth Transition Models, SSE/EFI Working Paper Series in Economics and Finance, No 604, Stockholm School of Economics. https://www.econstor.eu/bitstream/10419/56363/1/497881756.pdf.
55. **Grossman, G. & Helpman, E. (1991).** Trade, knowledge spillovers and growth, *European Economic Review*, 35 ( 2-3), 517-526. https://doi.org/10.1016/0014-2921(91)90153-A.
56. **Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002).** Does corruption affect income inequality and poverty? *Economics of governance*, 3(1), 23-45. https://doi.org/10.1007/s101010100039.
57. **Gujarati, D. N. (2003).** *Basic econometrics* (4th ed.). McGraw-Hill, New York.
58. **Hadri, K. (2000).** Testing for stationarity in heterogeneous panel data. *The Econometrics Journal,* 3(2), 148–161. https://doi.org/10.1111/1368-423X.00043.
59. **Hansen, B. E. (1999).** Threshold effects in non-dynamic panels: Estimation, testing, and inference. *Journal of Econometrics,* 93(2), 345-368. https://doi.org/10.1016/S0304-4076(99)00025-1.
60. **Harms, P., & Knaze, J. (2021).** Effective Exchange Rate Regimes and Inflation, Working Paper 2102, *Gutenberg School of Management and Economics, Johannes Gutenberg-Universität Mainz.* https://www.international.economics.uni-mainz.de/data-on-effective-exchange-rate-regimes/?folder=De-facto%20data.
61. **Henry, P.B. (2007).** Capital account liberalization: Theory, evidence, and speculation. *Journal of Economic Literature,* 45(4), 887-935. https://doi.org/10.1257/jel.45.4.887.
62. **Holtz-Eakin, D., Newey, W.K., & Rosen, H.S., (1988)**. Estimating vector autoregressions with panel data. *Econometrica,* 56(6), 1371–1395. https://doi.org/10.2307/1913103.
63. **Ilzetzki, E., Reinhart, C., & Rogoff, K. S. (2019).** Exchange arrangements entering the 21st century: Which anchor will hold? *Quarterly Journal of Economics*, 134(2), 599-646. https://www.ilzetzki.com/_files/ugd/b3763a_2bd7c9c69abd4d0085fbddd55dedc8aa.pdf . Data available at : https://www.ilzetzki.com/irr-data. and https://download.uni-mainz.de//fb03-international-economics/effective_err_data/De-facto%20data/Weighted_DeFacto_Regimes_2022.xlsx
64. **IMF (2017).** *World Economic Outlook, October: Seeking Sustainable Growth- Short-Term Recovery, Long-Term Challenges*. Washington, DC: IMF. https://www.imf.org/en/Publications/WEO/Issues/2017/09/19/world-economic-outlook-october-201
65. **Im, K. S., Pesaran, M. H., & Shin, Y. (2003).** Testing for unit roots in heterogeneous panels. *Journal of Econometrics,* 115(1), 53–74. https://doi.org/10.1016/S0304-4076(03)00092-7.
66. **Iversen, T., & Soskice, D. (2019)**. Democracy and Prosperity: Reinventing Capitalism Through a Turbulent Century. *Princeton: Princeton University Press*. https://econsoc.mpifg.de/38419/08_BookReviews_Econsoc-NL_21-1_Nov2019.pdf.
67. **Jaime-Castillo, A. M., & Marqués-Perales, I. (2019)**. Social Mobility and Demand for Redistribution in Europe: A Comparative Analysis. *British Journal of Sociology*, 70(1): 138–65. https://doi.org/10.1111/1468-4446.12363.
68. **Jaumotte, F., Lall, S. & Papageorgiou, C. (2013).** Rising Income Inequality: Technology, or Trade and Financial Globalization?. *IMF Economic Review,* **61(1)**, 271–309. https://doi.org/10.1057/imfer.2013.7.
69. **Jenkins, S. (2015).** World income inequality databases: an assessment of WIID and SWIID. The Journal of Economic Inequality, 13, 629–671. https://doi.org/10.1007/s10888-015-9305-3.
70. **Johansson, A. C. & Wang, X. (2014).** Financial sector policies and income inequality. *China Economic Review,* 31, 367-378. https://doi.org/10.1016/j.chieco.2014.06.002.
71. **Juodis, A., Karabiyik, H., & Westerlund, J. (2021).** On the Robustness of the Pooled CCE Estimator, *Journal of Econometrics*, 220( 2), 325-348 https://doi.org/10.1016/j.jeconom.2020.06.002.
72. **Karcher, S., & Steinberg, D. A. (2013).** Assessing the Causes of Capital Account Liberalization: How Measurement Matters. *International Studies Quarterly*, 57(1), 128–137. http://www.jstor.org/stable/41804852.
73. **Kervin, J. B. (1992).** *Methods for business research*. Harper Collins Publishers
74. Klein, M. W., & Shambaugh, J. C. (2010). Exchange Rate Regimes in the Modern Era. MIT Press. http://www.jstor.org/stable/j.ctt5hhbcb.

75. **Kose, M. A., Prasad, E. S., Rogoff, K., & Wei, S. J. (2009).** Financial globalization: A reappraisal. *IMF Staff Papers*, 56(1), 8–62. http://www.jstor.org/stable/40377798.
76. **Kose, M.A., Prasad, E.S & Taylor, A.D. (2011).** Thresholds in the process of international financial integration, *Journal of International Money and Finance*, Elsevier, 30(1), 147-179. https://doi.org/10.1016/j.jimonfin.2010.08.005..
77. **Kremer, S., Bick, A., & Nautz, D. (2013)**. Inflation and growth: New evidence from a dynamic panel threshold analysis. *Empirical Economics,* 44, 861–878. https://doi.org/10.1007/s00181-012-0553-9.
78. **Kutner, M. H., Nachtsheim, C. J., Neter, J. (2004).** *Applied linear regression models* (4th ed.). McGraw-Hill Irwin.
79. **Kuznets, S. (1955).** Economic Growth and Income Inequality. *The American Economic Review*, 45(1), 1–28. http://www.jstor.org/stable/1811581..
80. **Levin, A., Lin, C.-F., & Chu, C.-S. J. (2002).** Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), 1–24. https://doi.org/10.1016/S0304-4076(01)00098-7.
81. **Li, H., Xu, L. C., & Zou, H.-f. (2000).** Corruption, income distribution, and growth. *Economics & Politics*, Wiley Blackwell, 12(2), 155_182. https://doi.org/10.1111/1468-0343.00073.
82. **Lobont, O. R., Nicolescu, A. C., Costea, F., Li, Z. Z., Taran, A. M., & Davidescu, A. (2022).** A Panel Threshold Model to Capture the Nonlinear Nexus between Public Policy and Entrepreneurial Activities in EU Countries. *Mathematics„ MDPI*, 10(8), 1-15. https://www.mdpi.com/2227-7390/10/8/1265/pdf
83. **Marshall, M.G., & Jaggers, K. (2007).** Polity IV project: Dataset users' manual. George Mason Universityand Center for Systemic Peace. https://home.bi.no/a0110709/PolityIV_manual.pdf.
84. **Marshall, M.G., Gurr, T., & Jaggers. K. (2019).** Polity *IV Project: Political Regime Characteristics and Transitions, 1800-2018. Dataset Users' Manual.* Center for Systemic Peace. http://www.systemicpeace.org/inscr/p4manualv2018.pdf.
85. **Milanovic, B. (2016).** *Global Inequality: A New Approach for the Age of Globalization*. Cambridge, MA: Harvard University Press.
86. **Ngamaba, K. H. (2016).** Determinants of Subjective Well-Being in Representative Samples of Nations. *European Journal of Public Health*, 27(2), 377–82. https://doi.org/10.1093/eurpub/ckw103.
87. **Ostry, J. D., Berg, A., & Kothari, S. (2021).** Growth-equity trade-offs in structural reforms. *Scottish Journal of Political Economy,* 68(2), 209-237. https://doi.org/10.1111/sjpe.12265.
88. **O'brien, R.M. (2007).** A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity,* **41**, 673–690. https://doi.org/10.1007/s11135-006-9018-6.
89. **Obstfeld, M. (1998).** The Global Capital Market: Benefactor or Menace? *Journal of Economic Perspectives* 12 (4): 9–30. https://doi.org/10.1257/jep.12.4.9.
90. **Palma, J. G. (2019).** Behind the Seven Veils of Inequality: What If It's All About the Struggle Within Just One Half of the Population Over Just One Half of the National Income? *Development and Change,* 50(5), 1133–1213. https://doi.org/10.1111/dech.12505.
91. **Pesaran, M. H. (2004).** General Diagnostic Tests for Cross Section Dependence in Panels, IZA Discussion Papers 1240, *Institute of Labor Economics (IZA). https://www.econ.cam.ac.uk/research-files/repec/cam/pdf/cwpe0435.pdf.*
92. **Pesaran, M. H. (2006).** Estimation and inference in large heterogeneous panels with a multifactor error structure. *Econometrica,* 74(4), 967–1012**.** https://doi.org/10.1111/j.1468-0262.2006.00692.x.
93. **Pesaran, M.H. (2007).** A simple panel unit root test in the presence of cross-section dependence, *Journal of Applied Econometrics*, John Wiley & Sons, Ltd., 22(2), 265-312. https://doi.org/10.1002/jae.951.
94. **Pesaran, M.H., & Yamagata, T. (2008)** Testing Slope Homogeneity in Large Panels. *Journal of Econometrics*, 142, 50-93. https://doi.org/10.1016/j.jeconom.2007.05.010.
95. **Piketty, T., & Saez, E. (2014).** Inequality in the Long Run. *Science,* 344(6186), 838–843. https://doi.org/10.1126/science.1251936.
96. **Quinn, D.P. & Toyoda. A. M. (2008).** Does Capital Account Liberalization Lead to Economic Growth? *Review of Financial Studies*, 21(3), 1403-1449. https://doi.org/10.1093/rfs/hhn034.
97. **Radhianshah, M. T., & Kurnia, A. S. (2021).** Capital Account Liberalization and Income Inequality: A Panel Study of 28 European Countries. *Journal of Economics, Business, and Accountancy Ventura*, 24(1), 12 – 22. https://doi.org/10.14414/jebav.v24i1.2530.
98. **Ramírez-Rondán, N. R. (2019).** Maximum likelihood estimation of dynamic panel threshold models. *Econometric Reviews*, 39(3), 260–276. https://doi.org/10.1080/07474938.2019.1624401.
99. **Razin, A., & Rubinstein, Y. (2004).** Growth Effects of the Exchange-Rate Regime and the Capital-Account Openness in a Crisis-Prone World Market: A Nuanced View . *NBER Working Paper No. w10555*, https://ssrn.com/abstract=557188.
100. **Reinhart, C. M., & Rogoff, K. S. (2004).** The Modern History of Exchange Rate Arrangements: A Reinterpretation. *Quarterly Journal of Economics*, 119, 1-48. https://doi.org/10.1162/003355304772839515.
101. **Rey, H. (2015).** Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence, NBER Working Papers 21162, *National Bureau of Economic Research, Inc.* https://doi.org/10.3386/w21162.
102. **Rodriguez, J.J. M. & Velazquez, J.J. N. (2009).** Economic convergence of income distribution worldwide from 1986 to 2000, *Journal of Economic Studies,* 36 (6), 675-691. https://doi.org/10.1108/01443580911001797.
103. **Rodrik, D. (2011).** The Globalization Paradox: Democracy and the Future of the World Economy. New York and London: W.W. Norton. p. 368.. http://books.wwnorton.com/books/The-Globalization-Paradox/.
104. **Seven, U., & Coskun, Y. (2016).** Does financial development reduce income inequality and poverty? evidence from emerging countries. *Emerging Markets Review*, 26: 34-63. https://doi.org/10.1016/j.ememar.2016.02.002.
105. **Seo, M., & Shin, Y. (2016).** Dynamic panels with threshold effect and endogeneity. *Journal of Econometrics*, 195 (2), 169–186. https://doi.org/10.1016/j.jeconom.2016.03.005.
106. **Seo, M., Kim, S., & Kim, Y. (2019).** Estimation of dynamic panel threshold model using Stata. *The Stata Journal*, 19(3), 685–697. https://doi.org/10.1177/1536867X19874243.
107. **Schmukle, S. C., M. Korndörfer, & Egloff, B. (2019)**. No Evidence That Economic Inequality Moderates the Effect of Income on Generosity. *Proceedings of the National Academy of Sciences*, 116(20): 9790–95. https://doi.org/10.1073/pnas.1807942116.
108. **Solt, F. (2009).** Standardizing the World Income Inequality Database. *Social Science Quarterly,* 90(2), 231-242.. https://doi.org/10.1111/j.1540-6237.2009.00614.x.
109. **Solt, F. (2019).** The Standardized World Income Inequality Database, Versions 8-9, Harvard Dataverse, V13; swiid9_8.zip, 2024. https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/LM4OWF.
110. **Solt, F. (2020).** Measuring Income Inequality Across Countries and Over Time: The Standardized World Income Inequality Database. *Social Science Quarterly*, 101 (3), 1183-1199. SWIID Version 9.8, December 2024 https://doi.org/10.1111/ssqu.12795.

111. **Steele, L. G. (2016).** Ethnic Diversity and Support for Redistributive Social Policies. *Social Forces,* 94(4): 1439–81. https://doi.org/10.1093/sf/sow021.
112. **Stiglitz, J. E. (2000).** Capital Market Liberalization, Economic Growth, and Instability. *World Development*, 28(6), 1075–1086. https://doi.org/10.1016/S0305-750X(00)00006-1.
113. **Tong, H. (1978).** On a threshold model. In C. H. Chen (Ed.), *Pattern Recognition and Signal Processing*. Amsterdam: Sijthoff & Noordhoff.
114. **Tong, H., & Lim, K. S. (1980).** Threshold Autoregression, Limit Cycles and Cyclical Data. *Journal of the Royal Statistical Society. Series B (Methodological)*, *42*(3), 245–292. http://www.jstor.org/stable/2985164.
115. **Tong, H. (1983).** *Threshold Models in Non-linear Time Series Analysis*. Lecture Notes in Statistics, Vol. 21. New York: Springer-Verlag.
116. **Tsay, R. S. (1998).** Testing and Modeling Multivariate Threshold Models. *Journal of the American Statistical Association*, *93*(443), 1188–1202. https://doi.org/10.2307/2669861.
117. **UNU-WIDER[14]. (2025).** World Income Inequality Database (WIID) Companion dataset (wiidcountry and/or wiidglobal). https://doi.org/10.35188/UNU-WIDER/WIIDcomp-290425.
118. **Wang, Q. 2015.** Fixed-effect panel threshold model using Stata. *Stata Journal,* 15(1): 121–134. https://journals.sagepub.com/doi/pdf/10.1177/1536867X1501500108.
119. **Wang, X., & Shao, Q. (2019)**. Non-linear effects of heterogeneous environmental regulations on green growth in G20 countries: Evidence from panel threshold regression. *Science of The Total Environment*, *660*, 1346–1354. https://doi.org/10.1016/j.scitotenv.2019.01.094.
120. **Wang, Q., & Wang, L. (2021).** The nonlinear effects of population aging, industrial structure, and urbanization on carbon emissions: A panel threshold regression analysis of 137 countries. *Journal of Cleaner Production*, *287(1)*, 125381. https://doi.org/10.1016/j.jclepro.2020.125381.
121. **Xiang, L., & Dan, S. (2021)**.Does Capital Account Liberalization Affect Income Inequality? *Oxford Bulletin of Economics and Statistics,* 83(2), 377-410**.** https://doi.org/10.1111/obes.12405..
122. **Zhang, Y., Q. Zhou, and L. Jiang. 2017.** Panel kink regression with an unknown threshold. Economics Letters, 157, 116–121. https://doi.org/10.1016/j.econlet.2017.05.033.


# Appendix

**Table A.1. Capital Account Liberalization Measures**

| Indicator | Authors | Time Coverage | Country Coverage | Main Features | Limitations |
|---|---|---|---|---|---|
| KAOPEN | Chinn & Ito (2008) | 1970–2015 (updated to 2020) | 182 countries | ✓ Binary-coded based on IMF AREAER<br>✓ Widely used and updated<br>✓ Broad liberalization measures | • Does not distinguish flow types or directions<br>• Limited granularity |
| Quinn-Toyoda | Quinn & Toyoda (2008) | 1970–2014 | ~126 countries | ✓ Textual analysis<br>✓ Captures intensity of restrictions<br>✓ Fine-grained scoring (0–4 scale) | • Limited developing country coverage<br>• Infrequent updates |
| FKRSU | Fernández et al. (2016) | 1995–2015 (updated to 2019) | 100 countries | ✓ Disaggregated by asset class (equity, bonds, etc.) and flow direction (inflows/outflows)<br>✓ 10 sub-categories of capital controls | • Shorter time span<br>• Smaller sample |

**Table A.2: De Facto Exchange Rate Arrangement Classification according to Ilzetzki et al. (2019)**

| | Typologies of exchange rate regimes | |
|---|---|---|
| Natural classification | Fine classifcation codes (IRR) | Agregate classification |
| No separate legal tender or currency union | 1 | Fixed exchange regime |
| Pre announced peg or currency board arrangement | 2 | |
| Pre announced horizontal band that is narrower than or equal to +/-2% | 3 | |
| De facto peg | 4 | |
| Pre announced crawling peg; de facto moving band narrower than or equal to +/-1% | 5 | Intermediate exchange regime |
| Pre announced crawling band that is narrower than or equal to +/-2% or de facto horizontal band that is narrower than or equal to +/-2% | 6 | |
| De facto crawling peg | 7 | |
| De facto crawling band that is narrower than or equal to +/-2% | 8 | |
| Pre announced crawling band that is wider than or equal to +/-2% | 9 | |
| De facto crawling band that is narrower than or equal to +/-5% | 10 | |
| Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time) | 11 | |
| De facto moving band +/-5%/ Managed floating | 12 | Flexible exchange regime |
| Freely floating | 13 | |
| Freely falling | 14 | |
| Dual market in which parallel market data is missing. | 15 | |

**Source: Harms and Knaze (2021).**

**Table A.3: Data description and sources**

| Variables | Definitions | Mean | Std. D | Min | Max | Mean | Std. D | Min | Max | Sources |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Dependant variables** | | | | | | | | | |
| | | 19984-2020 (1776 obs) | | | | 1997-2019 (1104 obs) | | | | |
| GINI | GINI coefficient | 38.2 | 9.55 | 18.9 | 74.2 | 38.5 | 9.02 | 23.3 | 74.2 | UNU-WIDER. (2025). |
| INEQ | Income Inequality corresponding to a binary | .418 | .493 | 0 | 1 | .445 | .497 | 0 | 1 | Author's calculation |

[14] United Nations University World Institute for Development Economics Research

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | variable equal to 1 if the GINI coefficient is greater than the median value and 0 otherwise | | | | | | | | | |
| Gini coefficient (disp. income) | Estimate of GINI index based on households' disposable net income (post-tax, post-transfer). | 35.7 | 8.86 | 18.2 | 65.5 | 36.1 | 8.49 | 22.6 | 65.5 | Standardized World Income Inequality Database (SWIID) Solt, F. (2019) updated to 2023 in December 2024 |
| Gini coefficient (market income) | Estimate of GINI index based on households' market income (pre-tax, pre-transfer). | 46.6 | 6.25 | 30.5 | 71.5 | 47.4 | 6.05 | 30.5 | 71.5 | Standardized World Income Inequality Database (SWIID) Solt, F. (2019) updated to 2023 in December 2024 |
| | **Explanatory variables** | | | | | | | | | |
| | **Capital account liberalization measures** | | | | | | | | | |
| KAOPEN | De jure overall capital account liberalization index measuring a country's degree of openness; high values imply more openness. | .752 | 1.56 | -1.92 | 2.31 | 1.02 | 1.49 | -1.92 | 2.31 | Chinn and Ito (2006), updated to 2021 in November 2023. |
| KA | Overall restrictions index. | For all capital account liberalization index of Fernández et al. (2016): high value corresponds to less openness | | | | .358 | .340 | 0 | 1 | Fernández et al. (2016) |
| KAI | Overall inward restrictions index. | | | | | .328 | .328 | 0 | 1 | - |
| KAO | Overall outward restrictions index. | | | | | .388 | .375 | 0 | 1 | - |
| **eq** | Average equity restrictions | | | | | .377 | .389 | 0 | 1 | - |
| **bo** | Average bond restrictions | | | | | .373 | .384 | 0 | 1 | - |
| **mm** | Average money market restrictions | | | | | .364 | .382 | 0 | 1 | - |
| **ci** | Average collective investments restrictions | | | | | .345 | .354 | 0 | 1 | - |
| **de** | Average derivatives restrictions | | | | | .384 | .426 | 0 | 1 | - |
| **cc** | Average commercial credits restrictions | | | | | .256 | .393 | 0 | 1 | - |
| **fc** | Average financial credits restrictions | | | | | .389 | .440 | 0 | 1 | - |
| **gs** | Average guarantees, sureties and financial backup facilities restrictions | | | | | .260 | .391 | 0 | 1 | - |
| **di** | Average direct investment restrictions | | | | | .417 | .414 | 0 | 1 | - |
| **re** | Average real estate restrictions | | | | | .418 | .365 | 0 | 1 | - |
| | **Other control variables** | | | | | | | | | |
| XREG | De facto exchange rate regime classification based on arrangements flexibility as mentioned on table A.2 presented by Reinhart and Rogoff (2004). | 8.20 | 4.41 | 1 | 15 | 7.73 | 4.64 | 1 | 15 | Ilzetzki et al. (2019) and Harms and Knaze **(2021)**[15] |
| GDPC | GDP per capita (constant 2010 US$) | 9.42 | 1.20 | 6.06 | 11.3 | 9.55 | 1.16 | 6.50 | 11.3 | WDI |
| INFL | Inflation rate, GDP deflator (annual %) | 25.4 | 216.6 | -8.71 | 6261.2 | 5.10 | 9.07 | -6.0 | 143.6 | WDI |
| TRADE | Total imports and exports of goods and services (% of GDP) | 70.7 | 50.3 | 12.2 | 442.6 | 78.0 | 54.9 | 16.4 | 442.6 | WDI |
| EDUC | School enrollment, primary (% gross) | 103.4 | 10.9 | 53.4 | 165.6 | 103.6 | 8.48 | 58.6 | 165.6 | WDI |
| GSIZE | General government final consumption (% of GDP) | 16.5 | 4.95 | 2.97 | 34.3 | 16.7 | 4.65 | 5.69 | 27.9 | WDI |
| DCPS | Domestic credit to private sector (% of GDP) | 75.4 | 47.6 | 6.97 | 258.9 | 82.6 | 49.3 | 8.90 | 236.7 | WDI |
| M2RES | Broad money to total reserves ratio | 12.9 | 17.1 | .849 | 96.3 | 14.0 | 19.3 | .974 | 96.3 | WDI |
| UNUMP | Unemployment, total (% of total labor force) (national estimate) | 7.72 | 4.97 | .25 | 33.2 | 7.61 | 4.81 | .25 | 33.29 | WDI |
| ADEP | Age dependency ratio (% of working-age population) | 54.2 | 10.0 | 33.1 | 89.3 | 51.8 | 7.89 | 33.1 | 88.0 | WDI |
| polity2[16] | A score indicating political regime ranging from + 10 (strongly democratic) to −10 (strongly autocratic). | 6.89 | 5.05 | -8 | 10 | 7.36 | 4.50 | -7 | 10 | Marshall et al. (2019) |

## Statements and Declarations:

- The authors have no relevant financial or non-financial interests to disclose.

## Data availability Statements:

- Data are extracted from sources indicated in table A.3 and are available on request from authors.

## Author Contributions:

- **Mekki Hamdaoui** was responsible for the conceptualization of the study, the econometric analysis and estimations, and the overall coordination of the research project. He also led the structuring and organization of the manuscript, ensuring the coherence of the empirical strategy and the presentation of the results.
- **Radhia Amairia** conducted the literature review, synthesizing the theoretical and empirical contributions related to capital account liberalization, exchange rate regimes, and income inequality. She contributed to positioning the study within the existing academic debate and helped refine the research motivation.
- **Ramzi Ben Abdejlil** was responsible for the bibliographic research and assisted in improving the quality of the English language and clarity of the manuscript. He also contributed to refining references and enhancing the overall readability of the paper.

All authors contributed to the discussion of the results, reviewed the manuscript critically, and approved the final version for submission.

[15] Harms and Knaze (2021). https://download.uni-mainz.de//fb03-international-economics/effective_err_data/De facto%20data/Weighted_DeFacto_Regimes_2022.xlsx based on the classification of Ilzetzki et al. (2019).

[16] Polity is a composite index measuring Polity score based on the level of democracy and autocracy indices in a special country during a given year. It captures the regime authority spectrum on a 21-point scale ranging from −10 (monarchy) to +10 (democracy). The components variables that are used to construct this index are available at Marshall and Jaggers (2007).