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Middle income trap and income inequality: Empirical evidence on the distributional effect of economic liberalization and political regime^{*}

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Abstract:

In this paper I empirically examine the income-equalizing role of economic liberalization policies and political regime in a sample of 117 countries over the period of 1970-2014. With a specific focus on the middle income countries (MICs) shown to have been “trapped” at that level long after their transition from low income status, I propose that income inequality could be the underlying factor exacerbating growth slowdowns and suppressing development strategies aiming to escape from the trap and graduate to high income level. Using the Standardized World Income Inequality dataset, and via panel fixed effects and system GMM estimations that are able to handle unobserved heterogeneity, omitted variable bias and potential endogeneity, I examine the interrelationship between income inequality, five dimensions of Economic Freedom in the World, and democracy measures. The findings yield robust empirical evidence that freedom to trade internationally, unpredictable inflation and money supply, and small government size have significant relationship with inequality. Nevertheless, the impact of these variables on income inequality depends on the types of political regime in the country under study. The results suggest that these liberalization policies may yield the intended positive effect on income distribution in the presence of sufficiently democratic political regime.

Keywords: Middle income trap, income inequality, liberalization, economic freedom, democracy

JEL code: C33, D30, O15, P48

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1. Introduction

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. Although in the case of developing countries, Kuznets theory (Kuznets, 1955) of inverse U-shape relationship between inequality and development could provide a temporary respite to the unfavorable finding, the widening of income gap among groups of population and its prevalence in many MICs long after the countries' graduation from lower income status continue to be puzzling. Inequality is often shown as a consistent feature in countries presumed to be stuck in middle income trap –a situation where growth stagnates or even decelerates, productivity slows, and labor costs rises following the countries' rapid development leading to their middle income status. The stylized facts regarding continued growth stagnation or deceleration in these countries are 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 focus is given on the possibility of inequality as the underlying cause of middle income trap. As proposed by Egawa (2013), widening income gap and worsening inequality may pose 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, and this vicious circle would eventually cause the countries to be stuck in middle income trap. Understanding the cause of inequality is therefore crucial in devising appropriate policy measures that may prevent growth slowdowns, spur growth accelerations, and eventually avoiding middle income trap.

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 they cited). Along this line, Rudengren, Rylander, and Casanova (2014) strongly emphasize that the key to the puzzling situation in MICs experiencing rapid growth followed by economic stagnation is to go beyond mainstream analysis of economic factors, that is to understand factors related to governance and political institutions that underlie a determining role in explaining failure or success in sustaining economic growth. As proposed by Acemoglu, Johnson, and Robinson (2005), 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. Although political institutions' significant impact on economic development is arguably already at a consensus in the development literature, the relationship between political regime and inequality remains ambiguous.

There are increasing number of studies in the income inequality literature that seeks to explain the link of economic liberalization and political institutions to inequality, however these studies apparently only examine each aspect separately. To the best of my knowledge, only Reuveny and Li (2003) and a more recent study by Lin and Fu (2016) have examined both aspects

together as they seek to understand the relationship between economic openness or trade liberalization and democratic institutions and income inequality. I seek to add to this by providing a better understanding on the interlinkage between the three aspects with specific focus on the MICs. As noted by Bergh and Nilsson (2010), the link between inequality and various dimensions of economic freedom is little investigated in the previous literature, and my paper is close to Bergh and Nilsson in term of focus on the inequality and liberalization nexus, but I add to that by capturing the roles of democratic institutions that may reinforce or attenuate the impact of liberalization on income distribution. This constitutes the main contribution of the present paper.

Other notable contribution is that I extend the focus of analysis to a sub-sample of MICs; as some of these MICs are shown to have been stuck in the middle income trap, I investigate whether improving income distribution would be able to allow them to overcome growth slowdowns, accelerate economic development and eventually to escape from the trap to graduate to high income status. In short, I seek to imply the roles of the two variables of interest of this study, i.e. economic liberalization and democracy, on policy recommendations towards a more equitable income distribution in the MICs.

The study proceeds as follows: Section 2 reviews the literature on the link between middle income trap and income inequality, followed by Section 3 on previous empirical findings regarding the relationship between inequality and liberalization and democracy. In Section 4, I outline our empirical specifications to estimate the relationship between the variables of interest, followed by explanation on estimation strategy and data sources. Section 5 discusses and interprets the findings of the estimations and Section 6 concludes with some policy recommendations.

2. Middle income trap and income inequality

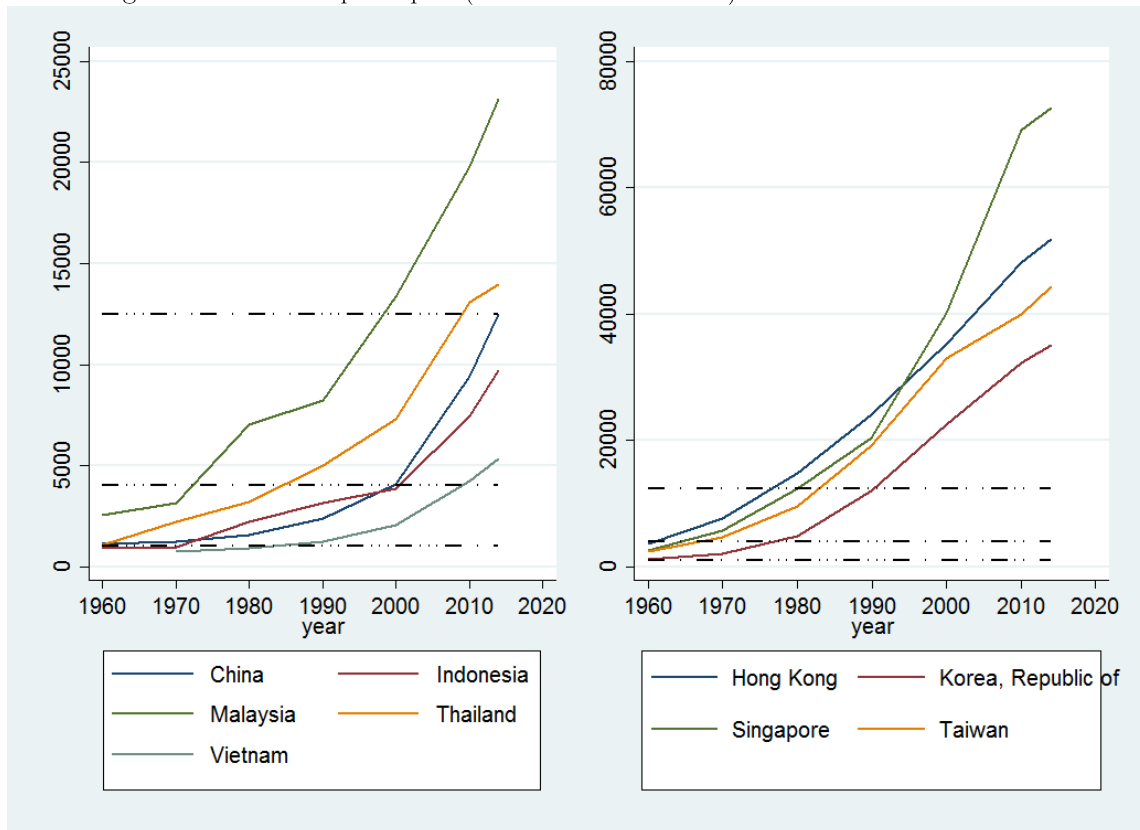
The term “middle income trap” is arguably first coined by Gill, Kharas and Bhattachali (2007) in their analysis of East Asian spectacular economic performance in 1990s “*An East Asian Renaissance, Ideas for Economic Growth*”, as they contrasted the slow growth in Middle East and Latin American countries with Asian MICs. The term commonly refers to a situation when a country that has realized rapid growth from low income level to become an MIC but is subsequently unable to grow further. 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.

Nevertheless, the term “middle income trap” often has various definitions proffered by the researchers with no precise or accepted definition in the literature. As noted by Im and Rosenblatt (2013), in some cases the phenomenon is described in term of relative catch-up with a certain reference country whose income level already at the level where the MICs aspire to achieve. In some other cases, it is based on absolute income levels of the countries which are

shown to advance over the years and comparison based on this absolute figures are made to determine whether the countries are stuck in middle income level and how long will the countries take in order to transition to higher income levels (Felipe, Kumar, and Galope, 2014). To understand middle income trap, first I define what *middle income country* is. 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 MIC and 56 as upper MIC.

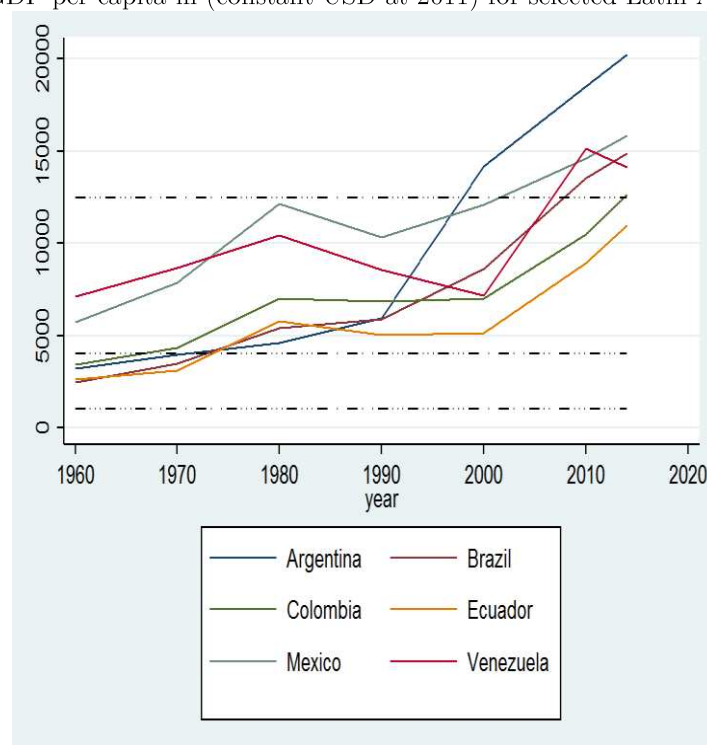
Figure 1 and Figure 2 below show the real GDP per capita value at constant US dollar (base year 2011) for selected countries in Asian and Latin American regions. The dotted lines indicate the threshold of income levels from lower middle income (bottom line) to upper middle income level (middle line) and to high income level (top line). Data on real GDP per capita begins from year 1960. For Asian region, the countries apparently started from a somewhat similar level of income and it took around forty years since 1960–2000 for China, Indonesia and Vietnam to achieve upper middle income status whereas for Malaysia and Thailand it was only around fifteen to twenty years. As at 2010, these two countries are already crossing the high income threshold, although the countries' official classification at the World Bank remains as upper

Figure 1: Real GDP per capita (constant USD at 2011) for selected Asian countries



Notes: Data source is from Penn World Table 9.0 (Feenstra, Inklaar, and Marcel, 2013).

Figure 2: Real GDP per capita in (constant USD at 2011) for selected Latin American countries



Notes: See notes in Figure 1.

middle income. In the case of high performing Asian countries, they achieve high income status in much less time than the rest of Asian countries. Meanwhile, an interesting situation is depicted in Figure 2 for Latin American countries where all countries in the region except Argentina were experiencing deceleration in income per capita level within a period of twenty years beginning 1980.

MICs stuck in the middle income trap are often characterized by growth slowdowns –a situation when a country experiences deteriorated growth performance– and the slowdown episodes are usually sustained for at least two consecutive periods (Aiyar, Duval, Puy, Wu, and Zhang, 2013).¹ One widely cited stylized fact of growth slowdowns is that the previous factors contributing to significant growth achievement of lower income countries that allow them to achieve middle income status –low cost labor and import of foreign technology– are no longer capable of creating added advantage in the value chain resulting in stagnation in productivity gains. When middle income status are achieved, increasing labor cost slows down the production and reduces country competitiveness leading to stagnated or lower growth rates.² To avoid being

¹ Aiyar et al (2013) define growth slowdowns as a country’s significantly lower actual rates relative to its estimated growth rates obtained from parsimonious growth regressions (i.e. when the residual differences is less than the 20th percentile; and residuals means actual growth rates minus estimated growth rates).

² In the literature, “standard” argument on the factors behind growth slowdowns are such as labor market rigidity, poor property rights enforcement, lack of innovation and investment in specialized production, absence of necessary infrastructure to diversify sources of economic growth, and low government commitment and capability to support economic diversification (Rudengren et al., (2014).

stuck in middle income trap, these countries require new sources of growth to maintain sustained increases in their per capita income.

Nevertheless, middle income trap could occur not only if there is delay in shifting the economy toward a productivity-driven structure but also if there is a worsening income distribution. Egawa (2013) in his analysis of Asian MICs shows that income inequality is a significant factor in reducing economic growth rate thereby has a role in triggering the middle income trap. Income inequality is present in most Asian and Latin American MICs and frequently considered as a by-product of previously attained rapid growth during these countries transition from lower to middle income status.³ Inequality in Latin America is shown by De Ferranti (2004) to be higher than in Asia, Eastern Europe, and the industrialized countries. Income inequality in the least unequal Latin American country, i.e. Uruguay, is higher than in the most unequal country in Eastern Europe and the industrialized countries, and not too much different from in the most unequal country in Asia. Egawa's (2012) estimated Kuznets curve shows that income inequality is related to middle income trap because it becomes a problem when a country exits least-developed level to become an MIC but continues to have greater ratio of income between the top 20% and the bottom 20% of the population. According to him, this situation can trigger a middle income trap as it hampers growth performance of the countries.

Inequality and growth relationship has been the subject of an intense debate (see an excellent theoretical study on inequality-growth nexus by Shin (2012), nevertheless, to qualify as a significant determinant of growth slowdowns, and consequently of middle income trap, Egawa (2013) demonstrates that income inequality must fulfil two conditions: a) income inequality rises when a country achieve middle income status, and b) over the middle and long term, its prevalence continues to hamper economic growth.⁴ To support his argument, Egawa illustrates this two conditions using the Kuznets hypothesis and the basic-needs approach.

Kuznets hypothesis is based on a demand-pull model, and it states that when a low income country accelerates its growth increases, it would typically cause a worsening income distribution in the initial stage of development. Growth in demand during the initial stage of development spurs labor-saving technological change favoring the demand for capital and skills, so increasing income inequality. In other words, an increase in income inequality is considered as a “price to pay” in exchange of the early stage economic development. Over the course of development, i.e. when the country attains middle income status, catching-up proceeds and the labor-saving tendency attenuates and more egalitarian forces, such as an increase in education and the supply of skilled labor, are allowed to have their impact which would result in improved income distribution. The relationship between country's income levels and its degree of income inequality typically displays an inverted U- shape, called as the Kuznets curve. Egawa (2013)

³ In Asia, for example, growth-promoting urbanization and industrialization in the urban areas have attracted higher migration from rural to urban areas resulting in widening rural-urban income disparities and intra-urban inequality (Kanbur and Zhuang, 2013).

⁴ Inequality in income distribution across groups of population is often presumed to hamper growth over the long term via unequal access to education and human development between these groups.

nevertheless shows that if an MIC fails to narrow the income gap, a decreasing growth rate could occur as a result.

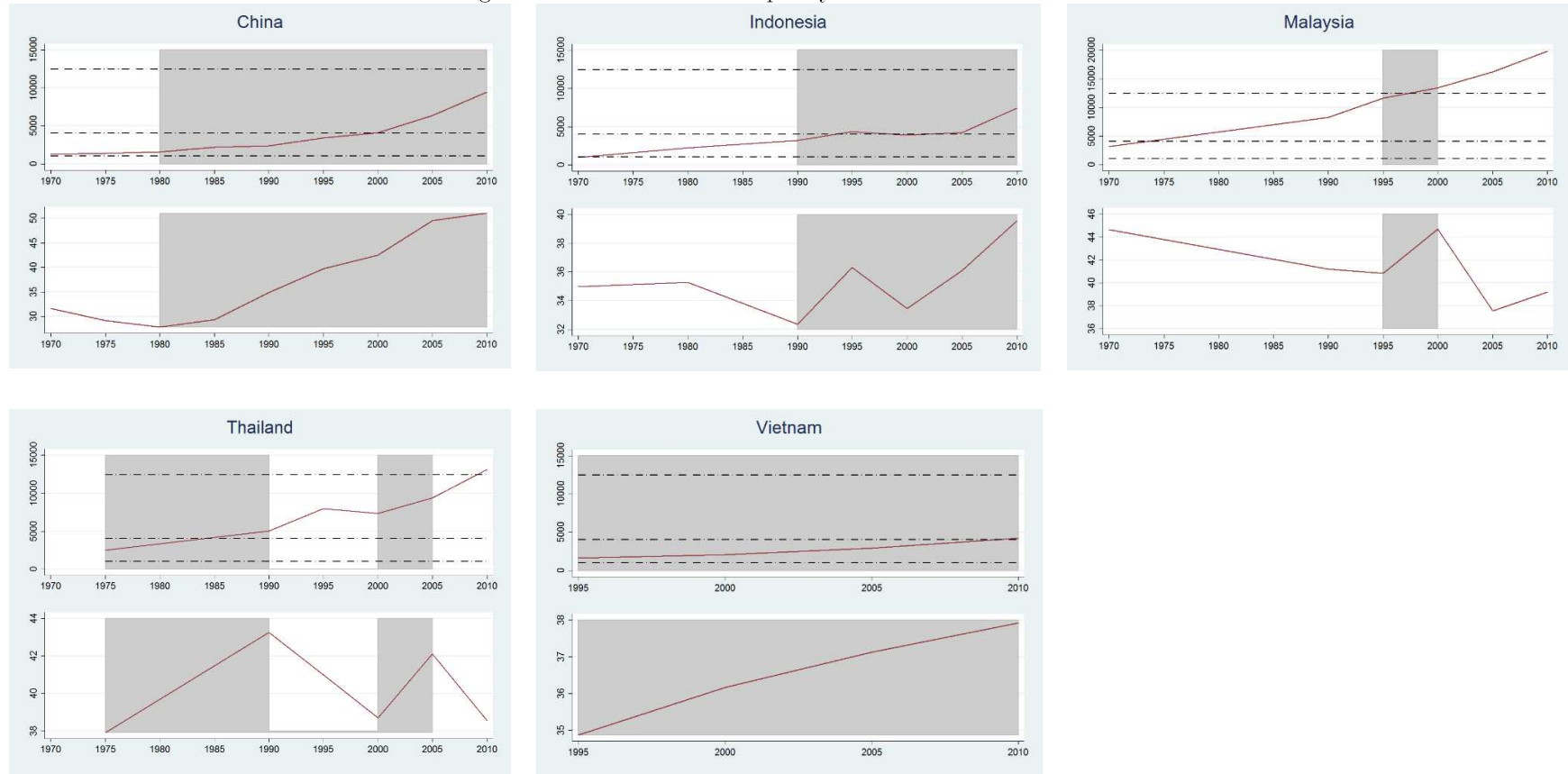
Whereas, arguments based on the basic-needs approach would normally chronicle how income inequality would limit human development, as low-income households would normally have less access to education and healthcare, less likely to engage in productivity-driven industries, pay little attention to eco-friendliness and environmental protection, which in turn would harm the sustainability of economic development (see Human Development Report by UNDP, 2011). Based on Inequality-adjusted Human Development Indicators (IHDI) index developed by UNDP, Egawa (2012) forecasts that Asian countries' IHDI index in 2020 would decline if income distribution in the countries is not improved. On overall, Egawa's (2013) empirical findings strongly support the argument that income inequality will become a problem for the MICs and will reduce growth rates if left untreated. He concludes that worsening inequality therefore may pose risk of decelerating growth of the Asian MICs and would eventually cause the countries to be stuck in middle income trap.

Apparently, the inequality and income data used in this study corroborate Egawa's (2013) findings. Figure 3 and 4 below depict income level against Gini index for selected countries in Asian and Latin American countries. For each country, top graph with dotted lines depicts real GDP per capita level where the dotted lines indicate the threshold of income levels from lower middle income (bottom line) to upper middle income level (middle line) and to high income level (top line). Bottom graph is the Gini index net income. Shaded area in graph reflects a period with rising inequality level.

A quick glance at these graphs reveals an important pattern where growth slowdown or deceleration in these countries are often associated 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, China, Indonesia, and Vietnam that earlier mentioned to be stuck in middle income level for about 40 years between 1960-2000, their inequality level during this period too is on the rising trend. For Malaysia and Thailand, on the other hand, their overall inequality level has been decreasing.

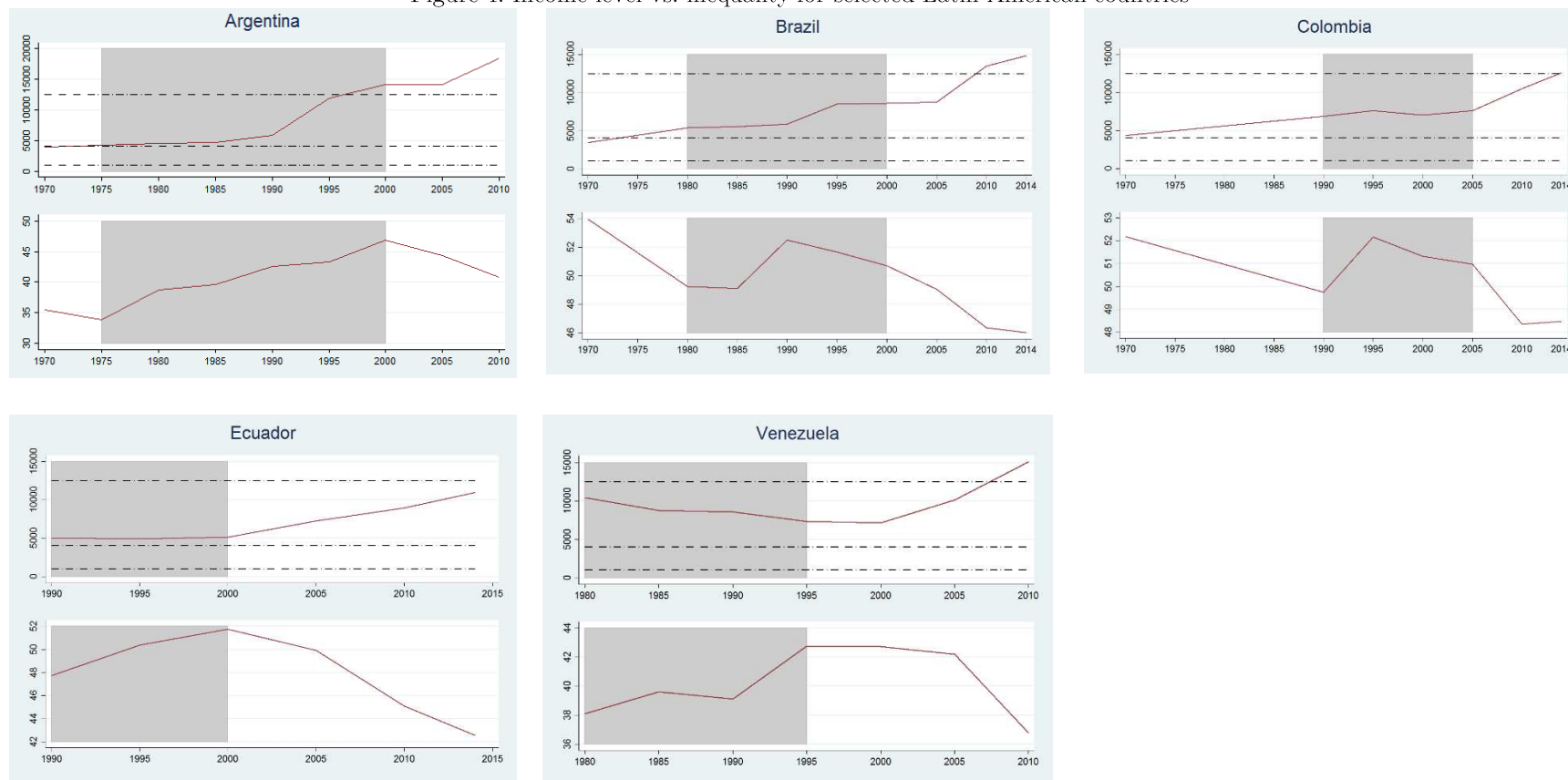
Thus, it is imperative for policy makers in MICs, while they elaborate and implement policies and medium-term plans to overcome growth stagnation, to give attention to widening income distribution as a possible underlying factor contributing to growth deceleration hence middle income trap.

Figure 3: Income level vs. inequality for selected Asian countries



Notes: Real GDP per capita data are from Penn World Table 9.0 (Feenstra, Inklaar, and Marcel, 2013), and inequality data are from Standardized World Income Inequality Database (SWIID) by Solt (2014).

Figure 4: Income level vs. inequality for selected Latin American countries



Notes: See notes in Figure 3.

3. Income inequality link to liberalization and democracy

Inequality and trade liberalization:

The standard trade theory based on the Heckscher–Ohlin (HO) model predicts that developing countries should experience egalitarian trends as a consequence of trade. As proposed by Stolper–Samuelson (SS) theorem, one of the HO model’s important corollaries and a main building block of international trade theory, trade liberalization such as via tariff reduction should decrease income inequality in developing countries since trade can increase the real returns to factors that are relatively abundant in these countries. In most developing countries, if compared to the world economy, the unskilled labors are relatively abundant and therefore with comparative advantage in this factor of production, international trade should increase the demand for the unskilled workers and their wages, resulting in an overall decrease in wage gap between the skilled and unskilled workers, and in income inequality. HO-SS theory is based on the assumption that level of technology between the trading countries are identical which in reality is not necessarily true. Income inequality continues to be prevalent in many MICs despite better growth achievement during their transition from low income to middle income status.

Despite growing body of literature, the empirical evidence on the impact of trade liberalization on inequality is apparently inconclusive. International Monetary Fund (2007) finds that trade openness may have income-equalizing effect in a panel of 51 developed and developing countries over a period from 1981-2003, as do Wu and Hsu (2012) who, based on a cross-sectional dataset taken from 54 countries over the period 1980–2005, find that international trade can lead to more equal income distribution. Asteriou, Dimelis, and Moudatsou (2014) also find income-equalizing effect of trade openness but their analysis of 27 EU nations is limited to developed countries only. Despite finding positive impact of trade openness on income distribution, they show that financial globalization via FDI, capital account openness and stock market liberalization however cause significant inequality.

Winters, McCulloch, and McKay (2004) survey empirical evidence on trade liberalization and poverty and highlight that trade liberalization in developing countries entails positive distributional changes in income but this effect however is conditional upon other factors such as trade reform measures, institutions, and other country specific factors. They cite an example of East Asian countries experiencing widening wage gap between skilled and unskilled labor although the countries have been implementing various trade liberalization measures. More recent papers also find similar findings along this line.

In their analysis of trade-inequality nexus of 65 developing countries during the 1980-1999 period, Meschi and Vivarelli (2009) show that trade with high income countries worsens income distributions in developing countries through both imports and exports, thus supporting argument that technological differentials and skill biased nature of new technologies are the important factors in shaping the distributive effect of trade. To this end, other possible factors are also documented such as trade limited to intermediate goods and vertical specialization, widening wage differentials due to firms’ trade participation (Lin and Fu, (2016), or due to labor

supply and demand changes as a result of factors such as immigration and emigration, minimum wages policy, unionism, capital market liberalization (Asteriou et al., 2014).

Ezcurra and Rodríguez-Pose (2013) meanwhile use KOF index of globalization that captures not only trade openness, but also capital controls, foreign direct investment, and social and political aspect of globalization and they find positive and significant effect of globalization on regional income disparities. The finding is consistent after controlling various other factors. Nevertheless, the effect is contingent upon the level of economic development of the countries under study; globalization caused greater inequality in low and middle income countries than in developed countries. Similarly, Bergh and Nilsson (2010) also use KOF index of globalization index together with Economic Freedom in the World index (data by Gwartney, Hall, and Lawson, 2010) to measure trade liberalization and they show that freedom to trade robustly related to income inequality, but only in the middle and high income countries. Social globalization and deregulation too are shown to have non-equalizing distribution impact. Lin and Fu (2016) meanwhile show the effect of economic liberalization on inequality is not conditional upon the level of economic development, but rather on the political institutions of the country, specifically they show that an increase in trade causes greater inequality in democracies but has income-equalizing effect in autocracies.

One of the factors contributing to mixed findings of the inequality-trade liberalization studies is probably due to empirical issues. Trade liberalization may be endogenous as the causality may run from inequality to trade reform. Gradstein (2007), for example, states that the more equal the income distribution in a society, the greater the support for property rights protection. Politicians may respond to increases in income inequality by implementing certain policies, favoring either more or less economic freedom or globalization depending on their preferences and beliefs about the causes of inequality. If an increase in inequality reduces liberalization and globalization, we believe our analysis may underestimate the inequality impact. Similarly, other unobserved factors may also be correlated with trade liberalization. Lin and Fu (2016) use instrumental variable (IV) regression, while (Asteriou et al., (2014) and Bergh and Nilsson (2010) use Generalized Method of Moments estimation to solve for endogeneity. Ezcurra and Rodríguez-Pose (2013) and Meschi and Vivarelli (2009) however leave the problem unaddressed.

Inequality and democracy:

Theoretically Balcázar (2015) explains four possible mechanisms democracy would breed more egalitarian society, based on previous paper findings: a) First is via rational choice of redistribution by utility-maximizing individuals, thus if the median income lies below the mean income, the median voter chooses redistribution and higher taxation for rich people. This model predicts that democracies have lower levels of inequality than non-democracies. b) A second mechanism alleges that democracy lowers the costs of political participation of organized labor, thus allowing labor unions to obtain a privileged position in the determining favorable policies such unionization, centralized wage bargaining, and minimum wages, which reduce wage dispersion. c) Via the third mechanism, democracies should also guarantee broad access to well-

defined property rights which would allow the poor have the possibility to gain access over improved or produced assets, facilitate them in the integration into efficient market-based economies. This also would prevent the elite from erecting entry barriers and enjoying markets with monopoly power. d) A fourth mechanism suggests that democracy increases competition among politicians for citizen support. This causes governments to invest more in public services, such as education. Education, in turn, acts as a redistribution channel reducing the dispersion of human capital and increasing a generation's human capital relative to the previous generation.⁵

Nevertheless, as greatly discussed by Acemoglu, Naidu, Restrepo, and Robinson (2015-page 1-2) and Balcázar (2016-page 291-292), the empirical literature on inequality-democracy link is far from a consensus. Evidence are mixed at best with findings divided between positive, negative and no impact of democracy on inequality, and some results are argued as not robust due to various econometric issues. In an analysis by Milanovic (1998) on the transition from planned to market economy of former Soviet countries, he finds that there is only a weak evidence for redistribution through the median voter channel. Indeed, he shows that the middle classes are not net beneficiaries from redistributive transfers. Timmons, (2010) meanwhile argues that although democracy may pay higher average wages in manufacturing, the regime however does not dampen wage dispersion between industries. Along this line, Amendola, Easaw, and Savoia (2013) reveal that democracy is not a sufficient condition to reduce income inequality in the presence of strong property rights. They find that in a low-democracy environment, increasing property rights actually lead to an increase in the level of inequality, and in order to reverse this impact, a country may need to consider its political equality too.

As in the inequality-trade liberalization literature, most empirical analyses on the linkage between inequality and democracy or political institutions suffer from various econometric issues. For example, majority of the earlier 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 details discussion on this empirical problems).

Lee (2005) departs from cross sectional setting and instead uses panel data random effects estimation to show that there are heterogeneous effects of democracy on inequality, as he argues there is a significant interaction between government size and democracy. Although democracy is positively correlated with inequality, however the interaction term of government size and democracy is negative significant which means that democracy will only reduce inequality when

⁵ See Balcázar(2016) for a detailed discussion on the mechanisms and the references he cited to support his arguments.

government is sufficiently large. Timmons (2010) meanwhile replicates the regression done by Reuveny and Li (2003) using similar specifications, similar and larger sample countries, and more observations with more appropriate estimation techniques namely instrumental variable and error correction model, still they find no relationship between democracy and aggregate measures of economic inequality thus concluding that whether and how democracy decreases economic inequality remains an open question. Amendola et al. (2013) use fixed effect estimations to control for unobserved heterogeneity and omitted variable bias, and least squared dummy variable corrected (LSDVC) estimation to control for endogeneity.

Acemoglu et al. (2015) and Islam (2016) employed the latest panel estimation technique namely system GMM that are capable to handle endogeneity, omitted variable bias, measurement error and unobserved heterogeneity, nevertheless both yield mixed findings as the former finds no robust impact of democracy on income inequality whilst the latter show that democracy regime may support positive impact of political freedom on income distribution. Balcázar (2016) uses pseudo panel estimation that consists of cohorts which considers gender, country, birth year, and the cohorts' database are available over time. Cohorts are ensured to be large enough to avoid small sample bias, measurement error problem, and to minimize within-cohort heterogeneity and maximize between-cohort heterogeneity to eventually yield a consistent estimator, and he finds income equalizing impact of democracy if a cohort has high exposure to this presumably welfare-augmenting regime. On overall, despite using various estimation techniques that are able to tackle most econometrics issues, a concrete evidence on the impact of democracy on inequality remains elusive.

4. Empirical specification, estimation strategy and data sources

To investigate the impact of economic liberalization and democracy on income inequality, I formulate the following two empirical models:

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

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

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. η and ρ is country and time fixed effect respectively, and ε is i.i.d error term. β , θ , δ and φ are the parameter of interests to be estimated. My 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 is panel fixed effects within estimator to estimate Equation (1) and system Generalized Method of Moments (SYS-GMM) introduced by Arellano and Bover (1995) and Blundell and Bond (1998) to estimate Equation (2). The latter estimation is meant

for robustness check of the results we obtain in within estimation, and necessary assumptions regarding the SYS-GMM estimation will be explained in a moment.⁶

Firstly, to estimate Equation (1) I proceed the estimation without the interaction term and I include economic liberalization variables one at a time. This is then followed with a general specification where all five dimensions of liberalization are concurrently included. In all specifications, democracy variable is present but at this stage the impact of both liberalization and democracy are investigated separately. Subsequently, I repeat the estimations with the interaction term between the included liberalization variable and democracy variable. In the general model of this second step, all five dimensions of economic liberalization, a democracy variable, and five interaction terms between the two variables of interest appear. Via this strategy, I first intend to examine the link to inequality of each individual dimension of economic freedom and democracy in isolation. Subsequently when the interaction term is included, I seek to understand the interplay between the two variables of interest and its consequence on income inequality. In all estimations, a full set of control variables which are assumed to influence income distribution are also included.⁷

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, I lag the variables of interest on the right hand side to one lag in the fixed effect estimation, with the assumption that liberalization policy and political regime has no contemporaneous effect on inequality.⁸

In Equation (2) I allow 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 right-hand-side 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 issue to be present. As earlier mentioned, I estimate Equation (2) via system GMM estimator introduced by Arellano and Bover (1995) and Blundell and Bond (1998) which has been shown to be able to correct unobserved country heterogeneity problems, omitted variable bias, measurement error and potential endogeneity issue frequently shown to plague models containing lagged dependent variable as one of the regressors. System GMM is also capable of reducing potential bias and imprecision associated with a simple first-difference GMM estimator.

The following assumptions are made for the system GMM estimation: I treat the lagged Gini as a predetermined variable and all economic freedom variables, democracy, real GDP per capita, and human capital as endogenous. I then set the instruments lag for endogenous regressors to be one period, and with this I postulate that the impact of economic liberalization, democracy,

⁶ OLS is straight forward bias due the estimation does not allow for the presence of fixed effects in the model to the assumption of endogeneity in the trade liberalization, democracy, GDP per capita.

⁷ Nevertheless, the focus in this study remains on the two variables interest above therefore the results of control variables are not reported to conserve space.

⁸ The practice to predate endogenous regressors as a way to handle endogeneity has also been done by Berggren (1999), Bergh and Nilsson (2010), and Acemoglu et al. (2015).

real GDP per capita and human capital on inequality are not contemporaneous and they will take within five years to affect a change in the income distribution. This assumption too is meant to eliminate endogeneity bias. 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, Sargan/Hansen test of over-identifying restrictions which tests for the overall validity of the instruments and the null hypothesis is that all instruments as a group are exogenous. The second test examines the null hypothesis that the error term of the differenced equation is not serially correlated, particularly at the second order (AR2). One should not reject the null hypothesis of both tests.⁹

I also examine the results' sensitivity analysis by using alternative democracy variables, firstly using dataset obtained from Boix, Miller, and Rosato (2013-henceforth BMR) on dichotomous democracy rating, and secondly from Cheibub, Gandhi, and Vreeland (2010-henceforth CGV). I repeat the same procedure as above on the Gini gross income.¹⁰

Since the focus of this study is to investigate the distributional roles of both economic liberalization and democracy in MICs where many of them are stuck in middle income trap, I repeat the above estimations for MICs 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.

I now discuss the dataset used in this study, which is a panel observation covering 117 countries over a period of 35 years from 1970 to 2014. All observations are taken as average of 5-year period, thus there are 9 non-overlapping 5-year periods i.e. 1970-1974, 1975-79, 1980-1984, 1985-89, 1990-1994, 1995-99, 2000-2004, 2005-2009, and 2010-2014. However, the panel data is unbalanced due to missing observations. The summary statistics of the variables are presented in Table A1 in the Appendix.

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 Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index

⁹ I follow Bond, Hoeffler, and Temple (2001) to employ one-step GMM estimator since efficiency gains from two-step GMM estimators is shown by Bond et al. to be small, and two-step estimators normally converge to its asymptotic distribution relatively slowly, and in a finite sample its asymptotic standard errors can be seriously biased downwards, and thus making it unreliable. Despite Windmeijer (2005)'s correction to this problem of achieving robust standard errors in two-step GMM estimation, I have already enforced heteroskedastic and autocorrelation robust standard error in the one-step GMM estimation, therefore, one-step GMM estimation is preferred.

¹⁰ Apparently results are identical when I use alternative democracy variables and when I use Gini of gross income variable. Their results are therefore not reported to conserve space and available upon request.

of 100 implies perfect inequality.”¹¹ The preferred measurement of income inequality is Gini coefficient 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.¹² I use both Gini coefficient of net income and gross income, and the latter meant for robustness check.

Independent variables: The variables of interest in this study are economic liberalization variables which are drawn from Economic Freedom in the World (EFW) from the Fraser Institute (Gwartney et al., 2010). EFW is a composite index that 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, I denote these five dimensions as EFW1, EFW2, EFW3, EFW4 and EFW5, respectively. Their scores range from 0 to 10, where 0 indicating least freedom and 10 greatest freedom. Table A2 in Appendix lists the complete coverage of data to calculate the composite index of EFW. Nevertheless, in this study I focus on the individual dimensions of the Economic Freedom rather than its overall index.

The other variable of interest is political regime indicator reflecting the level of democracy or autocracy in the countries under study, namely Imputed Polity2 variable obtained from the Freedom in the World dataset (Freedom House, 2015). Imputed Polity2 variable 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 Polity2.¹³ 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 as robustness check are dichotomous democracy indicator obtained from BMR (Boix et al., 2013) and classification of political regimes by CGV (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. Whereas, CGV classification of political regime states that a regime is considered a democracy if the executive and the legislature is directly or

¹¹ <http://data.worldbank.org/indicator/SI.POV.GINI>

¹² See Bergh and Nilsson (2010) for discussion on the superiority of Gini coefficient from SWIID as compared to World Income Inequality Database (WIID) of UNU-WIDER, Standardized Income Distribution Database (SIDD) created by Babones and Alvarez-Rivadulla (2007) or Luxembourg Income Study (LIS) etc.

¹³ In the event that data on Polity2 is missing this imputed version has imputed values for countries by regressing Polity2 on the average Freedom House measure.

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 (e.g. unconstitutional closing of the lower house or extension of incumbent's).

Table 1 below illustrates the pairwise correlation matrix between all five economic liberalization dimensions and democracy variables used in this study. As is seen in the table, several dimensions of economic liberalization dimensions are closely related but the correlation does not exceed 0.7. Nevertheless, all three democracy measures are highly correlated. As noted by Acemoglu et al. (2015), democracy indicators from the Freedom House and Polity2 indicate substantive changes in political power, whereas both BMR and CGV democracy classification of regimes are more procedural. I retain the use of the latter two alternative variables of democracy as robustness check against the main variable of democracy, Imputed Polity2.

Table 1: Correlation matrix between EFW dimensions and democracy variables

	EFW1	EFW2	EFW3	EFW4	EFW5	Dem1	Dem2
EFW2	-0.32						
EFW3	0.03	0.53					
EFW4	-0.01	0.65	0.70				
EFW5	0.22	0.47	0.58	0.57			
Dem1 (Imputed Polity2)	-0.23	0.65	0.53	0.68	0.47		
Dem2 (BMR)	-0.08	0.34	0.30	0.48	0.31	0.81	
Dem3 (CGV)	-0.01	0.30	0.27	0.44	0.28	0.75	0.86

Control variables included in the estimation of Equation (1) and (2) above are several factors which have been previously shown to be related to inequality. They are real GDP per capita which has been shown to consistently influence the income distribution in a country, and since the Kuznets' theory predicts a non-linear impact of GDP per capita on inequality, I also include GDP per capita squared in all regressions. Data on real GDP in million US dollar at constant 2011 price is obtained from Penn World Table 9.0 (Feenstra et al., 2013). Tertiary education level which is frequently found to strongly determine the skill differences and consequently wage premiums among the workers is also controlled, and I use share of population age 25 and above who have completed tertiary education from Barro and Lee (2013). I also control for age dependency ratio which corresponds to the share of population whose age is outside working age range (15-64). Larger dependency ratio would reflect large income inequality among the population. Finally, I add employment in industrial sector, employment in service sector and urban population to capture any specific effect these factors could have on the level of inequality in a country. Data on the last four control variables are obtained from the World Development Indicators (World Bank, 2016)

5. Results and discussions

Before I proceed with the estimation results, a quick look at the Table 2 containing the pairwise correlation matrix between the variables used in the estimation reveals some variables that are closely related, for example real GDP per capita which is highly correlated with human capital, age dependency ratio, urban population, employment in service sector, EFW2, EFW4 and Dem1 variables. Nevertheless, variance inflation factor (VIF) result indicates no multi-collinearity. Summary statistics of all variables meanwhile can be seen in Table A1 in the appendix.

Table 2: Pairwise correlation matrix of variables

	Gini of gross income	Gini of net income	Real GDP per capita	Tertiary education	Age dependency ratio	Urban Population	Employment in industry	Employment in service sector
Gini of net income	0.69							
Real GDP per capita	-0.08	-0.52						
Tertiary education	-0.08	-0.43	0.71					
Age dependency ratio	0.24	0.52	-0.74	-0.66				
Urban population	-0.06	-0.37	0.79	0.69	-0.56			
Employment in industry	-0.22	-0.40	0.42	0.14	-0.49	0.30		
Employment in service	0.09	-0.29	0.74	0.58	-0.31	0.74	0.20	
EFW1	0.12	0.46	-0.25	-0.02	0.10	-0.19	-0.38	-0.22
EFW2	-0.15	-0.56	0.79	0.52	-0.60	0.58	0.38	0.57
EFW3	0.06	-0.30	0.61	0.48	-0.46	0.41	0.07	0.49
EFW4	0.07	-0.31	0.71	0.55	-0.55	0.59	0.26	0.58
EFW5	0.07	-0.14	0.50	0.46	-0.42	0.32	-0.07	0.44
Dem1 (Imputed Polity2)	0.01	-0.44	0.74	0.55	-0.50	0.58	0.27	0.61
Dem2 (BMR)	0.05	-0.24	0.49	0.38	-0.37	0.39	0.18	0.33
Dem3 (CGV)	-0.02	-0.27	0.44	0.45	-0.39	0.38	0.18	0.30

The following Table 3 and 4 show the estimated results for inequality model as specified in the Equation (1) and (2) above. Table 3 is for overall sample, whilst Table 4 for sample of MICs. 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 liberalization variables or democracy thus obscuring the true impact of both variables of interest on income inequality. Similarly, we do not report estimations using Gini coefficient of gross income which have been found to yield somewhat identical results to that of net income.

On 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 (2007), 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, I rather postulate that political regime may not have any direct impact on income distribution, and its impact on inequality is assumed to be

Table 3: Panel fixed effects estimation of overall sample

Estimation	Without interaction term						With interaction term between EFW and democracy					
	(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*Dem1							0.005 (0.069)					0.138** (0.059)
EFW2*Dem1								0.035 (0.076)				0.039 (0.058)
EFW3*Dem1									0.062 (0.048)			0.084* (0.046)
EFW4*Dem1										-0.164*** (0.058)		-0.034 (0.044)
EFW5*Dem1											-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 4: Panel fixed effect estimation of MICs sample

Estimation	Without interaction term						With interaction term between EFW and Democracy					
	(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 3.

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 (2007), 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.

Now I proceed to interpret estimation results of economic freedom and democracy and their interactions in the sample of MICs, which is the focus of this paper. The results of this estimation appear in Table 4 above. 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 trade liberalization 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, Table 5 presents the results of SYS-GMM estimation. Columns with regression 25-27 are the estimations for full sample whilst regression 28-30 are for MICs. To ensure the findings are consistent, I report the estimation results using all variables of democracy although we omit their results in the earlier fixed estimation. Lagged Gini coefficients are consistently significant at 1% level of significance which provide 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.

Democracy variables 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 I find strong state are crucial to overcome inequality (positive sign of democracy variable), whereas now democratic regime is shown to have positive impact on income distribution. This conflicting results on democracy variables underlie 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.¹⁴

Nevertheless, the SYS-GMM result for EFW1 shows the opposite. Importantly, this signifies that bigger government does not imply a larger welfare state. In poor countries, where government may be corrupt or even predatory, 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

¹⁴ 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.

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.

Table 5: SYS-GMM estimation of all countries and MICs sample.

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

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 (AR(1) and AR(2)) 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.¹⁵

6. Conclusion and policy implications

In this study I seek to investigate the interlinkage between economic liberalization, political regime and income inequality, and specifically I am interested to examine the extent of these variables' relationship in MICs which have shown to be stuck in middle income trap. The objective is to widen our understanding on the possible policy implications in providing solution to unequal income distribution in MICs, as income inequality has been frequently shown to be one of the potential factors contributing to growth stagnation and middle income trap.

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

Finally, based on the findings of this study, important policy implications for policy makers in MICs aspiring to accelerate the growth rates and escape from middle income trap can be summarized as the following:

- a) Democratic regime on itself does not lower inequality. It is however shown to promote an egalitarian distribution of income via liberalization policies namely access to sound money, freedom to trade internationally and larger size of government. To ensure these liberalization policies yielding the intended income-equalizing effect, the government shall strive for 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.
- b) Consequently, a more equal distribution of political power is expected to support adoption of various redistributive policies such as welfare spending, progressive taxation,

¹⁵ Nevertheless, 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).

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).

- c) 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

Variable		Mean	Std. Dev.	Min	Max	Observations
Gini gross income	overall	45.80	7.26	24.32	73.60	N = 606
	between		6.38	30.03	71.78	n = 117
	within		3.80	28.69	61.35	T-bar = 5.18
Gini net income	overall	37.20	9.09	17.27	64.12	N = 606
	between		8.61	21.78	62.07	n = 117
	within		2.85	24.96	50.85	T-bar = 5.18
EFW1	overall	5.90	1.53	0	9.30	N = 606
	between		1.22	2.69	8.46	n = 117
	within		0.92	1.44	9.09	T-bar = 5.18
EFW2	overall	5.77	1.78	1.48	9.30	N = 603
	between		1.57	2.37	8.57	n = 117
	within		0.80	2.56	8.62	T-bar = 5.15
EFW3	overall	7.41	2.13	0	9.9	N = 606
	between		1.36	3.15	9.65	n = 117
	within		1.60	1.47	12.02	T-bar = 5.18
EFW4	overall	6.76	1.85	0.2	10	N = 602
	between		1.38	2.99	9.43	n = 117
	within		1.19	1.72	10.43	T-bar = 5.15
EFW5	overall	6.32	1.22	1.6	8.98	N = 604
	between		0.90	3.79	8.275	n = 117
	within		0.80	3.32	8.70	T-bar = 5.16
Dem1 (Imputed Polity2)	overall	7.35	2.76	0.67	10	N = 606
	between		2.45	1.17	10	n = 117
	within		1.26	0.77	11.11	T-bar = 5.18
Dem2 (BMR)	overall	0.70	0.45	0	1	N = 606
	between		0.39	0	1	n = 117
	within		0.24	-0.17	1.45	T-bar = 5.18
Dem3 (CGV)	overall	0.71	0.45	0	1	N = 606
	between		0.41	0	1	n = 117
	within		0.23	-0.17	1.38	T-bar = 5.18
Real GDP per capita	overall	14620.88	13906.60	413.95	89327.37	N = 600
	between		11922.80	595.61	61687.13	n = 115
	within		6319.44	-16624.61	53779.17	T-bar = 5.22
Tertiary education	overall	7.98	6.70	0.01	34.79	N = 575
	between		5.88	0.31	24.3725	n = 108
	within		3.35	-3.11	28.90	T-bar = 5.32
Age dependency ratio	overall	62.83	17.54	34.74	108.90	N = 593
	between		17.37	42.07	107.63	n = 116
	within		7.09	33.81	96.37	T-bar = 5.11
Employment in industry	overall	24.32	7.81	3.2	45.6	N = 442
	between		8.55	3.6	40.06	n = 110
	within		3.59	10.68	39.37	T-bar = 4.02
Employment in service sector	overall	55.35	15.80	9.9	83.08	N = 442
	between		16.53	14.95	77.02	n = 110
	within		6.25	30.07	74.93	T-bar = 4.02
Urban population	overall	58.42	22.73	7.211	100	N = 593
	between		22.34	8.46	100	n = 116
	within		4.43	34.73	76.13	T-bar = 5.11

Table A2: The Economic Freedom in the World Index – five dimensions

1: Size of government: expenditures, taxes, and enterprises (EFW1)
A. General government consumption spending as a percentage of total consumption
B. Transfers and subsidies as a percentage of GDP
C. Government enterprises and investment as a percentage of GDP
D. Top marginal tax rate (and income threshold at which it applies)
i. Top marginal income tax rate (and income threshold at which it applies)
ii. Top marginal income and payroll tax rate (and income threshold at which it applies)
2: Legal structure and security of property rights (EFW2)
A. Judicial independence: the judiciary is independent and not subject to interference from the government or parties in disputes
B. Impartial courts: a trusted legal framework exists for private businesses to challenge the legality of government actions or regulation
C. Protection of intellectual property
D. Military interference in rule of law and the political process
E. Integrity of the legal system
3: Access to sound money (EFW3)
A. Average annual growth of the money supply in the last five years minus average annual growth of real GDP in the last ten years
B. Standard inflation variability in the last five years
C. Recent inflation rate
D. Freedom to own foreign currency bank accounts domestically and abroad
4: Freedom to trade internationally (EFW4)
A. Taxes on international trade
i. Revenue from taxes on international trade as a percentage of exports plus imports
ii. Mean tariff rate
iii. Standard deviation of tariff rates
B. Regulatory trade barriers
i. Hidden import barriers: no barriers other than published tariffs and quotas
ii. Costs of importing: the combined effect of import tariffs, license fees, bank fees, and the time required for administrative red tape raises costs of importing equipment: by 10% or less=10, by more than 50%=0
C. Actual size of trade sector compared with expected size
D. Difference between official exchange rate and black market rate
E. International capital market controls
i. Access of citizens to foreign capital markets and foreign access to domestic capital markets
ii. Restrictions on the freedom of citizens to engage in capital market exchange with foreigners — index of capital controls among 13 IMF categories
5: Regulation of credit, labor, and business (EFW5)
A. Credit market regulations
i. Ownership of banks: percentage of deposits held in privately owned banks
ii. Competition: domestic banks face competition from foreign banks
iii. Extension of credit: percentage of credit extended to private sector
iv. Avoidance of interest rate controls and regulations that lead to negative real interest rates
v. Interest rate controls: interest rate controls on bank deposits and/or loans are freely determined by the market
B. Labor market regulations
i. Impact of minimum wage: the minimum wage, set by law, has little impact on wages because it is too low or not obeyed

ii.	Hiring and firing practices: hiring and firing practices of companies are determined by private contract
iii.	Share of labor force whose wages are set by centralized collective bargaining
iv.	Unemployment benefits: the unemployment benefits system preserves the incentive to work
v.	Use of conscripts to obtain military personnel
C.	Business regulations
i.	Price controls: extent to which businesses are free to set their own prices
ii.	Administrative conditions and new businesses: administrative procedures are an important obstacle to starting a new business
iii.	Time spent dealing with government bureaucracy: senior management spends a substantial amount of time dealing with government bureaucracy
iv.	Starting a new business: starting a new business is generally easy
v.	Irregular payments: irregular, additional payments connected with import and export permits, business licenses, exchange controls, tax assessments, police protection, or loan applications are very rare

Table A3: List of countries based on income level (World Bank classification)

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