Neo-liberal globalisation and income inequality: panel data evidence from OECD and western Balkan countries

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Abstract:

Over the last few decades, neo-liberal globalisation – marked especially by the liberalisation of finance, extended processes of commodification/privatisation, free trade and free flow of capital – has coincided with a rising income inequality and an ostensible decline in global poverty levels, the latter being largely attributed to China's and India's rapid economic development since the 1980s. Using a three-year-averaged non-overlapping data from 1991 to 2017 covering 39 OECD and western Balkan countries and applying the efficient Feasible Generalised Least Square (FGLS) estimation method, this article examines the effect of institutional "quality", export complexity, and labour union density on income inequality. We have indications that neo-liberal globalisation, measured using the KOF globalisation index and sub-indicators, is positively correlated with income inequality. We have also indications that institutional "quality", that is, mechanisms of "good governance", tend to reduce income inequality. Importantly, the level of economic or export complexity and the degree of labour unionization were also found to reduce income inequality, while improving institutional "quality" and mitigating downward pressures on wages.

Key words: Inequality, globalisation, economic complexity index, institutions, rule of law, labour unionisation

Introduction

Apart from the neo-liberal economics of Friedrich Hayek and Milton Friedman, one should also point out that the theoretical premise of globalisation draws on the neo-classical economics of trade and financial liberalisation, as articulated by the Stolper-Samuelson and Hecksher-Ohlin theorems. The view is that the removal of trade and capital barriers will allow consumers in richer countries to have access to cheaper goods and services produced by poorer countries (the price-lowering effect), which in turn would prosper poorer countries supplying their abundant cheap labour and materials (the trickle-down effect). Historically, globalisation is consubstantial with the advent of capitalism and the establishment of nation-states in imperialism.[1] Broadly speaking, the first bout of globalisation is attributed to the era of the Gold Standard (1870s-1914); and the second bout in the period that followed the collapse of the Bretton Woods system (1971 to the present day). This second period of globalisation that preoccupies us here has, arguably, delivered on some of its promises: it contributed to poverty reduction, technological innovation, and promoted gender equality, although not without avoiding the proletarianization of parenthood. It could also be argued that it advanced economic growth, but in western contexts this was a type of financialised growth driven by excessive borrowing and speculation, especially in the 1990s.[2] Nevertheless, global economic integration has led the U.S., E.U. and Japanese markets to be flooded with cheap imported goods and has resulted in millions of people in China, India, Brazil and other emerging markets to be lifted out of poverty, and in some cases there have been an emergence of a sizeable affluent middle class in these relatively poorer economies. For instance, the proportion of people living in absolute poverty has fallen from 36% in 1990 to 19% in 2008[3]. Whereas the first bout of globalisation had benefitted the USA at the expense of European colonial systems, the second bout benefitted Asia and, together, the entire globe.

Despite the seemingly beneficial impact of globalisation, there is a growing sense that it has also been contributing to the widening of income inequality. In fact, since the 1990s, a new wave of 'anti-globalisation' movement has started to denounce the unfettered rise of the phenomenon[4]. According to these antagonists, the increasingly integrated global economy marked by free trade and flow of capital and the tapping of cheaper foreign labour markets by multinationals, negatively impacted poorer economies and certain income groups in richer nations[5]. The impact on developed economies is seen to be the rising gap in wages between skilled and unskilled workers[6]. For example, the wages of unskilled workers in the US and Europe is seen to have fallen in real terms by 20% since the 1970s as a result of 'globalisation' and the introduction of new technologies[7]. The developing economies are seen to be worse-off as they continue to experience a proliferation of 'sweatshops' and general exploitation of cheap labour markets and raw materials. Furthermore, WTO rules is seen to be tilted towards the richer nations, thus helping to push down the price of agricultural-based goods, which are the main exports of the low-income nations and exposing these countries to more risk and volatility [8].

Although the global financial crisis of 2007/08 that was followed by the eurozone/Greek debt crisis and the sharp fall in oil and commodity prices caused a huge dent in global trade, recent events such as the 'Brexit' referendum in the UK in 2016, the election of Donald Trump as the president of the United States, the rise of far-right political parties in Europe, are further manifestations of the negative sentiment against globalisation and European integration. Falling real-wages, uncertainty in the labour market, and lack of opportunities and training for the unskilled workers in the US, UK and Europe coupled with the exponentially rising incomes of the top 1% of the population within these countries could be said to underlie the extreme populist movements of the Left and the Right and distrust of the ruling establishment and the contemporary socio-economic structure of capital accumulation.

There has been limited empirical research on the impact of globalisation on income inequality in countries of the western Balkan region. We carry out an empirical analysis of the western Balkan region as well as the OECD economies using recent data that covers the period from 1991 to 2017. We introduce three new variables in our econometric analysis, in addition to the globalisation measure, to explain income inequality. The variables introduced are the level of economic or export complexity, the quality of institutions and the degree of labour unionisation. Building on existing literature that suggests these variables play a significant macroeconomic role in the growth and income distribution of a country, we build an empirical model that accounts for these very vital factors. We use an efficient and consistent estimator that allows for the generalisation of our findings. In sum, by accounting for all these very important factors in our analysis and utilising an efficient and consistent estimator that also allows for a relative generalisation of our results, we provide a more accurate picture of the causes of inequality in western Balkans and other economies. We argue that our results carry wider policy implications.

The remainder of the paper has been divided into four parts. The first part looks into the existing literature of on the impact of globalisation, ECI and institutions on inequality. The second part is a brief account of the economic and political transition of the western Balkans since the 1990s. The third section introduces the data, research methodology, empirical model and findings. The final section highlights the key comparisons between the OECD and western Balkans and briefly looks into policy implications of our findings for the western Balkans.

The impact of globalisation, economic complexity and institutions on income inequality

There are numerous texts in the neo-classical tradition highlighting the gains of free trade and liberalisation that empirically establish the positive impact of trade liberalisation on economic growth. Trade openness, the argument goes, enables countries to exploit comparative advantages, gain from specialisation and foster innovation and efficiency in line with the Stolper-Samuelson and Hecksher-Ohlin theorems. The foundation of these theories suggest that trade liberalisation will benefit a country's relatively abundant factor as specialisation happens in sectors intensive in the abundant factor. Empirical analysis using trade-

openness as a proxy of globalisation find that it is positively associated with higher economic growth.[9] Other studies, as we have seen, based on analyses pioneered by Robert Brenner and Giovanni Arrighi, show that trade liberalisation is structurally determined by uneven (and combined) development, benefiting some countries and regions at the expense of others.[10]

Some empirical studies looking at the relationship between trade liberalisation and income distribution support the Stolper-Samuelson theorem which is based on the concept of *comparative advantage*. The developing countries where unskilled labour is an abundant factor will have a comparative advantage in this factor of production, and trade liberalisation in these countries will increase the demand for unskilled workers and their wages thus lowering the levels of inequality[11]. However, if the Stolper-Samuelson and Hecksher-Ohlin theorems are extended to include multiple skilled categories of workers, then the main premise of theorem is undermined and income distribution then becomes dependant on the relative weights and directions of trade flow, therefore some empirical studies contradict the distributive outcomes of traditional trade theory and show that international trade is positively linked to an increase in income inequality[12]. Few empirical articles do not support any significant relationship between the trade liberalisation and inequality[13].

Dreher, in a seminal paper he wrote in 2006,[14] developed the KOF Index of Globalisation[15] as a quantifiable measure of globalisation and used it to measure the impact of globalisation on economic growth for a sample of 123 countries for the period 1970-2000. Since then a significant amount of research has been carried out using the KOF Index of Globalisation showing a positive link between globalisation and economic growth around the world.[16] Rao *et al.* did an empirical exercise for low-income African countries and obtained the same positive link.[17] Chang *et al.* in their article analyse the correlation between globalisation and GDP per capita in OECD countries and show a positive link between the two.[18] The relationship between globalisation and cross-country per capita income convergence using a panel of 184 countries between 1970 and 2009 was carried out by Harger *et al.* and the results show that globalisation has enabled income convergence between richer and poorer countries providing they have similar political and economic institutional quality.[19] However, as the work by many heterodox economists has shown, the above approaches abstract from the issue of financialisation and uneven development and the subordinate social and economic position of periphery countries in relation to the developed core.[20]

Although there is considerable consensus among neo-liberals on the positive impact globalisation has had on economic growth, there is less agreement on the impact it has had on income distribution. One of the main areas this paper explores is the impact globalisation has had on income inequality within countries using empirical data from the western Balkan and the OECD countries. Analysis is based on the KOF globalisation index. Seminal analysis carried out by Bergh and Nilsson using KOF index of globalisation shows positive relationship between overall globalisation index and income inequality,[21] which suggests that the higher the level of globalisation the higher the income inequality within countries, a conclusion also shared by heterodox economists. However, the results are not straightforward when looking at the sub-

categories of KOF index. The KOF index is sub-categorised into three further groups namely economic, social and political each measured using several variables. The analysis is more complicated and contradictory when we consider countries belonging to different stages of development. In their study, the results of the baseline model indicate that the overall index and the social index of globalisation seem to be positive and significant for a sample of 79 countries, however the economic and political dimensions globalisation are positive but insignificant[22]. Further sensitivity test carried out in the paper, excluding countries from Latin American, sub-Saharan Africa and East Asia from the original sample shows that social globalisation (see appendix 1) loses its significance. Dreher & Gaston's empirical study shows that although economic and political dimensions of globalisation are significant and positive for developed countries, in contrast the impact of globalisation on inequality is negligible for developing nations.[23]

Gozgor & Ranjan[24] also use the KOF Index to carry out an empirical study of the impact of globalisation on inequality and redistribution for 140 countries between 1970 and 2012. Their benchmark regression confirms a positive relationship between the overall, economic, social and political globalisation and income inequality when considering all the countries in the sample. The results are the same for upper-middle-and -high income countries, however for low and lower middle-income countries only the economic dimension of globalisation is positive and significant. In this paper we contribute to the literature by developing an empirical model that looks at the causes of income inequality, including globalisation in the western Balkan Region. We then go on to compare these results to the OECD countries.

The level of economic complexity of a country plays a central role in its economic growth and income distribution.[25] The economic complexity of a country is measured by analysing the diversity and sophistication of the basket of products it exports. If a country exports goods that are less ubiquitous and produced by highly diversified countries it is considered to have a high economic complexity index (ECI). The productive capabilities or productive structure of a country determines the diversity and sophistication of the good and services it produces – what Karl Marx would capture with the concept of "social/technical division of labour". The productive structure includes variables such as the level of technical skill and knowhow of labour, infrastructure, government regulations and institutions. There has been a revival in interest in the macroeconomic role of structural transformation since the introduction of the ECI[26]. High economic complexity is positively correlated to economic growth and cross-country differences in income can be explained the difference in economic complexity. It has also been linked to low levels of inequality[27]. Globalisation has caused many countries to transform their productive structures. For example, many emerging economies have been able to reduce income equality through industrialisation and technology catch-up. Globalisation has also caused many industrialised countries to de-industrialise and de-unionise leading to vast disparities in wages between skilled and unskilled labour..[28] We contribute to the literature on economic complexity and inequality by empirically testing the robustness of this relationship in the Western Balkan region 1991-2017 and comparing it to the results of the OECD countries.

The importance of institutions in the economic growth and development of a country has been widely researched[29] and a clear link between institutional quality and GDP growth has been established. Institutional framework is both formal and informal constraints that influence human behaviour.[30] Constraints are class determinants that cover a wide spectrum of social relationships ranging from unwritten social norms, traditions, taboos, and the capital-labour balance of power, at one end, to the rules governing economics and politics (law and order, property rights, constitution), at the other. Theories of institutional change suggest that a robust institutional framework can affect the transaction and transformation costs enabling economic exchange to happen more efficiently and competitively, thus positively affecting economic growth and profit extraction. In transitional economies, such as the western Balkans, growth-igniting institutions, under certain conditions, can play a pivotal role where old institutions are being replaced by new emerging ones.[31] In the Balkan region we observe that the pace of transition has been uneven. Some states managed to become part western institutions, such as NATO and the EU, for geopolitical rather than economic or social reasons, whereas most of the western Balkans, also for geo-political reasons, continue to be left out of western normative assemblages. Of paramount importance is the capital-labour constraint and the rates of profit and exploitation. The power of labour market institutions, such as the trade unions, directly impact the bargaining power of workers, resulting in the narrowing of the wage gap. The de-unionisation is thus looked at as major cause for rising wage inequality in industrialised countries. Here we contribute to the existing literature by dwelling on the impact that institutions in the western Balkans have on the income distribution of the region.

Economic and Political Transition in the western Balkans (1989 -2017)

As noted above, the transition to liberal market economy in the Balkans was uneven and, in the case of Yugoslavia, marked by protracted ethnic and religious conflicts lasting for over a decade.[32] In this section of the article we will focus on the economic transition and globalisation in the western Balkans. We will also investigate the levels of inequality in this region during the period in question. For the purpose of this paper we will consider our definition of western Balkan region includes Albania, Bosnia and Herzegovina, North Macedonia, Montenegro Serbia, Croatia, Kosovo and Slovenia. Although Croatia and Slovenia are EU members, we will include them in our analysis as their experience prior to joining the EU is relevant to economic problems facing other western Balkan countries.

During the 1990s the highly unstable geo-political condition in the western Balkans had a significant negative impact on the transition process and the economic performance of this region.[33] The immediate impact of the transition-related economic reforms saw a significant fall in real GDP, rise in unemployment, high inflation and the worsening of other socio-economic indicators.[34] These problems were much more pronounced in the western Balkans compared to other transitional economies in Central and Eastern Europe. Macroeconomic instability was exacerbated by the expansionary fiscal and monetary policies adopted as a consequence of military conflicts. The recession in the second half of the 1990s in the western Balkans was deeper and lasted longer than in the other transitional economies in East-Central Europe.

International trade and FDI also suffered in the Western Balkan countries during this period, leading to chronic balance of payments deficits.[35] Low capital inflows led to lack of investment, widening the technological gap and weakening international competitiveness. The region became isolated from the global markets as a result of wars, international embargoes and sanctions imposed. Perceived as being Russia's client state, NATO's campaign in 1999 against the rump of Yugoslavia brought Serbia, the largest successor state, to its knees. Countries within the western Balkans were heavily reliant on international and EU aid in the early years of transition. In addition, delays in economic, political and institutional reform deterred integration of the emerging capital, labour and tradeable goods and services markets in this region to the global markets. Globalisation started to re-emerge in this region in the late 1990s when the liberalisation and privatisation of the financial sector was introduced initially in Croatia and then spread to other countries in this region. A large part of the banking sector was controlled by international banks resulting in the flow of low-cost capital into the region. Foreign investment started to flow into sectors such as tourism, energy and telecommunications.

After 2000 the western Balkan economies entered a period of accelerated growth that came to a halt in the wake of the global financial crisis. In 2000 the EU granted the Western Balkans autonomous trade preferences and a new financial assistance programme through the signing of the Stabilisation and Association Agreements. Trade liberalisation and the dismantling of nearly all tariffs and duties on their exports led to a sharp rise in exports. The EU is the region's leading trading partner accounting for nearly 74% regions total trade.[36]

Under pressure by the EU, the focus during this period was to increase exports by way of following a strict anti-inflationary programme. It was believed that this would increase international competitiveness. Neo-liberal market reforms were initiated to improve the business environment and infrastructure through privatisations and FDI and through upskilling the labour force to increase labour productivity. Special economic zones were set up along with tax exemptions and many other incentives were introduced to attract FDI into the region. While Croatia, Bulgaria and Romania continued to be the main recipients of FDI, during the 2000s there were also changes in the share of FDI by country. Between 2000 and 2010 the inflow of FDI increased by 10 times in Croatia, by 17 times in Albania and by 20 times in Serbia. However, Bosnia and Herzegovina and North Macedonia the FDI increase was less significant. There has also been a shift in the sectoral distribution of FDI across the region away from the more traditional sectors of agriculture, fishing, mining, construction and utilities to the service and the manufacturing sector. Above 60% of the FDI inflows in the western Balkan countries were in the service sector with Croatia and Serbia having over 70%. Banking, telecommunications, real estate and wholesale and retail trade have been the most favoured sectors for foreign investors in this region. Austria, Turkey, Greece, Netherlands, Italy and Germany are the main foreign investors in this region with intra-regional investment coming mainly from Slovenia, Serbia and Croatia. There have been various studies carried out to determine why the western Balkan countries attract lower FDI than other transitional economies in Central Europe. Historical reasons, such as the development gap between northern and southern (excluding Greece) Balkans, political

instability and unresolved conflicts, as well as the size of the economy of some states that inhibits development of economies of scale, are some key determinants affecting FDI inflows to the western Balkans.[37] The actual FDI in most western Balkan countries is lower than potential and gravity factors, policies relating to relative unit labour costs, corporate tax rate, infrastructure and the trade region all influence the flow of FDI[38]. In addition to these exogenous factors highlighted by Demekas et al. (2005), other important factors include policy framework and institutional environment.[39] As argued by neo-liberal economists, the western Balkan economies have failed to deliver adequate levels of privatisation and institutional reform to create an attractive investment environment for big capital. The institutional "quality" is closely related to EU membership and therefore countries that are able to show improvements in institutional reform are more likely to become EU members.

The boom years of the early 2000s brought steady increase in income across the western Balkan region. Poverty fell sharply both in terms of headcount and poverty gap. Rapid growth also resulted in large increases in inequality between 1999 and 2003, although this cannot be captured accurately from the statistics due to the large underground and informal economic activity in the region. It has been argued that this was driven by a rise in the share of income of the top 1% compared to the bottom After 2003, the argument goes, inequality started to fall in Albania, Bosnia and Herzegovina, Serbia and Montenegro this was mainly due to fall in income of the top decile in these economies. Inequality continued to rise in Croatia and North Macedonia. Since the financial crisis in 2008 the situation has worsened. Factors affecting inequality in the region are all linked to the regions ability to globalise and attract FDI by creating an investment climate. This, in turn, is notionally linked to the rate of economic and financial reform, which entails active participation of trade unions in governance guaranteeing improvements in institutional "quality".

2. Data sources and descriptive statistics

For the analysis, annual data from 1991 to 2017 were collected for 39 countries. These include 32 OECD member countries and 7 western Balkan countries[1]. To minimise the impact of short-term movements and possible measurement errors in the series the annual data is converted to non-overlapping three-year-averaged periods. The series used in this study were retrieved mainly from the World Bank's World Development Indicator (WDI) and World Governance Indicator (WGI) databases, the International Labour Organisation (ILO) statistical database, the Harvard University Growth Lab data repository, The Swiss Economic Institute KOF database, and the University of Texas Inequality Project repository. The dataset includes the Estimated Household Income Inequality (EHII) index (*Gini*), the *kof* index and its subsets (see appendix 1), real income per capita (*gdp_pc*), rule of law estimate (*rule*), economic complexity index (*eci*), and the degree of labour unionisation (*union*).

To measure globalisation, we use the KOF indices developed by Dreher (2006)[40]. The index covers annual globalisation indicators for 120 countries from 1970 onwards. It is a composite index and not only

[1] For a full list of countries see appendix 2.

measures the level of overall globalisation of a country but drills down into three dimensions of globalisation – economic, social and political. The Kof indices range between 0 and 100, higher values representing higher levels of globalisation. The kofgi index is the aggregated globalisation index, while kofecgi, kofsogi and kofpogi reflect the economic, social and political globalisation indices. Further details of these indicators are contained in appendix 1.

To capture the quality of institutions we utilize the rule of law estimate sourced from the World Governance Indicator (WGI) database[41]. The WGI includes six broad dimensions of governance for over 200 countries and territories, the rule of law estimate being one of them. The series captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. The rule of law (rule) estimate value ranges from -2.5(weak) to 2.5(strong) governance performance or institutional quality.

To measure the role of unions we use union density rate data from the International Labour Organisation (ILO)[42]. The union density rate is calculated as the ratio of the number of employee union members by the total number of employees. A high ratio reflects a higher level of labour unionisation.

The economic complexity index (eci), developed by Hidalgo and Hausman (2009)[43], measures the relative knowledge intensity of an economy. Economic complexity index is measured by taking into account the diversity of product range and the ubiquity of the product i.e. how many other countries are able to produce the good. Countries that have high product diversity and low level of ubiquity score highly on the economic complexity index.

GDP per capita is sourced from the World Development Indicators database[44] and is calculated as the total gross domestic product of a country divided by its population. The gini coefficient measures inequality and the data is sourced from the Estimated Household Income Inequality Index (EHII) dataset[45]. EHII is a global dataset, derived from the econometric relationship between the University of Texas Inequality Project and UNIDO, other conditioning variables, and the World Bank's Deininger & Squire data set. It is a global data set that calculates the industrial pay-inequality measures for 151 countries from 1963-2015.

For this study, we follow the traditional approach of using the natural logarithm of income inequality indicator, *lngini*, as the dependent variable. The logarithm of the kof indices (lnkofgi, lnkofecgi, lnkofsogi and lnkogpogi) and the degree of labour unionisation (lnunion) formed part of the explanatory variables, which also included levels of the economic complexity index (eci) and the rule of law (rule) estimate. Table 1 below contains the descriptive statistics of these variables.

Table 1: Descriptive statistics

Variable	section	Mean	Std. Dev.	Min	Max	Observations
gini	overall	39.43533	4.502142	28.37072	51.5999	N = 351
	between		4.216992	30.53607	48.03983	n = 39

	within		1.700802	29.52803	46.03011	T =	9
kofgi	overall	75.03063	11.98465	34.57949	91.19385	N =	351
	between		9.65364	55.66634	87.87388	n =	39
	within		7.250456	51.87108	92.70248	T =	9
kofecgi	overall	76.12186	11.23718	31.99178	83.9901	N =	351
	between		10.08572	49.23307	81.43047	n =	39
	within		5.184352	54.08631	95.14374	T =	9
kofsogi	overall	74.63324	11.68329	37.55004	91.84356	N =	351
	between		9.274027	54.28411	87.65579	n =	39
	within		7.242761	53.18217	90.11708	T =	9
kofpogi	overall	82.29112	16.35003	23.49005	98.53155	N =	351
	between		14.24778	40.47063	97.27536	n =	39
	within		8.304461	48.25002	111.0877	T =	9
gdp_pc	overall	23781.82	14563.2	1082.346	73125.4	N =	351
	between		12142.55	2977.887	44156.89	n =	39
	within		8247.144	183.258	59141.11	T =	9
rule	overall	0.805594	0.8383863	-1.261475	2.033355	N =	351
	between		0.7317963	-0.6051116	1.685697	n =	39
	within		0.4237999	-0.8801026	1.268831	T =	9
eci	overall	1.032195	0.6987231	-0.861924	2.575307	N =	351
	between		0.6870335	-0.2639498	2.413964	n =	39
	within		0.16428	0.4342209	1.759084	T =	9
union	overall	26.46223	16.58481	4.5	79	N =	351
	between		16.60578	7.001333	72.02778	n =	39
	within		2.367883	17.75112	38.85112	T =	9

Note: Based on the authors' own analysis.

From Table 1, we see that the average Gini index in our panel is 39, with the most equitable country having an index of 28 and the most unequal 52. The Table also shows that there is indeed variation in the index within countries over the years. The KOF indices averaged around 75-83. Income per capita averaged around $23,782 in the panel, with the highest income country posting an income per capita of around $73,125 and the lowest $1083. The most complex economy recorded an economic complexity index of circa 2.58 and the least circa -0.862. The country with the most effective institution, according to the rule of law estimate, has a score of 2.03 and the least a score of -0.86. The highest degree of labour union density recorded is 79% and the lowest is 4.5%. Overall, all the variables show a degree of variation both within and between countries over the years measured.

Table 2 categorises the sample by income group, using the World Bank's income classification benchmark, and gives a more granular picture of the descriptive statistics presented above. As shown in Table 2, the overall level of globalisation (kofgi) and the its subcategories (kofecgi, kofsogi and kogpogi) increase as we move from low income to high income countries, implying that high-income countries are more globalised than low and middle-income countries and at the same time having lower levels of inequality than low and

middle-income countries. Another striking observation is that high-income countries have highly effective formal institutions (higher rule of law estimate), export more complex products (higher economic complexity index), with higher degree of labour unionisation. Certainly, what cannot be captured is the degree of integration of the union within the disciplinarian structures of capital accumulation in the anti-inflation austerity era of post-2008 global financial crisis coupled with the Covid-19 conditions. At any event, it is assumed that labour participation in governance tends to counter-balance austerity and improve institutional "quality" because it puts a break on downward pressures on wages.

Table 2 : Classification by income level

Income group	gini	kofgi	kofecgi	kofsogi	kofpogi	gdp_pc	rule	eci	union
low	44.67	57.44	56.34	62.48	53.89	4202.38	-0.41	0.15	25.12
mid	40.96	69.35	76.22	68.85	78.44	17146.19	0.42	1.00	18.47
high	37.42	82.13	80.57	80.55	90.85	31851.12	1.29	1.25	31.13

Note: Based on the authors' own analysis

Table 2 is illustrated graphically in Figures 1-4. The figures show a quadrant analysis of the dependent variable (gini) against the four main explanatory variables; eci, union, rule and gdp pc, respectively. Figure 1 affirms that the highly industrialised countries exporting diverse and sophisticated products are the ones with the lowest levels of inequality. Interestingly, New Zealand, Australia, Norway and Canada fall in the bottom-left quadrant indicating low inequality and low eci. This is expected as these countries are resource-rich countries that export mostly low- tech products but do have relatively effective institutions. It is worth pointing out that Israel, USA and Japan seem to be outliers in the Gini Vs ECI panel, as they have a high eci score but a relatively higher gini index. When contrasted with the Gini vs Rule panel in Figure 3 we find these countries have a lower rule of law estimate than most comparable high- income countries. This we think explains the anomaly. The de-unionisation that has occurred globally since the 1980s, with the exception of the Scandinavian countries, is clearly depicted in Figure 2. Figure 4 demonstrates that higher income tends to correlate with lower within income inequality, as the average of the inequality index is lower in high income economies than in relatively low income countries – again with few exceptions such as Israel, Japan and USA. It is worth noting that the western Balkan countries fair poorly compared to most OECD countries in all four panels; a majority of them appeared in the top-left quadrant in all the figures. This demonstrates that their high gini values are associated with low levels of eci, rule, and gdp_capita.

Figure1: Gini vs. ECI

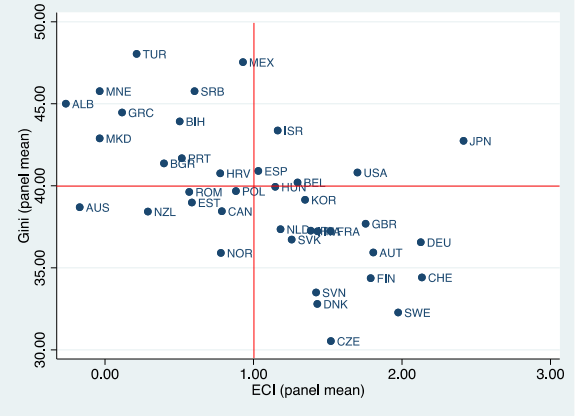
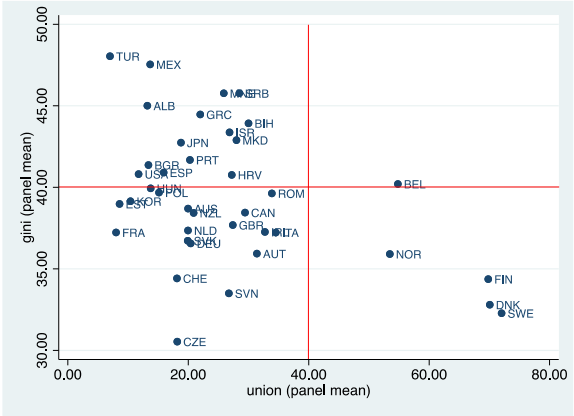


Figure 2: Gini vs Union



Note: Based on the authors' own analysis.

Figure 3: Gini vs Rule

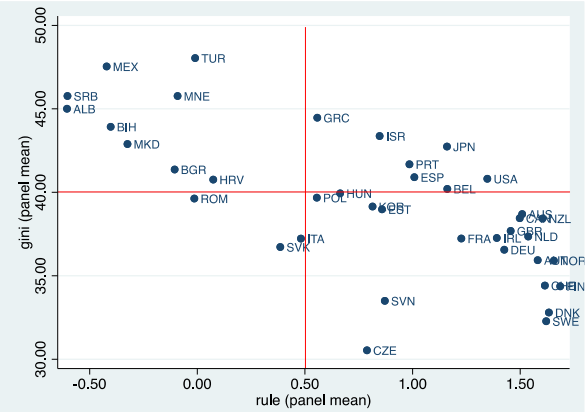
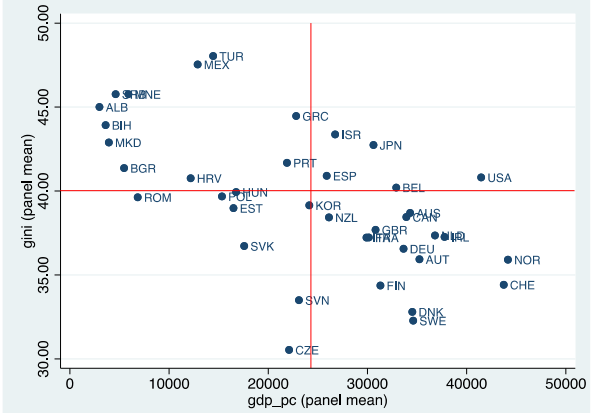


Figure 4: Gini vs GDP_PC



Note: Based on the authors' own analysis.

Based on the patterns that have emerged from the analysis of the descriptive statistics and the results from the quadrant analysis, we test the following hypothesis using the efficient Swamy-Arora Feasible Generalised Least Square (FGLS) estimator.

Hypothesis statement -

i. Effective formal institutional arrangement is inversely correlated to income inequality. So, improving institutional quality can lead to the reduction in income inequality.

ii. Likewise, the higher the degree of economic complexity – i.e., when a country's exports are characterized by more high-tech produce – the lower the within inequality and the more such economy converges to the income level of frontier economies.

iii. The relation between labour unionisation and income inequality is a little hazy, although there seem to be an inverse relation.

iv. Globalisation is positively correlated with inequality; this is more significant for low income, non-complex, and institutionally weak economies.

3. Research Methodology

For the empirical study we utilise a simple Swamy and Arora (1972)[46] feasible GLS estimator. Our analysis is based on a panel data covering 39 countries from 1991 to 2017. We use a three-year-averaged non-overlapping data instead of the annual series to build the model, to minimise the impact of short-term movements and possible measurement errors in the series. The model takes into account heterogeneity across countries and also over time. The two-way error component model is specified as follows.

$$y_{it} = \alpha + \sum_{k=1}^{k} x_{kit}\beta_{kit} + u_i, \qquad i = 1, \ldots, N, \; t = 1, \ldots, T \tag{1}$$

$$u_i = \mu_i + \lambda_t + v_{it} \tag{2}$$

Where N is the number of countries and T is the number of periods. The subscript k corresponds to the number of variables used in the model. The dependent variable y_{it} denotes the Estimated Household Income Inequality (EHII) index. α is a scalar, x_{it} is a $1 \times k$ vector of variables that vary over individual and time (these include the log of *kof* indices, the log of real GDP per capita [*gdp_pc*], log of union membership density [*lnunion*], rule of law estimate [rule], and the economic complexity index [*eci*]), β is the $k \times 1$ vector of coefficients on x. μ_i denotes the unobservable individual effect, λ_t denotes the unobservable time effect, and v_{it} is the remaining stochastic error.

The above two-way error-component model (also known as a two-way Random Effect [RE] model) has been shown to be appropriate when making generalised conclusions from a sample. This is because, unlike the fixed effect (Least Square Dummy Variable [LSDV] model) that considers individual-specific intercept, the FGLS/RE model specifies the individual effect as a random draw that is uncorrelated with the regressors and the overall disturbance term. As such, inference from the FGLS model pertains to the whole population.

To be efficient, the FGLS estimator uses the assumption that x_{it} is independent of μ_i, λ_t and v_{it} for all i and t.

$$\text{i.e., } \mathrm{E}(u_{it} \mid x_{it}) \tag{3}$$

The model also assumes that both the individual effects, time effects and the stochastic disturbance term are mean-zero processes.

$$\text{i.e., } \mu_i \sim \mathrm{IID}(0, \sigma_\mu^2), \lambda_t \sim \mathrm{IID}(0, \sigma_\lambda^2), \text{ and } v_{it} \sim \mathrm{IID}(0, \sigma_v^2) \tag{4}$$

The disturbances are also assumed homoscedastic with $\mathrm{var}(u_{it}) = \sigma_\mu^2 + \sigma_\lambda^2 + \sigma_v^2$ for all i and t and cross-sectionally independent, and serially uncorrelated over time.

$$\mathrm{Cov}(u_{it}, u_s) = \begin{cases} \sigma_\mu^2 & \text{for } i = j, \; t \neq s; \\ \sigma_\lambda^2 & \text{for } i \neq j, \; t = s; \\ 0 & \text{for } i = j, \; t \neq s; \end{cases} \tag{5}$$

To confirm validity of our model, we test all these standard assumption as well as carry out several robustness checks. Additionally, all the results include heteroscedastic-robust standard errors.

Discussion of results

Following a specific to general identification strategy, our benchmark equation starts with the logarithm of the aggregate kof index (*lnkofgi*) and the level of income per capital (*lngdp_pc*) as the main explanatory variables. The rule of law (*rule*) and the interaction term – between the level of income per capita and the rule of law (*lngdp_pc#rule*), the logarithm of the union density measure (*lnunion*), as well as the economic complexity index (*eci*) serve as the additional control variables, which are added sequentially to the model. By including the interaction term, we are saying that increasing national income only leads to decreasing income inequality if there exist some form of effective institutional arrangement that fosters a hospitable environment that is capable of stimulating socially beneficial economic exchanges. This is built on the premise that effective institutions that shapes human interaction for the benefit of the society also mitigate the misappropriation of the increasing income, thereby promoting mutually beneficial exchanges[47] in the long-run.

In summary, the first model utilises only the kofgi index and the level of income per capita as the explanatory variables. For the second model, we introduced the rule of law variable and the interaction term as control variables. For the third model, we further control for the effect of economic complexity by introducing the *eci* variable to the model. In the fourth model we introduce the union indicator. The premise for the degree of labour unionisation ($union_{it}$), estimated as the share of employees who are union members, as earlier studies have indicated, is that those participating in organised labour unions tend to secure a relatively higher income, due to the collective wage bargaining power[48]. Overall, the general benchmark model includes all the variables contemporaneously.

The benchmark specifications include time dummies, to control for individual-invariant but time-specific effects, such as the dot-com bubble of the early 2000s, the 2007/08 financial crisis, and the 2009/10 European debt crises. To confirm the consistency and efficiency of our model, we first applied the Hausman (1978)[49] specification test to check whether the unique errors are correlated with the regressors, given that one of the underlying assumption of our model is that the regressors are strictly exogenous. The null of the Hausman test is that they are not correlated with the composite error term. In essence, accepting the null of the Hausman test will show that our model is appropriate.

Similarly, the Breusch and Pagan (1980)[50] proposed Lagrange Multiplier (LM) test is used to test the presence of panel effect in the model - that is, whether there is significant differences across the units. The null hypothesis of the LM test is that variances across the entities is zero. So, the failure to reject the null hypothesis will render our model inappropriate. In such a case, the ordinary least square (OLS) would be a more appropriate estimator to use.

Finally, the Pesaran (2007)[51] test is used to assess whether there is a contemporaneous correlation among the residuals. As stated earlier, one of the assumptions of the FGLS model (equation 5) is that there is no cross-sectional dependence. The null of the Pesaran Cross-Section Dependence (CD) test is that residuals are not correlated. To be consistent, we would expect to accept the null of the Pesaran CD test.

To further verify the consistency of our results, we re-estimated the parameters of the benchmark models using the full maximum likelihood estimator. Like the FGLS, the maximum likelihood estimation also assumes that the regressors and the error terms are uncorrelated. The corresponding likelihood-ratio test was used to test this exogeneity assumption. If maximum likelihood estimates of our benchmark models yield similar parameters to the FGLS estimates, the consistency of our results will be justified. To save space, the result of this estimation is presented in the appendix.

Additional sensitivity analysis include the use of the three subsets of the kof globalisation index; $lnkofecgi_{it}$ (reflecting economic globalisation), $lnkofsogi_{it}$ (reflecting social globalisation) and $lnkofpogi_{it}$ (reflecting political globalisation) in the empirical analysis. We also separate the data into OECD and Western Balkan panels, to further verify the stability of the parameters. The results of the various analyses carried out and the corresponding diagnostic and sensitivity tests are discussed next.

To begin with, Table 3 presents the results of the baseline regression with the log of the Gini index as the dependent variable. In addition to the results of our preferred Random Effect (FE) models, we also present the result of the Fixed Effect (FE) estimation, especially for those models for which the exogeneity assumption is violated (models 1-3). In this case, the FE parameters are consistent compared to the RE parameters. However, for our preferred general benchmark model (model 4) the underlying assumptions of the RE estimates are not violated, hence the result is both efficient and consistent.

The above notwithstanding, the results of all the models, except model 1 (column 1), show that the overall globalisation index (kofgi) is positively and significantly correlated with income inequality, suggesting that the higher the level of overall globalisation the higher the level of income inequality. This is line in with the findings by many previous studies. In all the models (column 1-4), the log of per-capita income is found to be negatively related to income inequality. The R-square from the consistent FE estimates of model 1 shows that the regression explains around 33% of the variation in the Gini index in the panel, 35% of the variation within countries and 32% of the variation between countries. The model also shows that circa 85% of the variance is due to differences across panels. The significant Wald test shows that the included time dummies are relevant in all the models.

Table 3 - Benchmark results of the Gini regression

Models	(1)		(2)		(3)		(4)
Variables/Estimators	RE	FE	RE	FE	RE	FE	RE
lnkofgi	0.025	0.035	0.104**	0.153***	0.109**	0.159***	0.116***
	(0.029)	(0.029)	(0.043)	(0.044)	(0.043)	(0.044)	(0.043)
lngdp_pc	-0.094***	-0.104***	-0.110***	-0.118***	-0.092***	-0.109***	-0.095***
	(0.013)	(0.018)	(0.014)	(0.018)	(0.015)	(0.019)	(0.015)
rule			-0.179**	-0.251***	-0.177**	-0.252***	-0.171**
			(0.080)	(0.081)	(0.080)	(0.081)	(0.080)
c.lngdp_pc#c.rule			0.019**	0.026***	0.018**	0.026***	0.018**
			(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
eci					-0.029**	-0.018	-0.031***
					(0.012)	(0.014)	(0.012)
lnunion							-0.030**
							(0.015)
Constant	4.548***	4.605***	4.336***	4.194***	4.165***	4.091***	4.257***
	(0.160)	(0.216)	(0.190)	(0.240)	(0.202)	(0.252)	(0.205)
R-squared (within)	0.354	0.354	0.383	0.386	0.384	0.389	0.381
R-squared (between)	0.324	0.321	0.254	0.211	0.315	0.248	0.384
R-squared (overall)	0.328	0.324	0.271	0.233	0.324	0.267	0.383
F-test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
rho	0.816	0.851	0.814	0.874	0.791	0.866	0.783
Hausman	-	N/A	0.011	N/A	0.006	N/A	0.107
Breusch-Pagan LM test	0.000	N/A	0.000	N/A	0.000	N/A	0.000
Pesaran CD test	0.175	N/A	0.129	N/A	0.163	N/A	0.148
Wald test	0.000	0.000	0.000	0.000	0.000	0.010	0.000
Observations	351	351	351	351	351	351	351
Number of cross-sections	39	39	39	39	39	39	39

Note: Calculations are based on the authors' own analysis
Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Controlling for the effect of institutions (by adding the rule of law indicator and the interaction term) in model 2, we find that the improved model explains around 39% of the variation in income inequality within countries (based on the consistent FE estimation). The result shows that quality of institutions alone accounts for 4% of the variation in income inequality within countries. From our preferred model 4, we find that the impact of the economic or export complexity and labour unionisation on inequality is considerably less compared to the rule of law effect. The results of the efficient and consistent model 4 shows that our regression explains around 38% of the variation in the Gini index with countries, 38% of the variation between countries and 38% of the overall variation in the panel. The results of the diagnostic tests confirm the consistency and efficiency of our preferred model 4 – the F-test shows that all the coefficients are relevant and the Hausman test confirms that the exogeneity condition is not violated. The Breusch-Pagan LM test and the Pesaran CD test prove the presence of panel effect and cross-section independence respectively.

The conclusion that can be drawn from the analyses is that globalisation leads to increasing income inequality both within and between countries. Higher levels of income per capita and quality institutions reduces both within and between income inequality significantly and at a diminishing marginal rate. Economic or export complexity and the degree of labour unionisation also reduces both within and between income inequality, but at a slower rate. In sum, labour integration in governance tends to articulate more efficient "quality" institutions.

The results of the sensitivity analysis, presented in Table 4 below, largely confirm our main findings. To begin with, the results show that the various subsets of the Kof index (kofecgi, and kofsogi), like the aggregate globalisation index (kofgi) is significantly and positively related with the Gini index. Implying higher levels of these indices widens the within and between income inequality gap. Interestingly, we find, in line with the results of the main benchmark model (model 4), that quality institutions, economic complexity and the degree of labour unionisation are significantly and negatively correlated with income inequality, with exception to model 8, where the institutional proxy and the interaction term are insignificant, albeit with the right signs.

Table 4 – Sensitivity results of the Gini regression

	(5)	(6)	(7)	(8)
lngdp_pc	-0.095***	-0.094***	-0.101***	-0.083***
	(0.015)	(0.014)	(0.016)	(0.015)
rule	-0.171**	-0.252***	-0.140**	-0.027
	(0.080)	(0.071)	(0.070)	(0.069)
c.lngdp_pc#c.rule	0.018**	0.026***	0.015**	0.004
	(0.008)	(0.007)	(0.007)	(0.007)
eci	-0.031***	-0.021*	-0.033***	-0.027**
	(0.012)	(0.012)	(0.012)	(0.012)
lnunion	-0.030**	-0.035**	-0.038**	-0.027*
	(0.015)	(0.015)	(0.015)	(0.015)
lnkofgi	0.116***			
	(0.043)			
lnkofecgi		0.150***		
		(0.030)		
lnkofsogi			0.142***	
			(0.051)	
lnkofpogi				0.006
				(0.020)
Constant	4.257***	4.100***	4.230***	4.615***
	(0.205)	(0.182)	(0.209)	(0.164)
R-squared (within)	0.381	0.406	0.385	0.357
R-squared (between)	0.384	0.448	0.373	0.424
R-squared (overall)	0.383	0.441	0.373	0.414
F-test	0.000	0.000	0.000	0.000
rho	0.783	0.797	0.789	0.783
Hausman	0.107	-	0.071	-

Breusch-Pagan LM test	0.000	0.000	0.000	0.000
Pesaran CD test	0.148	0.215	0.191	0.209
Wald test	0.000	0.000	0.000	0.000
Observations	351	351	351	351
Number of cross-sections	39	39	39	39

Note: Calculations are based on the authors' own analysis
Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The results of the sensitivity analysis based on the OECD panel (Table 5) is also largely in line with those of our main benchmark model. For this analysis, only the results of the consistent FE estimates are discussed. The result shows that our regression explains circa 46% of the variation in the Gini index within countries, with 89% of the variance attributable to panel differences. Institutional quality and the high level of income are also the main determinants of income inequality. Although the eci score has the expected sign, it is however insignificant. This could be attributed to the fact that a majority of OECD countries are already at the frontier of economic complexity and with little variation in the index during the period sampled.

Table 5 - OECD estimates of the Gini regression

	(9 - RE)	(10 - RE)	(11 - FE)	(12 - FE)
lnkofgi	-0.125***	0.039	0.090	0.073
	(0.047)	(0.056)	(0.061)	(0.061)
lngdp_pc	-0.102***	-0.139***	-0.136***	-0.158***
	(0.018)	(0.019)	(0.021)	(0.023)
rule		-0.481***	-0.503***	-0.514***
		(0.110)	(0.111)	(0.111)
c.lngdp_pc#c.rule		0.047***	0.050***	0.051***
		(0.011)	(0.011)	(0.011)
eci			-0.008	-0.009
			(0.015)	(0.015)
lnunion				-0.046**
				(0.021)
Constant	5.303***	4.925***	4.675***	5.125***
	(0.228)	(0.234)	(0.290)	(0.350)
R-squared (within)	0.378	0.444	0.447	0.459
R-squared (between)	0.250	0.175	0.148	0.279
R-squared (overall)	0.264	0.202	0.178	0.299
F-test	0.000	0.000	0.000	0.000
rho	0.882	0.892	0.913	0.899
Hausman	0.756	0.397	N/A	N/A
Breusch-Pagan LM test	0.000	0.000	N/A	N/A
Pesaran CD	0.077	0.051	N/A	N/A
Wald test	0.000	0.000	0.000	0.000
Observations	279	279	279	279
Number of cross-sections	32	32	32	32

Note: Calculations are based on the authors' own analysis
Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The Balkan result (Table 6) also show that globalisation is positively and significantly correlated with rising income inequality. The result also confirms our main findings that higher income per capita reduces income inequality, albeit with the rule of law and the union indicators showing up insignificant and with inconsistent signs. We feel however that this could be because of the small sample size bias, as this panel contains only 63 observations, which is asymptotically inefficient.

Table 6 - Balkan estimates of the Gini regression

	(13)	(14)	(15)	(16)
lnkofgi	0.296***	0.315***	0.292***	0.280***
	(0.047)	(0.047)	(0.056)	(0.052)
lngdp_pc	-0.123***	-0.119***	-0.103***	-0.082***
	(0.028)	(0.029)	(0.036)	(0.031)
rule		0.037	-0.057	0.174
		(0.193)	(0.198)	(0.227)
c.lngdp_pc#c.rule		-0.008	0.003	-0.028
		(0.021)	(0.021)	(0.024)
eci			-0.014	-0.049*
			(0.031)	(0.027)
lnunion				0.056
				(0.040)
Constant	3.599***	3.487***	3.441***	3.152***
	(0.149)	(0.230)	(0.233)	(0.296)
R-Squared (within)	0.341	0.325	0.339	0.251
R-squared (between)	0.771	0.826	0.812	0.919
R-squared (overall)	0.649	0.701	0.689	0.752
Observations	63	63	63	63
Number of cross-sections	7	7	7	7

Note: Calculations are based on the authors' own analysis
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Concluding Remarks

Over the last four decades the phenomenal rise in neo-liberal globalisation has spurred greater global economic activity resulting in higher economic growth, promoting consumption and prosperity worldwide via increased access to borrowing. However, as a consequence of such greater economic integration and because of uneven development, some countries have witnessed growing levels of income inequality. Building on existing literature, this paper investigated the impact of four key variables namely the level of globalisation, quality of institutions, the degree of economic complexity and labour union density in determining the level of income inequality both within and across countries. The paper uses data between 1991 and 2017 for randomly selected 39 countries (32 OECD countries and 7 western Balkan countries) to examine the causes of income inequality. Applying the efficient Swamy-Arora Feasible Generalised Least Square (FGLS) on our panel data we find that globalisation is positively correlated with income inequality, and that effective institutions reduces within and between income inequality significantly. The effect of

institutional "quality" is seen to be higher at lower levels of income per capita, thus suggesting poorer countries can significantly reduce within income inequality as well as the gap with high income countries by improving the quality of their institutions. The level of economic complexity and the degree of labour unionization was also found to significantly reduce income equality both within and across countries.

The policy implications of our findings are significant. One of the empirical findings of this paper states that effective formal institutional framework is inversely correlated to income inequality. Therefore, by improving institutional quality and level of unionisation, ie, making labour a true participant in the distribution of power, a country can reduce its income inequality and improve democracy. This is particularly significant for transitional economies such as the western Balkan countries which have suffered long periods of political instability and unrest and where the pace and rate of institutional reform has been inadequate and uneven. The second policy implication suggests that income inequality both within and across countries can be reduced with higher levels of economic complexity. In practice, this can happen only of western Balkan economies achieve sustainable levels of domestic growth. In countries, such as the western Balkans, with low level economic complexity, public and private sector investment should focus on transforming their productive capabilities to enable the country to export a diverse and sophisticated basket of products. This will subsequently lead to higher and sustained economic growth and reduced inequality. The third policy implication relates to the collective bargaining power of a unionised labour force to ensure that wages and conditions are fair and to reduce the widening wage gap between skilled and unskilled workers while guaranteeing institutional "quality" and democracy. Finally, our paper finds that there is a strong positive correlation between neo-liberal globalisation and rising inequality and the policy implications are substantial. By ensuring a higher degree of economic complexity, effective institutional framework and unionised labour the negative impact that neo-liberal globalisation has on income distribution can be reduced as constant downward pressure on wages can be avoided.

Notes

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Appendix 1

2018 KOF Globalisation Index
Variable descriptions

Indices and variables	**Sources**	**Definitions**
Economic Globalisation (KOFEcGI)		
Economic Globalisation, de facto (KOFEcGIdf)		
Trade Globalisation, de facto (KOFTrGIdf)		
Trade in goods	World Bank WDI (2017)	Sum of exports and imports in goods as share of GDP.
Trade in services	World Bank WDI (2017)	Sum of exports and imports in services as share of GDP.
Trade partner diversification	Own calculations based on IMF	Herfindahl-Hirschman concentration index for trade in goods. Constructed as the average of the sum of squares of trade partner shares in total exports and imports (inverted).
Financial Globalisation, de facto (KOFFiGIdf)	DOTS (2017)	
Foreign direct investment	IMF IIP (2017) / historical data from EWN	Sum of stocks of assets and liabilities of foreign direct investments (% of GDP).
Portfolio investment	IMF IIP (2017) / historical data from EWN	Sum of stocks of assets and liabilities of international equity portfolio investments (% of GDP).
International debt	IMF IIP (2017) / historical data from EWN	Sum of inward and outward stocks of international portfolio debt securities and international bank loans and deposits (% of GDP)
International reserves	IMF IIP (2017) / historical data from EWN	Includes foreign exchange, SDR holdings and reserve position in the IMF (% of GDP)
International income payments	IMF IIP (2017) / historical data from EWN	Sum of capital and labour income to foreign nationals and from abroad (% of GDP)
Economic Globalisation, de jure (KOFEcGIdj)		
Trade Globalisation, de jure (KOFTrGIdj)		

Trade regulations	Gwartney et al. (2017)	Average of two subcomponents: Prevalence of non-tariff trade barriers and compliance costs of importing and exporting.
Trade taxes	World Bank WDI (2017)	Income from taxes on international trade as percentage of revenue (inverted).
Tariffs	Gwartney et al. (2017)	Unweighted mean of tariff rates.
Financial Globalisation, de jure (KOFFIGIdj)		
Investment restrictions	Gwartney et al. (2017)	Prevalence of foreign ownership and regulations to international capital flows.
Capital account openness 1	Chinn, Ito (2017)	Chinn-Ito index of financial openness.
Capital account openness 2	Jahan, Wang (2016)	Jahan-Wang index of openness of the capital account.
Social Globalisation (KOFSoGI)		
Social Globalisation, de facto (KOFSoGIdf)		
Interpersonal Globalisation, de facto (KOFIpGIdf)		
International voice traffic	ITU (2017)	Sum of international incoming and outgoing fixed and mobile telephone traffic in minutes per capita.
Transfers	World Bank WDI (2017)	Sum of gross inflows and outflows of goods, services, income or financial items without a quid pro quo per capita.
International tourism	World Bank WDI (2017)	Sum of arrivals and departures of international tourists as a share of population.
Migration	World Bank WDI (2017)	Number of foreign or foreign-born residents as percentage of total population.
Informational Globalisation, de facto (KOFInGIdf)		
Patent applications	Own calculations based on World Bank WDI (2017)	Patent applications by non residents filed through the Patent Cooperation Treaty procedure or with a national patent office (stocks as % of population)
International students	UNESCO (2017)	Sum of inbound and outbound number of tertiary students (% of population)
High technology exports	World Bank WDI (2017)	Exports of products with high R&D intensity as share of total merchandise exports.
Cultural Globalisation, de facto (KOFCuGIdf)		
Trade in cultural goods	UN Comtrade (2017)	Sum of exports and imports of cultural goods as defined in UNESCO (2009).
Trademark applications	World Bank WDI (2017)	Applications to register a trademark with a national or regional Intellectual Property (IP) office by non residents in percent of all applications.
Trade in personal services	IMF BOPS (2017)	Sum of exports and imports in personal services.
McDonald's restaurant	Various sources.	Number of McDonald's restaurants (per capita).
IKEA stores	IKEA	Number of IKEA stores (per capita)
Social Globalisation, de jure (KOFSoGIdj)		
Interpersonal Globalisation, de jure (KOFIpGIdj)		
Telephone subscriptions	World Bank WDI (2017)	Fixed telephone and mobile subscriptions as percentage of population.
Freedom to visit	Gwartney et al. (2017)	Percentage of countries for which a country requires a visa from foreign visitors.
International airports	ICAO (2017)	Number of airports that offers at least one international flight connection (per capita).
Informational Globalisation, de jure (KOFInGIdj)		
Television	World Bank WDI (2017)	Share of households with a television set.
Internet user	World Bank WDI (2017)	Indiviuals using the internet (as % of population). Internet users are individuals who have used the internet in the last three months.
Press freedom	Gwartney et al. (2017)	Numerical scores evaluating the legal environment for the media, political pressure that influence reporting and economic factor that affect access to news and information.

Internet bandwidth	ITU (2017)	Total used capacity of international internet bandwidth in bits per second per capita.
Cultural Globalisation, de jure (KOFCuGIdj)		
Gender parity	UNESCO (2017)	Ratio of girls to boys enrolled in primary education level in public and private schools.
Expenditure on education	UNESCO (2017)	General government expenditure on education (current, capital and transfers) per capita.
Civil freedom	Gwartney et al. (2017)	Quantification of aspects on freedom of expression and belief, associational and organizational rights, rule of law and personal autonomy and individual rights.
Political Globalisation (KOFPoGI)		
Political Globalisation, de facto (KOFPoGIdf)		
Embassies	Europe World Yearbook (various years)	Absolute number of embassies in a country.
UN peace keeping missions	Department of Peacekeeping Operations, UN	Personnel contributed to U.N. Security Council Missions per capita.
International NGOs	Union of International Association (various years)	Number of international oriented nongovernmental organisations (NGO) with members in that country or territory.
Political Globalisation, de jure (KOFPoGIdj)		
International organisations	CIA World Factbook (various years).	Number of international inter-governmental organisations in which a country is member.
International treaties	United Nations Treaty Collection.	Internationall treaties signed between two or more states and ratified by the highest legislative body of each country since 1945.
Number of partners in investment treaties	UNCTAD (2017)	Number of distinct treaty partners of a country with bilateral investment treaties.

Appendix 2: List of countries

S/N	Country	kofgi	kofecgi	kofsogi	kofpogi	gini	gdp_pc	eci	union	rule
1	Albania	55.67	49.23	55.75	62.01	45.01	2977.89	-0.26	13.20	-0.61
2	Australia	77.88	64.15	81.92	87.57	38.70	34298.90	-0.17	19.97	1.51
3	Austria	86.09	79.69	83.72	94.75	35.94	35238.42	1.81	31.39	1.58
4	Belgium	87.87	81.43	81.58	95.73	40.20	32897.28	1.30	54.81	1.16
5	Bulgaria	70.87	65.94	63.86	82.82	41.37	5463.62	0.40	13.39	-0.11
6	Bosnia and Herzegovina	56.18	55.67	56.36	56.52	43.92	3599.20	0.50	30.00	-0.40
7	Canada	81.07	81.43	85.32	91.19	38.45	33917.68	0.79	29.42	1.50
8	Switzerland	87.22	81.43	87.50	93.58	34.41	43735.93	2.13	18.12	1.61
9	Czech Republic	77.79	81.43	75.54	84.51	30.54	22097.54	1.52	18.17	0.79
10	Germany	84.24	81.43	81.14	96.10	36.56	33631.30	2.13	20.40	1.43
11	Denmark	86.30	81.43	85.25	92.27	32.80	34517.83	1.43	70.07	1.63
12	Spain	79.76	81.43	74.59	94.46	40.91	25889.06	1.03	15.92	1.01
13	Estonia	73.36	81.43	75.23	63.53	38.98	16491.93	0.58	8.59	0.86
14	Finland	83.72	81.43	81.85	91.05	34.37	31300.13	1.79	69.81	1.69
15	France	83.48	81.43	79.63	97.28	37.23	30134.45	1.52	8.01	1.23
16	United Kingdom	86.40	81.43	84.40	96.84	37.69	30812.17	1.75	27.39	1.46
17	Greece	75.78	81.43	73.62	88.60	44.47	22810.04	0.11	21.99	0.56
18	Croatia	67.44	60.24	71.81	70.26	40.76	12176.10	0.78	27.22	0.07

19	Hungary	78.90	81.43	73.48	88.30	39.94	16753.54	1.15	13.76	0.66
20	Ireland	82.08	81.43	82.98	74.87	37.26	37766.11	1.39	32.73	1.39
21	Israel	71.91	81.43	78.34	69.24	43.37	26739.32	1.16	26.85	0.85
22	Italy	78.40	81.43	73.34	95.92	37.23	29899.88	1.43	34.54	0.48
23	Japan	69.79	81.43	72.12	84.10	42.74	30604.97	2.41	18.79	1.16
24	South Korea	69.30	81.43	73.11	82.16	39.15	24131.25	1.35	10.41	0.81
25	Mexico	61.47	81.43	57.80	75.67	47.54	12879.93	0.93	13.67	-0.42
26	Macedonia	56.07	55.02	60.63	52.84	42.89	3925.58	-0.04	28.00	-0.32
27	Montenegro	59.35	66.46	73.15	40.47	45.77	5895.65	-0.04	25.90	-0.09
28	Netherlands	87.03	81.43	80.12	94.75	37.35	36804.85	1.18	19.96	1.54
29	Norway	83.68	81.43	87.66	88.59	35.91	44156.89	0.78	53.47	1.66
30	New Zealand	75.81	81.43	81.55	74.77	38.43	26115.39	0.29	20.89	1.60
31	Poland	71.97	81.43	68.66	90.28	39.68	15328.21	0.88	15.14	0.56
32	Portugal	78.33	81.43	72.52	89.72	41.68	21883.24	0.52	20.28	0.99
33	Romania	68.02	55.56	61.50	86.68	39.63	6837.07	0.57	33.88	-0.01
34	Serbia	59.94	55.30	66.49	57.62	45.77	4613.58	0.60	28.47	-0.60
35	Slovak Republic	73.21	81.43	74.31	77.84	36.72	17571.74	1.26	19.91	0.39
36	Slovenia	70.01	81.43	75.16	70.52	33.50	23089.97	1.42	26.74	0.87
37	Sweden	86.98	81.43	85.96	95.37	32.28	34605.28	1.97	72.03	1.62
38	Turkey	64.88	81.43	54.28	88.20	48.04	14440.17	0.21	7.00	-0.01
39	United States	77.97	81.43	78.45	92.38	40.81	41458.84	1.70	11.75	1.35

Note: Based on authors' own calculation.
Estimates are based on the country's averages.

Appendix 3: Parameter estimates of the general benchmark regression based on diff. estimators

Model	FE (within)	BE (between)	RE (overall)	MLE
lnkofgi	0.159***	-0.287	0.116***	0.127***
	(0.044)	(0.206)	(0.043)	(0.042)
lngdp_pc	-0.108***	0.097**	-0.095***	-0.100***
	(0.020)	(0.044)	(0.015)	(0.016)
rule	-0.254***	-0.471	-0.171**	-0.191**
	(0.082)	(0.345)	(0.080)	(0.078)
c.lngdp_pc#c.rule	0.027***	0.036	0.018**	0.020***
	(0.008)	(0.032)	(0.008)	(0.008)
eci	-0.018	-0.055**	-0.031***	-0.029**
	(0.014)	(0.023)	(0.012)	(0.012)
lnunion	0.002	-0.035	-0.030**	-0.025
	(0.023)	(0.023)	(0.015)	(0.016)
Constant	4.079***	4.186***	4.257***	4.240***
	(0.297)	(0.834)	(0.205)	(0.210)
R-squared	0.389	0.633	0.383	-
RMSE	0.037	0.071	0.038	-
Observations	351	351	351	351
Number of cross sections	39	39	39	39

Note: Based on authors' own analysis
Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

FE is the Fixed Effect method, BE is the Between Effect method, RE is the Random Effect method and MLE is the Maximum Likelihood Estimation.