

# **INCOME INEQUALITY AND MIDDLE-INCOME TRAP: A PANEL DATA ANALYSIS ON THE EFFECTS OF ECONOMIC FREEDOM AND DEMOCRACY**

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## **ABSTRACT**

This paper investigates the distributive effect of economic freedom and democracy in a panel of countries up to 117 over 1970-2014. With a specific focus on the middle-income countries (MICs) which are shown to have been trapped at that level long after their transition from low-income status, this paper hypothesizes that income inequality could be the underlying factor behind the countries' stagnated income. Using the latest Standardized World Income Inequality dataset, and via panel fixed effects and system GMM estimation methods, the interrelationship between income inequality, economic freedom, and democracy are empirically examined. The findings yield robust evidence that freedom to trade internationally, unpredictable inflation and money supply, and small government size have significant relationship with inequality. Nevertheless, the inequality-effects of these liberalization policies depends on the types of political regime, as the results show that these policies only yield the intended positive distributive effect in a democratic regime. The paper concludes with several policy implications.

**Keywords:** Middle income trap; Income inequality; Economic freedom; Democracy; Panel data.

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## **1. INTRODUCTION**

Arguably first coined by Gill, Kharas and Bhattasali (2007), “middle-income trap” refers to a situation when countries that have realized rapid growth from low income level to become middle-income countries (henceforth MICs),<sup>1</sup> but subsequently are unable to grow further. In other words, the countries' growth stagnates, or even decelerates, its productivity slows, and labor costs rises following their rapid development leading to middle-income status. Many countries in Latin America and Middle East in 1970s have achieved middle-income status, but very few have made the transition to become high-income countries afterwards. According to the World Bank (2012), of the 101 MICs in 1960, only 13 had become high income by 2008.

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<sup>1</sup> Latest World Bank definition classifies an MIC is an economy with income per capita, or technically Gross National Income per capita (GNI per capita), between \$1,026-12,475 threshold. This threshold is further divided into two groups, which are lower middle-income with GNI between \$1,026–4,035, and upper middle-income, GNI between \$4,036–12,475. Currently there are 52 countries classified as lower MICs and 56 as upper MICs.

The stylized fact regarding continued growth stagnation or deceleration in these countries is that the slowdowns are invariably conjectured as to be the outcome of various technological and skill gaps, resources misallocation, and increasing wage premiums.

Nevertheless, little attention is given on the possibility of inequality being the underlying cause of middle-income trap. As shown by Egawa (2012, 2013), income inequality is apparent in most Asian and Latin American MICs following the countries' transition from lower to middle-income status. He argues that widening income gap and worsening inequality pose a risk of decelerating growth of the MICs via various mechanisms such as increased urban-rural development divide, delayed human development due to unequal access to education and healthcare, widening social gaps, and a potential of social unrest. This vicious circle would eventually cause the countries to be stuck, or trapped, in middle-income status.

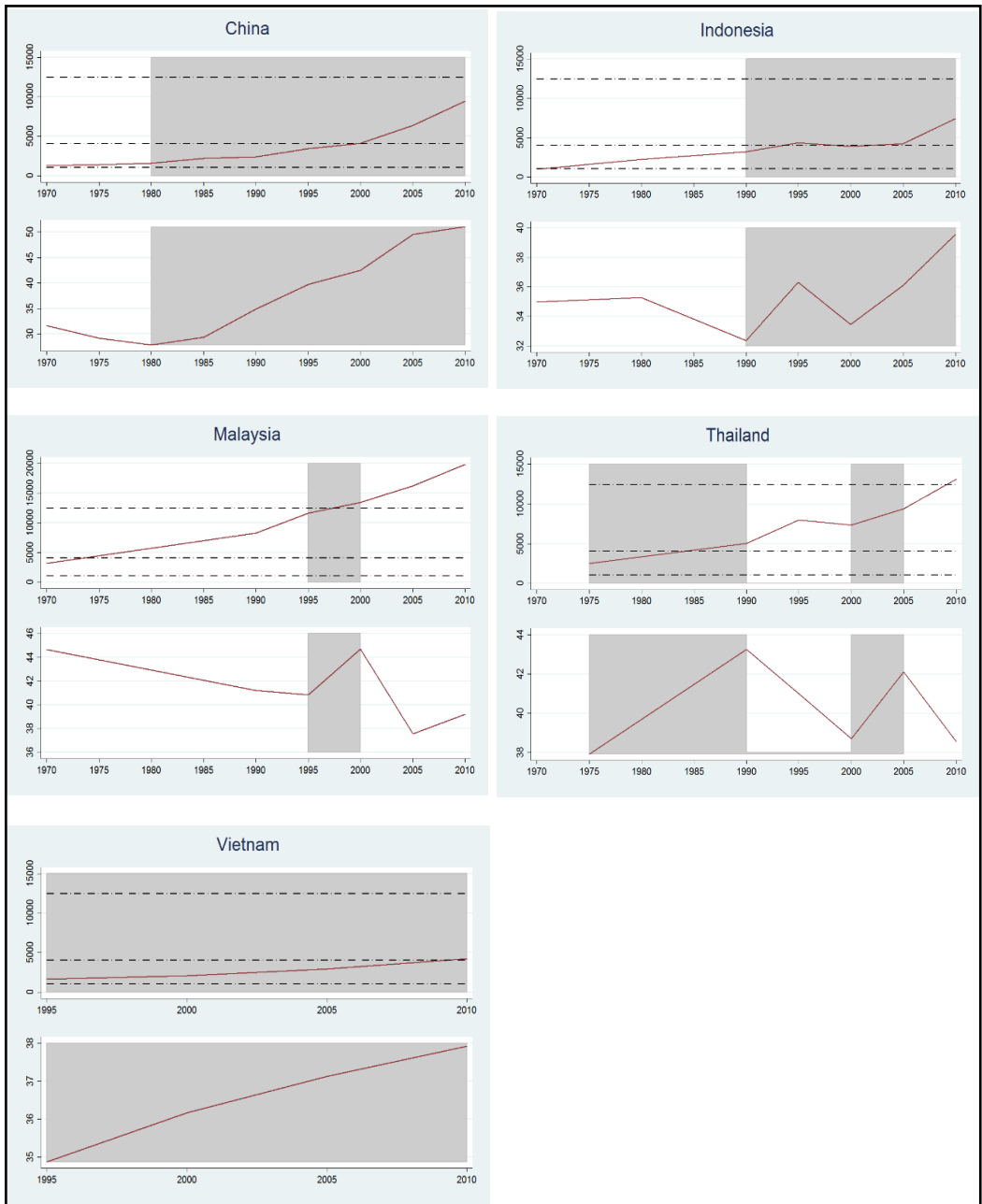
A quick glance on the inequality and income data used in this study, we have strong belief that they are able to corroborate Egawa's (2013) findings. As depicted in Figure 1 and 2 below, data on real GDP per capita are plotted against income inequality data for selected Asian and Latin American countries. For each country, the top graph plots the real GDP per capita level, and the dotted lines indicate the threshold of income levels from lower middle income (bottom line) to upper middle income (middle line) and to high income (top line) level. The bottom graph, meanwhile, plots the income inequality index, whereas the shaded areas reflect a period with rising inequality level.

Clearly, these graphs reveals an important pattern of growth slowdown or deceleration in these countries, i.e. when real GDP per capita level hovering around middle income areas. This slowdown can be seen to coincide with a period of rising inequality. This pattern is particularly striking in Latin American countries such as Argentina, Ecuador and Venezuela. In Asian region, meanwhile, the rising inequality is similarly striking for China, Indonesia, and Vietnam, which have been shown to be 'trapped' in middle income level for about 40 years between 1960-2000. For Malaysia and Thailand, on the other hand, the overall inequality level has been decreasing.

Therefore, we posit that understanding the causes of inequality is undoubtedly crucial in devising appropriate policy measures to prevent growth slowdowns, to spur growth accelerations, and eventually to avoid middle-income trap. This paper concentrates its focus on economic freedom and democracy as two possible determinants of income inequality, due to several gaps in the previous literature.

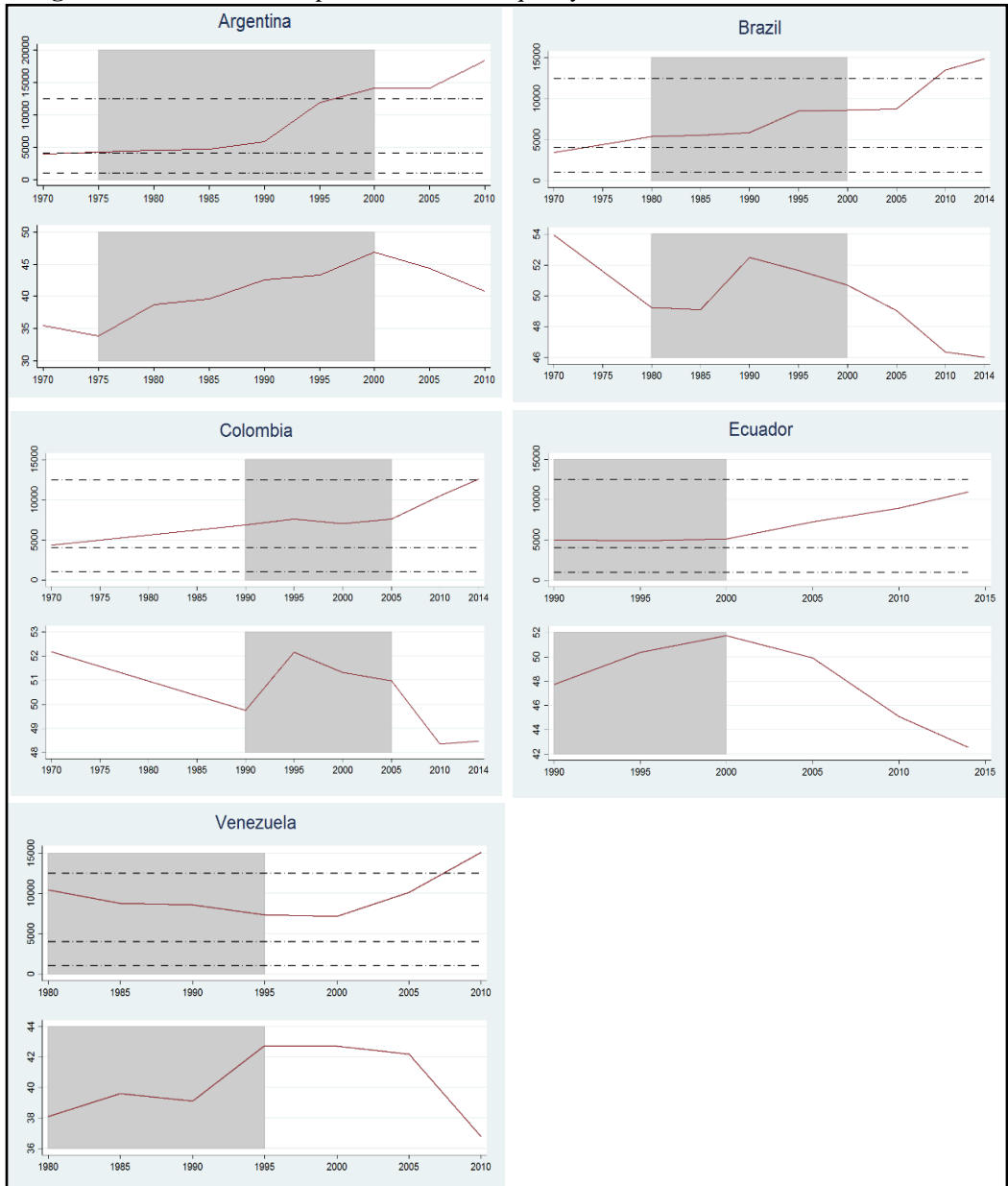
Firstly, there is an apparent paucity in empirical studies on the interrelationship between income inequality and these two factors (see Ahmad, 2017). As for economic freedom, Bergh and Nilsson (2010) note that the link between inequality and various dimensions of economic freedom is little investigated in the previous literature, and this paper is close to Bergh and Nilsson in this regard. In addition to that, this paper extends the analysis further by capturing the roles of democracy in income inequality-economic freedom nexus. This extension seeks to provide an additional evidence on the effect of democracy on income inequality due to previous studies' inconclusive findings. Secondly, this paper gives a specific focus on the MICs due the prevalence of income inequality in such countries as earlier discussed, and the fact that inequality being the least investigated aspect in the context of middle-income trap. Therefore, the findings on the inter-

**Figure 1: Real GDP Per Capita vs. Income Inequality for Selected Asian Countries**



**Notes:** Real GDP per capita data are from Penn World Table 9.0 (Feenstra, Inklaar, and Marcel, 2015), and inequality data are from Standardized World Income Inequality Database (SWIID) by Solt (2014)

**Figure 2:** Real GDP Per Capita vs. Income Inequality for Selected Latin American Countries



**Notes:** See notes in Figure 1

relationship between income inequality, economic freedom and democracy in this set of countries are expected to greatly inform policymakers on measures and policies to overcome inequality, and

eventually to help the countries to escape the middle-income trap and to graduate to high-income status.

Apart from filling the above gaps, this paper's contribution is in its large dataset and latest method of analysis. This paper utilizes an extensive dataset covering up to 117 developed and developing countries over a period of 45 years between 1970 and 2014 including the most complete inequality data obtained from the latest SWIID data version 5.0. As for the empirical analysis, this paper employs panel data analysis comprising of fixed effects and GMM estimation techniques that is capable of overcoming the unobserved heterogeneity issue, omitted variable bias, endogeneity problem, as well as measurement errors.

Overall, we find that freedom to trade internationally, unpredictability in inflation and money supply, and small government size have robust positive relationship with inequality. Nevertheless, these variables' impact on income distribution are shown to be dependent on the type of political regime in the countries under study. The results indicate that these liberalization policies may yield the intended income-equalizing effect on income distribution in the presence of democratic regime. The results are robust to various democracy measures and estimation techniques.

The study proceeds as follows: Section 2 reviews the literature on previous empirical findings regarding the relationship between inequality, economic freedom and democracy. In Section 3, empirical specifications to estimate the relationship between the variables of interest are outlined, followed by discussion on estimation strategy and data sources. Section 4 discusses and interprets the findings and Section 5 concludes with some policy implications.

## **2. THE LINKS BETWEEN INCOME INEQUALITY, ECONOMIC FREEDOM AND DEMOCRACY**

### **2.1. *Inequality and Economic Freedom***

The consensus in the literature is that economic freedom are linked to economic growth, but many studies find this positive effect has come at the expense of greater income inequality. See for example discussion by Spruk and Kešeljević (2018), Wiseman (2017), Acikgoz, Amoah, and Yilmazer (2016), and Carlsson and Lundström (2002) on the impact of economic freedom on growth, and Ahmad (2017), Bennett and Nikolaev (2017), Bjørnskov (2017), Bergh and Nilsson (2010), and Carter (2006) on the nexus between economic freedom and income inequality.

Generally, economic freedom is related to market-oriented reform with the aim of creating an environment conducive for market-supported personal and voluntary exchanges, freedom to enter and compete in the market, as well as freedom of ownership of property with protection against aggression by others. According to Fraser Institute (see Gwartney, Hall, and Lawson, 2010), Economic Freedom in the World (EFW) index is designed to measure the extent to which the institutions and policies of a nation are consistent with this protective function and the freedom of individuals to make their own economic decisions. The EFW index consists of five main areas namely (1) size of government, (2) legal system and property rights, (3) access to sound money, (4) freedom to trade internationally, and (5) regulation of credit and labor, see Ahmad (2017) and

Bergh and Nilsson (2010) for a detailed discussion on the theoretical links between each component of EFW index and income inequality.

The empirical evidence of the inequality-effect of economic freedom is nevertheless mixed. Some studies find there was an inequality-reducing effect of economic freedom, such as Clark and Lawson (2008); Bennett and Vedder (2013)—in a study on 50 U.S. states; Scully (2002)—although he also finds a positive freedom indirect effect on inequality via growth; Carter (2006); and Apergis and Cooray (2015)—the latter two studies also find a U-shape non-linear relationship between economic freedom and inequality. On the other hand, there are also studies finding economic freedom caused higher inequality, such as Berggren (1999)—positive effect for level of economic freedom, but negative effect of 10-year changes in economic freedom; Bergh and Nilsson (2010)—for overall index of economic freedom and for freedom to international trade component; Bennett and Cebula (2016); Bennett and Nikolaev (2017)—but they also find a non-linear relationship between economic freedom and inequality i.e., economic freedom is associated with more (less) inequality at lower (higher) level of freedom. Sturm and De Haan (2015) however find no robust relationship.

## **2.2. *Inequality and Democracy***

Meanwhile, from the perspective of political regime, significant growth achievement by the MICs especially in Asian region during the 1990s is invariably shown to be associated with strong authoritarian governments implementing numerous pro-growth policies, secure private property rights and well-functioning public institutions and bureaucracy (see discussion and findings by Hall and Ahmad, 2014, and the references therein).

Along this line, Rudengren, Rylander, and Casanova (2014) strongly emphasize that the key to the puzzling growth-then-stagnation situation in MICs is to go beyond mainstream analysis of economic factors, that is to understand the factors related to governance and political institutions, which according to them, underlie a determining role in explaining failure or success in sustaining economic growth. In the same vein, Acemoglu, Johnson, and Robinson (2005) proposed that any market system in a country is embedded in a larger political system that shapes and influences economic institutions leading to economic development and income distribution. Therefore, the political institutions' significant impact on growth is arguably already at a consensus in the development literature. Nevertheless, the relationship between political regime and inequality remains ambiguous.

Theoretically, a democratic regime is expected to bring about a more egalitarian distribution of income in society via the following mechanisms: (1) Median voter theory, which argues that the median voters, based on their rational choice of redistribution, would choose higher taxation for rich people if the median income lies below the mean income; (2) Political participation mechanism, where democracy is expected to lower the costs of political participation, giving rise to strong and organized labor unions, political parties and interest groups representing the low and middle income groups. These groups would then push for more welfare-augmenting policies such as minimum wage that reduce wage dispersion; and finally (3) Political competition mechanism, where reelection-oriented democratic leaders would compete for citizen support, and consequently invest more in meeting the needs of the larger segments of suffrage who are normally the low and middle income earners. In other words, they would adopt various redistributive measures such as

welfare spendings and benefits, greater access to education and healthcare, price subsidies, and other public services provisions in order to win the voters' support. For a more detailed discussion on the distributive effect of democracy, see Acemoglu, Naidu, Restrepo, and Robinson (2015), Balcázar (2016), Reuveny and Li (2003), and Timmons (2010).

Nevertheless, the empirical literature on inequality-democracy link is far from a consensus and evidence are mixed at best. For example, in an analysis on former Soviet countries, Milanovic (1998) finds that there is only a weak evidence for redistribution through the median voter channel. Timmons, (2010) argues that although democracy may pay higher average wages in manufacturing, the regime however does not dampen wage dispersion between industries. Amendola, Easaw, and Savoia (2013) reveal that democracy is not a sufficient condition to reduce income inequality in the presence of strong property rights.

Additionally, most empirical analyses on the inequality-democracy nexus suffer various econometric issues since the majority of the studies use cross-country data, despite the fact that country-level aggregates do not provide relevant distributional information. Similarly, many studies conceptualize the link between democracy and inequality as the effect of regime type on inequality at certain time plus some specified period, even though regimes are historically informed phenomena, rather than contemporary variables. Most of the studies too do not convincingly address the endogenous nature of democracy, suffer from omitted variable bias, reverse causality and measurement errors, leading to majority ambiguous results on the link between democracy and inequality – see Acemoglu et al. (2015) and Balcázar (2016) for a more detailed discussion on this empirical issues.

### 3. DATA SOURCES, MODEL SPECIFICATION AND ESTIMATION STRATEGY

The dataset used in this study is an unbalanced panel observation for up to 117 countries over 45 years from 1970 to 2014. All observations are taken as average of 5-year period, thus there are nine non-overlapping 5-year periods. Summary statistics of the variables are presented in Table A1 in the Appendix.<sup>2</sup>

*Dependent variable:* According to World Bank's definition, "Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution". A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality." The preferred measure of income inequality is Gini coefficient net income from Standardized World Income Inequality Database (SWIID) created by Solt (2014) due to its superiority in term of availability and comparability for cross national research (see further discussion in Bergh and Nilsson, 2010). Gini coefficient gross income is also used for robustness check.

*Independent variables:* The variables of interest in this study are economic freedom variables obtained from Economic Freedom in the World-EFW (Gwartney et al., 2010) and the dataset

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<sup>2</sup> The dataset preparation follows the widely-used practice in institutional studies i.e. to take a 5-year interval data due to the slow-changing characteristics of institutional quality over times, and due to benefits from data aggregation such as elimination of short-term cyclical movements and measurement errors. Furthermore, data on economic freedom prior to 2000 are prepared in 5-year interval and the whole set of education data by Barro and Lee (2013) are given in 5-year interval.

covers large number of countries since 1970 when it started with 5-yearly data and since 2000 the data is provided annually. It weighs together five dimensions of economic freedom namely a) size of government, b) legal structure and property rights, c) access to sound money, d) freedom to trade internationally, and e) regulation of credit, labor, and business. Throughout this study, these five dimensions are denoted as EFW1, EFW2, EFW3, EFW4 and EFW5, respectively. Their scores range from 0 to 10, where 0 indicating least freedom and 10 greatest freedom.

The second variable of interest is democracy indicator, proxied by Imputed Polity 2 variable obtained from the Hadenius and Teorell (2007). It is an average score of three widely used measures of democracy namely political rights and civil liberties indicators from the Freedom House (Freedom House, 2015) and Polity2 indicator from Polity IV project (Marshall and Jaggers, 2014). Specifically, the average score of political rights and civil liberties is transformed to a scale 0-10, as do Polity2 score of -10 to 10. Subsequently these transformed scores are averaged into an imputed version of Polity2. Hadenius and Teorell (2007) show that this imputed version of Polity2 performs better both in terms of validity and reliability than its constituent parts.

Alternative measures of democracy used in robustness check are BMR dichotomous democracy indicator (Boix et al., 2013) and CGV classification of political regimes (Cheibub et al., 2010). BMR democracy dataset provides a dichotomous coding of democracy i.e. the authors define a country as democratic if it satisfies conditions for both contestation and participation. Specifically, democracies feature political leaders chosen through free and fair elections and satisfy a threshold value of suffrage. CGV classification of political regime meanwhile states that a regime is considered a democracy if the executive and the legislature is directly or indirectly elected by popular vote, multiple parties are allowed, there is de facto existence of multiple parties outside of regime front, there are multiple parties within the legislature, and there has been no consolidation of incumbent advantage.

Control variables included in the estimation of Equation (1) and (2) below are as follows: Real GDP per capita which has been shown to consistently influence the income distribution; real GDP per capita squared to test for non-linear impact of GDP on inequality –data on real GDP in million US dollar at constant 2011 price are obtained from Penn World Table 9.0 (Feenstra et al., 2015); tertiary education level, often a significant determinant of skill differences and wage premiums among the workers –proxied by share of population age 25 and above who have completed tertiary education from Barro and Lee (2013); age dependency ratio where larger dependency ratio would reflect larger income inequality among the population –proxied by share of population whose age is outside working age range (15-64); employment in industrial sector; employment in service sector; and urban population; Data on the last four control variables are obtained from the World Development Indicators (World Bank, 2016).

To investigate the impact of economic liberalization and democracy on income inequality, the following models are formulated:

$$gini_{it} = \alpha + lib_{it}\beta + dem_{it}\theta + (lib_{it} * dem_{it})\delta + x_{it}'\gamma + \eta_i + \rho_t + \varepsilon_{it} \quad (1)$$

$$gini_{it} = \alpha + gini_{it-1}\phi + lib_{it}\beta + dem_{it}\theta + (lib_{it} * dem_{it})\delta + x_{it}'\gamma + \eta_i + \rho_t + \varepsilon_{it} \quad (2)$$



where, *gini* is the variable of interest,  $gini_{it-1}$  is the lagged dependent variable, *lib* is a vector of indices of economic liberalization, *dem* is the variable that reflects political regime in the country, *x* is additional control variables, which will be discussed in the next subsection.  $\eta$  and  $\rho$  is country and time fixed effect respectively, and  $\varepsilon$  is i.i.d error term.  $\beta$ ,  $\theta$ ,  $\delta$  and  $\varphi$  are the parameter of interests to be estimated.

The approach is to estimate a canonical panel data model allowing for country fixed effects and time effects while also modelling the dynamics of inequality. The estimation of choice for Equation (1) is panel fixed effects within estimator to estimate Equation (1) since OLS is already biased due the presence of fixed effects resulted from panel data. Furthermore, a potential endogeneity problem may arise if levels of economic freedom are influenced by the changes in income inequality, and not just the other way around, as earlier discussed. Thus, to mitigate the endogeneity issue, the variables of interest on the right hand side are lagged to one lag in the fixed effect estimation, with the assumption that freedom and democracy have no contemporaneous effect on inequality.

Equation (2) allows for the dynamics of inequality to be present as a way of robustness check. This is captured via inclusion of the lagged Gini among the regressors with the assumption of mean reversion or persistence of the inequality occurrence. The inclusion of lagged Gini as one of the regressors however causes endogeneity problem, thus, system Generalized Method of Moments (SYS-GMM) introduced by Arellano and Bover (1995) and Blundell and Bond (1998), capable to correct unobserved country heterogeneity problems, omitted variable bias, and potential endogeneity, is used.

According to Arellano and Bover (1995) and Blundell and Bond (1998), system GMM is capable of reducing potential bias and imprecision associated with a simple first-difference GMM estimator. Meanwhile, Bond, Hoeffler, and Temple (2001) show that system GMM is able to correct unobserved country heterogeneity problem, omitted variable bias, measurement error and endogeneity issue that frequently affect models with lagged dependent variable.

The following assumptions are made for the system GMM estimation: lagged Gini is assumed as a predetermined variable and all economic freedom variables, democracy, real GDP per capita, and human capital as endogenous variables. The instruments lag for endogenous regressors is set to be one period, thus it postulates the inequality-effects of economic freedom, democracy, real GDP per capita and human capital are not contemporaneous but will take within five years to affect a change in the income distribution.

Consistency of the GMM estimator depends on the validity of the instruments, and as suggested by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998), two specification tests are used. First, Hansen test of over-identifying restrictions that tests for the overall validity of the instruments and the null hypothesis is that all instruments as a group are exogenous. Secondly, AR2 test with the null hypothesis that the error term of the differenced equation is not serially correlated at the second order. One should not reject the null hypothesis of both tests. One-step GMM estimator is preferred as it is shown by Bond, Hoeffler, and Temple (2001) to have higher efficiency gains than two-step GMM estimator, and two-step estimators normally converge to its asymptotic distribution relatively slowly. In a finite sample its asymptotic standard errors can be seriously biased downwards, thus making the estimator unreliable.

Furthermore, heteroskedastic and autocorrelation robust standard error can easily be enforced in the one-step GMM estimation by adding word 'robust' to the STATA command.

The results' sensitivity analysis are examined by using alternative democracy variables, firstly using Boix, Miller, and Rosato (2013-henceforth BMR) democracy rating, and secondly Cheibub, Gandhi, and Vreeland (2010-henceforth CGV) democracy data. Furthermore, all estimations above are repeated on the Gini gross income. Nevertheless, results are apparently identical when alternative democracy variables and Gini gross income variable are used, therefore their results are not reported to conserve space and they are available upon request.

Since the focus of this study is to investigate the distributive effect of economic freedom and democracy in MICs where many of them stuck in middle-income trap, the above estimations are done for MICs sub-sample. The findings are expected to better our understanding of the interplay between the two variables of interest and income inequality and how this interplay could illustrate important policy implications regarding income distribution and eventually providing a solution to getting out of the middle-income trap.

#### **4. EMPIRICAL RESULTS**

The following Table 1 and 2 show the estimated results for inequality model as specified in the Equation (1) and (2) above. Table 1 is for overall sample, whilst Table 2 for MICs sample. The dependent variable is Gini coefficient of net incomes. All regressions include period dummies and country dummies and robust standard errors are enforced across all panel fixed effect estimations to overcome heterokedasticity issue. The variables of interest are EFW indicators and democracy variable and the interaction terms of the two.

Results for control variables i.e. real GDP per capita, real GDP per capita squared, human capital, age dependency ratio, employment in industrial and service sectors, and urban population are not reported to conserve space. Their inclusion is simply to observe their impact on inequality which otherwise could possibly be picked up by freedom variables or democracy thus obscuring the true impact of both variables of interest on income inequality. Similarly, estimated results of Gini coefficient of gross income are not reported too which have been found to yield somewhat identical results to that of net income.

Overall, uncertainty in inflation and money supply (EFW3) and freedom to trade internationally (EFW4) are significantly associated with income inequality be it in estimations where these EFW indicators individually appear (estimation 3 and 4) or in an estimation where they are concurrently included (estimation 6). As do deregulation in credit, labor and business EFW5 (in estimation 6, 11 and 12).

Sound money dimension of Economic Freedom (EFW3) is negatively related to inequality, which fits the theoretical argument well. As earlier discussed, EFW3 captures the effect of large and unpredictable changes in inflation and money supply in a country, and it has low scores when there is large unpredicted inflation. Consequently, the costs of inflation in term of returns to capital and lending rates are expected to be relatively more harmful to low income earners, whose assets are less protected against inflation. This would eventually create a wider gap between the incomes of

top and bottom earners within a population. This result is consistent to the finding by Albanesi (2007) who shows that inflation and income inequality are positively related.

Freedom to trade internationally (EFW4) is meanwhile positively related to inequality, which is also theoretically reasonable. This finding also in line on many other empirical studies such as Carter (2006), Meschi and Vivarelli (2009), and Bergh and Nilsson (2010). As earlier discussed in the literature review section, increasing income inequality between low-skilled and high-skilled labors in a country that has large trade activities with other countries could be due to skill premiums, technological differences, tariff differences, and many others. This finding therefore does not support the theoretical argument of HO-SS that trade liberalization should decrease inequality, and the arguments by IMF (2007) and Wu and Hsu (2012).

Legal structure and property rights (EFW2) and market deregulation (EFW5) dimensions are significant only when they appear in general model, not when they are included individually. Nevertheless, their signs are in line with the previous empirical findings and carry theoretical support. For example, better protection of property rights and strong rule of law should mainly benefit those with property, which are normally the high-income earners. This protection in turn increases the value of the properties and contributes to rising the earnings of this group, creating larger gap with the low-income earners in the country. Similarly, deregulation in the market, although theoretically it could provide more access to credit for the low-income section of the population and may subsequently improve their earnings, it also could cause adverse effect to them when the deregulation policies can be influenced by political elites to benefit a small section of the people. This finding is supported by that of Calderón and Chong (2009) who find that labor market regulations reduce income inequality.

On the other hand, the democracy measure does not yield convincing results in the estimation 1-6 and mixed results in estimation 7-12. On overall it is found to have positive association to inequality which might actually explain that democracy may not have income-equalizing impact in the countries under study, if its impact is looked in isolation. In other words, it may be presumed that non-democratic regime may have stronger role to implement income-equalizing policies than democratic regime. At this point, we rather postulate that political regime may not have any direct impact on income distribution, and its impact on inequality is assumed to be stronger via liberalization policies which we will clearly see in the next estimations 7-12 where the interaction terms EFW\*Dem are included.

The interaction term accounts for the impact of economic liberalization depending on political regime be it democracy or autocracy in the country under study. Positive (negative) sign of interaction term shows greater effect of a liberalization policy on inequality in the presence of democracy (autocracy). In other words, negative (positive) sign can be interpreted as autocratic (democratic) political regime supporting the liberalization policy towards a more equal income distribution. Liberalization policies undoubtedly require necessary support by the political institutions inasmuch that implementation of economic incentives and institutions is invariably determined by the political settings and constraints on executive in the country. As strongly advocated by Acemoglu et al (2005), economic institutions determine economic development of a country, but it is after all shaped by the political interests of those in power.

The outcome of estimation 7-12 reveals interesting findings, especially the coefficient of interaction terms. Greater unpredictable inflation and changes in money supply (low score of EFW3, hence negative sign) contribute to widen income gap between groups in the population, but democracy could play a role in improving this situation to create better mechanisms in reducing uncertainty in prices and money supply, thereby reducing inequality as shown by the positive EFW3\*Dem1 term in estimation 9 albeit it is not significant. A democratic regime is normally answerable to large majority of suffrage and seeks to retain their support via ensuring a stable market, sufficient information to voting public on their policy decision and implementation.

Freedom to trade (EFW4) and deregulation of market (EFW5) are significant in both individual estimations (10 and 11) and general estimation (12), and both contribute to widening income inequality when their impact is looked at separately (positive sign). Nevertheless, both liberalization measures could have the intended positive effect on income distribution in the presence of a democratic political regime (see interaction terms EFW4\*Dem1 and EFW5\*Dem1, both with negative sign). This is particularly true since democratic regime is expected to have no vested interests in its deregulation and trade policies, thus reducing possibility of monopoly creation and rent-seeking practices, and supporting greater unionization with strong bargaining power for higher minimum wages. This eventually creates positive impact on income distribution in the country. These findings are consistent in the general estimation (12) where all dimensions and interaction terms are regressed on inequality together.

The estimated results of economic freedom and democracy and their interactions in the sample of MICs, which is the focus of this paper, are shown in Table 2 below. One particular outcome stands out from the results is that autocratic political regime in MICs now have strong and significant association with a more equal income distribution in these countries (Dem1 variable is significant in almost all estimations). This finding is in line with Winters et al. (2004) who show that the distributive impact of economic freedom on income in developing countries is conditional upon other factors such as (political) institutions, trade reform measures, and other country specific factors. Meanwhile, the significance and sign of the EFW4 and EFW5 remain, during estimation when they appear individually (estimation 15, 16, 22, and 23) or concurrently (estimation 18 and 24), as do the interaction term of EFW4 and EFW5 and democracy variable.

Finally, the results of SYS-GMM estimation as presented in Table 3 below. Columns with regression 25-27 are the estimations for full sample whilst regression 28-30 are for MICs sample. To ensure the findings are consistent, the estimation results are reported using all variables of democracy although their results are omitted in the earlier fixed effects estimation. Lagged Gini coefficients are consistently significant at 1% level, which give support to the persistency in the income distribution in the countries. The estimated results for freedom to trade internationally (EFW4) reinforce the previous fixed effect findings, nevertheless sound money dimension (EFW3) is no longer significantly associated with inequality whether in isolation or in its interaction with democracy. Deregulation dimension EFW5 are only significant when it estimated with Dem1 and Dem2 measures of democracy but not Dem3. Furthermore, deregulation does not carry any statistical significant to inequality in MICs.

**Table 1: Panel Fixed Effects Estimation of Overall Sample**

Estimation no:	Without interaction term (Estimation 1-6)					With interaction term EFW*Democracy (7-12)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
EFW1	0.128 (0.179)					0.148 (0.209)	0.086 (0.598)					-0.787 (0.486)
EFW2		0.328 (0.211)				0.469*** (0.172)		0.082 (0.623)				0.187 (0.456)
EFW3			-0.272*** (0.103)			-0.338*** (0.106)			-0.766** (0.369)			-0.900** (0.381)
EFW4				0.420** (0.185)		0.278* (0.161)				1.683*** (0.475)		0.466 (0.378)
EFW5					0.439 (0.301)	0.614* (0.341)					2.351*** (0.570)	2.766*** (0.477)
Dem1	0.243 (0.181)	0.247 (0.196)	0.298* (0.170)	0.157 (0.190)	0.074 (0.203)	0.073 (0.160)	0.210 (0.451)	0.056 (0.440)	-0.085 (0.311)	1.029*** (0.318)	1.541*** (0.366)	0.391 (0.568)
EFW1*Dem 1							0.005 (0.069)					0.138** (0.059)
EFW2*Dem 1								0.035 (0.076)				0.039 (0.058)
EFW3*Dem 1									0.062 (0.048)			0.084* (0.046)
EFW4*Dem 1										-0.164*** (0.058)		-0.034 (0.044)
EFW5*Dem 1											-0.259*** (0.066)	-0.305*** (0.054)
Constant	18.398 (39.845)	33.630 (41.218)	19.882 (37.910)	49.125 (37.861)	35.582 (35.700)	46.682 (36.611)	18.221 (39.914)	34.225 (41.335)	18.225 (38.528)	70.472** (31.164)	47.334* (28.348)	60.116** (29.684)
No of observation	343	344	344	344	343	342	343	344	344	344	343	342
No of country	106	106	106	106	106	106	106	106	106	106	106	106
Adj. R- squared	0.292	0.278	0.298	0.294	0.255	0.349	0.290	0.277	0.304	0.349	0.326	0.430

**Notes:** Dependent variable is Gini coefficient net income. All estimations include country and time fixed effects. Additional covariates in the estimations are real GDP per capita, real GDP per capita squared, human capital, age dependency ratio, employment in industrial sector, employment in service sector, and urban population; their results are not reported to conserve space. Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate significant level at 1%, 5% and 10% respectively.

**Table 2: Panel Fixed Effects Estimation of MICs Sample**

Estimation no:	Without interaction term (Estimation 13-18)						With interaction term EFW*Democracy (19-24)					
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
EFW1	0.343 (0.294)					0.462 (0.278)	1.069 (0.784)					-1.219** (0.518)
EFW2		0.270 (0.341)				0.440 (0.270)		-0.698 (0.768)				0.108 (0.614)
EFW3			-0.352*** (0.122)			0.569*** (0.102)			-0.312 (0.700)			-0.637 (0.477)
EFW4				0.632* (0.351)		0.180 (0.236)				1.725*** (0.482)		0.253 (0.552)
EFW5					1.078** (0.453)	1.418*** (0.426)					2.656*** (0.435)	2.867*** (0.585)
Dem1	0.466*** (0.171)	0.460** (0.189)	0.509*** (0.157)	0.409** (0.187)	0.247 (0.214)	0.249* (0.125)	1.189 (0.899)	-0.312 (0.545)	0.545 (0.682)	1.298*** (0.419)	1.849*** (0.572)	-0.461 (0.993)
EFW1*Dem1							-0.106 (0.127)					0.283*** (0.087)
EFW2*Dem1								0.157* (0.093)				0.054 (0.091)
EFW3*Dem1									-0.005 (0.097)			0.011 (0.069)
EFW4*Dem1										-0.171** (0.071)		-0.029 (0.075)
EFW5*Dem1											- 0.272*** (0.087)	-0.241** (0.094)
Constant	-33.382 (71.476)	-22.197 (67.185)	-22.083 (60.407)	-14.088 (59.785)	-8.611 (48.763)	27.496 (47.431)	-32.548 (66.449)	-14.590 (68.298)	-21.985 (59.856)	11.394 (38.992)	-2.769 (36.805)	46.850 (44.877)
No of observation	155	156	156	156	155	154	155	156	156	156	155	154
No of country	54	54	54	54	54	54	54	54	54	54	54	54
Adj. R-squared	0.387	0.363	0.404	0.402	0.377	0.533	0.389	0.377	0.400	0.451	0.430	0.573

*Notes:* See notes in Table 1.

**Table 3: SYS-GMM Estimation of All Countries and MICs Sample**

Sample	All countries			MICs		
Democracy measures	Dem1	Dem2	Dem3	Dem1	Dem2	Dem3
Estimation no:	(25)	(26)	(27)	(28)	(29)	(30)
Lagged Gini net	0.373***	0.447***	0.399***	0.357***	0.374***	0.298**
Income	(0.089)	(0.099)	(0.073)	(0.092)	(0.116)	(0.114)
EFW1	-6.932***	-4.474***	-6.155***	-6.526**	-2.961	-6.558***
	(1.171)	(1.140)	(1.095)	(2.326)	(2.148)	(2.120)
EFW2	-1.348	-2.506**	-2.457**	-3.921*	-2.158	-1.973
	(1.006)	(1.005)	(1.123)	(2.214)	(1.686)	(1.931)
EFW3	2.315	0.003	1.673	2.239	-0.445	0.719
	(1.452)	(1.264)	(1.303)	(2.124)	(1.659)	(2.197)
EFW4	7.109***	9.934***	6.985***	7.709	10.779**	10.128*
	(2.466)	(2.618)	(2.385)	(4.667)	(4.502)	(5.054)
EFW5	-3.645*	-4.722**	-1.877	-3.606	-5.651	-2.230
	(2.163)	(2.334)	(1.869)	(3.254)	(3.513)	(3.221)
Dem	-2.497*	-24.009**	23.095***	-5.145	-29.863	-0.722
	(1.464)	(9.220)	(7.199)	(3.361)	(17.608)	(10.609)
EFW1*Dem	0.936***	6.268***	8.076***	1.116***	5.232**	7.501***
	(0.143)	(1.290)	(1.208)	(0.336)	(2.286)	(2.050)
EFW2*Dem	0.093	2.379**	1.976	0.838*	5.837	0.256
	(0.131)	(1.125)	(1.220)	(0.486)	(3.783)	(2.683)
EFW3*Dem	-0.418*	-0.412	-2.072	-0.477	-0.603	-1.518
	(0.211)	(1.498)	(1.483)	(0.361)	(2.117)	(2.322)
EFW4*Dem	-0.599*	-9.781***	-6.466**	-0.843	-9.844*	-7.368
	(0.303)	(2.875)	(2.639)	(0.630)	(5.358)	(5.563)
EFW5*Dem	0.468*	5.551**	2.457	0.413	4.935	0.253
	(0.258)	(2.536)	(1.999)	(0.454)	(4.321)	(3.575)
Constant	30.807	-21.073	19.574	119.947	176.621	506.891**
	(70.427)	(93.954)	(99.597)	(298.833)	(303.791)	(219.947)
No. of observation	92	92	92	32	32	32
No. of country	48	48	48	22	22	22
No. of instrument	87	80	79	32	32	32
AR(1) p-value	0.614	0.481	0.696	0.270	0.370	0.541
AR(2) p-value	0.241	0.767	0.808	-	-	-
Hansen p-value	1.000	1.000	1.000	1.000	0.990	0.990

*Notes:* Dependent variable is Gini coefficient net income. Additional covariates in the estimations are real GDP per capita, real GDP per capita squared, human capital, age dependency ratio, and employment in industrial sector, employment in service sector, and urban population; their results are not reported to conserve space. Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate significant level at 1%, 5% and 10% respectively.

Democracy variable meanwhile shows negative association with inequality across all estimation although it has statistical significance in only full sample estimation. This finding however is inconsistent with the earlier findings in fixed effect estimations when autocracy is shown to be significant to overcome inequality (positive sign of democracy). This conflicting results on democracy variable underlies our earlier assumption that the impact of political regime on income distribution is rather indirectly via the economic liberalization measures.

One particular result stood out from the SYS-GMM estimation, which is an interesting finding regarding the size of government dimension (EFW1). This liberalization dimension is consistently negatively significant in its own association with inequality, but turns to positive significant when its impact is examined via the political regime. EFW1 is coded in a way that larger size of government received less freedom score, thus a positive priori sign is expected since smaller government is expected to contribute to widening inequality, or larger government should be associated with lower inequality. This is theoretically true since countries with larger size of government measured by the size of public consumption and transfers relative to GDP tend to have lower income inequality due to large welfare systems and increased public sector transfers into various income-equalizing policies such as child benefits and free education and healthcare etc.

Nevertheless, the SYS-GMM result for EFW1 shows the opposite. Importantly, this signifies that bigger government does not imply a larger welfare state. As argued by Bergh and Nilsson (2010), government in poor countries may be corrupt or even predatory, therefore a larger government may not lower income inequality among groups in the population at all. This result is similar to a study by Odedokun and Round (2004) on the relationship between government size and income inequality in 35 African countries. Another interesting finding is that, when both term EFW1 and democracy are interacted (EFW1\*Dem) the sign is now positive which argues that the positive impact of larger government size on income distribution may be realized if sufficient level of democracy is present. This result therefore envisages that income-equalizing role of larger size of government is only accomplished in a truly democratic political regime that is answerable to large majority of voting public. Without vested interests of any smaller section of the population, this government would seek to retain their majority support via implementation of various welfare-enhancing and income-improving policies to population on overall.

As far as the empirical performance of SYS-GMM estimation in this study is concerned, it seems reasonably satisfactory and robust. The tests for first- and second-order serial correlation in the residuals (AR1 and AR2) show that the test statistics are unable to reject the null hypothesis of no serial correlation in the first- and second-order (p-value ranges from 0.241 to 0.808 in all estimations). The Hansen test for over-identification meanwhile indicates the null hypothesis of exogeneity of the overall instruments is not rejected too (with p-value from 0.99 to 1.000). Nevertheless, the implausibly good p-value of this range for Hansen test should be interpreted with caution since the test is apparently weakened by a high instrument count. Nevertheless, we are not too worried about this since there are a number of studies employing SYS-GMM that report p-value of 1.000 or close to 1.000 for Hansen test, for example Baltagi, Demetriades, and Law (2009) and Hasan, Wachtel, and Zhou (2009).



## 5. CONCLUSION AND POLICY IMPLICATION

This study investigates the nexus between economic freedom, democracy and income inequality, and specifically it examines the extent of these variables' interrelationship in MICs, many of which are shown to be stuck in middle-income trap. The ultimate objective of the analysis is on the potential policy implications towards overcoming the rising unequal income distribution in MICs, since income inequality has been frequently shown to be one of the potential factors contributing to growth stagnation leading middle-income trap.

Overall, our analysis shows that freedom to trade internationally, unpredictability in inflation and money supply, and government size have robust relationship with inequality. Nevertheless, these variables' impact on income distribution are found to depend on the type of political regime in the countries under study. Results suggest that these liberalization policies may yield the intended positive effect on income distribution in the presence of democratic regime. The results are robust to various democracy measures and estimation techniques.

Finally, based on the findings of this study, the following are several policy recommendations that can be drawn to assist policymakers in MICs to kickstart and accelerate the rate of growth and finally to escape the middle-income trap:

- a) A democratic regime on itself does not actually reduce income inequality. Nevertheless, it is shown to be able to promote an egalitarian distribution of income via economic liberalization policies namely greater access to sound money, freedom to trade internationally and larger size of government. In other words, a democratic government has the capacity to sustain and extend the positive benefits of these economic liberalization policies across a wider segment of population via various egalitarian redistributive measures.
- b) To ensure the successful implementation of the egalitarian redistribution policies, they must be embedded in a democratic environment. Therefore, the government especially in the MICs shall strive to be more democratic by pushing for a stronger implementation of democratization policies such as to improve political freedom and rights, increase opportunities for political participation for all level of income earners, ensure greater transparency and accountability to the voters, etc. A democratic government would promote a more equal distribution of political power, give rise to labor unions and political parties that represent the lower and middle income classes, and consequently improve various public policies that redistribute income to their constituents.
- c) When the distribution of political power is more equal i.e. greater level of democracy is attained, the government is expected to adopt various redistributive policies such as increased welfare spending, progressive taxation, price subsidies, better access to education to all population groups (related to large government size); creation of better mechanisms in reducing uncertainty in prices and money supply, greater money market transparency, predictable monetary policy direction and objective (related to access to sound money); stronger labor unions with sufficient bargaining power to reduce skill-based and technologically influenced wage premiums, implementation of equality-promoting trade taxes, tariff rates and trade barriers as well as capital market controls (related to freedom to trade internationally).

- d) The implementation of the above policies in the presence of sufficient level of democracy therefore is expected to improve income distribution in MICs eventually leading to sustained acceleration of economic growth and development over the long term.

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**Appendix:****Table A1: Summary Statistics**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Observations</b>
Gini gross income	45.80	7.26	24.32	73.60	606
Gini net income	37.20	9.09	17.27	64.12	606
EFW1	5.90	1.53	0	9.30	606
EFW2	5.77	1.78	1.48	9.30	603
EFW3	7.41	2.13	0	9.9	606
EFW4	6.76	1.85	0.2	10	602
EFW5	6.32	1.22	1.6	8.98	604
Dem1 imputed polity2	7.35	2.76	0.67	10	606
Dem2 (BMR)	0.70	0.45	0	1	606
Dem3 (CGV)	0.71	0.45	0	1	606
Real GDP per capita	14620.88	13906.60	413.95	89327.37	600
Tertiary education	7.98	6.70	0.01	34.79	575
Age dependency ratio	62.83	17.54	34.74	108.90	593
Employment in industry	24.32	7.81	3.2	45.6	442
Employment in service	55.35	15.80	9.9	83.08	442
Urban population	58.42	22.73	7.211	100	593

**Table A2: List of countries based on income level (World Bank classification)**

<b>High income (41 countries)</b>	<b>Upper middle income (33 countries)</b>	<b>Lower middle income (25 countries)</b>	<b>Lower income (18 countries)</b>
Australia	Albania	Armenia	Benin
Austria	Algeria	Bangladesh	Burundi
Barbados	Argentina	Bolivia	Central African
Belgium	Azerbaijan	Cameroon	Republic
Canada	Botswana	Cote d'Ivoire	Chad
Chile	Brazil	Egypt	Guinea-Bissau
Croatia	Bulgaria	El Salvador	Haiti
Czech Republic	China	Ghana	Madagascar
Denmark	Colombia	Guatemala	Malawi
Estonia	Costa Rica	Honduras	Mali
Finland	Dominican Republic	India	Nepal
France	Ecuador	Indonesia	Niger
Germany	Fiji	Kenya	Rwanda
Greece	Georgia	Mongolia	Senegal
Hungary	Guyana	Morocco	Sierra Leone
Iceland	Iran	Nicaragua	Tanzania
Ireland	Jamaica	Nigeria	Togo
Israel	Jordan	Pakistan	Uganda
Italy	Macedonia	Papua New Guinea	Zimbabwe
Japan	Malaysia	Philippines	
Korea, Republic of	Mauritius	Sri Lanka	

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Latvia	Mexico	Tunisia
Lithuania	Montenegro	Ukraine
Luxembourg	Namibia	Vietnam
Malta	Panama	Zambia
Netherlands	Paraguay	
New Zealand	Peru	
Norway	Romania	
Poland	Russia	
Portugal	South Africa	
Singapore	Thailand	
Slovakia	Turkey	
Slovenia	Venezuela	
Spain, Sweden		
Switzerland		
Taiwan		
Trinidad and Tobago		
United Kingdom		
United States		
Uruguay		

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