

DO DATA SHOW DIVERGENCE? REVISITING GLOBAL INCOME INEQUALITY TRENDS

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The present paper shows the results of an empirical study to prove that income inequality has increased over the past decades. To conduct the study, an income inequality dataset containing 133 countries over the 1990-2014 period was created. The results indicate that globally, income inequality (population-weighted Gini coefficients), on average, increased from 38.6 to 41.8 during that period. They further show the existence of variations in the level of income inequality across regions and groups of countries. The reduction in income inequality, among others, remains one of the key challenges associated with the 2030 Agenda for Sustainable Development. Therefore, in this paper, various transmission mechanisms and drivers of the increasing level of income inequality are identified and possible forward-looking development policies to reduce income inequality are given.

JEL classification: D63, Q01, F43.

Keywords: Inequality, Gini coefficient, sustainable development, growth.

I. INTRODUCTION

Government leaders and policymakers have adopted an ambitious and transformative agenda to not only work towards the complete eradication of extreme poverty but also to reduce inequality within the context of the 2030 Agenda for

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Sustainable Development.¹ The Sustainable Development Goals are expected to transform the societal approach to the changing nature of the global distribution of income and transmit the benefits of increasing global income across the countries in order to share prosperity for all. To implement the 2030 Agenda, countries need to be prepared to provide a set of national development policies that are more inclusive and sustainable.

Over the past decade, it has become increasingly evident that the regions around the world are recording growth in varying degrees, while, on average, income and social inequality has risen across various groups and regions. Therefore, with the current cycles of growth volatility, the implementation of the 2030 Agenda is even more demanding, especially to achieve Sustainable Development Goal 10 of the agenda, which is to “reduce inequality within and among countries”² and the explicit commitment to reach “the furthest behind first”.

With global integration increasing, countries are facing a greater degree of uncertainty caused by global growth cycles, financial sector crises and trade deceleration, as well from the consequences of the challenges associated with ageing societies, low levels of human capital and productivity growth, and natural disasters and climate change. Therefore, in implementing the ambitious global development agenda, countries are facing growing challenges from domestic and external forces, which significantly affect the opportunities and equal access to services for citizens to benefit from the global connectivity through finance, trade, investment and information and communication technology.

During the past decades, the impact of this uncertainty has been witnessed mostly in the forms of socioeconomic inequalities across sectors and different groups of people and across developed or developing countries. The prevalence of socioeconomic inequalities in each of the societies across different stages of development translates into a steady deceleration of economic growth prospects, which hampers the process and efforts aimed at eliminating extreme poverty in order to create a space for peaceful and inclusive societies.

The gap between the rich and the poor is widespread across all regions and growing rapidly in many countries. From the Forbes Billionaires list,³ it appears that the combined wealth of 1,826 individuals is significantly higher than the total gross domestic product (GDP) of all least developed countries, landlocked developing

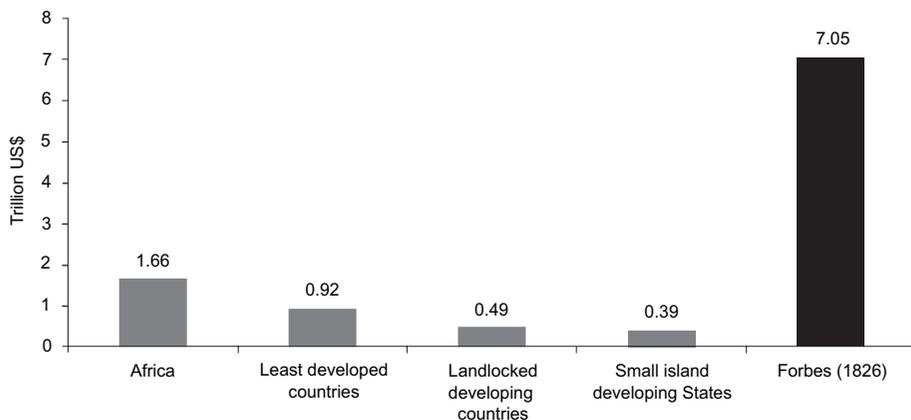
¹ General Assembly resolution 70/1.

² Ibid.

³ Available from www.forbes.com/billionaires/list/.

countries, and small island developing States, and the total GDP of Africa in 2015 (figure 1). Importantly, an analysis of the Forbes billionaires list shows that persons with a net worth of \$1 billion or more accounted for 9.5 per cent of the global income in 2015. The 1,826 persons (0.00005 per cent of the global population in 2015) that are billionaires had a combined net wealth of \$7.05 trillion in 2015. In some countries, the total net worth of the billionaires' net wealth was more than half that of the current level of GDP. The net wealth of the billionaires was eight times more than the combined GDP of the least developed countries (\$0.92 trillion in current prices in 2015). This implies that income concentration is a major characteristic of inequality around the world.

Figure 1. Comparing billionaires net worth in selected developing countries with gross domestic product

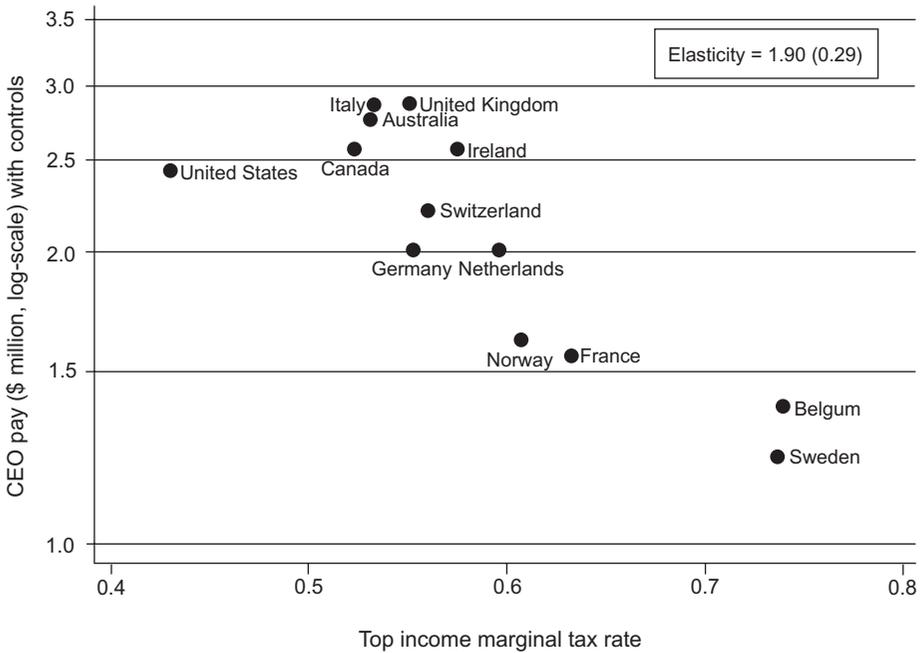


Source: Author's calculations based on Forbes online (accessed 18 March 2017) and the World Bank, World Development Indicator. Available from <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>.

Addition recent evidence is that of the salaries of chief executive officers (CEOs) in various developed and developing countries, including emerging countries, and their implications to inequalities. The theory is that the compensation of top earners is not (only) determined by their productivity but also through bargaining. If top marginal tax rates decline, then the incentive for top earners to bargain harder over extra income is higher, which is why they put more effort into influencing the responsible pay committee. In this context, Piketty, Saez and Stantcheva (2014) explain this relationship through the "compensation bargaining effect" (Alvaredo and others, 2013; see also Bebchuk, Fried and Walker, 2002). They test the hypothesis by

examining the relationship between CEO compensation and top income marginal tax rates, controlling for firm performance and CEO characteristics. Furthermore, Roine, Vlachos and Waldenström (2009) have also shown that tax progressivity reduces top income shares. Indeed, they find support for their hypothesis given the strong negative relationship between CEO compensation and top income marginal tax rates (figure 2).

Figure 2. CEO pay and top income marginal tax rates



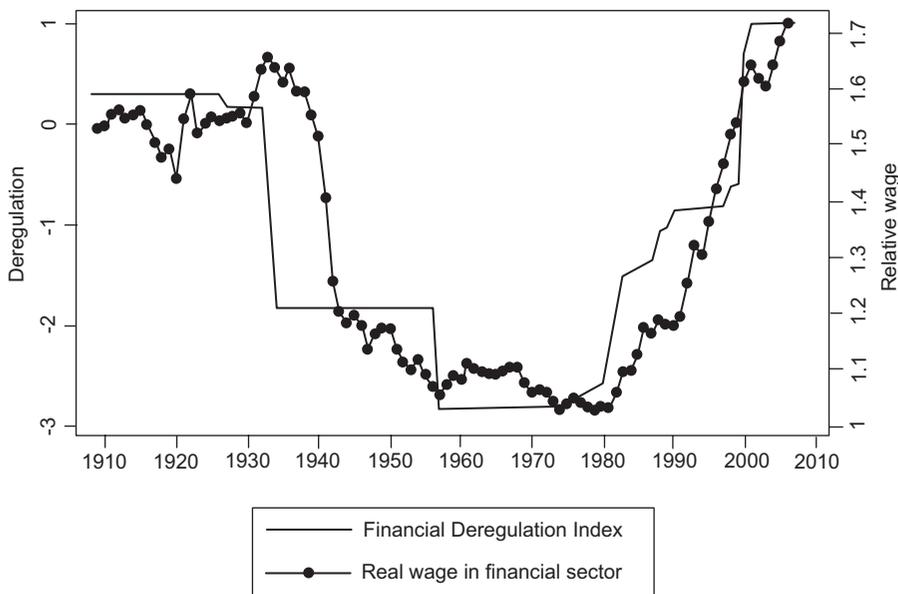
Source: Piketty, Saez and Stantcheva (2014).

Apart from taxation, social transfers, in particular conditional cash transfers, have played a role in the recent decline in income inequality in countries in Latin America, such as Brazil (Arnold and Jalles, 2014) and Mexico (Schultz, 2004).

This can be further analysed with respect to lobbying by the top 1 per cent. In particular, the financial industry is also cited as a factor behind rising income inequality and the recent global financial crisis by Acemoglu (2011), who draws upon the work of Philippon and Reshef. Philippon and Reshef (2012) find an education-adjusted wage premium of about 50 per cent for the finance sector of the United

States of America relative to other sectors in 2006. For top executives, this premium even accounts for up to 250 per cent. They also report a strong positive correlation between financial deregulation and relative wages in finance (figure 3), suggesting that financial deregulation may have contributed to the recent increase in income inequality in the United States.

Figure 3. Relationship between financial deregulation and relative wages in finance in the United States



Source: Philippon and Reshef (2012).

Although top executives in all sectors are able to extract economic rents given their bargaining power to influence their own pay (Bebchuk, Fried and Walker, 2002), executive compensation is particularly high in the financial sector globally, not just in the United States. For instance, Bell and Van Reenen (2014) and Godechot (2012) document the role the financial sector has played in the increase in the income share of the top 0.1 per cent in the United Kingdom of Great Britain and Northern Ireland and France, respectively. Bonuses have contributed to this trend, particularly in the United Kingdom (Bell and Van Reenen, 2014), but also in other Organisation for Economic Coordination and Development (OECD) member countries (OECD, 2011).

Other studies have shown that the size of the financial sector itself, as measured, for example, by private credit to GDP, stock market capitalization to GDP or bank deposits to GDP, can negatively affect income inequality (Claessens and Perotti, 2007; Roine, Vlachos and Waldenström, 2009), unless financial frictions hindering the poor from access to and use of financial service are removed (Dabla-Norris and others, 2015b).

There has been growing recognition that inequality is an impediment to inclusive economic growth, social development and environmental sustainability. First, high levels of income inequality make it more difficult to reduce poverty through economic growth. Unequal societies in terms of wealth constrain the productive capacity of the poor and the vulnerable groups along with their potential to contribute to economic growth. Second, inequality undermines social cohesion and solidarity. A growing divide between the rich and the poor is often a factor behind rising levels of crime and social unrest, as it undermines trust and weakens bonds of solidarity in societies. Third, inequality hampers environmental sustainability. In societies where inequality abounds, collective action is trumped by the pursuit of individual or vested group interest. In these societies, there tends to be less public support for policies designed to protect the environment.

The objective of the present paper is to create a new income inequality dataset covering 133 countries over the 1990-2014 period, and to provide an overview of key factors and policies related to income inequality. The paper also provides a new set of results on the income inequality trends in the United Nations regions and other classifications. It is organized as follows: section II contains an overview of the literature on income inequality, which includes reviews of the literature with a focus on the key drivers of the rising level of income inequality. In section III, there is description of the construction of a new database analysed in this paper, which has been compiled and created by using several available global data sources. The results from the analysis of income inequality are presented in section IV. Finally, concluding observations are given in section V.

II. LITERATURE REVIEW

This section provides a brief overview of a growing body of literature on inequality, especially in terms of income and social services. Figure 4 shows a clear trend of the growing body of literature that covers the issue of inequality. With the adoption of the Millennium Development Goals in September 2000, social and economic services gained further momentum, and brought the striking disparity in income in the global policy debates. It can be seen that over the years, academia and

commentators have invested time and research capacity in discussing and understanding the economics of inequality and its implications.

In particular, since the onset of the 2008-2009 Great Recession, a majority of countries have been experiencing growing income, social and wealth inequality. These countries are also facing economic, social and environmental challenges that can only be addressed through a concerted effort and forward-looking sustainable development policies. The impact of the changing patterns of productivity-enhancing and technology-based economic growth, movement of capital flows, lack of access to affordable energy services, and depressed commodity prices has resulted in falling income shares, especially of the low-skilled workers and the most vulnerable and disadvantaged communities, and has unevenly affected developing countries, especially the least developed countries. Additionally, the relatively low level of economic growth has tilted the income distribution towards the top 1 per cent and raised concerns globally. At the national level, therefore, addressing the concerns of socioeconomic inequality has increasingly become a key priority of development planners.

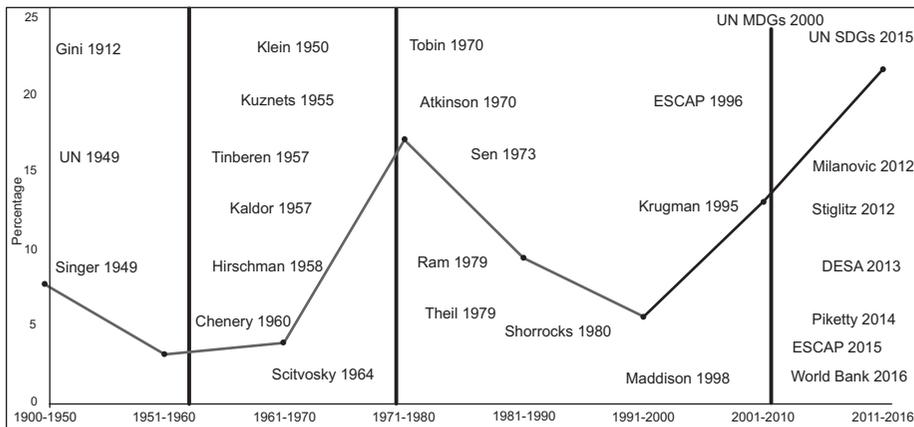
The literature on inequality has been increasing, starting in the 1990s, as compared to discussing only the issues of economic growth. The evidence suggests that beginning in the early 2000s, the focus on inequality by researchers increased in line with the growing debate on the issue of inclusive growth and sustainable development, which led to the adoption of the Sustainable Development Goals in 2015. Since the pioneering work of Gini (1912), and in the aftermath of World War II, the implications of inequality and its associated impact on economic growth (United Nations, 1951; Singer, 1949; Klein, 1950; Kuznets, 1955; Kaldor, 1957; Tinbergen, 1975; Hirschman, 1958; Chenery, 1960; Scitovsky, 1964) have been the focus of economic literature.

During the 1970s to the 1990s, research on inequality declined with respect to the economic growth because of uncertainties related to various global economic issues. However, in the academic world, some important contributions were made during this period, especially with regard to the measurement issues of inequality under the overall context of the economic growth and development discourse (Tobin, 1970; Atkinson, 1970; Sen, 1973; Ram, 1979; Theil, 1979; Shorrocks, 1980). As noted above, in 2000, the United Nations adopted the Millennium Declaration,⁴ which focused on eight time-bound and quantified targets, known as the Millennium Development Goals, to be achieved by 2015. This has led to renewed interest among researchers and think tanks to redirect their focus not only on economic issues, but

⁴ General Assembly resolution 55/2.

also on the implications of economic and social policies on broader ideas and outcomes of development, especially with respect to sustainability of economic growth and development (Krugman and Venables, 1995; ESCAP, 1996, Maddison, 1998; Milanovic, 2012, Stiglitz, 2012; DESA, 2013; Piketty, 2014).

Figure 4. Tracking trends in global inequality research



Source: Computed from Google Scholar site. Available from <https://scholar.google.co.th/> (accessed 18 March 2017).

Notes: Share of total number of articles on issue of “income inequality”, “Gini index”, and “Gini coefficient” to “economic growth”. DESA: United Nations, Department of Economic and Social Affairs. MDGs: Millennium Development Goals. SDGs: Sustainable Development Goals. ESCAP: United Nations, Economic and Social Commission for Asia and the Pacific.

Finally, since the adoption of the 2030 Agenda, in which the global community adopted a goal to reduce inequality within and across countries the importance of addressing inequality has been at the heart of global public discourse (Atkinson, 2015; ESCAP, 2015; Word Bank, 2016).

The current discussion on achieving sustainable development is focusing on the issue of multidimensionality of inequality. In addition to income inequality, two other forms of inequality heavily affect poverty and prosperity: inequality of opportunity, which captures the unequal access to life fulfilment; and horizontal inequalities, which reflects the degrees of inclusion of different groups in society. Inequality of opportunities is usually associated with access to quality services for health and education. In this context, a specific area of concern is gender inequality. Regional policies and legislation that enable women to participate in economic activities specifically, and underpin gender equality more broadly, can improve the

quality of living of all women. Allowing women and men to work equally in economic activities with equal pay, and realize their full potential, is integral to a country's economic resilience and productivity. In the present paper, various aspects of inequality and their linkages to economic, social and environmental aspects are evaluated.

Inequality and growth

It is generally regarded that the higher economic growth is, the better it is for society in general. However, for income inequality, it has not always been clear to policymakers whether lower income inequality implies a better outcome for society. This is because, according to the economics literature, there are various channels through which income inequality may have a negative impact on economic growth and sustainable development outcomes.

One strand of literature highlights the trade-off between efficiency and equality in a society. Income inequality, achieved through redistribution, leads to inefficient outcomes because it entails administrative costs and lowers incentives to work (Okun, 1975; Chaudhuri and Ravallion, 2007). This would imply a positive link between income inequality – through redistribution – and economic growth. Based on the *General Theory of Employment, Interest and Money* of John Maynard Keynes (1936), people with higher income save more as a fraction of their income. If the economy is closed to a sufficient extent, this would mean that lower income inequality, achieved in the form of redistributing sources from the rich to the poor, would decrease national saving and thereby investment and economic growth.

More recent studies mention various transmission mechanisms through which income inequality actually adversely affects economic growth and other social development indicators, such as poverty or inequality of opportunities to access public services. Empirical analysis supports the negative effect of income inequality on economic growth. Barro (2000) lists three theories pertaining to how inequality can negatively affect economic growth. *First*, because of imperfect capital markets, people may not invest as much as they would like to because their limited wealth imposes borrowing constraints on them. In this case, redistribution from the rich to the poor may result in higher returns to average investment and boost economic growth. *Second*, the political economy theory (for example, Perotti, 1993; Alesina and Rodrik, 1994) suggests that higher inequality leads to greater pressure for redistribution, which is likely to distort economic decisions and investment. *Third*, a higher degree of income inequality tends to increase incentives for criminal activities and unrest (for example, Gupta 1990; Alesina and Perotti, 1996). The resulting political instability may threaten property rights and deter investment. Additionally, resources the poor use in

criminal activities and riots are directly wasted and could be used in a more productive manner.

Several recent empirical studies support the view that income inequality has a negative impact on economic growth. For example, Berg and Ostry (2011) find income distribution to be one of the most robust and relevant factors associated with economic growth duration. Ostry, Berg and Tsangarides (2014) show that lower net income inequality is robustly correlated with more rapid and more durable growth for a given level of redistribution. Dabla-Norris and others (2015a) investigate the effect of an increase in different shares of the income distribution on economic growth. They find that a one percentage point increase in the income share of the top 20 per cent is associated with a lower GDP growth by 0.08 percentage points in the following five years. On the contrary, a one percentage point increase in the income share of the bottom 20 per cent is linked to a 0.38 percentage point rise in economic growth. In a report of OECD, a similar conclusion was drawn in which it is argued that income inequality has a negative and statistically significant effect on subsequent growth. Naturally, growing income inequality may influence other inequalities, such as inequality in education or inequality of opportunities. For instance, Cingano (2014) has shown that rising income inequality impairs both the quantity and quality of education of individuals with a poor parental background, while there is no effect on the skill development of individuals from a rich parental background. Similarly, Corak (2013) outlines that rising income inequality tempers intergenerational mobility of income.

Income inequality may also adversely affect economic growth by increasing the likelihood of financial crises (Rajan, 2010; Acemoglu, 2011; Saith, 2011) and by stimulating current account deficits (Kumhof and others, 2012). In addition to economic growth on its own, higher income inequality can dampen the effect of economic growth on poverty reduction (Ravallion, 2004; Rhee, 2012). Higher income inequality may raise the power held by the elite of a country, which, in turn, may increase the likelihood that the provisions of public goods will be cut. This may further intensify income inequality as the poor tend to benefit more than the rich from the provision of public goods (Putnam, 2000; Bourguignon and Dessus, 2009).

In summary, higher inequality is therefore associated with worsening economic, social and environmental outcomes, as it hampers economic growth, fosters unrest, crime and social instability and undermines sustainable environmental governance (ESCAP, 2017).

Key factors driving income inequality

Given the negative impact rising income inequality can have on economic growth and other sustainable development factors, it is essential to understand the

underlying drivers of income inequality. There are several theories and empirical links that indicate the potential drivers of income inequality over the last decades (see Atkinson, 2015; Stiglitz, 2012; DESA, 2015; ESCAP, 2015). In this paper, some of the factors driving the income inequality across the regions are highlighted.

Trade and globalization

Frequently debated drivers of income inequality are trade and globalization. Both empirical and theoretical analyses have produced unclear results regarding the existence and the nature of the impact of trade and globalization on income inequality. While Goldberg and Pavcnik (2007), after analysing Brazil, Chile, Colombia and Mexico in the 1990s, have found no effect of trade liberalization on income inequality, while a vast majority of researchers have come up with the opposite results. The nature of this effect remains mixed.

Following the Heckscher-Ohlin theorem,⁵ trade and globalization affect income inequalities differently, depending on the level of development of the country. In developed countries, which are generally more abundant in capital and skilled labour, the return to capital as well as the wage of skilled workers increases following trade liberalization, which leads to an increase in income inequality. In contrast, as developing countries are generally more abundant in unskilled labour, they experience an increase in the wages of unskilled workers and a decline in the return to capital or the wages of skilled workers. The result is a decline in income inequality following the opening of the goods market (Stolper and Samuelson, 1941). On the contrary, Milanovic (2005) finds empirically that trade openness benefits the rich relative to the poor in very poor countries, while it benefits more the middle class and the poor as the country becomes richer. Cragg and Epelbaum (1996) have also found that trade increased the wage premium in Mexico.

A study conducted by the International Monetary Fund (IMF) indicates that while financial globalization increases income inequality, trade globalization has a reducing effect. The mixed results may arise from the difficulty in disentangling the effect of globalization or trade from other factors, such as technological change (IMF, 2007). For instance, following the liberalization of trade, a developing country may

⁵ According to this theory, autarky countries focus on the production of goods, which use intensively the production factor (capital, skilled or unskilled labour) that is abundant in the country. When a country opens up to trade, it exports the good which uses intensively the factor abundant in that country. This greater demand from abroad would lead to an increase in the price of the exported good and an increase in the return to the corresponding production factor relative to the pre-liberalization price levels. Additionally, the price of the imported good and the return to the factor intensively used in the production of the imported good would decline.

import technology, which, in turn, favours skilled over unskilled workers and increases income inequality. Both trade liberalization and technological change certainly play a role in this case.

According to Buckup (2017), the impact of globalization on income inequalities is inherent to countries' sectoral concentration. Indeed, if globalization of capital and knowledge enables countries to achieve greater diffusion of market power, a stark concentration of this diffusion at the sectoral or organizational level results in rising income inequalities. In this way, countries where sectoral concentration has declined in the recent decades, such as the Republic of Korea, income inequality has fallen whereas it has increased in countries, such as Norway, where sectoral concentration has intensified.

On a similar note, Hartmann and others (2017) find that countries exporting complex products (as measured by the Economic Complexity Index) tend to have lower levels of income inequality than countries exporting simpler products. These results suggest that a country's structure of production may have a limiting effect on income inequality.

Skill-biased technological change

Acemoglu (1998) provides a theoretical model that explains how technological change can benefit skilled over unskilled workers and thereby increase wage inequality if it is skill-complementary. Indeed, technological change is said to have been skill-biased over the last sixty years in the United States (Acemoglu, 2002). By complementing skills, which is generally proxied by education, technological change increases the productivity of highly educated workers relative to less educated workers and thereby increases the wage income of the former relative to the latter group, resulting in a rise in wage inequality. Greater returns to education on the back of a skill-biased technological change raise the incentives for individuals to obtain a higher education, which would result in an increase in the supply of skills (the demand for education) and, at least to some extent, lower wages of skilled workers. However, in spite of an increase in the supply of skills in the United States from the middle to the end of the twentieth century (Autor, Katz and Krueger, 1998), the college wage premium actually increased during the same period (Juhn, Murphy and Pierce, 1993; Acemoglu, 2002). This implies that demand for skills has risen even more strongly than the supply of skills. The race between schooling and technology seems to have been won by technology (Tinbergen, 1975; Goldin and Katz, 2008).

Apart from the United States, skill-biased technological change has been cited as a key driver of the rise in income inequality in Asia (Rhee, 2012) and in several OECD countries (OECD, 2011).⁶ In particular, the emergence of technological changes, market-oriented economic reforms that raise skill premiums for more educated talents and reduce employment and wage prospects for low-skilled workers, raise further the income inequality across the population groups.

Demographic changes

In developed countries, demographic changes, such as in family structures, have been cited recently as factors that contribute positively to household income inequality. In OECD countries, single-headed households have risen to its highest level. Notably, these household cannot benefit from economies of scale, such as from pooling resources and sharing expenditure (OECD, 2011). Another phenomenon likely to have contributed to growing household income inequality is “assortative mating” (Greenwood and others, 2014; Schwartz, 2010; OECD, 2011). More people are marrying someone with a similar education level and income, which worsens income inequality. Examining the United States from 1967 to 2005, Schwartz (2010) finds that in the absence of the mentioned phenomenon, earnings inequality would have increased by about 25-30 per cent less than it actually has. Daly and Valletta (2006) similarly regard the increase in the number of single-headed households as a key driver of the growth in income inequality in the country.

Institutions

In a democratic political system, a country, on behalf of its citizens, would be expected to act in line with the wishes of the median voter. In a democratically restricted country, greater democracy, perhaps a widening of the voting franchise, should result in increased pressure for income redistribution as the median voter would move further down in the income ladder. The hypothesis that follows is that the more democratic a country is, the more progressive the taxation system and the lower income inequality should be (Meltzer and Richard, 1981).

Indeed, there may be situations when greater political enfranchisement actually does not lead to lower income inequality (Acemoglu and others, 2013). For instance, if social mobility is high and the right expectations hold, poor people may find it more attractive to vote against redistribution if they expect to be among the better-earning segment in the near future and if tax policy regimes are complex and regressive.

⁶ See Basu and Das (2011) for further discussion on the analysis that higher level of skill and technology intensive manufactures could help increase GDP per capita in developing countries, but the impacts may vary depending on the level of institutions and other conditions of the economy.

Equally, people do not necessarily vote for a political party only based on their preference towards redistribution and income inequality. There are many other relevant policy stances, which may be more important for the voter.

Additionally, *de jure* power of a democracy does not have to be equal to *de facto* power. Bonica and others (2013) mention factors that may explain a less than expected negative relationship between democracy and income inequality in the United States. They argue that voting participation is skewed towards the top end of income distribution. For instance, of those households earning less than US\$15,000 annually, less than 50 per cent of them voted in recent elections. On the contrary, of those households earning more than \$150,000 annually, more than 80 per cent of them voted. The fact that a higher proportion of the poor represents non-citizens who are not eligible to vote also plays a role. Bonica and others (2013) provide further evidence that policy is more responsive to the opinions of the rich than to those of the poor. They state that if 80 per cent of the richest segment of society supports a policy change, there is a 50 per cent chance that it gets passed. However, if 80 per cent of the poorest segment is in favour of a policy change, then the chance of getting the change passed is only 32 per cent. This sheds light on the role of lobbying by the rich and in particular the financial industry. The share of the total income of the top 0.01 per cent of households in the United States is about 5 per cent, but its share of total campaign contributions amounts to approximately 40 per cent.

Structural issues

Other factors are also influencing the increasing trends in income inequality, namely (a) during the transition from agriculture to industry and services, wages vary more significantly while agricultural productivity lags behind, creating a large-scale variation across different groups of the population, as well as between rural and urban sectors, (b) decreasing bargaining power of workers as the role of trade unions and collective bargaining power have declined during the past decade, which has resulted in higher wage inequality (ILO and European Commission, 2017), and (c) credit market imperfections.

In particular, the structural issue of inequality is related to household debt. This finding conforms with recent research at IMF, which shows how inequality can lead to household indebtedness. With income growth lagging, the poorer sections of society increase debt-financed consumption. This is made possible by the availability of cheap credit, as higher income groups deposit their increasing wealth in the banking system. Such a transmission process could lead to ever-rising household debt in countries with growing inequality, making them vulnerable to shocks. As households spend more than they earn, countries face growing current account deficits, exacerbated by luxury imports by the well-off.

III. METHODOLOGY AND DATA

The analysis in the present paper is based on the measure of inequality: the Gini coefficient of inequality.

Gini coefficient

The following standard formula is used for calculating the Gini coefficient:

$$Gini = \frac{\sum_{j=1}^N \sum_{k=1}^N |y_j - y_k| P_j P_k}{2\bar{Y} \left(\sum_{i=1}^N P_i \right)},$$

Where y_i is country's i 's relevant measure of income and/or consumption (or indicator of interest), and P_i is country's i 's population. \bar{Y} is the total average income and/or consumption weighted by population:

$$\bar{Y} = \frac{\left(\sum_{i=1}^N y_i P_i \right)}{\sum_{i=1}^N P_i}.$$

The Gini coefficient will give a value between 0 and 1, with 0 signifying perfect equality and 1 signifying perfect inequality.

Country groupings

This paper is based on the regional grouping of the United Nations regional classification, which is as follows: Economic and Social Commission for Asia and the Pacific (ESCAP), Economic Commission for Europe (ECE), Economic Commission for Africa (ECA), Economic and Social Commission for Western Asia (ESCWA) and Economic Commission for Latin America and the Caribbean (ECLAC). Other country groupings include classifications by development stage, income and the United Nations Human Development Index.

Data

To analyse income inequality trends, data from different sources are used with the goal to compile a database with the most reliable, time-consistent and comparable Gini coefficients possible. The Gini coefficient used in the analysis is based on household market (gross) income. Using data on the market (gross) income means that the effect of transfers and taxes is not considered. The reason for this is as

follow: while the net Gini coefficient may be a better measure of the actual income distribution, the gross Gini coefficient may be a better measure of the income distribution a country wants to achieve in the long term. In the short term, redistribution is important to increase incomes of the lower part of the distribution and thereby help them take advantage of opportunities that otherwise are restricted to the upper part of the distribution. However, the long-term goal should be to enable the highest number of citizens possible the same opportunities to participate in the production of a country and earn a decent income prior to redistribution. Additionally, this paper focuses on developing countries. Although the actual (net) income distribution may significantly differ from the market (gross) distribution in a number of developed countries. As the net Gini coefficient is usually lower than the gross Gini coefficient in several developed countries, this deviation is less significant in developing countries (where redistribution is usually of a limited size measured as per cent of GDP).

In preparing the dataset for income inequality, the “All the Ginis” dataset for ECLAC and data from the Statistics Division of ESCAP for ESCAP are used because the two data sources provide fairly complete data directly from household surveys for most countries in the region for the period 1990-2014. This makes it possible to bypass various limitations of the Standardized World Income Inequality Database (SWIID, version 5.1) for some developing countries. For ECA and ESCWA, data from SWIID are used because no reliable source with fairly complete data over the years are available and SWIID provides the most complete estimates. For ECE, data from SWIID are used because it consists of data from the Luxembourg Income Study, which covers data from household surveys for most member States of ECE, as a standard. The Luxembourg Income Study is generally regarded as a very reliable source.

It should be noted that while estimates from SWIID are based on a household adult-equivalent scale (Solt, 2016), this study has almost exclusively drawn on data based on the household per capita income level from the “All the Ginis” dataset (Milanovic, 2014). It is assumed that the difference is negligible although for within-region comparisons over time, the different household equivalence scale is not crucial as the same data source for each United Nations region is used throughout the period under review.⁷

⁷ SWIID uses the Luxembourg Income Study as a standard and combines data from various sources to generate estimates of market and net income Gini coefficients for a wide range of countries over time. Its aim is to maximize the comparability of income inequality data while maintaining the largest coverage possible across countries and over years. While it outperforms other available datasets on income inequality based on coverage of countries and years and has predicted Luxembourg Income Study data well, it should be noted that a limitation of SWIID is that for developing countries, estimates are mainly based on data observed in other countries.

Thus, the same data source for the whole period for each United Nations region is used, but different sources are used for different regions. It follows that when comparing Gini coefficients of different United Nations regions or countries from different United Nations regions, the analysis should focus on the trend over time rather than the absolute value, as values are consistent over time for each region and country but not completely consistent across regions because of the different data sources used.

Simple and population-weighted Gini coefficients are calculated based on different classifications: United Nations region (for example, ESCAP), the United Nations development stage (for example, least developed countries), the World Bank income classification (for example, lower-middle income) and the United Nations Human Development Index (for example, high-human development). Gini coefficients are calculated per country for five-year periods, namely 1990-1994, 1995-1999, 2000-2004, 2005-2009 and 2010-2014. In all the periods, the data that are available for at least one year of the period for a particular country are included. For the United Nations development stage classification, countries are clustered into country groups according to a country's status. For the World Bank income classification, countries are clustered into country groups based on a country's status in August 2016. For the United Nations Human Development Index classification, countries are clustered into country groups based on a country's average of the available Human Development Index data in 2015. To calculate population-weighted Gini coefficients, population data are drawn from the United Nations. In total, the final database used for the analysis comprises 133 countries. This empirical evidence clearly provides a unique opportunity to explore in-depth a rich and newly created dataset on income inequality for 133 countries from all regions, developed and developing countries, over the period 1990-2014.⁸

IV. RESULTS

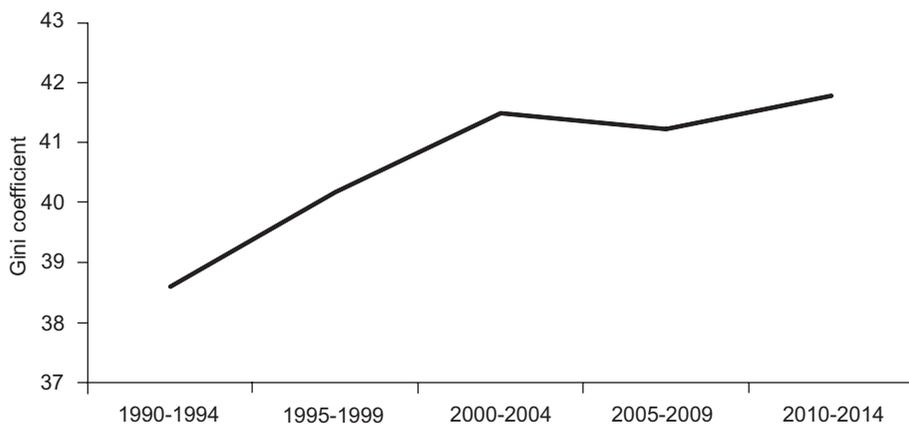
This section presents the trends and patterns of global income inequality since the 1990s according to the United Nations regional commission classification, the level of development and income of countries, and the Human Development Index.

⁸ The full set of the Inequality database is available upon request from the author.

Global analysis

Globally, based on a sample of 133 countries, market income inequality has increased from the early 1990s to the late 2000s, as indicated in figure 5. The population-weighted Gini coefficient was about 38.6 during the period 1990-1994; it rose to 41.8 in the 2010-2014 period. Even though there was a small change during the periods 2000-2004 and 2005-2009, the overall increase from 1990-1994 period to the 2010-2014 period corresponds to a 3.2 per cent increase.

Figure 5. Global population-weighted Gini coefficient based on market income, 1990-2014



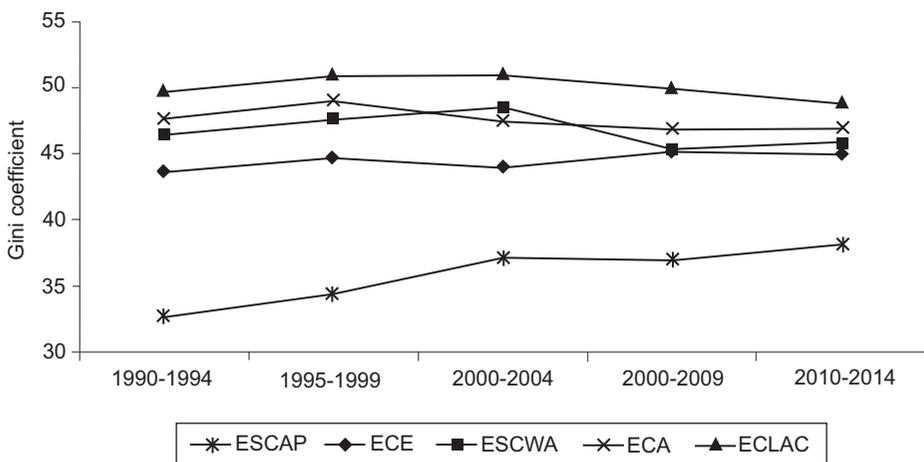
Source: Author's calculations.

Regional analysis

Figure 6 shows the population-weighted market income Gini coefficient in five periods between 1990 and 2014 for the five United Nations regions. Contrary to the global trend, ECA experienced a decline in market income inequality during the same period. In the 2005-2009 period, the market income Gini coefficient was lower than the one of the ECE region. The latter region experienced a 1.4 per cent increase over the past decade. Market income inequality in ECLAC increased marginally during the period 2000-2004, but then went down in the following periods. Despite the recent slight decline, ECLAC remained the region with the highest income inequality throughout the two decades, with the market income Gini coefficient being just above 50 in the most recent period. While ESCWA exhibited an increase in market income inequality from the early 1990s to the early 2000s, the level decreased in the latest

period. The market income Gini coefficient of ESCAP rose sharply, by 5.4 per cent, from the period 1990-1994 to the period 2010-2014. Although the increase, which was mainly driven by China and India, is the largest among the five regions, the level of market income inequality in ESCAP was still low compared to ECLAC, ECE, ECA and ESCWA.⁹

Figure 6. Trends of the market income Gini coefficient, 1990-2014, regions



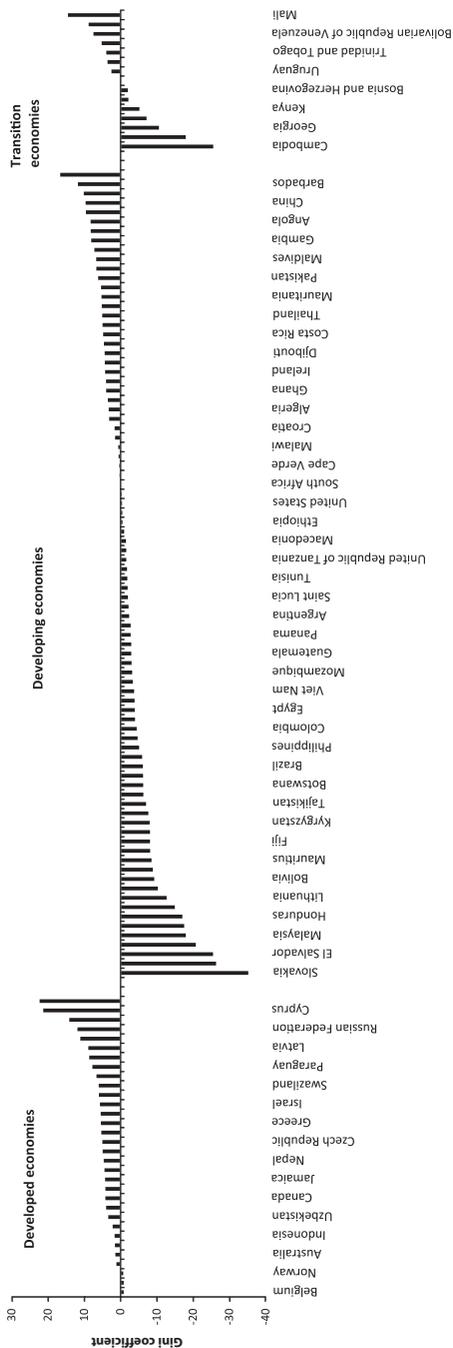
Source: Author's calculations.

At the national level, figure 7 presents the fact that income inequality (as measured by the Gini coefficient) had different patterns across countries over the past two decades.

By comparing the compound annual change from the 1990s to the 2000s, the data show that in the majority of developed countries, income inequality has steadily increased, while in developing countries, the evidence has been mixed, depending on the region. In particular, for major developing countries, the evidence shows that there is a large difference in income inequalities and that income equalities have increased in varying degrees over this period of unprecedented global growth mixed with heightened financial market uncertainty.

⁹ ESCAP (2017) notes that “in addition, income inequality has been growing in China, India, Indonesia and the Russian Federation, among other countries, leaving more than 60 per cent of the region's population to live in countries where income inequality is increasing”.

Figure 7. Compound annual change in Gini coefficient, 1990-2014



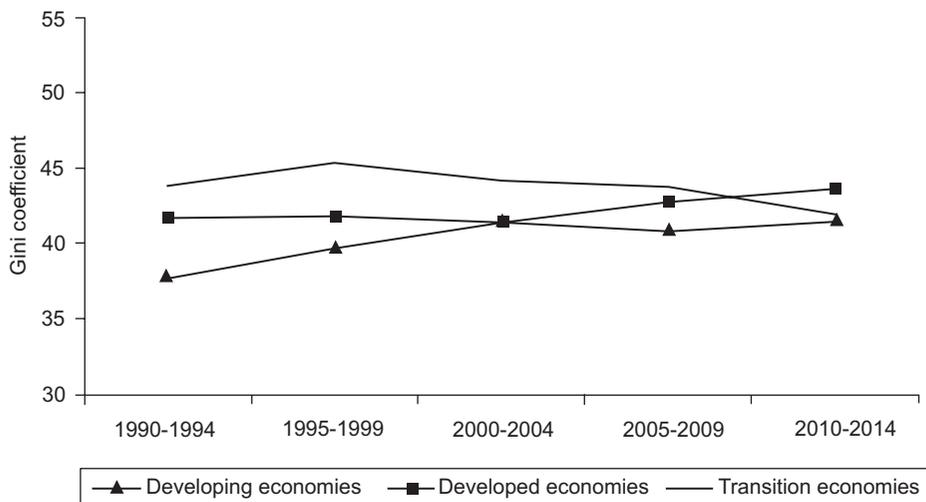
Source: Author's calculations.
 Notes: Countries are classified according to the United Nations data sources as indicated in the annex.

Development stage and income-based analysis

This section describes the trends of market income inequality of country groups, which are in a different United Nations development stage and are classified differently based on the World Bank income classification.

Figure 8 shows the market income inequality trend for developed, developing and transition countries. While both developed and developing countries experienced an increase in market income inequality from the 1990-1994 period to the 2010-2014 period, the population-weighted Gini coefficient tended to go down in transition economies. Developed countries, on aggregate, had the highest level of market income inequality throughout the whole period, while the increase in the Gini coefficient for developing countries was mainly because of the increases for China and India. However, it should be noted that those countries on aggregate have the highest level of redistribution as well.

Figure 8. Trends of the market income Gini coefficient, 1990-2014, level of development

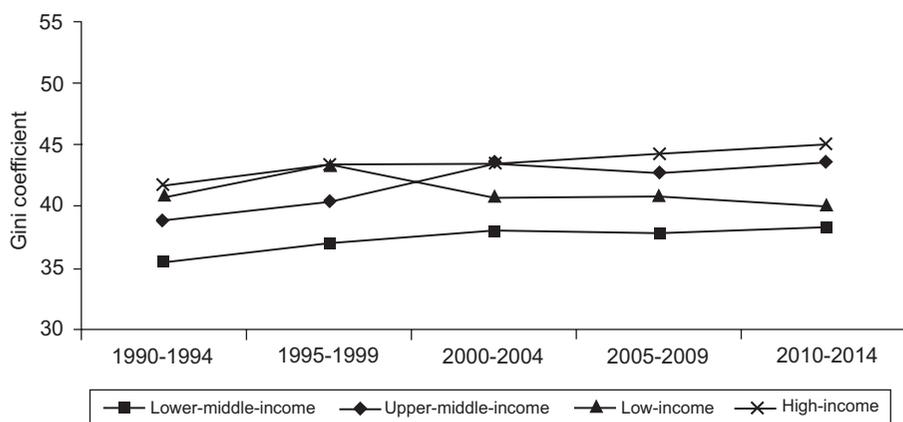


Source: Author's calculations.

Figure 9 shows the evolution of the population-weighted market income Gini coefficient from 1990 to 2014 by the World Bank income classification. For example, high-income and upper-middle-income countries show a rise in income inequality over the 25-year period, although upper-middle-income countries, on aggregate, exhibited

a decline after peaking during the period 2000-2004, but it is again picking up. While lower-middle-income countries similarly experienced a slight steady increase from 1990 to 2014, in low-income countries, market income inequality, on average, decreased gradually. As far as the level is concerned, lower-income countries seem to have a lower market income Gini coefficient than higher-income countries.

Figure 9. Trends of the market income Gini coefficient, 1990-2014, income classification



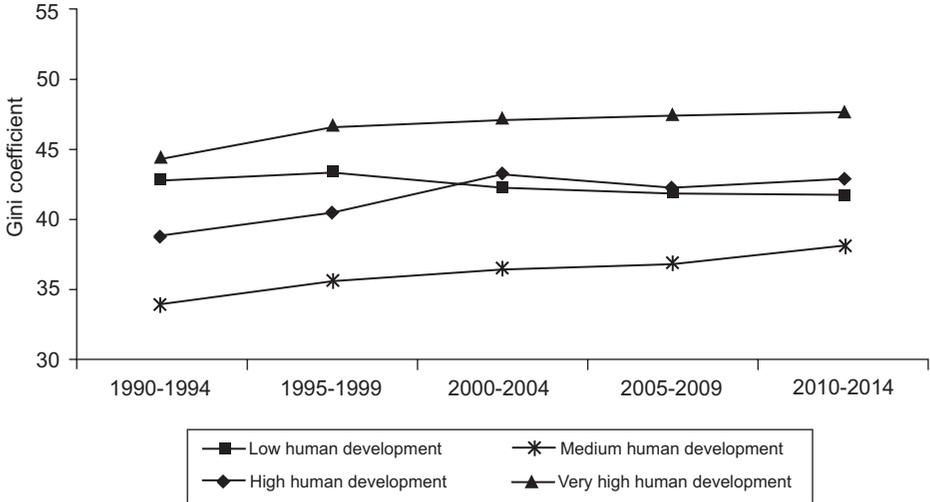
Source: Author's calculations.

Human development-based analysis

In the last step, the population-weighted market income Gini coefficients for country groups with a different level of human development is computed, as measured by the United Nations Human Development Index. The index is composed of measures of life expectancy, education and per capita income. Figure 10 shows the trends for country groups, which, on average, had a very high (value > 0.8), high (0.7-0.8), medium (0.5-0.7) and low (< 0.5) HDI in the 1990-2014 period. When comparing the trends of the four categories, the picture seems less clear.

Countries with a very high Human Development Index exhibited an increase in the market income Gini coefficient and had the highest level throughout the entire period, similar to the scenarios mentioned above. However, income inequality in high Human Development Index countries decreased after an increase in the period 1995-1999. While the Gini coefficient in low Human Development Index countries went down from 1990 to 2014, countries with an average medium Human

Figure 10. Trends of the market income Gini coefficient, 1990-2014, Human Development Index



Source: Author's calculations.

Development Index exhibited a rise but the Gini coefficient was still lower than other groups of countries.

V. CONCLUDING REMARKS

The present paper has provided an overview of key literature describing the relationship between income inequality and economic growth, relevant drivers of income inequality based on theory and empirical analysis. It included a discussion of global income inequality, by using Gini coefficient trends over the period 1990-2014, using a dataset of 133 countries. The dataset was compiled from different available income inequality databases in order to obtain a broader set of comparable data over time within each United Nations region and to some extent still maintain comparability across United Nations regions.

The findings show that globally, based on the population-weighted market income Gini coefficient, income inequality has increased from the 1990 to 2014. By the United Nations regions, however, the trends have been diverse. While the African United Nations region has experienced a decline in market income inequality, both the European and Asia and Pacific regions of the United Nations recorded increases in

market income inequality. The population-weighted market income Gini coefficient of the United Nations region of Western Asia has been declining, while the Gini coefficient for the Latin America and Caribbean region remained high during the period even though the Gini coefficient had declined between the periods.

As far as the classifications by the United Nations development stage, the World Bank income and the United Nations Human Development Index are concerned, on average, the developed and richer countries tended to experience increases in market income inequality. While middle-income countries also experienced an increase in the market income Gini coefficient, market income inequality in transition economies declined.

While it should be noted that analysis in this paper is merely of a descriptive nature and no causation or correlation has been shown between income inequality and GDP per capita or other social and environmental outcomes, a few policy suggestions can be made keeping in view the sustainable development goals and targets:

- For the increase in market income inequality of high-income countries, available literature suggests that skill-biased technological change has played a role. However, deregulation and increasing compensation of executives in the financial sector and institutions also appears to have contributed to market income inequality in many countries, particularly in developed economies.
- Middle-income countries also went through two decades of rising market income inequality. With China and India being part of this group, key explanations likely include skill-biased technological change alongside trade liberalization. Least developed countries and small island developing States, on average, recorded a slight increase in market income inequality between 1990 and 2014. The landlocked developing countries, on average, experienced a slight decline during the same period. The structural transformation is essential to overcome many of the economic and social policy constraints in these economies, while taking into account the opportunities from technological advancements in the national development planning processes.
- Redistributive policies, such as conditional cash transfers, may have limited the increase or even accounted for a decline in market income inequality in some countries. However, it should be noted that a rise in income inequality, measured by the market income Gini coefficient, does not always mean that certain segments of the population have suffered. For instance, if only the top 10 per cent of a population increased their real

income over a certain period and the other 90 per cent maintained the same real income, income inequality would go up, even though no one would be worse off than at the beginning of the period. Still, in the longer term, countries need to ensure that economic growth is shared by everyone. This may be achieved through redistributionary policies or by structural transformation policies, among others, so that all people benefit from the 2030 Agenda.

With the adoption of the 2030 Agenda, there is no doubt that countries will redouble their policy focus to increasingly address the issue of growing income inequality as part of their national transformative process. Importantly, this paper paves the way for undertaking further research in the area of income inequality as it contains a reliable and consistent panel dataset covering 133 countries over the period 1990-2014.

The findings of this paper clearly indicate that various regions' past record in lowering economic and social inequality has been less than impressive despite solid economic growth and reduced poverty. From the policymakers' point of view, looking ahead, the changing global, regional and national economic and business prospects would make the task even more demanding.

As countries become more knowledge-based, ageing societies emerge, climate change intensifies, and growth in developed economies adjusts to a lower rate, more people could be left behind while the fiscal burden to ensure equal opportunities and social protection will likely rise in the developing countries, especially in the least developed countries. Without a doubt, policymakers will consequently have to put more effort into overcoming these socioeconomic inequalities. If income and non-income inequality are left at high levels for an extended period of time, it would not only impair the positive impact that economic growth has on poverty reduction but it would also risk causing social tensions and unrest, which, in turn, could derail the development process, and adversely affect progress made in building and sustaining inclusive and peaceful societies. It is encouraging to note that countries are increasingly recognizing the importance of this issue and placing inequality at the core of their national development processes and planning frameworks.

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Annex

United Nations regional classification

Economic Commission for Europe (ECE)	Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, ^{c, f} France, ^{c, d} Germany, ^c Greece, Hungary, Iceland, Ireland, Israel, Italy, ^{c, e} Latvia, Lithuania, Luxembourg, Republic of Macedonia, Moldova, Netherlands, ^c Norway, Poland, Portugal, ^c Romania, Slovakia, Slovenia, Spain, ^c Sweden, Switzerland, Ukraine and United Kingdom ^{c, d}
Economic and Social Commission for Western Asia (ESCWA)	Egypt, ^a Jordan, Lebanon, Morocco, ^a Syrian Arab Republic, Tunisia, ^a Yemen
Economic Commission for Latin America and the Caribbean (ECLAC)	Argentina, Barbados, Bolivarian Republic of Venezuela, Bolivia (Plurinational State of), Brazil, Canada, ^b Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Suriname, Trinidad and Tobago, United States ^{b, c, d} and Uruguay
Economic and Social Commission for Asia and the Pacific (ESCAP)	Armenia, ^b Australia, Azerbaijan, ^b Bangladesh, China, Fiji, Georgia, ^b Indonesia, India, Iran (Islamic Republic of), Kazakhstan, ^b Kyrgyzstan, ^b Cambodia, Lao People's Democratic Republic, Maldives, Mongolia, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Russian Federation, ^b Sri Lanka, Thailand, Tajikistan, ^b Turkey, ^b Uzbekistan ^b and Viet Nam
Economic Commission for Africa (ECA)	Angola, Algeria, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Côte d'Ivoire, Djibouti, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia and Zimbabwe

Sources: ECE: www.unece.org/; ESCWA: www.escwa.un.org/; ECLAC: www.cepal.org/en/; ESCAP: www.unescap.org/; and ECA: www.uneca.org/.

Notes: ^a Member States of ECA.

^b Member States of ECE.

^c Member States of ECLAC.

^d Member States of ESCAP.

^e Excluding the Holy See and San Marino.

^f Including Åland Islands.