

Does globalization cause inequality in Developed Countries? Evidence from the OECD economies

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Introduction

- Pronounced Income Inequalities that remained persistent & pervasive over time (esp. since 1990s)
- concerns regarding income inequality coinciding with the rapid pace of globalization and digitalization has been widespread in recent decades in developed economies.
- Open trade and globalization forces are blamed for causing persistent losses for low-wage earners, accentuating income inequalities within developed economies (Coyle, 2016; Rodrik, 2018; Bourguignon, 2016 and Milanovic, 2016; Gozgor and Ranjan, 2017), however the empirical evidence is far from conclusive.

Introduction

- we approach this issue from trade & globalization perspective and seek to answer 2 questions:
 - 1) Is there any discernible trend in income inequalities observed over time across different sample of OECD countries
 - 2) Whether higher levels of globalization are associated with increase in income inequalities across OECD countries irrespective of their location?
- This assumes policy relevance while planning broader reforms of redistribution policies & ensuring benefits of globalization are widely shared.

What we do?

- Our study therefore aims to test the long-run relationship and existence of causal linkages between globalization and income inequality for 23 OECD member countries across different geographical regions over 1970-2016.
- Cross-country, so do not focus on within country inequalities
- We focus on the long and short-run causal relationships underpinning key interactive variables in this relationship between globalization and inequality.

What we do?

- empirical analysis, involves applying the Yamamoto and Kurozumi (2006) approach to test for the presence of long-run Granger non-causality between our chosen variables
- advantages - ability to estimate in one step the multilateral relationships between all the variables being studied; helps to examine the long-run block non-causality between variables
- sign rule for causal inference and contemporaneous conditioning in regression models proposed by Rajaguru and Abeysinghe (2008) further establishes the genuine long-run causal relationships between the variables of interest.

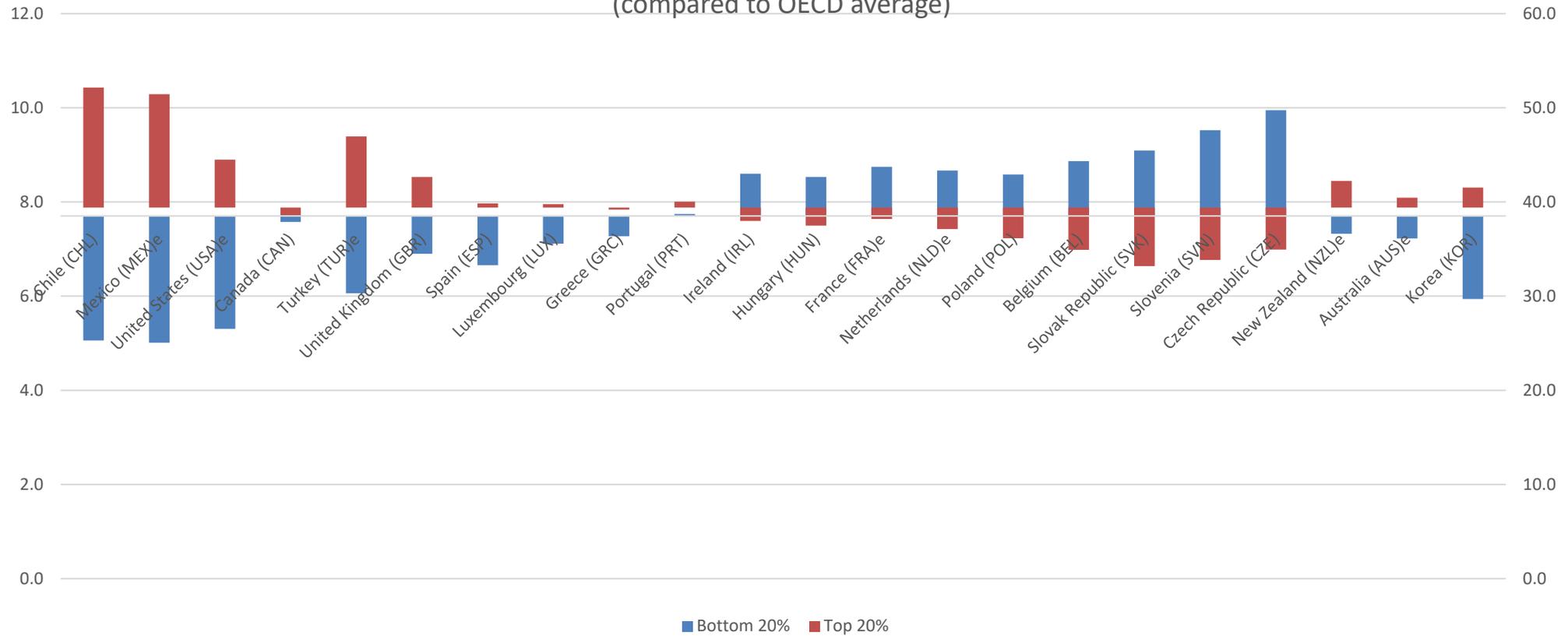
Why OECD ?

- In OECD countries average income of the richest 10% of the population to that of the poorest 10% shows a ratio of 9 to 1 ;varies widely from one country to another (OECD, 2011)
- The Gini stood at an average of 0.29 in OECD countries in the mid-1980s. By the late 2000s, however, it had increased by almost 10% to 0.316.

Why OECD ?

- Gini rose in 17 of the 22 OECD countries climbing by more than 4 percentage points in Finland, Germany, Israel, Luxembourg, New Zealand, Sweden, and the United States.
- Only Turkey, Greece, France, Hungary, and Belgium recorded no increase or small declines.
- From the late 1980s, the increase in income inequality became more widespread, widening gap between rich and poor since 2000s, not limited only to high inequality countries (viz. Israel, United States)

Figure 1
 Share of top and Bottom 20% of average household disposable income in selected sample countries as of 2017
 (compared to OECD average)



Recent literature

- heterogeneous effects of globalization on income inequality hugely debated (Heimberger, 2020; Nolan et al., 2019).

Rise in income inequalities could be attributed to:

- Income levels & stages of development (Kuznet's income hypothesis)
- Intensification of trade & investment
- Technological advancement resulting in higher wage skill premium over time
- higher levels of globalization (that combines economic, political & social dimensions)
- Institutional changes (minimum wage, employment or welfare policies etc.)
- Political factors (political regime, unionization, government size etc.)

Recent literature

Tamasauskiene & Žičkienė (T and Z) (2021), Heimberger (2020) and Dorn et al. (2018) are among the latest empirical studies:

- T & Ž (2021) - modelled all three dimensions of globalization separately on income inequality in the context of EU (as a whole) over 1998-2017 in a panel framework –
- concludes economic and political globalization dimensions have had a significant impact compared to social globalization on increasing overall income inequality within EU.
- Dorn et. al. (2018) - confirm absence of systematic effect of globalization on income inequality: argue moderated effect could be due to stable political and democratic institutions, education opportunities (subsample of advanced countries- 140 countries over 1970-201) using instrumental variable (IV) econometric approach in a panel-framework
- Heimberger (2020), using meta-analysis and meta-regression methods -emphasizing the importance of education and technology moderating the impact of globalization on income inequalities for developed countries.

Recent literature

- considerable uncertainty regarding the predicted effects of globalization on income inequality
- None of these studies specifically analyzed causal links so far
- we aim to fill the gap in the existing literature by looking at almost half a century of data and focusing on the causal relationships
- We have employed the overall globalization index combining different subcomponents (economic, social & political) affecting income inequality differently and opens room for subsequent investigation.

Data and Variables

- **Income inequality** statistics use the Gini coefficient for pre-tax income from UNU-WIDER, which we label as Gini (compares the actual distribution of income to the complete equality benchmark)
- Wide ranging variation noted in median inequality across countries even after separating pre and post GFC
- We choose globalization, trade competitiveness, labour market legislation, and unionization dynamics affecting income inequality, following the literature

Data and Variables

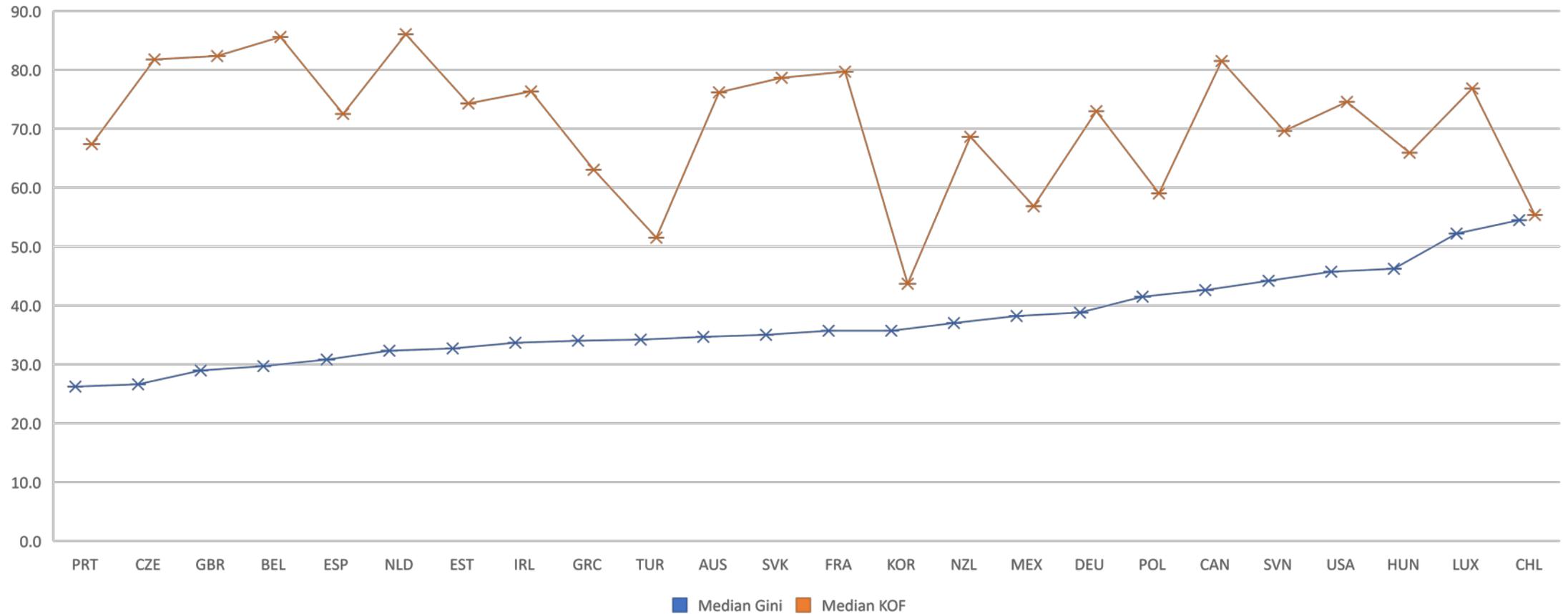
Variables	Source	Expected relation with Gini (a priori)
LRGDPpc	World Development Indicators	+ (Kuznets hypothesis)
Gini	UNU-WIDER World Income Inequality Database, Version 2.0c, May 2008 (WIID2)	
KOF Globalisation Index (KOF)	http://globalization.kof.ethz.ch/ ; Overall index of globalization derived from 24 variables grouped into Economic, Social, and Political Globalization.	?
Minimum wage at constant prices at 2015 USD PPPs (LRMW)	OECD. Stat (https://stats.oecd.org/Index.aspx?DataSetCode=UN_DE N#)	- (higher MW reduces income inequalities)
Terms of Trade (TOT)	World Development Indicators	- (better ToT is equity enhancing)
Union Density (Union)	OECD. Stat (https://stats.oecd.org/Index.aspx?DataSetCode=UN_DE N#)	- (unionization lowers income inequality)
Education (EDU)	<i>hc</i> variable in Penn World Tables 9.1, which stands for Human capital index, based on years of schooling, and returns to education, based on Feenstra et al. (2015).	+ (in case of SBTC; long run effect)

What's included in our globalization variables ?

Variables	Weights (%)
Key Components	
A, Economic globalization	36%
i) Actual Flows (Trade, FDI, Investment, Remittances)	50%
i) Restrictions on Trade (Import tariffs, taxes on trade, Capital a/c)	50%
B. Social globalization	37%
i) Data on personal contact (tourism, migration, telecom)	33%
ii) Data on information flows (internet hosts, users, newspapers)	35%
iii) Data on cultural proximity (McDonalds and Ikea outlets per capita, trade in books)	37%
C. Political globalization	27%

Source: Dreher et al. (2008)

No clear link between globalization and inequality ?



Source: Author's calculations

Methodology

- 1) Test for long-run relationship (Cointegration – Johansen procedure)
- 2) Yamamoto-Kurozumi tests for Granger non-causality (long and short-run) ; check for spuriousness using sign tests by Rajaguru and Abeysinghe (2008)
- 3) Check for Robustness (adding a related variable – education)

Results

- 1) ensure that the results are robust and unaffected by the weak power of selected standard unit root test procedures (based on the stationary ADF and PP) and non-stationary alternative (KPSS) in this step)
- 2) raise possibility that there may not exist a long-run relationship between globalization and inequality for some of these countries.
- 3) The results more heterogeneous across European countries.
- 4) In Asia, America, and Oceania, all variables for all developed countries chosen are I (1) except for Union in the case of KOR (Korea).

Summary of Unit root test results

Variables	I (1)
<i>LRGDPpc</i>	All 23 countries modelled
<i>Gini</i>	All except 7 countries (ESP, EST, GRC, HUN, IRL, and LUX)
<i>KOF</i>	All except LUX
<i>LRMW</i>	All except FRA, LUX, and NLD
<i>ToT</i>	All except IRL
<i>Union</i>	All except BEL, HUN, KOR, and SVK

Johansen procedure to test cointegration between Gini, KOF_{SG}, LRMW, LRGDPPc, ToT, and Union

Acronym	Country	Trace Statistics						Maximum Eigen Value					
		r = 0	r ≤ 1	r ≤ 2	r ≤ 3	r ≤ 4	r ≤ 5	r = 0	r ≤ 1	r ≤ 2	r ≤ 3	r ≤ 4	r ≤ 5
AUS^C	Australia	128.491**	74.57	52.52	31.44	15.17	3.81	53.92**	22.04	21.09	16.27	11.36	3.81
BEL	Belgium	114.94**	57.63	34.20	14.25	5.76	0.02	57.31**	23.42	19.96	8.49	5.74	0.02
CAN^C	Canada	116.88**	59.1	39.86	17.07	7.68	2.13	57.78**	19.24	22.79	9.39	5.56	2.13
CHL^C	Chile	136.09**	65.84	40.56	26.96	9.62	0.16	70.25**	25.27	13.6	17.34	9.46	0.16
CZE	Czech Republic	73.38	52.73	36.39	18.92	10.82	0.76	20.65	16.34	17.47	8.1	10.06	0.76
ESP	Spain	120.97**	52.95	32.31	14.12	8.73	0.01	68.02**	20.64	18.19	5.39	8.72	0.01
EST	Estonia	122.69**	59.77	37.74	20.73	3.93	0.08	62.91**	22.03	17.01	16.8	3.85	0.08
FRA	France	107.41**	58.35	32.56	16.42	5.67	1.19	49.06**	2579	16.14	10.75	4.48	1.19
GBR^C	United Kingdom	82.54**	34.93	20.60	8.48	1.75	0.58	47.61**	14.33	12.12	6.73	1.72	0.58
GRC	Greece	112.25**	58.94	40.57	23.53	11.14	0.62	53.31**	18.38	17.04	12.39	10.52	0.62
HUN	Hungary	179.13**	96.05**	35.73	22	11.46	1.94	83.08**	60.31**	13.73	10.54	9.52	1.94
IRL	Ireland	140.71**	74.35**	39.49	22.47	7.36	0.43	66.35**	34.87**	17.02	15.11	6.92	0.43
JPN	Japan	94.01	67.21	39.79	23.07	8.25	1.14	26.8	27.42	16.72	14.82	7.11	1.14
KOR^C	Korea	138.81**	79.57*	39.73	20.24	6.63	2.08	59.24**	39.84*	19.49	13.61	4.55	2.08
LUX	Luxembourg	138.42**	86.1**	48.36**	21.34	7.87	0.51	52.32**	37.74**	27.02*	13.47	7.36	0.51
MEX^C	Mexico	115.79**	58.37	34.00	22.44	6.95	0.86	57.43**	24.37	11.57	15.49	6.09	0.86
NLD	Netherlands	101.11**	66.02*	38.57	21.87	7.55	0.83	35.09	27.45	16.7	14.32	6.72	0.83
NZL^C	New Zealand	128.19**	57.98	31.11	18.76	9.72	3.05	70.21**	26.87	12.35	9.04	6.67	3.05
POL	Poland	82.31	57.6	34.83	20.16	9.56	1.84	24.71	22.77	14.67	10.6	7.72	1.84
PRT^C	Portugal	153.52**	85.17	59.19	37.81	19.39	7.39	68.35**	25.98	21.38	18.42	12	7.39
SVK	Slovakia	144.09**	69.37	39.5	24.43	10.38	0.46	74.72**	29.87	15.07	14.05	9.92	0.46
TUR^C	Turkey	127.86**	58.47	30.13	11.12	3.91	0.20	69.39**	28.34	19.02	7.21	3.71	0.20
USA^C	United States	125.29**	57.42	38.64	21.28	7.59	1.64	67.86**	18.78	17.36	13.69	5.94	1.64

The following vector error correction model (VECM) is estimated to establish the long-run and short-run relationships between the variables.

$$\begin{pmatrix} \Delta Gini_t \\ \Delta KOF_t \\ \Delta TOT_t \\ \Delta LRGDPC_t \\ \Delta Union_t \\ \Delta LRMW_t \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \\ \alpha_5 \\ \alpha_6 \end{pmatrix} e_{t-1} + \begin{pmatrix} \gamma_{11} & \gamma_{12} & \gamma_{13} & \gamma_{14} & \gamma_{15} & \gamma_{16} \\ \gamma_{21} & \gamma_{22} & \gamma_{23} & \gamma_{24} & \gamma_{25} & \gamma_{26} \\ \gamma_{31} & \gamma_{32} & \gamma_{33} & \gamma_{34} & \gamma_{35} & \gamma_{36} \\ \gamma_{41} & \gamma_{42} & \gamma_{43} & \gamma_{44} & \gamma_{45} & \gamma_{46} \\ \gamma_{51} & \gamma_{52} & \gamma_{53} & \gamma_{54} & \gamma_{55} & \gamma_{56} \\ \gamma_{61} & \gamma_{62} & \gamma_{63} & \gamma_{64} & \gamma_{65} & \gamma_{66} \end{pmatrix} \begin{pmatrix} \Delta Gini_{t-1} \\ \Delta KOF_{t-1} \\ \Delta TOT_{t-1} \\ \Delta LRGDPC_{t-1} \\ \Delta Union_{t-1} \\ \Delta LRMW_{t-1} \end{pmatrix} + \begin{pmatrix} \xi_{1t} \\ \xi_{2t} \\ \xi_{3t} \\ \xi_{4t} \\ \xi_{5t} \\ \xi_{6t} \end{pmatrix}$$

where

$$e_t = Gini_t - \beta_2 KOF_t - \beta_3 ToT_t - \beta_4 OPEN_t - \beta_5 Union_t - \beta_6 LRMW_t$$

Results - Standardized Beta Coefficients (Dependent Variable: Gini)

	Americas				Asia	Oceania		Europe		
	USA	CAN	MEX	CHL	KOR	AUS	NZL	GBR	PRT	TUR
LRGDPpc	-4.32**	0.42	8.72**	-7.34**	0.00	16.16***	6.42**	4.50**	-3.35	80.27**
KOF	1.90**	-0.88**	-2.41	-27.85**	1.55**	-10.35*	1.93	7.21**	13.82**	-60.59**
LRMW	1.09**	-0.26**	-2.79**	18.77**	0.02	1.71	-2.39**	-2.68**	-0.86**	-11.34**
TOT	0.09	-0.33**	-0.75**	2.31**	0.61**	-8.61***	-0.99**	0.32**	-9.14**	2.90**
Union	-3.83**	-0.78**	0.68	-3.99**	-0.35**	5.46	15.16**	6.56**	11.56**	17.68**

Note: **Statistically significant variables at the five percent level of significance.

No pattern across regions; US, GBR, PRT and KOR show higher globalization increases inequality in the long –run, but opposite holds for CAN, CHL and AUS (weaker)

Results - Country Summary Results for Long-Run Positive Granger Causality relationships^a

Effect (→) Cause (↓)	LRGDPpc	Gini	KOF	LRMW	ToT	Union
LRGDPpc		MEX, NLD, TUR	AUS, TUR	GBR	AUS, CAN, USA	MEX
GINI					KOR, USA	NZL
KOF	PRT, TUR	PRT, USA		GBR, PRT	PRT	AUS, KOR, MEX
LRMW	TUR	NLD	CHL		GBR	MEX*, NZL, PRT
TOT		NLD, TUR*, USA	CHL	AUS, GBR	GBR	AUS, KOR, MEX*, NZL, PRT
Union	PRT	PRT*, TUR	TUR	GBR, PRT	KOR, PRT, USA	

a Refers to rejection of Granger non-causality at 5% level of significance, positive effect

*indicates a country with additional evidence of presence of short-run positive causality as well between the same set of variables

Only 2 countries, PRT and USA show long-run positive causal effect from Globalization on inequality, but not in short-run

Results - Country Summary Results for Long-Run Negative Granger Causality relationships^a

Effect (→) Cause (↓)	LRGDPpc	GINI	KOF	LRMW	TOT	Union
LRGDPpc		USA	CHL	AUS	CAN, GBR*	AUS, MEX, NZL
GINI	CHL, PRT			GBR, PRT		CAN, KOR
KOF		NLD, TUR			CAN, GBR*, KOR*, USA	CAN, NZL, PRT
LRMW	PRT, TUR	MEX, PRT, TUR			CAN*, PRT, USA	CAN
TOT	PRT	MEX, PRT	AUS	PRT		CAN
Union	TUR	NLD, USA	CHL		CAN, GBR*	

^a Refers to rejection of Granger non-causality at 5% level of significance, negative effect

*indicates a country with additional evidence of presence of short-run negative causality as well between the same set of variables

Only 2 countries, NLD and TUR show long-run negative causal effect from Globalization on inequality, but not in short-run

Testing for robustness – role of education

- Controlling for the effect of education draws a special attention in the empirical literature as it is the skill-biased technological change (SBTC) that has partially driven the differences in income inequalities across countries
- We, therefore, incorporate a variable for Education (EDU), proxied by a Human capital index, based on years of schooling, and returns to education made available from Feenstra et al. (2015)
- there is no specific evidence that globalization causes income inequality in the long run across any geographical region, even if we control for human capital formation and skill-premium due to higher education.
- Country-specific result suggests that role of education found to be a relatively important factor in moderating the income inequality gaps for US, PRT

Results - Standardized Beta Coefficients controlling for Education (Dependent Variable: Gini)

	Americas		Asia	Oceania	Europe
	USA	CAN	KOR	AUS	PRT
LRGDPpc	-4.17**	0.16	0.05	4.60***	-2.45*
KOF (with EDU)	1.46***	-1.93***	2.52***	-2.70**	10.45***
KOF (no EDU)	1.90**	-0.88**	1.55**	-10.35*	13.82**
LRMW	1.10***	-0.61***	-0.36***	-0.21	-0.51***
TOT	0.14	-0.19	0.83***	-2.42***	-6.03***
Union	-4.22***	-2.60***	0.10**	0.71	9.63***
EDU	0.42*	0.98***	0.33***	0.41*	-2.78***

role of education is also found to be a relatively important factor in moderating the income inequality gaps for US, PRT

Note: ***, ** and * represent Statistically significant variables at the one and five, and ten percent level of significance respectively.

What does this tell policymakers ?

- Protectionism not the answer to reduce inequality
- Skill biased technological change requires greater emphasis on education which moderates the impact on inequality
- Global value chain based trade requires globalization indices to measure new dimensions such as backward and forward participation, which may tell us the real story on the labour market impacts, going forward

Conclusions

- Contrary to the prevailing political narrative, only four countries in our sample (Portugal, followed by the United Kingdom, USA, and Korea) suggest presence of a long-run relationship between globalization and income inequality.
- on a regional basis, no evidence of rising globalization driving inequality for the countries studied and causality runs from higher globalization levels to higher long-run income inequality only for Portugal and USA.
- role of education is also found to be a relatively important factor in moderating income inequality gaps for countries.
- findings based on our cross-country analysis mixed; data limitations poses constraints to separate out the dynamics played by global value chain & institutional factors

THANK YOU !!!