There is no Free Lunch: What is the Cost of Economic Freedom?

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Abstract

This research studies how economic freedom affects income distribution in developing countries. Results reveal economic freedom increases income inequality. The results are consistent across two measures of economic freedom (i.e., Fraser Institute and Heritage Foundation) and several measure of income inequality (i.e., SWIID/WIID Gini Coefficients, share top 20 percent, and bottom 40 percent). The results are robust across several econometric frameworks (MMQR, FE, GMM, and FGLS), model specifications (e.g., control variables), and subgroups of countries (e.g., sensitivity tests). An insight from the Method of Moment quantile regressions is that while economic freedom is a statistically significant factor exacerbating income inequality across all quantiles (e.g., from low to high levels of inequality), its impact is more pronounced in quantiles with lower levels of income inequality. In other words, economic freedom has a stronger inequality-widening effect in environments where inequality is initially less severe.

KEYWORDS

Economic Freedom, income distribution, income inequality, MMQR

1. INTRODUCTION

Many developing countries have experienced increased economic freedom and income inequality over the last 30 years (Roser & Cuaresma, 2014; Gwartney et al., 2022; World Bank, 2022). Market economy principles, defined here as economic freedom, such as private property rights, free markets, limited government intervention, and open trade policies, are promoted by the International Monetary Fund (IMF) and the World Bank (IMF, 2019). It is claimed free-market fundamentals promote economic growth (Dreher, 2006), economic development (IMF, 2019), economic efficiency (Okun, 1975), higher life expectancy (Bennett, 2024), entrepreneurship (Holcombe, 2013), and better psychological well-being (Tsai, 2007)). In light of such potential, one wonders why anyone would want to deviate from economic freedom. However, even in countries that do not subscribe to the socialism doctrine, governments are heavily engaged in economic affairs through a myriad of regulations and policies. To avoid accusing our parents and ancestors of stupidity or ignorance, it is reasonable to believe there must have been some reasons for imposing policies and regulations, other than the zest of politicians to show their power or to control things for their own benefit. There are examples of adverse consequences when governments were not able to impose policies to curb the power of national and multinational companies, such as the role of Anaconda Copper Company in Chile (Moran, 1974). The United States government mandated many policies to avoid runs on the bank

by creating the Federal Reserve, to curb the power of railroad owners through the Interstate Commerce Act of 1887, or to reduce the power of large corporations by enacting the Sherman Antitrust Law in 1890 (Grandy, 1993). Interestingly, some of these laws were introduced in response to citizen demands and concerns, which may seem at odds with the principles of economic freedom that advocate for reducing government regulations. However, since these regulations promote greater competition, they were welcomed by proponents of economic freedom. This paper demonstrates that even in the realm of economic freedom, the adage 'there is no free lunch' holds true. Of course, economic freedom is not a commodity to be purchased so it does not have a "price." However, it has an opportunity cost. The evidence presented in this paper indicates that one of the opportunity costs of economic freedom is economic justice, as measured by income inequality. The study explores whether economic freedom—while fostering growth—may simultaneously exacerbate income inequality in developing countries.

Discussions on income inequality involve normative elements, and different views exist on income inequality. For example, Starmans et al. (2017) indicate that people may prioritize perceptions of fairness in opportunity over income inequality. However, the Great Gatsby Curve indicates that countries with high inequality tend to experience low intergenerational mobility, meaning that a parent's economic status plays a significant role in shaping the opportunities and outcomes available to their children (Krueger, 2012). This means that those in lower income deciles tend to have fewer opportunities to move up the economic ladder, because the income of one's parents significantly influences one's access to education, resources, and career prospects, perpetuating inequality across generations, seemingly regardless of the level of economic freedom. This situation is especially pronounced in developing countries, where the lack of funding for educational subsidies, coupled with corruption, severely restricts merit-based opportunities (Patrinos & Psacharopoulos, 2020). Therefore, while people may prioritize fairness of opportunity over inequality itself, high income inequality can ultimately limit those very opportunities. Moreover, research suggests that high income inequality leads to other problems. For example, high income inequality can exacerbate political instability and internal conflict (Alesina & Perotti, 1996; Winkler, 2019; Parsons, 2023). Therefore, research in understanding the determinants of income inequality continues to be important.

The effects of economic freedom on income distribution are debated. On the one hand, some researchers claim that higher levels of economic freedom increase income inequality (Okun, 1975; Muller, 2013). One claim is that economic freedom may lead to disproportionate gains for capital owners (Piketty, 2014). One reason is that those with capital are better positioned to exploit the opportunities afforded by economic freedom (Muller, 2013). Additionally, deregulation and lower taxes might benefit higher-income individuals and corporations more than lower-income groups (Claessens & Perotti, 2007). Furthermore, privatization and reduced government intervention may reduce social safety nets, potentially widening the income gap (Gupta et al., 1999). Even if economic freedom leads to more employment opportunities for lower-income individuals, higher-income earners may make disproportionately more, worsening income inequality. On the other hand, markets open to trade and investment can improve productivity, which may increase real wages across industry sectors, potentially benefiting lower-income individuals (Stolper & Samuelson, 1941)

There is inconsistency in the results of studies on the relationship between economic freedom and income inequality (Bennett, 2024). For instance, research studies find that economic freedom increases inequality (Pérez-Moreno & Angulo-Guerrero, 2016; Kwon, 2018; Karakotsios et al., 2020), decreases inequality (Clark & Lawson, 2008; Apergis & Cooray, 2017), or is insignificant (Bergh & Nilsson, 2010; Sturm & de Haan, 2015; Yay et al., 2016). The mixed findings can be attributed to empirical heterogeneity, including variations in econometric models, country samples, time periods, and the specific measures of inequality and economic freedom employed in different studies (Bennett & Nikolaev, 2016; Ahmad, 2017; Bennett, 2024). For instance, econometric approaches range from Ordinary Least Squares (OLS), Fixed Effects (FE), Random Effects (RE), Two-Stage Least Squares (2SLS), System Generalized Method of Moments (SGMM), panel integration, Pooled Mean Group (PMG), to propensity score matching. In addition, studies use a range of inequality measures, including net and market Gini coefficients, income share ratios, Theil index, and 80/20 income ratio, as well as industrial pay inequality and consumption Gini (Bennett, 2024). Studies also use different measures of economic freedom, including comprehensive measures, such as the Fraser Institute's Economic Freedom of the World Index (EFW), the Heritage Foundation's Index of Economic Freedom (IOEF), or individual subcomponents of these composite measures, such as sound money or property rights. There is also disagreement in the functional form of the relationship between

economic freedom and income distribution (Bennett, 2024). Some researchers suggest a linear relationship, while others propose polynomials of different powers (Carter, 2006; Apergis & Cooray, 2017). Lastly, studies often focus on developed countries or create a large set of countries that mix both developed and developing countries. The latter creates greater heterogeneity that can cause problems if the study fails to account for heterogeneity, autocorrelation, and cross-sectional dependence (HAC).

This study adds to the economic freedom-income distribution literature in the following ways. For one, to the best of our knowledge, no study employs the Method of Moment quantile regression (MMQR) technique (Machado & Silva, 2019). MMQR allows for a more comprehensive analysis than other econometric measures by analyzing how different segments of Gini coefficient distribution (e.g., countries with low income inequality at the bottom quantiles, versus countries with high income inequality at the upper quantiles) respond to changes in economic freedom. Unlike previous research, we examine whether economic freedom has differential effects across distinct income inequality contexts. Specifically, the study investigates whether economic freedom disproportionately moderates/exacerbates income inequality in countries with higher inequality. Furthermore, whether reforms moderate/exacerbate income inequality in countries with lower inequality. By focusing on the lower distribution (countries with less income inequality) and the upper distribution (countries with more pronounced inequality), the study explores whether economic freedom has heterogeneous effects based on the level of income inequality. In addition to capturing these distributional differences, the MMQR approach offers other methodological advantages. For instance, MMQR is resistant to skewed data, that would otherwise influence averages in approaches such as OLS, FE, and GMM (Machado & Silva, 2019). Since outliers are common in income inequality datasets, this method is effective. Furthermore, MMQR addresses issues of endogeneity and measurement error through its moment-based framework (Machado & Silva, 2019). Secondly, most studies either focus on developed countries or have a large set of developed and developing countries. This study focuses solely on developing countries, which allows for a more targeted analysis. Developing countries often exhibit varying degrees of economic freedom and regulatory environments, compared to the relatively more homogeneous developed countries. By focusing on developing countries, the study examines a group of countries that tend to have weaker institutional frameworks (Acemoglu & Robinson, 2010).

Weaker institutions may allow high earners to capture a larger share of the income, as economic freedom reforms increase economic growth, exacerbating inequality. Third, this study is comprehensive. It includes developing countries with data covering 1986 to 2021. Furthermore, the study tests two measures of economic freedom (i.e., EFW and IOEC) and several measures of income inequality from two different sources (World Income Inequality Database [WIID] and Standardized World Income Inequality Database [SWIID]). Fourth, the results are robustly tested across different econometric techniques (e.g., OLS, FE, RE, feasible generalized least squares [FGLS], and GMM), control variables, and samples of countries.

The study finds economic freedom increases income inequality in developing countries, with the inequality-widening effect being more pronounced in countries which have lower levels of initial income inequality. These results are robust across multiple econometric methods, model specifications, and country subgroups. The study highlights that while economic freedom may bring economic benefits, it comes at the cost of greater income inequality.

The literature review examines the literature on the economic freedom income redistribution relationship. The econometric models are detailed in the methods section. The research findings, discussion, and conclusion sections provide the results and further explore the study's contributions and limitations.

2. LITERATURE REVIEW

2.1. *Income Inequality and Economic Freedom*

Aspects of income inequality, including how much is tolerated, are normative. Normative considerations, including judgments about fairness, vary across countries (Starmans et al., 2017). Different countries have distinct cultural perspectives on income equality, often influenced by their cultural orientation toward individualism or collectivism. For example, the United States, with a strong connection to individualism, prioritizes incentives toward achievement, and many accept greater income inequality as a consequence. On the other hand, Japan, which values collectivism, emphasizes social harmony and group cohesion and tends to view income inequality more negatively (Matsumoto & Triandis, 1996). However, it is well documented that high income inequality is problematic for a country (Stiglitz, 2013; Piketty, 2014; World Bank, 2022). For instance, it can exacerbate social tensions (Duca & Saving, 2015), increase internal

conflict (Parsons, 2023), and limit access to essential services (Rogayan & de Guzman, 2024), ultimately undermining long-term development and stability.

Economic freedom is different from the laissez-faire capitalism. The former not only allows, but also recommends some regulations of labor and credit markets as well as businesses in general (Satz, 2007). However, the two names are often used as synonyms, and both concepts are believed to promote economic growth (Ayal & Karras, 1998; Dawson, 1998; Gwartney et al., 1999; de Haan & Sturm, 2000; Heckelman & Stroup, 2000; Gwartney et al., 2006; Dreher, 2007; Young & Sheehan, 2014; Grier & Grier, 2021). Studies have shown that countries with more economic freedom tend to experience higher growth rates, lower unemployment, especially among women and youth, and better health outcomes (Berggren, 2003). Moreover, economic freedom is associated with better human rights, lower crime rates, and higher investment in education and human capital (de Soysa & Vadlamannati, 2021, 2023). Furthermore, many economists argue that private investment, where individuals benefit directly from their work, promotes specialization and enhances productivity (Smith, 1776). For instance, Adam Smith, along with the physiocrats, recognized that state interventions and monopolistic practices under mercantilism hindered productivity and growth (1776). Smith saw the government's role as maintaining free and competitive markets and providing essential public goods, such as education and infrastructure, that would enhance productivity (Tanzi, 2011). It is noteworthy that economic freedom does not advocate the exclusion of government from economics. Economists often advocate for minimal government interference, emphasizing that market-based growth should focus on absolute gains for the poor rather than their relative gains (Friedman, 1962).

Although economic growth is often seen as a means to reduce poverty, income inequality is frequently regarded as an unavoidable trade-off for achieving that growth (Carter, 2007). Consequently, this has led to debates about the trade-offs between economic growth, induced by economic reforms, and income inequality, with some suggesting that the benefits of growth may outweigh concerns about inequality. Kuznets (1955) hypothesizes that in the early stages of economic growth, income inequality tends to increase. The reason is that industrialization tends to concentrate wealth and income in certain sectors and regions. The hypothesis claims that eventually, as a country becomes more developed income inequality will reduce. The hypothesis was based on economic growth and changes in income inequality from the Industrial Revolution

until the 1950s in industrialized countries (Kuznets, 1955). The worsening of income distribution in countries that have reduced income redistribution, such as the United States, has cast doubt on this hypothesis (Levy, 1975; Naghshpour & Nissan, 2018). Furthermore, income inequality's convergence is affected by the choice of data periods and sample size, among other things (Naghshpour, 2008). The Stolper-Samuelson theorem predicts trade (i.e., a form of economic freedom) leads to a country specializing in sectors where comparative advantage exists (1941). If a country's comparative advantage is capital-intensive or centered in a niche industry that employs only a small portion of the population, it can lead to increased income inequality. Furthermore, owners of unskilled labor in agriculture, in an industry that is not a comparative advantage, may experience relative losses, further exacerbating income inequality (Stiglitz, 2002).

However, other economists, such as de Soto (2000), argue that economic freedom, particularly through the protection of property rights, provides lower-income individuals with greater access to markets, thereby improving their economic standing and contributing to poverty alleviation. It is noteworthy that mathematically the same percentage increase in high- and low-income individuals leads to income divergence and higher income inequality. However, although the same percentage increase in low and high-income individuals is mutually beneficial for both parties, it leads to greater relative income inequality. Subsequently, some economists assert that since low-income individuals benefit as their absolute income rises, countries should prioritize absolute gains over relative income distribution. Finally, redistributive policies (e.g., progressive taxation) could stifle growth, potentially harming low-income groups (Lyon & Waugh, 2018).

Marxist doctrine argues that while markets are highly efficient at generating wealth, they inherently lead to unequal distributions of wealth as well as power and resources (Marx, 1867). Capital continues to accumulate while a laborer's experience and capabilities are lost after the death of each worker resulting in continuous increase in capital, a higher ratio of capital to labor, and a deepening class divide. Marxist theory suggests that the rich controls the political system, ensuring their privileges are maintained, thereby perpetuating a cycle of inequality and limiting opportunities for the working class (Tanzi, 2011). Similar themes have resurfaced in modern critiques of globalization, which argue that capitalism while promoting growth, continues to institutionalize inequality (Held & McGrew, 2003; Harvey, 2010).

On the other hand, free markets encourage competition and innovation, leading to investments in public goods, such as education and healthcare, which benefit everyone. Over time, this could help reduce inequality by improving access to resources that enhance productivity and human capital (Chambers et al., 2019). Therefore, while some argue that the focus should be on increasing opportunity rather than worrying about income inequality, others suggest that income inequality itself can limit access to opportunities (e.g., the Great Gatsby Curve), creating a vicious cycle of poverty (Acemoglu & Robinson, 2012).

Studies of the effect of economic freedom on income inequality have inconsistent and mixed results (Bennett & Nikolaev, 2017; Bennett, 2024). The mixed findings are attributed to differences in methodologies, variables, and the subset of countries examined. The choice of the sample of countries further complicates comparisons. For instance, some studies focus exclusively on developed nations, while others include a large heterogeneous mix of developed and developing countries (Bennett, 2024). This can be problematic, as pooling countries with different characteristics may obscure the true relationship between economic freedom and inequality, making it difficult to draw consistent conclusions across studies. Few studies employ panel data analysis on a large sample of non-OECD countries, which reveals a gap in the literature (Bennett, 2024). Furthermore, although quantiles of income have been used, no study has employed a quantile regression framework. As noted in the introduction, this approach allows for a more detailed examination of how different segments of the income distribution respond to changes in economic freedom, providing insights into whether these changes have varying effects across countries with low versus high income inequality. See Table 1 for a summary of previous research, which focuses on studies that feature large panels that include developing countries, while excluding studies related to developed countries.

Berggren (1999) studies 66 developed and developing countries using OLS and finds higher levels of economic freedom are associated with greater inequality. However, over longer time horizons, economic freedom reduces income inequality. Specifically, higher levels of economic freedom in 1985 are associated with greater income inequality, while increases in economic freedom between 1975 and 1985 are associated with a reduction in income inequality in 1985. The study is often criticized for using non-comparable measures of inequality and for misinterpreting the dynamics between short- and long-term effects (Bennett & Nikolaev, 2017).

Carter (2007) uses a FE model in a panel of 39 developed and developing countries over six five-year intervals between 1980 and 2000. After controlling for factors such as industrial structure, education, income levels, demographics, and political systems, the study finds economic freedom is associated with an increase in income equality. However, the positive relationship between economic freedom and inequality is less pronounced in countries that initially had lower levels of economic freedom.

Bergh & Nilsson (2010) use FE and SGMM in a panel of 78 developed and developing countries between 1970 and 2005. Their findings were mixed; while certain types of economic freedom, such as trade openness and regulatory policies, increase income inequality, no statistically significant relationship is observed for the composite EFW measure. The results highlight the sensitivity of findings to the specific components of freedom being measured, the sample period, and the econometric approach.

Sturm & de Haan (2015) analyze 108 developed and developing countries from 1971 to 2010. They exclude redistribution policies from the EFW, focusing on legal structure and property rights. They find no significant relationship between economic freedom and income inequality. Their results show that while GDP per capita and financial globalization significantly affect inequality, economic freedom itself does not. Additionally, they investigate the role of ethnolinguistic fractionalization, finding that countries with high fractionalization exhibit lower income redistribution, though this effect varies with the level of economic freedom.

Ahmad (2017) studies the relationship between economic freedom, political regime, and income inequality in 115 developed and developing countries from 1970 to 2014. The study uses SGMM approach and finds economic freedom increases income inequality, with an estimated annual effect ranging from 0.3% to 0.5%. However, this inequality-increasing effect of economic freedom is mitigated in democratic regimes, where the presence of democracy reduces inequality by 0.13% to 0.6% per year. However, the inclusion of OECD countries, including European countries, may bias the results as many of these countries follow social-democratic policies with significantly higher levels of income redistribution, a factor that should have been accounted for in the analysis.

Apergis & Cooray (2015) analyze a panel data from 138 developed and developing countries over 50 years. The study employs both linear and non-linear cointegration methods to

assess the long-term relationship between EFW and income inequality. Linear analysis finds a negative association between economic freedom and inequality in the long run, indicating that higher levels of economic freedom reduce inequality. However, their non-linear analysis reveals a threshold effect: below an EFW of 5.428, an increase in economic freedom increases inequality, but above this threshold, further increases in economic freedom reduce inequality. The study also disaggregates the EFW index, finding that deregulation has the strongest moderating effect on income inequality, while other components like property rights and trade freedom also contribute to moderating income inequality, but more so in the long run.

Bennett & Nikolaev (2017) find an ambiguous relationship between economic freedom and income inequality, using data from up to 112 countries between 1970 and 2010. The researchers replicate previous studies using six different measures of inequality, including the SWIID. Their results show that the relationship between economic freedom and inequality is highly sensitive to the country sample, time period, and the inequality measure. In their dynamic panel system GMM analysis, the study finds that economic freedom has a positive relationship with income inequality across some specifications, but this relationship varies across measures and samples. Their study highlights the uncertainty and complexity of the economic freedom and income inequality research nexus.

Callais & Young (2023) analyze data from 117 countries from 1970 to 2015. The study employs matching methods, including propensity score and Mahalanobis distance to test causality. Although the researchers find increases in economic freedom are associated with significant income gains across all income deciles, the top income decile earns disproportionately larger gains, contributing to modest increases in income inequality. The Gini coefficients (both disposable and market income) reflect this pattern, showing slight increases in inequality, particularly in the top 1 and 10 percentile income brackets.

De Soysa & Vadlamannati (2023) analyze a panel dataset covering 128 developing countries from 1990 to 2017. This study is unique as it is the only study focusing solely on developing countries. The researchers use fixed effects and find increases in EFW are associated with increases in income inequality. However, they also find that greater economic freedom leads to more equitable access to opportunities, such as education, healthcare, and justice. Their results suggest that while economic freedom may exacerbate income disparities, it

simultaneously fosters conditions that improve access to vital public services, potentially benefiting the broader population over the long term in other ways.

TABLE 1

Cross-Country Economic Freedom and Income Inequality Studies

Author(s)	Countries	Period	Methods	Inequality Measure	Finding
Berggren (1999)	66 – Mix	1975-1985	OLS	Income Gini Income Share Ratio	(+) (-)
Carter (2007)	39 – Mix	1980-2000	FE	Income Gini	(+)
Bergh & Nilsson (2010)	80 - Mix	1970-2005	FE SGMM	Net income Gini	N/S
Sturm & de Haan (2015)	108 – Mix	1971 – 2010	FE	Gross income Gini	N/S
Ahmad (2017)	115 – Mix	1970-2014	SGMM	Net income Gini	(+)
Apergis & Cooray (2017)	138 - Mix	1960-2010	PTSR	Net income Gini Gross income Gini Theil index	(+) before threshold, turns (-)
Bennett & Nikolaev (2017)	112 – Mix	1970-2010	FE SGMM	Net Income Gini Gross income Gini Consumption Gini	N/S
Callais & Young (2023)	117 - Mix	1970-2015	PSM	Income Decile Shares	(+)
de Soysa & Vadlamanntani (2023)	128 – Developing	1990-2017	FE SGMM	Net Income Gini	(+)

Note: Mix means a group of developed and developing countries in the same panel of analysis. N/S means insignificant results. PTSR is panel smooth transition regression. PSM is propensity score matching.

3. METHODS AND DATA

3.1. *Data Description and Variable Selection*

The study uses multiple measures of income distribution. The net Gini coefficient from the SWIID (Solt, 2020). The study uses version 9.7 of SWIID, which addresses previous measurement errors and improves compatibility (Solt, 2020). The net Gini measures disposable income post-tax and post-transfer. The SWIID measures income inequality on a scale between (0.00) and (100). Higher Gini coefficients indicate greater income disparities. To confirm the consistency and reliability of results, the study also uses the market Gini coefficient, which measures the distribution of income before taxes and transfer.

The study utilizes two income distribution measures from the WIID Companion dataset. First, the disposable income of the top 10 percent, and second, the disposable income of the bottom 40 percent. The WIID Companion dataset has global per capita income distributions at the percentile level. The WIID includes relative and absolute inequality data and various income share ratios. The WIID Companion is ideal for robust cross-country inequality analysis. The study uses version 28 of the WIID Companion dataset (UNU-WIDER, 2023). The WIID companion offers standardized and pre-adjusted income distribution data, which enhances the comparability of inequality measures across countries and over time (UNU-WIDER, 2023). Lastly, to test for consistency of results, the study compares the results of the WIID net Gini Coefficient to the comparable WIID net Gini measure.

The study used two measures of economic freedom: the EFW and IOEF. The Fraser Institute's EFW is the measure used in most empirical studies (Bennett, 2024). EFW is a composite measure that aggregates five subcomponents of economic freedom: the size of government, legal system and property rights, sound money, freedom to trade internationally, and regulation. Each subcomponent is scored on a scale from (0.0) to (10), with higher scores indicating greater economic freedom (Gwartney et al., 2022)

The first subcomponent measures government size through public consumption, transfers as a share of GDP, marginal tax rates, and state-owned enterprises (Gwartney et al., 2022). Higher scores signify smaller governments. Studies find larger governments with welfare systems may have policies that reduce income inequality through redistribution (Åberg, 1989; Rothstein, 1998; Bergh & Nilsson, 2010). However, developing countries redistribute much less than developed ones, suggesting that larger governments in these contexts do not necessarily result in greater wealth redistribution or more equitable outcomes (Parsons & Nagshpour, 2024). Furthermore, a large government does not necessarily mean more social welfare programs since developing countries often struggle with corruption and governmental and bureaucratic inefficiencies that limit the effective delivery of public services (Odedokun & Round, 2004).

The second subcomponent measures the integrity of the legal system, the protection of property rights, and the rule of law. Greater property protections, more legal system integrity, and a better rule of law have higher scores. The protection of private property is a pillar of the market economy, and it creates incentives for individuals and businesses to take capital risks

(Smith, 1776). Although stronger property rights promote economic growth, their effects on income inequality are mixed (Bergh & Nilsson, 2010). On one hand, they may benefit those with more wealth and income by securing ownership of property, increasing the stability and value of their assets, and further consolidating their economic advantage (Okun, 1975). In many developing countries, where elites often accumulate wealth through corruption, improving legal protections may benefit the less privileged, thereby reducing inequality (Ochi et al., 2024). Sonin (2003) suggests that weak property rights may actually favor the wealthy, further widening inequality. Elites in developing countries with weak property rights can exploit legal loopholes, and use bribes, or political connections, to maintain or increase their control over assets. In these environments, limited legal protections create opportunities for dispossession and exploitation.

The sound money subcomponent measures inflation and the money supply. Greater unexpected changes in inflation and the money supply have lower scores. Inflation is widely seen as disproportionately harmful to low-income individuals, whose assets are less protected, thereby exacerbating income inequality (Albanesi, 2007; Rabhi & Parsons, 2024). Sudden inflation can cause hardship for businesses. For instance, it can lead to resource misallocation and significant costs in gathering information to manage price uncertainty (Fischer & Modigliani, 1978). Therefore, this uncertainty may dissuade foreign direct investment, lower economic growth, and potentially affect the amount of financial resources available for public services.

In the fourth subcomponent, EFW evaluates trade freedom by tariffs, trade barriers, and controls on capital markets. Lower tariffs, fewer barriers to trade, and fewer controls on capital markets lead to higher scores. The role of trade liberalization on income inequality is debated. Stopler & Samuelson (1941) and Kanbur (2000) predict that unskilled workers' wages will rise, helping to reduce inequality. However, evidence suggests unskilled labor may be worse off in developed countries (Stiglitz, 2002). Similarly, Sebastian (1997) finds that trade openness exacerbates inequality in developed economies but not in developing ones. Savvides (1998) demonstrates that trade openness in less developed countries during the late 1980s also led to rising inequality.

The fifth subcomponent of EFW is regulation. The regulation dimension of the EFW measures the regulation of credit markets, labor markets, and business. Higher scores reflect less

regulation. Similar to property protection and trade, the relationship between deregulation and income inequality is uncertain. On one hand, expanding credit may reduce income inequality enabling more individuals to invest in education, skills development, or physical assets (Galor & Zeira, 1993). On the other hand, deregulation might exacerbate inequality when high-income elites influence policy for their benefit (Claessens & Perotti, 2007). While empirical evidence is mixed, a number of studies suggest income inequality may increase as a country's eliminates regulations. For instance, Calderón & Chong (2009) find labor market regulations tend to reduce inequality. However, regulations limit output due to higher standards and costs. This reduces the demand for labor and increases income inequality.

The study also uses the Heritage Foundation's IOEF to test for robustness (Heritage Foundation, 2023). The IOEF measures: the rule of law, government size, regulatory efficiency, and market openness. It uses 12 specific components, each rated on a scale of (0.0) to (100). These components include property rights, judicial effectiveness, government integrity, tax burden, government spending, fiscal health, business and labor freedom, monetary freedom, trade freedom, investment freedom, and financial freedom. Scores are derived from sub-factors, averaged, and equally weighted, producing an overall economic freedom score (Heritage Foundation, 2023). The IOEF relies on data from global institutions like the World Bank and IMF, with an emphasis on policy measures and institutional quality, particularly regulatory efficiency and government integrity. In contrast, the EFW focuses more on market functioning. The correlation between the EFW and IOEF is (0.873). See Figure 1 for a binscatter illustration of the relationship between the net Gini coefficient and the IOEF in developing countries. The upward slope suggests higher economic freedom is associated with larger Gini coefficients.

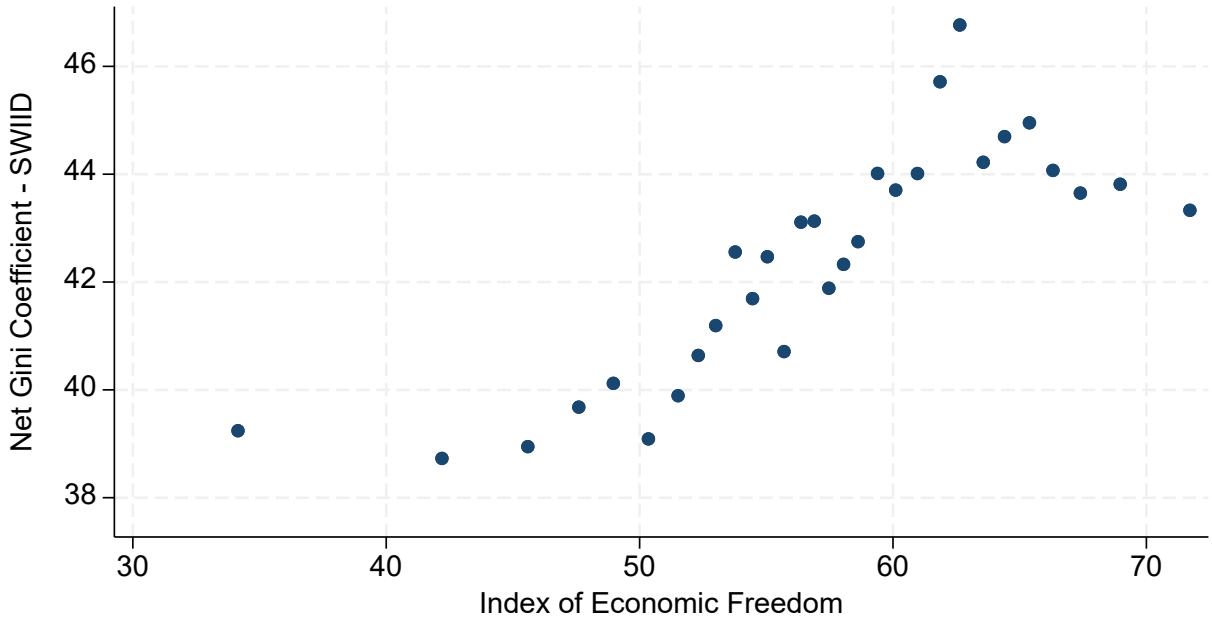


Figure 1. Binscatter of Net Gini Coefficient and Index of Economic Freedom in Developing Countries

This study controls for population distribution (age dependency ratio), economic development (per capita Gross Domestic Product (GDP)), short-run economic performance (GDP growth rate), economic structure (employment in manufacturing), globalization (imports as a percentage of GDP), education (human capital index (HCI)), and a country's investment profile. These controls operationalize economic freedom by controlling for key variables that shape the economic environment, ensuring that any effects attributed to economic freedom are not confounded by external factors.

The World Bank's per capita GDP accounts for economic development. Kuznets (1955) and Kaldor (1957) state that economic development increases income inequality at the early stages of development. However, further development decreases income inequality. Subsequently, it is expected that the linear per capita GDP form will increase income inequality, while the quadratic form will reduce it. All studies use the linear form of per capita GDP, but not all use the quadratic form (Bennett & Nikolaev, 2017; Bennett, 2024). We test both, and find the model fits best with the quadratic term.

The World Bank's employment in manufacturing accounts for the structure of an economy. Some researchers use the size of the agriculture, while others use the size of the service sector (Bennett, 2024). In the early stages of development, the movement from agriculture to manufacturing can increase income inequality due to higher wages in manufacturing. Since the movement from agriculture to manufacturing often leads to urbanization. Young (2013) argues that urban-rural income variances may account for a sizable percentage of intercountry income inequality. However, as a country continues to develop further the service sector's jobs pay higher wages than manufacturing, and subsequently, the manufacturing moves to lesser developed countries.

The World Bank's age dependency ratio accounts for demographic differences. A larger dependency ratio means a smaller labor force relative to the population. Subsequently, as more income is earned by those in the labor markets, income inequality increases. Many studies account for the age dependency ratio (Bennett, 2024).

The World Bank's GDP-adjusted sum of imports accounts for globalization and trade. An influx of foreign competition, including cheaper imports, can negatively affect domestic labor markets (Stiglitz, 2002). However, the effects of trade and globalization are uncertain and uneven (Heckscher, 1919; Ohlin, 1933; Stolper & Samuelson, 1941; Stiglitz, 2013). For instance, if demand for skill-biased technology trade increases the incomes of high-income groups, income inequality can increase (Card & DiNardo, 2002). Although most studies focus on trade volume, considering both imports and exports, this study focuses on imports. Imports are a crucial measure of globalization's impact on domestic economies, as they reflect the degree of exposure to foreign markets and competition. By focusing on imports, this study aims to capture the direct effects of foreign goods entering the domestic market, which can lead to shifts in labor demand, wage structures, and ultimately income inequality.

Nearly all studies control for human capital (Bennett, 2024). This study uses the HCI from the Penn World Table version 10.01, which measures human capital based on years of schooling and returns to education, with scores ranging from 1.0 to 4.0 (Feenstra et al., 2015). A larger score indicates more years of schooling and subsequently a greater return to education. Theoretically, the effect of higher education on inequality is unclear. For instance, Knight & Sabot (1983) claim that human capital's effect on income inequality is ambiguous because of two

opposing forces: the composition effect and the wage compression effect. The composition effect increases income inequality by enlarging the higher-earning of the educated group as they gain human capital. However, the wage compression effect reduces inequality as education becomes widespread, leading to a larger supply of skilled workers, which lowers wage premiums.

Finally, the study controls for a country's investment profile. A country's investment profile is from the International Country Risk Guide (ICRG). The Investment Profile assesses the risk to investment through three subcomponents: contract viability/expropriation, profits repatriation, and payment delays, with a total possible score of 12 points (ICRG, 2024). A higher score indicates lower risk, while a lower score signals high risk to investors. This measure is critical because even if a country implements economic freedom reforms, high investment risk can still deter foreign and domestic investment. Including it as a control ensures that the analysis accounts for factors that could undermine the benefits of economic reforms by making the business environment less attractive.

See Table 2 for descriptive statistics.

TABLE 2
DESCRIPTIVE STATISTICS – DEVELOPING COUNTRIES

	N	Mean	Standard Deviation	Min-Max
Age Dependency Ratio	2,395	65.6	20.0	15.7 – 115
Bottom 40 - WIID	846	14.2	4.12	3.51 – 30.6
Economic Freedom - EFW	2,059	6.10	1.02	1.87 – 7.94
Economic Freedom - IOEF	2,395	55.6	10.7	1.00 – 77.7
Employment in Manufacturing	2,215	18.6	8.34	2.56 – 59.6
Gini Coefficient - SWIID	1,905	42.3	7.13	24.0 – 65.5
Gini Coefficient - WIID	882	45.4	9.22	15.2 – 74.7
GDP Growth Rate - Real	2,349	3.99	5.12	-50.3 – 86.8
GDP Per Capita – Nat. Log.	2,332	7.92	1.13	5.38 – 11.1
Human Capital Index	1,963	2.18	.558	1.05 – 3.58
Imports as a % of GDP	2,167	37.5	17.5	.017 - 112
Investment Profile	2,378	7.41	1.83	0.00 – 11.5
Top 20 - WIID	846	40.8	3.45	27.5 – 52.3

3.2. *Empirical Framework*

The study uses unbalanced panels with up to 91 developing countries, based on the World Bank classification (i.e., income level). See Appendix A for a list of countries in the study. All developing countries with data across variables are included in the study. Data reporting for the EFW is from 1986 to 2020 and 1996 to 2020 for the IOEF. The EFW reports every five years from 1986 to 2000, and then annually after 2000. The unbalanced panel structure increases observations and leads to a larger panel of countries. As country participation and observations increase, the sample more closely resembles the population, and the potential for selection bias decreases (Rosenbaum & Rubin, 1984).

Model specification testing includes the Hausman test, the Wald test, the Breusch-Pagan Lagrange Multiplier test, the joint (time fixed effects) test, the Wooldridge test, the Pesaran test, the Im-Pesaran-Shin unit root test, regression equation specification error test (RESET), and the variance inflation factor (VIF) test. Results indicate there are country and time-fixed effects and the presence of heteroskedasticity, autocorrelation, and cross-sectional dependence (HAC). The model misspecification test does not indicate any specification problem. However, the VIF is large (53.5) when the linear and quadratic terms of per capita GDP are both in the model. To reduce this problematic level of VIF, we center both terms and it reduces the VIF to (2.69). A VIF equal to (1.0) indicates no multicollinearity. However, Fox (2016) claims a (4.0) VIF cutoff since above it lowers precision by 50 percent. We also conduct sensitivity analysis testing (e.g., compare values before and after adding the uncentered per capita GDP and its quadratic term) and find no difference in the statistical significance of economic freedom variables (i.e., EFW and IOEF). Finally, Kennedy (2013) claims multicollinearity is of no concern if there is a high statistical probability exists (e.g., t statistics are higher than (2.0). Finally, the presence of multicollinearity does not matter if one is only interested in the predictive power of the model rather than the specific role of the individual variable (Baltagi, 2013). In other words, it does not matter which blade of the scissor cuts.

Researchers claim empirical heterogeneity explains much of the inconsistency in findings in the economic freedom-income inequality literature (Bennett & Nikolaev, 2017). One problem is that a large portion of the literature fails to account for HAC, which is often a problem in

macro-panel data over ten years (Hoechle, 2007; Wooldridge, 2010; Baltagi, 2013). In this study, we account for HAC and test several econometric models to add robustness to our results.

The first is the Method of Moment quantile regression (MMQR). One advantage of MMQR is the ability to examine if the relationship between economic freedom and income distribution varies across different levels of income inequality. MMQR also addresses heteroscedasticity, autocorrelation, and endogeneity (Machado & Silva, 2019). This Quantile via Moment method establishes asymmetric and non-linear associations, ensuring that residuals remain orthogonal to the independent variables and are normalized to meet the Moment conditions (Machado & Silva, 2019). Moreover, MMQR offers robust estimates of non-linear forms by addressing location-based asymmetries without requiring the assumption of a specific functional relationship between the dependent and independent variables (Machado & Silva, 2019). This allows for more precise modeling of complex, non-linear dynamics. Additionally, MMQR handles outliers and skewed distributions more effectively, providing more reliable estimates compared to conventional panel data techniques. It enhances estimation accuracy and sheds light on how economic freedom influences the conditional mean across the entire spectrum of income distribution measures. Model (1) controls for country-specific fixed effects and clusters standard errors by country. The study also applies the robust option to account for heteroskedasticity and autocorrelation.

$$Q_y(\tau|X_{it}) = \left(a_i(\tau) + \delta_i q(\tau)\right) + X'_{it}\beta(\tau) + Z'_{it}\gamma(\tau) \qquad (1)$$

Whereas $a_i(\tau)$ represents the quantile -(τ) fixed and location/distribution effects for countries (i), $\delta_i q(\tau)$ is the scale effect (i.e., variability of dependent variable across different quantiles of the conditional distribution), τ is the quantile, $Q_y(\tau|X_{it})$ is the dependent variable and its quantile, $X'_{it}\beta(\tau)$ is the vector of independent variables, and $Z'_{it}\gamma(\tau)$ is the vector of differentiable transformations of individual components of X.

The second econometric approach used is a fixed-effect regression with HAC-robust Driscoll and Kraay standard errors (DKSE) (Driscoll & Kraay, 1998). DKSE utilizes cross-sectional averages of nonparametric standard errors to address HAC. DKSE employs covariance matrix estimators that remain consistent, regardless of the cross-sectional dimension. It is applied to verify the robustness of the results derived from the MMQR models by comparing them to

DKSE results at the 50th MMQR quantile. Another benefit of using DKSE is for model testing, as MMQR does not provide an R-squared value. After testing the error term lags, a three-year lag was found to effectively resolve correlation concerns. Model (2) is presented below:

$$IncDist_{it} = \alpha + Econfree_{it-1} + X_{it-1} + \mu_i + \lambda_t + \varepsilon_{it} \ and \ (i = 1, \dots n; t = 1, \dots T) \quad (2)$$

$IncDist_{it}$ is the measure of inequality for country (*i*) and time (*t*). $EconFree_{it-1}$ is the measure of economic freedom that varies across time and countries. X_{it} is the vector set of explanatory variables that vary across time and countries. The parameter α contains a constant and country-specific variable invariant over time. The μ_i captures unobservable individual-specific effects and λ_t captures unobservable time-specific effects. ε_{it} is the error term.

The study employs additional econometric methods to enhance both rigor and robustness. First, the system GMM, using a two-step dynamic estimation (Arellano & Bond, 1991), is applied to further address endogeneity. GMM includes a lag of the dependent variable, which captures dynamic relationships over time, as it allows the model to account for past influences on current outcomes. This approach mitigates forms of endogeneity bias by using internal instruments derived from the data. However, incorporating lagged dependent variables in other econometric models like DKSE and MMQR leads to model overfitting, which in turn biases the estimates (Wooldridge, 2010; Baltagi, 2013). GMM is not ideal for this dataset, as it is typically designed for panels with a large cross-sectional dimension (N) and a smaller time period (T), which could limit its effectiveness with this dataset (Arellano & Bond, 1991). Therefore, we show GMM results for comparison purposes. Second, the study uses a model with feasible generalized least squares (FGLS). FGLS allows for efficient estimation even when the error terms are heteroscedastic and correlated across panels, providing more reliable standard errors in such complex data structures (Greene, 2012). Finally, OLS and RE regressions are shown using DKSE (Driscoll & Kraay, 1998). Together, these methods provide comprehensive validation, ensuring that the results are not only statistically sound but also resilient in different econometric approaches.

Econometric issues may still arise. For instance, omitted variable bias is possible if an unobserved variable jointly determines economic freedom and income distribution (Baltagi, 2013). Fixed effects models mitigate omitted variable bias by controlling for unobservable

factors (Baltagi, 2013). Furthermore, control variables reduce the likelihood of bias in the model. Lastly, we conduct sensitivity analyses by adding and subtracting control variables (e.g., ICRG's institutional strength and quality of bureaucracy and the World Bank's population density). No significant variations in the results are observed (results omitted due to space limitation).

Measurement error can bias estimates (Baltagi, 2013). In the study of economic freedom and income inequality, inaccuracies may arise due to the challenges in precisely measuring these variables. The new SWIID and WIID data mitigates measurement error (Solt, 2020; UNU-WIDER, 2024). The SWIID and WIID take steps to minimize inconsistencies in data by using multiple imputation methods and collating multiple sources. However, we note that measurement error is not fully eliminated. The study relies on reputable sources, including the ICRG, Penn World Tables, SWIID, and WIID, all widely recognized in academic research.

Sample selection bias occurs when a sample does not reflect the population. The sample for this study includes 91 countries, representing nearly half of all developing countries. All countries with data are included. Therefore, the researchers acknowledge the potential for sample selection bias, especially for lower-income countries, which tend to have data reporting problems. To mitigate this, we test different subsamples of countries, to assess whether the results hold consistently across different subgroups. Data limitations are a well-documented challenge in this area of research, often hindering the ability to draw comprehensive conclusions across broader contexts (Bennett, 2024).

Reverse causality bias occurs when two variables reciprocally affect each other (Kennedy, 2013). In this case, if changes in income distribution changes affect economic freedom. The study mitigates reverse causality in the following ways. First, the study lags economic freedom, and all other independent variables by one period, which is consistent with the approach of Ahmad (2017). Second, the use of GMM in robustness tests controls for potential reverse causality (Arellano & Bond, 1991).

4. RESULTS

4.1. *SWIID Gini coefficient and Economic Freedom of the World*

Table 3 provides two-way fixed effects regressions with DKSE on a panel of up to 91 developing countries. The dependent variable is the disposable income Gini coefficient from the SWIID.

Table 3 uses the EFW economic freedom measure. The R-squared values demonstrate increasing explanatory power as covariates are added, as expected, and all the models meet statistical significance thresholds. EFW is statistically significant in every model. The positive EFW coefficients indicate economic freedom is associated with higher Gini coefficients, which means as the economic freedom index increases in developing countries so does income inequality. Model 9 has the full model with the linear and quadratic form of per capita GDP, while Model 10 includes only the linear form. Although EFW is positive and statistically significant in both Model 9 and Model 10, Model 9's F stat and R-square values indicate a better-fitting model.

All significant covariates shown in Table 3 conform with theoretical expectations. For instance, increases in the linear form of per capita GDP is associated with an increase in the Gini coefficient, while its quadratic form lowers the Gini (Kuznets, 1955; Kaldor, 1957). As predicted, higher dependency ratios lead to a larger Gini coefficient. Employment in manufacturing increases the Gini coefficient, although the coefficient is not statistically significant in models 7-9. This is consistent with economic development theory (Kuznets, 1955; Kaldor, 1957; Young, 2013). Young (2013) claims that demographic changes that coincide with modernization may increase income inequality. The results for the human capital index suggest that an increase in education and the subsequent higher income reduce the Gini coefficient. Education can provide low-income individuals with opportunities for upward mobility, improving income distribution in developing countries. Economic freedom that brings opportunity for investment in human capital can lead to higher economic returns, particularly for lower-income individuals, which increases their earnings, and narrows inequality (Schultz, 1961). GDP growth rate, imports, and a country's investment profile are insignificant. However, short-run economic performance and trade are often insignificant determinants of income inequality. For one, there are winners and losers of trade, and it can create much heterogeneity (Stiglitz, 2013). Secondly, there may be a latency effect that causes economic growth from last year to be an insignificant indicator for the following year's Gini coefficient (Halter et al., 2014).

To identify the effect of economic freedom on income distribution in countries in different stages of economic growth, indicator variables based on World Bank income classifications are used. We assign the following conventions:

Income group: 1 high; 2 upper middle; 3 lower middle; 4 low income.

Since using values 1 through 4 will result in bias in analysis, the following indicator variables are created instead. When a country is present in a group it gets the value of 1, e.g., high income countries are assigned (1) in the first indicator variable while all other countries receive the value of (0), and so on. The low income countries are used as the base and receives the value of (0) in all three indicator variables. The coefficients for the three indicator variables are:

Indicator I	0.072
Indicator II	10.18***
Indicator III	5.45***

Indicators II and III are statistically significant, while Indicator I is not. This implies that at the highest level of income, income is no longer a factor in the effect of economic freedom on income distribution. The countries that belong to this group were among the first to achieve economic growth and have been at the highest level of income since the Industrial Revolution. The value of 5.45 indicates that in the lower middle income countries economic freedom increases the Gini coefficient more than in the low income countries. Thus, worsening income distribution relatively. The value of 10.18 indicates that the effect is even more substantial in upper middle income countries.

TABLE 3

SWIID GINI COEFFICIENT AND ECONOMIC FREEDOM OF THE WORLD INDEX

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
EFW	.607**	.532***	.749***	.838***	.723***	.572**	.521**	.553**	.571**	.720***
	(.250)	(.118)	(.186)	(.203)	(.240)	(.228)	(.244)	(.242)	(.224)	(.231)
Age Dep. Ratio		.126***	.106***	.105***	.106***	.110***	.099***	.107***	.108***	.104***
		(.034)	(.014)	(.013)	(.013)	(.020)	(.021)	(.019)	(.018)	(.013)
Employment Manu.			.112***	.117***	.101***	.048**	.025	.010	.010	.075**
			(.026)	(.028)	(.027)	(.021)	(.025)	(.025)	(.026)	(.030)
GDP Growth Rate				-.003	-.003	-.010	-.014	-.017	-.014	-.008
				(.010)	(.011)	(.011)	(.011)	(.015)	(.013)	(.013)
GDP PC – NL					.626	16.0***	16.6***	17.5***	17.5***	.734
					(.662)	(1.61)	(1.38)	(1.23)	(1.37)	(.873)
GDP PC Squared – NL						-.940***	-.952***	-1.016***	-1.013***	
						(.124)	(.111)	(.097)	(.102)	
Human Capital Index							-2.33***	-2.74***	-2.75***	-2.94***
							(.271)	(.223)	(.232)	(.212)
Imports as a % GDP								.000	.000	.007
								(.005)	(.005)	(.005)
Investment Profile									.028	.052
									(.044)	(.045)
F Statistic	***	***	***	***	***	***	***	***	***	***
R^2	.248	.286	.352	.347	.338	.367	.398	.400	.409	.373
Observations	1522	1522	1412	1407	1391	1391	1272	1271	1271	1271
Countries	91	91	91	91	91	90	79	79	79	79

Note: ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the SWIID net Gini Coefficient —standard errors in parenthesis. Models use fixed effects for country and time with Driscoll & Kraay's (1998) HAC robust standard errors. All independent variables have a one-year lag. The period ranges from 1986 to 2020. Data for EFW is reported every year from 2000 to 2020. It is reported every five years from 1986 to 2020. We test models with EFW interpolation and find no significant differences (results omitted).

4.2. *SWIID Gini coefficient and Index of Economic Freedom*

See Table 4 for the same regression as Table 3, but with EFW replaced with IOEF. Table 4 displays the results for FE regressions with DKSE on the same panel of up to 91 developing countries. The dependent variable is the disposable income Gini coefficient from the SWIID. All models have the period of 1996 to 2020, and there are between 300 and 400 more observations in each Model compared to EFW in Table 3. Table 4 shows adjusted R-squared values increase as covariates are added. IOEF is statistically significant across models with a 99 percent confidence interval. Similar to EFW, the positive IOEF coefficients indicate an increase in economic freedom is associated with a larger Gini coefficient. Model 9 adds the linear and quadratic form of per capita GDP, while Model 10 contains only the linear form. While IOEF is positive and statistically significant in both Model 9 and Model 10, Model 9 has a higher R-squared value (i.e., 0.397 versus 0.378). Since the linear form of the per capita GDP in model 10 is not significant but is significant in Model 9 together with the quadratic form, therefore, Model 9 is better than Model 10 as it identifies the role of the per capita GDP on income distribution. The lack of significance in Model 10 could be due to the fact that fitting a linear relationship to non-linear data would fail to detect any relationship, even if there were a perfect relationship as in a parabola such as $Y=X^2$ relationship.

Lastly, covariates in Table 4 conform to the results in Table 3 and theoretical expectations. For instance, human capital reduces the Gini coefficient, reflecting the role of education and returns to education in providing higher income-earning opportunities. Larger dependency ratios increase inequality in all models, as expected, and employment in manufacturing generally leads to greater inequality when significant. Additionally, variables such as GDP growth rate, imports, and investment profile remain largely insignificant, indicating limited short-term effects on income inequality. Therefore, Table 3 and Table 4 demonstrate consistency for economic freedom variables (i.e., EFW and IOEC) and other covariates, which is an indication of the robustness and reliability of the findings across Tables and Models.

TABLE 4

SWIID GINI COEFFICIENT AND INDEX OF ECONOMIC FREEDOM

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
IOEF	.110***	.111***	.104***	.108***	.096***	.094***	.090***	.085***	.105***	.106***
	(.020)	(.018)	(.019)	(.021)	(.025)	(.026)	(.026)	(.026)	(.022)	(.021)
Age Dep. Ratio		.081***	.086***	.086***	.084***	.078***	.070***	.092***	.088***	.093***
		(.012)	(.014)	(.014)	(.015)	(.017)	(.016)	(.012)	(.014)	(.011)
Employment Manu.			.069***	.069***	.052***	.017	.011	-.011	-.021	.022
			(.015)	(.016)	(.017)	(.018)	(.018)	(.021)	(.026)	(.022)
GDP Growth Rate				.005	.001	-.004	-.001	.001	.013	.016
				(.010)	(.013)	(.013)	(.012)	(.015)	(.010)	(.010)
GDP PC – NL					.890	11.0***	11.5***	12.5***	14.0***	1.38
					(.593)	(1.83)	(1.80)	(1.87)	(1.87)	(.860)
GDP PC Squared – NL						-.635***	-.658***	-.711***	-.783***	
						(.136)	(.138)	(.139)	(.133)	
Human Capital Index							-1.34***	-1.75***	-1.98***	-2.40***
							(.323)	(.352)	(.362)	(.320)
Imports as a % GDP								.003	-.001	.007
								(.005)	(.006)	(.006)
Investment Profile									-.068	-.042
									(.041)	(.043)
F Statistic	***	***	***	***	***	***	***	***	***	***
R^2	.343	.367	.354	.350	.343	.359	.366	.382	.397	.378
Observations	1831	1831	1802	1794	1774	1774	1643	1553	1543	1543
Countries	91	91	91	91	90	90	81	78	78	78

Note: ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the SWIID net Gini Coefficient —standard errors in parenthesis. Models use fixed effects for country and time with Driscoll & Kraay's (1998) HAC robust standard errors. All independent variables have a one-year lag.

4.3. *SWIID Gini and Economic Freedom with Quantile via Moments Regressions*

Table 5 provides the MMQR regressions at quantiles 15, 50, and 85. Also shown in Table 5 are regressions using FE, RE, GMM, and FGLS to confirm consistency of results across econometric measures. The use of these varied techniques enhances the rigor and robustness of the analysis, addressing potential concerns over heterogeneous outcomes stemming from the application of different econometric models (Bennett, 2024). Table 5 displays both measures of economic freedom (i.e., EFW and IOEF), but covariate values are reported only for the EFW measure to conserve space and avoid additional tables.

The positive EFW and IOEF coefficients are statistically significant in all models. However, MMQR models show the size of the coefficients decreases along the upward distribution of the Gini coefficient. Therefore, this suggests that economic freedom may exacerbate income inequality more in environments of lower existing inequality. Furthermore, when income inequality is high, economic freedom may still exacerbate income inequality and does not act as a moderator of inequality. Lastly, FE, RE, GMM, and FGLS confirm the consistency of finding that economic freedom is associated with an increase in the disposable income Gini coefficient. The declining coefficient of EFW in MMQR models with higher percentile indicates a greater adverse effect on income inequality. In other words, economic freedom has a higher "price," in terms of increasing income inequality, at lower MMQR percentiles.

TABLE 5

SWIID GINI COEFFICIENT AND ECONOMIC FREEDOM – QUANTILES VIA MOMENT

	MMQR Quant. 15	MMQR Quant. 50	MMQR Quant. 85	DKSE FE	DKSE RE	GMM	FGLS
EFW	.723*** (.232)	.590*** (.185)	.448** (.203)	.571** (.224)	.582** (.218)	.093*** (.028)	1.66*** (.133)
IOEF	.107*** (.017)	.099*** (.014)	.093*** (.014)	.105*** (.021)	.105*** (.020)	.014*** (.002)	.119*** (.012)
Age Dep. Ratio	.054*** (.018)	.100*** (.015)	.149*** (.016)	.108*** (.018)	.107*** (.012)	020*** (.003)	.138*** (.008)
Employment Manu.	.002 (.040)	.015 (.032)	.029 (.036)	.010 (.026)	.000 (.026)	-.026*** (.005)	-.243*** (.015)
GDP Growth Rate	.005 (.010)	-.004 (.010)	-.015 (.013)	-.014 (.013)	-.015 (.013)	-.003 (.002)	-.060*** (.021)
GDP PC – NL	17.0*** (2.87)	15.2*** (2.53)	13.4*** (3.10)	17.5*** (1.37)	17.7*** (1.19)	2.67*** (.569)	22.3*** (1.40)

GDP PC Squared – NL	-1.05*** (.174)	-.970*** (.154)	-.881*** (.189)	-1.01*** (.102)	-1.01*** (.080)	-.198*** (.035)	-1.09*** (.086)
Human Capital Index	-5.84*** (.779)	-4.70*** (.596)	-3.47*** (.605)	-2.75*** (.232)	-2.69*** (.383)	.171* (.098)	-4.61*** (.278)
Imports as a % GDP	.007 (.006)	.001 (.006)	-.005 (.006)	.000 (.005)	.001 (.004)	-.001 (.001)	-.003 (.004)
Investment Profile	.203*** (.062)	.134** (.053)	.059 (.062)	.028 (.044)	.029 (.055)	.020*** (.007)	-.074 (.065)
Net Gini Lag						.898*** (.006)	
F Statistic	***	***	***	***	***	***	***
R^2				.401	.286		
Observations	1543	1543	1543	1543	1543	1481	1543
Countries	79	79	79	79	79	77	79

Note: ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the SWIID net Gini Coefficient —standard errors in parenthesis. MMQR use Machado & Silva's (2019) Quantile via Moments. DKSE Models use FE and RE with Driscoll & Kraay's (1998) HAC robust standard errors. GMM uses Arellano & Bond's (1991) dynamic panel estimator. FGLS is Feasible Generalized Least Squares which is robust to heteroskedasticity and autocorrelation. All independent variables have a one-year lag. Data for EFW is reported every year from 2000 to 2020. It is reported every five years from 1986 to 2020. We test models with EFW interpolation and find no significant differences (results omitted). IOEF data is from 1996 to 2020.

4.4. *WIID Gini and Economic Freedom with Quantile via Moments Regressions*

Table 6 displays the same MMQR regressions shown in Table 5 but changes the dependent variable to the WIID disposable income Gini coefficient. Although the number of observations is reduced by half (i.e., from 1543 to 742) utilizing WIID as well as SWIID enhances the study's consistency, rigor, and robustness. This is especially important given the heterogeneity of results common in the literature (Bennett & Nikolaev, 2017; Bennett, 2024).

Table 6 displays the EFW and IOEF measures of economic freedom, but covariate values are reported only for the IOEF measure. The positive EFW and IOEF coefficients are statistically significant in all models. Models for FE, RE, GMM, and FGLS continue to confirm the consistency of finding that economic freedom is associated with an increase in the disposable income Gini coefficient. All the MMQR models confirm the nonlinear nature of the effect of GDP per capita. Since the coefficient of the GDP per capita is positive and that of its square is negative indicates that after a threshold, as the GDP per capita increases, its effect on income distribution reduces.

TABLE 6

WIID GINI AND ECONOMIC FREEDOM – QUANTILES VIA MOMENT

	MMQR Quant. 15	MMQR Quant. 50	MMQR Quant. 85	DKSE FE	DKSE RE	GMM	FGLS
EFW	1.02**	1.22***	1.47**	1.19**	1.19**	.725**	1.09***
	(.422)	(.407)	(.629)	(.575)	(.537)	(.353)	(.265)
IOEF	.120***	.133***	.147***	.131***	.131***	.067***	.041**
	(.029)	(.026)	(.034)	(.030)	(.024)	(.021)	(.020)
Age Dep. Ratio	.036	.083***	.136***	.053	.105***	.067**	.228***
	(.032)	(.030)	(.037)	(.054)	(.034)	(.028)	(.013)
Employment Manu.	-.208***	-.121*	-.024	-.123**	-.133**	-.250***	-.306***
	(.066)	(.065)	(.093)	(.050)	(.050)	(.057)	(.024)
GDP Growth Rate	-.001	.007	.016	-.034	-.031	.011	-.023
	(.029)	(.027)	(.035)	(.039)	(.042)	(.021)	(.034)
GDP PC – NL	38.0***	25.4***	11.4	27.0***	22.0***	16.8**	20.3***
	(6.19)	(5.84)	(7.75)	(3.57)	(3.49)	(7.06)	(2.20)
GDP PC Squared – NL	-2.23***	-1.57***	-.826*	-1.50***	-1.27***	-.960**	-.977***
	(.361)	(.346)	(.466)	(.214)	(.212)	(.411)	(.131)
Human Capital Index	-9.48***	-7.47***	-5.25***	-4.53***	-5.63***	-5.13***	-8.26***
	(1.12)	(1.12)	(1.50)	(1.19)	(1.17)	(1.22)	(.404)
Imports as a % GDP	-.002	-.007	-.012	-.010	-.012	-.009	-.031***
	(.015)	(.012)	(.014)	(.010)	(.008)	(.012)	(.007)
Investment Profile	.241**	.213**	.181	.092	.109	.166**	.183**
	(.095)	(.086)	(.121)	(.091)	(.108)	(.081)	(.086)
Net Gini Lag						.550***	
						(.037)	
F Statistic	***	***	***	***	***	***	***
R^2				.398	.424		
Observations	742	742	742	742	742	381	742
Countries	77	77	77	77	77	33	77

Note: ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the WIID net Gini Coefficient —standard errors in parenthesis. MMQR use Machado & Silva's (2019) Quantile via Moments. DKSE Models use FE and RE with Driscoll & Kraay's (1998) HAC robust standard errors. GMM uses Arellano & Bond's (1991) dynamic panel estimator. FGLS is Feasible Generalized Least Squares which is robust to heteroskedasticity and autocorrelation. All independent variables have a one-year lag. Data for EFW is reported every year from 2000 to 2020. It is reported every five years from 1986 to 2020. We test models with EFW interpolation and find no significant differences (results omitted). IOEF data is from 1996 to 2020.

4.5. *WIID Bottom 40 and Economic Freedom with Quantile via Moments Regressions*

See Table 7 for regressions when the dependent variable is the income share of the bottom 40 percent (WIID). EFW and IOEF represent the measures of economic freedom, while covariate values are reported only for the IOEF measure. The EFW and IOEF are statistically significant in all models, and an increase in either of the two economic freedom measures causes an increase in income inequality. MMQR models show the size of the coefficients decrease from quantile 15 to 85, indicating the lesser impact of economic freedom on income distribution at the higher income levels. Thus, economic freedom exacerbates income inequality, especially at lower income levels. Models for FE, RE, GMM, and FGLS confirm the consistency of finding that economic freedom is associated with a decrease in disposable income for the bottom 40 percent.

The GMM model includes the lag of the dependent variable "bottom 40 percent" to eliminate the possibility of inverse causality.

Human capital and manufacturing increase the income distributed to the bottom 40 percent in all models. All the other variables are similar to the previous analysis using different measures of income inequality except for GDP per capita and its square, which were positive and negative, respectively, in Table 6 and have changed their signs in Table 7. The results still align with the Kuznets Curve. In this case, the initial increase in per capita GDP decreases income distributed to the bottom 40 percent. However, an inflection point exists where further increases in per capita GDP increase the percentage of income distributed to the bottom 40 percent. Therefore, this change in signs is a function of the different focus of the dependent variable (i.e., Gini coefficient across all percentiles versus the bottom 40 percent).

TABLE 7

WIID BOTTOM 40 AND ECONOMIC FREEDOM – QUANTILES VIA MOMENT

	MMQR Quant. 15	MMQR Quant. 50	MMQR Quant. 85	DKSE FE	DKSE RE	GMM	FGLS
EFW	-.811*** (.309)	-.677*** (.191)	-.581*** (.192)	-.648** (.296)	-.618** (.289)	-.428*** (.162)	-.649*** (.124)
IOEF	-.081*** (.015)	-.068*** (.012)	-.058*** (.013)	-.066*** (.014)	-.065*** (.012)	-.033*** (.010)	-.018* (.010)
Age Dep. Ratio	-.055*** (.019)	-.034** (.014)	-.017 (.015)	-.032* (.017)	-.049*** (.013)	-.006 (.014)	-.102*** (.006)
Employment Manu.	.048 (.042)	.071** (.029)	.089*** (.031)	.068** (.026)	.081*** (.027)	.089*** (.027)	.184*** (.012)
GDP Growth Rate	-.016 (.018)	-.012 (.013)	-.009 (.014)	-.003 (.017)	-.003 (.017)	-.002 (.009)	.021 (.016)
GDP PC – NL	-6.97* (3.62)	-10.0*** (2.54)	-12.5*** (2.61)	-10.6*** (1.79)	-9.59*** (1.39)	-6.41** (3.24)	-9.44*** (1.28)
GDP PC Squared – NL	.521** (.215)	.641*** (.152)	.738*** (.157)	.623*** (.115)	.572*** (.087)	.386** (.189)	.430*** (.079)
Human Capital Index	1.73** (.717)	2.91*** (.530)	3.85*** (.531)	1.99*** (.551)	2.15*** (.480)	2.37*** (.546)	3.61*** (.184)
Imports as a % GDP	.002 (.007)	-.003 (.006)	-.007 (.007)	-.002 (.005)	-.001 (.003)	.005 (.007)	.008* (.004)
Investment Profile	-.090* (.052)	-.103*** (.037)	-.114*** (.042)	-.065** (.030)	-.069** (.032)	-.083** (.036)	-.125*** (.039)
Bottom 40 Lag						.572*** (.038)	
F Statistic	***	***	***	***	***	***	***
R^2				.375	.384		
Observations	715	715	715	715	715	361	715
Countries	74	74	74	74	74	32	74

Note: ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the WIID disposable income shares to the bottom 40 percent —standard errors in parenthesis. MMQR use Machado & Silva's (2019) Quantile via Moments. DKSE Models use FE and RE with Driscoll & Kraay's (1998) HAC robust standard errors. GMM uses Arellano & Bond's (1991) dynamic panel estimator. FGLS is Feasible Generalized Least Squares which is robust to heteroskedasticity and autocorrelation. All independent variables have a one-year lag. Data for EFW is reported every year from 2000 to 2020. It is reported every five years from 1986 to 2020. We test models with EFW interpolation and find no significant differences (results omitted). IOEF data is from 1996 to 2020.

4.5. *WIID Top 20 and Economic Freedom with Quantile via Moments Regressions*

See Table 8 for MMQR, FE, RE, GMM, and FGLS regressions when the dependent variable is the WIID disposable income shares of the top 20 percent. Both the EFW and IOEF are shown, however, the covariate values are reported for the IOEF. The EFW and IOEF are statistically significant in all models, and the positive coefficients indicate economic freedom is associated with an increase in the income shares of the top 20 percent. MMQR models show the size of the coefficients remains consistent across quantiles. Results are consistent across FE, RE, GMM, and FGLS models. Collectively, when examining economic freedom's effect on the income of the bottom 40 percent versus the top 20 percent, results indicate top top-income earners are better off and lower income earners are worse off. Therefore, these results support the literature claiming market liberalization may favor those who possess more capital resources (Okun, 1975; Piketty, 2014).

TABLE 8

WIID TOP 20 AND ECONOMIC FREEDOM – QUANTILES VIA MOMENT

	MMQR Quant. 15	MMQR Quant. 50	MMQR Quant. 85	DKSE FE	DKSE RE	GMM	FGLS
EFW	.448**	.443***	.438**	.414**	.432**	.373**	.521***
	(.188)	(.160)	(.197)	(.187)	(.174)	(.147)	(.110)
IOEF	.054***	.055***	.055***	.052***	.051***	.025***	.020**
	(.011)	(.009)	(.011)	(.010)	(.009)	(.009)	(.008)
Age Dep. Ratio	.012	.024**	.036**	.020	.032**	.002	.067***
	(.013)	(.012)	(.015)	(.020)	(.014)	(.013)	(.005)
Employment Manu.	-.100***	-.072***	-.044	-.071***	-.082***	-.071***	-.161***
	(.026)	(.023)	(.031)	(.020)	(.022)	(.024)	(.011)
GDP Growth Rate	.005	.020*	.035**	.008	.008	.013	.009
	(.013)	(.011)	(.014)	(.014)	(.014)	(.009)	(.015)
GDP PC – NL	11.77***	8.01***	4.15	8.69***	8.17***	3.53	7.20***
	(2.41)	(2.24)	(2.96)	(1.47)	(1.18)	(2.98)	(1.17)
GDP PC Squared – NL	-.720***	-.527***	-.329*	-.515***	-.489***	-.219	-.315***
	(.143)	(.132)	(.176)	(.093)	(.071)	(.174)	(.072)
Human Capital Index	-2.69***	-2.26***	-1.81***	-1.53***	-1.64***	-2.01***	-3.17***
	(.491)	(.449)	(.539)	(.492)	(.475)	(.504)	(.167)

Imports as a % GDP	.006 (.007)	-.001 (.005)	-.007 (.005)	-.002 (.005)	-.003 (.003)	-.004 (.006)	-.008*** (.003)
Investment Profile	.097** (.042)	.069** (.035)	.039 (.045)	.031 (.034)	.035 (.038)	.039 (.034)	.086** (.039)
Top 20 Lag						.516*** (.039)	
F Statistic	***	***	***	***	***	***	***
R^2				.345	.362		
Observations	715	715	715	715	715	361	715
Countries	74	74	74	74	74	32	74

Note: ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the WIID disposable income shares to the top 20 percent —standard errors in parenthesis. MMQR use Machado & Silva's (2019) Quantile via Moments. DKSE Models use FE and RE with Driscoll & Kraay's (1998) HAC robust standard errors. GMM uses Arellano & Bond's (1991) dynamic panel estimator. FGLS is Feasible Generalized Least Squares which is robust to heteroskedasticity and autocorrelation. All independent variables have a one-year lag. Data for EFW is reported every year from 2000 to 2020. It is reported every five years from 1986 to 2020. We test models with EFW interpolation and find no significant differences (results omitted). IOEF data is from 1996 to 2020.

4.6. *Robustness Tests - SWIID Market Gini Coefficient and Economic Freedom*

See Table 9 for regressions when the dependent variable is the SWIID market income Gini coefficient. Implementing a robustness check based on disposable income versus market income is important for validating the stability and reliability of the findings, ensuring that the observed relationships persist across different measures of income inequality. EFW and IOEF measure economic freedom, while covariate values are reported only for the IOEF measure. The EFW and IOEF are statistically significant in all models, and the positive coefficients reveal economic freedom is associated with an increase in the market Gini. MMQR models show the size of the EFW and IOEF coefficients decreases as the quantile increases. Thus, while economic freedom increases market income inequality across the distribution of the market Gini, the exacerbating effects may be more pronounced when less initial income inequality exists. Models for FE, RE, GMM, and FGLS confirm the consistency of the finding.

TABLE 9

SWIID MARKET GINI COEFFICIENT AND ECONOMIC FREEDOM – QUANTILES VIA MOMENT

	MMQR Quant. 15	MMQR Quant. 50	MMQR Quant. 85	DKSE FE	DKSE RE	GMM	FGLS
EFW	.649*** (.220)	.525*** (.178)	.398** (.193)	.564** (.225)	.582** (.221)	.053** (.021)	.886*** (.109)
IOEF	.101*** (.016)	.094*** (.013)	.088*** (.013)	.097*** (.019)	.098*** (.018)	.005** (.002)	.068*** (.010)
Age Dep. Ratio	.024 (.015)	.078*** (.012)	.122*** (.012)	.077*** (.012)	.080*** (.011)	.014*** (.002)	.115*** (.007)

Employment Manu.	-.038 (.027)	-.017 (.023)	-.001 (.025)	-.025 (.027)	-.030 (.026)	-.024*** (.004)	-.219*** (.014)
GDP Growth Rate	.018 (.012)	.012 (.009)	.007 (.010)	.003 (.010)	.003 (.008)	.001 (.001)	-.038** (.018)
GDP PC – NL	11.76*** (2.41)	8.40*** (1.90)	5.68*** (1.98)	11.20*** (1.32)	11.8*** (1.34)	1.16*** (.393)	17.3*** (1.06)
GDP PC Squared – NL	-.698*** (.164)	-.496*** (.128)	-.333** (.129)	-.544*** (.089)	-.589*** (.089)	-.084*** (.025)	-.845*** (.067)
Human Capital Index	-5.46*** (.730)	-3.62*** (.586)	-2.14*** (.603)	-.596* (.326)	-.512 (.532)	-.036 (.077)	-.093 (.207)
Imports as a % GDP	.011* (.006)	.009* (.005)	.008 (.005)	.009 (.006)	.009* (.005)	.000 (.001)	.019*** (.004)
Investment Profile	.063 (.045)	.020 (.035)	-.015 (.036)	-.082*** (.027)	-.081** (.035)	.010** (.005)	.035 (.052)
Market Gini Lag						.923*** (.004)	
F Statistic	***	***	***	***	***	***	***
R^2				.351	.167		
Observations	1543	1543	1543	1543	1543	1481	154
Countries	78	78	78	78	78	77	78

Note: ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the SWIID market income Gini coefficient — standard errors in parenthesis. MMQR use Machado & Silva's (2019) Quantile via Moments. DKSE Models use FE and RE with Driscoll & Kraay's (1998) HAC robust standard errors. GMM uses Arellano & Bond's (1991) dynamic panel estimator. FGLS is Feasible Generalized Least Squares which is robust to heteroskedasticity and autocorrelation. All independent variables have a one-year lag. Data for EFW is reported every year from 2000 to 2020. It is reported every five years from 1986 to 2020. We test models with EFW interpolation and find no significant differences (results omitted). IOEF data is from 1996 to 2020.

4.7. *Robustness Tests - SWIID Gini Coefficient and Economic Freedom in Random Sample of Developing Countries*

To ensure the robustness of the results, the researchers conduct sensitivity analysis by randomly selecting 34 countries from the study sample and re-evaluating the consistency of the findings. This approach helps to assess whether the results are dependent on a particular subset of countries, which is often an explanation for the mixed findings in the literature (e.g., country heterogeneity) (Bennett & Nikolaev, 2017; Bennett, 2024). See Table 10 for regressions when the dependent variable is SWIID disposable income Gini coefficient and 34 randomly selected countries are selected. EFW and IOEF measure economic freedom, while covariate values are reported only for the IOEF measure. The EFW and IOEF are statistically significant in all models, and the positive coefficients indicate economic freedom is associated with an increase in the disposable income Gini. MMQR models show the size of the EFW and IOEF coefficients decreases as the quantile increases. Thus, while economic freedom increases the Gini coefficient in each quantile, the exacerbating effects are larger when there is less initial income inequality. Models for FE, RE, GMM, and FGLS confirm the consistency of findings.

TABLE 10

SWIID GINI COEFFICIENT AND ECONOMIC FREEDOM – RANDOM SAMPLE

	MMQR Quant. 15	MMQR Quant. 50	MMQR Quant. 85	DKSE FE	DKSE RE	GMM	FGLS
EFW	1.76***	1.16***	.656**	.815**	.872**	.105**	2.61***
	(.337)	(.311)	(.363)	(.321)	(.372)	(.043)	(.217)
IOEF	.190***	.161***	.134***	.175***	.175***	.006**	.229***
	(.026)	(.022)	(.025)	(.028)	(.027)	(.003)	(.021)
Age Dep. Ratio	.080***	.132***	.181***	.180***	.158***	.015***	.106***
	(.018)	(.017)	(.019)	(.029)	(.023)	(.003)	(.014)
Employment Manu.	-.112***	-.100***	-.088***	-.072	-.062	.008*	-.334***
	(.029)	(.028)	(.033)	(.050)	(.044)	(.004)	(.022)
GDP Growth Rate	.066***	.058***	.050***	.053***	.040**	.000	.055
	(.022)	(.018)	(.019)	(.013)	(.015)	(.003)	(.037)
GDP PC – NL	25.8***	19.2***	13.0***	13.7***	12.7***	-3.44***	11.2***
	(3.69)	(3.13)	(3.42)	(3.87)	(3.30)	(.702)	(1.75)
GDP PC Squared – NL	-1.78***	-1.30***	-.846***	-.979***	-.777***	.208***	-.452***
	(.227)	(.191)	(.208)	(.228)	(.206)	(.043)	(.104)
Human Capital Index	-2.07**	-1.16	-.309	-2.21*	-1.80	-.310***	-2.74***
	(.992)	(.808)	(.820)	(1.09)	(1.18)	(.110)	(.446)
Imports as a % GDP	-.012	-.009	-.007	-.021***	-.017**	.003**	-.030***
	(.009)	(.008)	(.010)	(.006)	(.008)	(.001)	(.007)
Investment Profile	.084	.161***	.092*	.011	.018	.030***	-.049
	(.061)	(.022)	(.053)	(.031)	(.041)	(.007)	(.097)
Market Gini Lag						.954***	
						(.007)	
F Statistic	***	***	***	***	***	***	***
R^2				.472	.205		
Observations	750	750	750	750	750	722	750
Countries	34	34	34	34	34	34	34

Note: ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the SWIID disposable income Gini coefficient — standard errors in parenthesis. MMQR use Machado & Silva's (2019) Quantile via Moments. DKSE Models use FE and RE with Driscoll & Kraay's (1998) HAC robust standard errors. GMM uses Arellano & Bond's (1991) dynamic panel estimator. FGLS is Feasible Generalized Least Squares which is robust to heteroskedasticity and autocorrelation. All independent variables have a one-year lag. Data for EFW is reported every year from 2000 to 2020. It is reported every five years from 1986 to 2020. We test models with EFW interpolation and find no significant differences (results omitted). IOEF data is from 1996 to 2020.

5. DISCUSSION AND CONCLUSION

This study finds economic freedom is associated with an increase in income inequality in developing countries. The conclusion is valid across various econometric frameworks (e.g., MMQR, DKSE FE, DKSE RE, GMM, and FGLS). Furthermore, the findings are consistent across all measures and sources of income inequality (e.g., SWIID disposable income Gini coefficient, SWIID market income Gini coefficient, WIID disposable income Gini coefficient, WIID bottom 40 shares of disposable income, and WIID top 20 shares of disposable income).

Lastly, the results are similar for different model specifications, including when we add covariates one by one (See Table 3 and Table 4) and when we take a random sample of 34 countries (See Table 10). Collectively, these persistent results reinforce the argument that while economic freedom may foster economic growth, economic development, and economic opportunity, it can also exacerbate income disparities. In other words, there is a price to be paid for economic freedom, regardless of whether it leads to economic growth or not.

We posit one of the primary reasons economic freedom is associated with greater income disparity is that higher-income individuals are better positioned to capitalize on opportunities arising from capitalist reforms. The literature supports this, with researchers like Okun (1975) and Piketty (2014) highlighting how market liberalization often favors those who already possess capital. Capital owners are more equipped to exploit new opportunities in deregulated environments, whether through investments, property rights, or the ability to mobilize resources in a free market. One of the reasons for having regulations and restrictions for free market economy is to curb high-risk behavior, which either leads to high returns or bankruptcy. It is a well-known fact that in order to take a higher risk the possibility of higher returns is necessary (Markowitz, 1952). In addition, social safety nets and other measures to protect or assist lower-income individuals and workers function as a form of societal insurance. Like any insurance, these measures are not free—their cost is often borne through reduced returns on the capital of the wealthy. As market economy measures expand within a society, the cost of this 'insurance' decreases, and overall risk is lowered, which in turn promotes economic growth but also increases income inequality. Furthermore, if in developing countries, institutional safeguards are limited, and corruption is higher, higher-income groups may have more opportunities to obtain a larger percentage of economic gains. For instance, the privatization of state-owned industry in Russia led to Russian oligarchs accumulating vast wealth and disproportionate control over key sectors of the economy, further entrenching inequality (Novokmet et al., 2018). This highlights how high-income groups can leverage their political connections and financial power to gain broader economic benefits. The combination of the two influencing factors causes economic freedom to disproportionately benefit the higher-income groups in developing countries, which widens the income gap. Secondly, the deregulation of markets contributes to this dynamic by limiting social safety nets and reducing government intervention in wealth redistribution. With fewer regulatory constraints and lower taxes (both subcomponents of economic freedom),

corporations and high-income individuals benefit disproportionately (Jaumotte et al. 2013). Those with more income and wealth have greater access to financial resources and pay a smaller percentage of their profits in taxes. This allows higher-income groups to increase their gains in deregulated environments while contributing a smaller percentage of their income back in taxes. As a result, opportunities are unequally distributed, and there is less income available for redistribution or subsidized education. Furthermore, as noted by de Soto (2000), while property rights and trade liberalization promote economic growth, they can also reinforce existing power structures, thereby exacerbating income inequality. Lastly, economic freedom may drive the forces of creative destruction that lead to higher income disparity. While economic freedom may drive economic growth, economic efficiency, competition, and innovation, it can disrupt industries and displace workers, disproportionately harming lower-income groups. For instance, as new technologies and industries emerge or shifts in comparative advantage occur, those with the resources (e.g., financial assets, human capital, or adaptable skills) are better positioned to take advantage of the new opportunities. However, those with fewer resources may be left behind, which widens the income disparity gap (Stiglitz, 2002, 2013). Regardless of the reasons, the overall findings of this study are consistent with the recent studies of Ahmad (2017), Callais & Young (2023), and de Soysa & Vadlamanntania (2023), who also find economic freedom is associated with rising inequality.

This study is unique not only because of its comprehensiveness and the use of multiple measures of economic freedom, income inequality, and econometric methods but through its use of MMQR quantile regression. A couple of key insights are revealed through the use of quantile regressions. First, the income-exacerbating effect of economic freedom is consistent across the distribution of all income inequality levels. Therefore, regardless of whether income inequality is low, medium, or high (i.e., at the lower or higher end of the distribution), economic freedom consistently contributes to widening the income gap. Secondly, the study finds that economic freedom exacerbates income inequality more when there are lower initial levels of income inequality (i.e., in the lower distribution of the income inequality spectrum). We posit that when income inequality is already high, high-income groups already capture a significant share of the income generated in the economy. Therefore, while economic freedom may increase the absolute income of a country, it will not increase the relative income distribution as much as in cases where there is lower income inequality. In situations where income is distributed more evenly,

economic freedom may allow an increase in the absolute income as well as the relative income distribution since relative income distribution is low. For example, in a society where the top 25 percent already earn 75 percent of the income, economic freedom reforms may increase their absolute income, but their share of total income may only rise modestly, as it is already high. In contrast, in a more equal society where the top 25 percent earn 40 percent of the income, economic freedom not only increases their absolute income but also provides greater scope for them to capture a larger share of total income.

Although this study finds economic freedom increases income inequality, the authors do not propose initiatives that limit economic freedom as a solution. Economic freedom has many benefits which include economic growth, economic efficiency, innovation, competition, and opportunity (Bennett & Nikolaev, 2017; Bennett, 2024). Economic freedom increases the size of the economic pie, but this study finds that the distribution of this economic pie becomes less equal, especially in developing countries. However, an individual's absolute income may still increase, and they may have more opportunities and liberties. In other words, the gains of the high-income group is disproportionately more than the gains of low-income group, which indicates a departure from Pareto optimality. On the one hand, the advantage of income inequality is a normative discussion, and different views exist on the need for income equality. What is evident is that some income inequality is necessary, as an equal distribution of income through taxes and transfers would undermine the incentives for innovation, productivity, and economic growth (Smith, 1776). One factor that is missing from this argument is that it ignores the possibility of creating opportunities if the taxes are spent appropriately. A good example of this seemingly universally accepted belief is free education in all countries, although there is a wide discrepancy in the extent and duration of free education. The Great Gatsby Curve reveals that inequality affects the opportunities of low-income individuals, as higher inequality is associated with less generational income mobility. This suggests that while some income inequality may drive economic efficiency, excessive inequality can hinder long-term growth by constraining equal access to opportunities. Furthermore, this is problematic for an economy when individuals have skills, talents, and human capital potential but are unable to reach their potential. When a country's labor resources are not used to their potential (highest-value use), economic inefficiency and lower GDP is the result. Lastly, higher income inequality as other ills, such as a driver of social discontent, political and social polarization, and even higher risks of

internal conflict (Gurr, 1970). Finally, none of the existing literature on this subject examines the consequences of extreme income inequality. The subject is addressed in a special branch of political science that focuses on social and economic inequalities and their role in revolutions, such as the French Revolution (Skocpol, 1976).

The study has limitations. We account for over 50 percent of developing countries due to a lack of data, which, although a large sample, is not the entire population. For that reason, some caution is required in the generalization of the results. We acknowledge measuring economic freedom and income distribution is not an exact science. In addition, this study uses the aggregate composite measure of economic freedom and not individual subcomponents (e.g., private property or sound money). Therefore, individual subcomponents of economic freedom may differ from the aggregate measure. Future research should explore these subcomponent measures through a quantile econometric technique.

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DATA AVAILABILITY STATEMENT

All data used in the study is publicly available. The ICRG data is licensed and requires a subscription.

APPENDIX

Appendix A: Countries in Study

Developing Countries: Albania, Algeria, Angola, Argentina, Armenia, Bahrain, Bangladesh, Botswana, Brazil, Bulgaria, Burkina Faso, Cameroon, Chile, China, Colombia, Congo (Democratic Republic), Congo (Republic), Costa Rica, Cote d'Ivoire, Cuba, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Gambia, Ghana, Greece, Guatemala, Guyana, Haiti, Honduras, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Madagascar, Malaysia, Mali, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nicaragua, Niger, Nigeria, Panama, Paraguay, Peru, Philippines, Romania, Russian Federation, Saudi Arabia, Senegal, Serbia, Sierra Leone, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Syrian Arab Republic, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, and Zambia.

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