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Income inequality convergence: Evidence from the World Inequality Database

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Abstract

This paper analyzes the hypothesis of inequality convergence for the subsamples of developing and developed countries over the period 1980-2020 using the World Inequality Database (WID.world). To that end, I apply club convergence techniques, which allow for transitional heterogeneity. The results from the analysis of the top 10 percent income share reveal that there are different factors driving inequality across countries other than technological change and globalization. In contrast, the evolution of the top 1 percent income share follows a more synchronized pattern across developed and developing countries.

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1. Introduction

There has been a distinct pattern of rising inequality in the vast majority of countries since 1980 (Alvaredo et al., 2017, 2018). The extant literature suggests that technological change (e.g. see Berman et al., 1994, 1998), globalization (e.g. see Feenstra and Hanson, 1996; Broda and Romalis, 2008; Goldberg and Pavcnik, 2007; Krugman, 2008; Jaumotte et al., 2013) or financial development(e.g. see Roine et al., 2009; Bivens and Mishel, 2013; Tanndal and Waldenström, 2018) could be the driving force of the rise in inequality. These recent trends in global inequality have begun to attract renewed academic and policy interest in international inequality dynamics.

The neoclassical growth model predicts not only convergence in per capita incomes, but also convergence in the whole income distribution (Bénabou, 1996). That is, countries with the same fundamentals will tend towards the same income distribution. Yet the convergence of inequality across countries has received relatively little attention in the empirical literature.[1] This might be because country-specific policies and institutions play an important role in determining the extent of inequality.[2]

This paper is related to some of the sparse literature on inequality convergence between countries. Ravallion (2003) finds evidence that income inequalities have been slowly converging among countries since the 1980s. Bleaney and Nishiyama (2003) argue that the convergence of income inequality seems to be faster across developed countries than across developing countries. Dhongde and Miao (2013) show that within-country income inequality has converged during 1980 and 2005. They also suggest that the speed of convergence is faster among developed countries than among developing countries. Monfort et al. (2018) propose that economic integration in Europe has not caused real economic convergence in terms of income inequality.

This paper contributes to the literature on inequality convergence by empirically testing convergence between countries using the World Inequality Database (WID.world). The database reports panel data on upper-end measures of income inequality such as top 1 percent and 10 percent income shares over long periods of time and across countries. Thus, I use these inequality measures rather than the Gini coefficient contrary to most of the existing literature. A drawback of using the Gini coefficient is that it may provide misleading information due to lack of the low end of the income distribution (Frank, 2009; Atems and Jones, 2015).

The aim of this paper is to test whether income inequalities across developed and developing countries converge to the same equilibrium path or whether there exists a convergence club. I apply the methodology of Phillips and Sul (2007) to test for club convergence. This approach has several advantages that make it useful in empirical work. First, this method makes possible the flexibility in idiosyncratic behavior over time and across countries because it is based on a nonlinear time varying factor model. In addition, the Phillips and Sul (2007) test does not rely on any particular assumptions about trend stationarity or stochastic non-

[1] In contrast, there exists an extensive empirical literature on cross-country convergence of per capita incomes. For example, see Barro (1991), Barro and Sala-i Martin (1991), Pritchett (1997).

[2] Taking this view into consideration, some researchers have focused on regional inequality convergence within countries. For example, see Panizza (2001) and Ezcurra and Pascual (2009) for the U.S. and Mendoza-Velázqueza et al. (2020) for Mexico.

stationarity of the variables concerned. Club convergence test has been applied in various topics such as per capita GDP (Hamit-Haggar, 2013; Monfort et al., 2013; Tian et al., 2016; Bergeaud et al., 2020), cost of living (Phillips and Sul, 2007), housing price (Montañés and Olmos, 2013; Churchill et al., 2018; Holmes et al., 2019) and so on.

The remainder of the paper is organized as follows. Section 2 gives a description of the data and presents the empirical methodology. Section 3 presents the empirical findings and the last section concludes.

2. Data and Methodology

Data on inequality are taken from the World Inequality Database (WID.world).[3] These panel data were constructed by combining all available data sources, including household surveys, tax data, and national accounts in accordance with the Distributional National Accounts Guidelines (DINA). The WID currently reports income distribution series covering all countries worldwide on an annual basis from 1980 onward. Thus, I restrict the sample of countries to those for which inequality data is available for the period 1980 to 2020.[4] Extremely small countries may have lower-quality statistics and do not have a significant impact on global inequality. Hence, I exclude small countries with a population of less than 1 million in 2020. Total population data are obtained from the World Bank's World Development Indicators (WDI) database.

As mentioned above, policies and institutions matter for inequality. Partly reflecting this argument, the current study splits the sample of countries into two subgroups: developed countries and developing countries. The classification of developed countries is conducted according to the World Economic Outlook country classification (IMF, 2022).[5] Finally, the whole sample includes 32 developed countries and 125 developing countries. Table A1 lists all countries included in the analysis together with the 2-digit ISO country codes.

The cluster analysis is carried out for the share of pretax national income (before taxes and before government transfers) held by groups at the upper ends of the distribution. Personal income series uses the adult individual as the unit of observation and splits income equally for married couples.

Phillips and Sul (2007) have proposed the 'log t' test to empirically test for convergence and the identification of convergence clubs. This test has the advantage of allowing for different convergence paths among heterogeneous individuals. For any given panel data set X_{it}, we can decompose it into a product of two components:

$$X_{it} = \delta_{it}\mu_t \tag{1}$$

where μ_t is a common factor, and δ_{it} is a time varying idiosyncratic factor.

[3] The data can be downloaded on the website `https://wid.world`.

[4] According to Alvaredo et al. (2018), "1980 is the turning point in inequality and policy in many countries (the Reagan-Thatcher revolution in the Western world, deregulation in China and India)."

[5] The World Economic Outlook divides the world into two subgroups: advanced economies and emerging and developing economies.

However, we cannot directly estimate the model due to over-parametrization. Thus, Phillips and Sul (2007) removed the common factor as follows:

$$h_{it} = \frac{X_{it}}{\frac{1}{N}\sum_{i=1}^{N} X_{it}} = \frac{\delta_{it}}{\frac{1}{N}\sum_{i=1}^{N} \delta_{it}} \tag{2}$$

where h_{it} is called the relative transition path, and captures a trajectory for individual i relative to the panel average. Equation (2) indicates that the cross-sectional mean of h_{it} is unity, and the cross-sectional variance of h_{it} satisfies the following condition:

$$H_t = \frac{1}{N}\sum_{i=1}^{N}(h_{it}-1)^2 \to 0 \quad \text{if} \lim_{t\to\infty} \delta_{it} = \delta \quad \text{for all } i \tag{3}$$

To formulate a formal test of convergence, Phillips and Sul (2007) constructed a semi-parametric model for δ_{it} as follows:

$$\delta_{it} = \delta_i + \sigma_i \xi_{it} L(t)^{-1} t^{-\alpha} \tag{4}$$

where δ_i is fixed, $\sigma_i > 0$, ξ_{it} is i.i.d. (0,1) across i but weakly dependent over t. The function $L(t)$, which is assumed to be $log(t)$, is a slowly increasing function. The size of α determines the behavior (convergence or divergence) of δ_{it}. The null hypothesis of convergence can be written as:

$$H_0 : \delta_i = \delta, \quad \alpha \geq 0 \tag{5}$$

and the alternative hypothesis:

$$H_A : \delta_i \neq \delta \text{ for all } i \text{ or } \alpha < 0 \tag{6}$$

Phillips and Sul (2007) showed that the hypothesis test can be implemented by the following $log(t)$ regression model:

$$\begin{aligned} log(H_1/H_t) - 2log[log(t)] &= a + b\log(t) + u_t \\ \text{for } t = [rT], [rT]+1, \cdots, T \text{ with } r > 0 & \end{aligned} \tag{7}$$

where r is the trimming parameter implying that the first r% of the data is dropped. Specifically, it is suggested to set $r = 0.3$ for the small or moderate $T(\leq 50)$ sample and set $r = 0.2$ for the large $T(\geq 100)$ sample.

Phillips and Sul (2007) further showed that $\hat{b} = 2\hat{\alpha}$ and the null hypothesis is tested through a conventional one-sided t test of $\hat{b} \geq 0$. At the 5% significance level, the null hypothesis is rejected when $t_{\hat{b}} < -1.65$. However, rejection of the null hypothesis does not eliminate the possibility of convergence in subgroups of panel individuals. Thus, I apply the robust four-step clustering algorithm for identifying clubs in a panel suggested by Phillips and Sul (2007).[6]

[6]For a detailed explanation of the algorithm, see Phillips and Sul (2007) and Du (2017).

3. Empirical Results

Table 1 shows the club classification for the top 10 percent income share obtained from a sample of 32 developed countries. The club clustering algorithm identifies two convergence clubs. The first club includes the United States, Canada, Germany, Denmark, Lithuania, Latvia, Israel, Hong Kong, Japan, Korea, Singapore, Taiwan. This result is rather consistent with Lee and Shin (2021) who find that Korea and Japan converged to the Anglo-Saxon type of capitalism. One probable reason proposed by the authors is that these countries may be highly vulnerable to external shocks such as the Plaza Accord in 1985, and the financial crisis in 1997. Since then, Japan and Korea experienced substantial market-oriented reforms. The second club is made up of most of the European countries (including the United Kingdom, France, Italy, Spain, Sweden, Norway etc.) plus Australia and New Zealand. The results in the last row of Table 1 do not support the merger of Clubs 1 and 2.

Table 1 Top 10% income share convergence: developed countries (1980-2020)

Clubs	Country	Log t	t-stat
1	CA, DE, DK, HK, IL, JP, KR, LT, LV, SG, TW, US	-0.043	-0.360
2	AT, AU, BE, CH, CY, EE, ES, FI, FR, GB, GR, IE, IT, NL, NO, NZ, PT, SE, SI, SK	0.583	4.931
1+2		-0.652	-7.691

The term log t represents a parameter which is related to the speed of convergence of this club towards the panel average. t-stat is the convergence test statistic with a critical value of -1.65 at the 5% level of significance.

Table 2 reports the identified two convergence clubs for a sample of 125 developing countries in terms of the top 10 percent income share. The merging of these clubs is not supported. Club 1 comprises 96 countries including the BRICS nations (Brazil, Russia, India, China, South Africa), most countries in the Middle East and sub-Saharan Africa. Club 2 consists of 29 countries. Interestingly, the second club includes many transition economies such as Albania, Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Serbia, Ukraine and so on.

Table 2 Top 10% income share convergence: developing countries (1980-2020)

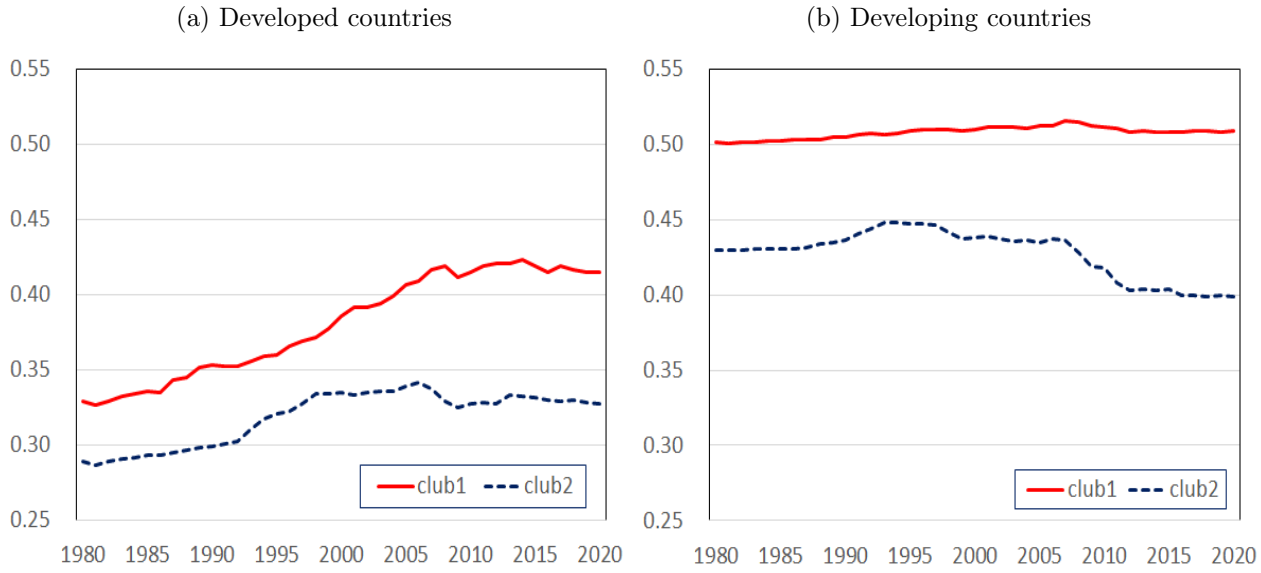
Clubs	Country	Log t	t-stat
1	AE, AF, AO, BA, BD, BF, BG, BH, BI, BJ, BO, BR, BW, CD, CF, CG, CI, CL, CM, CN, CO, CR, DO, EG, GE, GH, GQ, GT, GW, HN, HR, HT, ID, IN, IQ, IR, JM, JO, KE, KP, KW, LA, LB, LK, LR, LS, LY, MA, MG, MN, MU, MW, MX, MZ, NA, NI, NP, OM, PA, PE, PG, PH, PK, PL, PS, PY, QA, RO, RU, RW, SA, SD, SL, SN, SO, SS, SV, SY, SZ, TD, TG, TH, TJ, TL, TM, TR, TT, TZ, UG, UZ, VE, VN, YE, ZA, ZM, ZW	-0.104	-1.455
2	AL, AM, AR, AZ, BY, CU, CZ, DZ, EC, ET, GA, GM, GN, HU, KG, KH, KZ, MD, MK, ML, MM, MR, MY, NE, NG, RS, TN, UA, UY	0.374	2.758
1+2		-0.379	-4.815

The term log t represents a parameter which is related to the speed of convergence of this club towards the panel average. t-stat is the convergence test statistic with a critical value of -1.65 at the 5% level of significance.

Panel (a) of Figure 1 shows each club's transition path for the sample of developed countries by using the arithmetic average of the income shares. The top 10 percent income share has increased since 1980 but with considerable variations in magnitude across clubs. The transition path of Club 1 starts off with a somewhat higher value (33%) compared with that of Club 2 (29%), and then follows a steady upward trend from 1980 to the mid-2010s. In contrast, Club 2 showed a moderate increase until the mid-2000s and then entered a slight downward trend. The transition path of Club 2 seems to be consistent with the traditional 'caring' European model, mainly represented by the continental European countries and the Nordic countries (Monfort et al., 2018). According to Alesina et al. (2004), European governments are more concerned with inequality than the United States government. As a possible reason for this finding, they argue that the poor and left-wingers in Europe feel more uncomfortable with inequality than the corresponding classes in America.

Panel (b) of Figure 1 displays the transition paths corresponding to each club for the sample of developing countries. In Club 1, the top 10 percent income share has remained comparatively stable at extremely high levels since 1980. On the other hand, Club 2 has shown a moderate downward trend since the mid-1990s. This evolution is similar to Dorn et al. (2018) who find that income inequality did not increase or even decreased in most transition countries from Central and Eastern Europe during the 2000s. Egger and Stehrer (2003) propose that intermediate goods trade has led to decreased wage inequality in Central and Eastern European manufacturing.

Figure 1 Top 10% income share convergence



Consider now the share of income accruing to the top 1 percent of adults. Table 3 presents the clubs identified for the sample of developed countries. The first club includes most countries in the sample; 25 out of 32. Thus, more advanced countries show a similar pattern of significant increase in pay for top earners. The second club consists of Austria, Belgium, France, Greece, Netherlands, Sweden, Slovenia. The results in the last row of Table 3 indicate that the currently formed clubs are maintained.

Table 3 Top 1% income share convergence: developed countries (1980-2020)

Clubs	Country	Log t	t-stat
1	AU, CA, CH, CY, DE, DK, EE, ES, FI, GB, HK, IE, IL, IT, JP, KR, LT, LV, NO, NZ, PT, SG, SK, TW, US	-0.085	-0.633
2	AT, BE, FR, GR, NL, SE, SI	0.266	1.905
1+2		-0.344	-2.668

The term log t represents a parameter which is related to the speed of convergence of this club towards the panel average. t-stat is the convergence test statistic with a critical value of -1.65 at the 5% level of significance.

Table 4 shows the result of the $\log t$ test to test for convergence in the top 1 percent income share with developing countries. The results indicate that the null hypothesis of full panel convergence cannot be rejected.

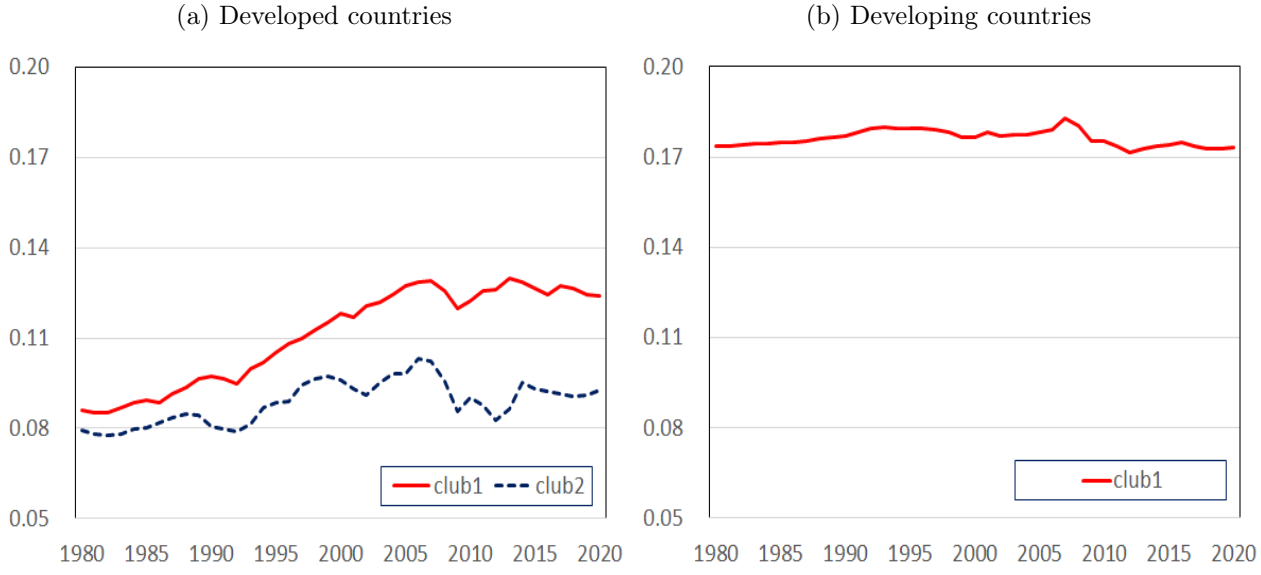
Table 4 Top 1% income share convergence: developing countries (1980-2020)

Clubs	Country	Log t	t-stat
1	AE, AF, AL, AM, AO, AR, AZ, BA, BD, BF, BG, BH, BI, BJ, BO, BR, BW, BY, CD, CF, CG, CI, CL, CM, CN, CO, CR, CU, CZ, DO, DZ, EC, EG, ET, GA, GE, GH, GM, GN, GQ, GT, GW, HN, HR, HT, HU, ID, IN, IQ, IR, JM, JO, KE, KG, KH, KP, KW, KZ, LA, LB, LK, LR, LS, LY, MA, MD, MG, MK, ML, MM, MN, MR, MU, MW, MX, MY, MZ, NA, NE, NG, NI, NP, OM, PA, PE, PG, PH, PK, PL, PS, PY, QA, RO, RS, RU, RW, SA, SD, SL, SN, SO, SS, SV, SY, SZ, TD, TG, TH, TJ, TL, TM, TN, TR, TT, TZ, UA, UG, UY, UZ, VE, VN, YE, ZA, ZM, ZW	-0.025	-0.399

The term log t represents a parameter which is related to the speed of convergence of this club towards the panel average. t-stat is the convergence test statistic with a critical value of -1.65 at the 5% level of significance.

As shown in Panel (a) of Figure 2, Club 1 is characterized by a relatively clear upward trend. Kaplan and Rauh (2013) assert that the US evidence on income and wealth shares for the top 1 percent is most consistent with the superstar hypothesis of Rosen (1981) based on the importance of scale and skill-biased technological change. Meanwhile, in general Club 2 showed a slightly increasing trend until the mid-2000s and then its top 1 percent income share fell close to the initial value in 1980 and rebounded in the recent decade. Panel (b) of Figure 2 shows the convergence path for the sample of developing countries. The top 1 percent income share stood at about 17 percent in 1980 and has remained relatively stable over the whole sample period.

Figure 2 Top 1% income share convergence



Lastly, I change the truncation parameter r following von Lyncker and Thoennessen

(2017) in order to examine the robustness of the findings of the above mentioned. Concretely, I use $r = 0.2$ and $r = 0.4$ instead of the choice $r = 0.3$ proposed by Phillips and Sul (2007). The club classification results are provided in the Appendix (Tables A2 through A9). These clustering patterns are qualitatively similar for those of the baseline results.

4. Conclusion

This study aims to empirically investigate convergence in upper-end measures of income inequality across a large set of countries using panel data obtained from the World Inequality Database. The results suggest that there is no evidence of convergence in terms of the top 10 percent income share across developed and developing countries. The finding of two convergence clubs for each subsample suggest that there are different factors driving inequality across countries. Therefore, policies and institutions are no less important than technological change and globalization as determinants of within-country inequality. In contrast, the evolution of the top 1 percent income share follows a more synchronized pattern across developed and developing countries.

References

Alesina, Alberto, Rafael Di Tella, and Robert MacCulloch (2004) "Inequality and Happiness: Are Europeans and Americans Different?" *Journal of Public Economics* **88** (9-10), 2009–2042.

Alvaredo, Facundo, Lucas Chancel, Thomas Piketty, Emmanuel Saez, and Gabriel Zucman (2017) "Global Inequality Dynamics: New Findings from WID.world," *American Economic Review* **107** (5), 404–409.

——— (2018) "The Elephant Curve of Global Inequality and Growth," *AEA Papers and Proceedings* **108**, 103–108.

Atems, Bebonchu and Jason Jones (2015) "Income Inequality and Economic Growth: A Panel VAR Approach," *Empirical Economics* **48**, 1541–1561.

Barro, R. (1991) "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics* **106** (2), 407–443.

Barro, R. and X. Sala-i Martin (1991) "Convergence across States and Regions," *Brookings Papers on Economic Activity* **1991**, 107–182.

Bénabou, R. (1996) "Inequality and Growth," in Bernanke, B. and J. Rotemberg eds. *National Bureau of Economic Research Macroeconomics Annual*: MIT Press.

Bergeaud, Antonin, Gilbert Cette1, and Rémy Lecat1 (2020) "Convergence of GDP Per Capita in Advanced Countries over the Twentieth Century," *Empirical Economics* **59**, 2509–2526.

Berman, E., J. Bound, and Z. Griliches (1994) "Changes in the Demand for Skilled Labor within U.S. Manufacturing: Evidence from the Annual Survey of Manufactures," *Quarterly Journal of Economics* **109** (2), 367–397.

Berman, E., J. Bound, and S. Machin (1998) "Implications of Skill-Biased Technological Change: International Evidence," *Quarterly Journal of Economics* **113** (4), 1245–1279.

Bivens, Josh and Lawrence Mishel (2013) "The Pay of Corporate Executives and Financial Professionals as Evidence of Rents in Top 1 Percent Incomes," *Journal of Economic Perspectives* **27** (3), 57–78.

Bleaney, Michael and Akira Nishiyama (2003) "Convergence in Income Inequality: Differences between Advanced and Developing Countries," *Economics Bulletin* **4** (22), 1–10.

Broda, C. and J. Romalis (2008) "Inequality and Prices: Does China Benefit the Poor in America?" working paper, University of Chicago.

Churchill, Sefa Awaworyi, John Inekwe, and Kris Ivanovski (2018) "House Price Convergence: Evidence from Australian Cities," *Economics Letters* **170**, 88–90.

Dhongde, Shatakshee and Xing Miao (2013) "Cross-Country Convergence in Income Inequality," Working Papers 290, The Society for the Study of Economic Inequality (ECINEQ).

Dorn, Florian, Clemens Fuest, and Niklas Potrafke (2018) "Globalization and Income Inequality Revisited," Working Paper 6859, CESifo.

Du, Kerui (2017) "Econometric Convergence Test and Club Clustering Using Stata," *The Stata Journal* **17** (4), 882–900.

Egger, P. and R. Stehrer (2003) "International Outsourcing and the Skill Specific Wage Bill in Eastern Europe," *World Economy* **26** (1), 61–72.

Ezcurra, Roberto and Pedro Pascual (2009) "Convergence in Income Inequality in the United States: A Nonparametric Analysis," *Applied Economics Letters* **16**, 1365–1368.

Feenstra, R. C. and G. H. Hanson (1996) "Globalization, Outsourcing, and Wage Inequality," *American Economic Review* **86** (2), 240–245.

Frank, Mark W. (2009) "Inequality and Growth in the United States: Evidence from a New State-level Panel of Income Inequality Measures," *Economic Inquiry* **47** (1), 55–68.

Goldberg, P. K. and N. Pavcnik (2007) "Distributional Effects of Globalization in Developing Countries," *Journal of Economic Literature* **45** (1), 39–82.

Hamit-Haggar, Mahamat (2013) "A Note on Convergence across Canadian Provinces: New Insights from the Club Clustering Algorithm," *The Annals of Regional Science* **50**, 591–601.

Holmes, Mark J., Jesús Oterob, and Theodore Panagiotidisc (2019) "Property Heterogeneity and Convergence Club Formation among Local House Prices," *Journal of Housing Economics* **43**, 1–13.

IMF (2022) "World Economic Outlook: War Sets Back The Global Recovery,"Technical report, International Monetary Fund.

Jaumotte, Florence, Subir Lall, and Chris Papageorgiou (2013) "Rising Income Inequality: Technology, or Trade and Financial Globalization?" *IMF Economic Review* **61** (2), 271–309.

Kaplan, Steven N. and Joshua Rauh (2013) "It's the Market: The Broad-Based Rise in the Return to Top Talent," *Journal of Economic Perspectives* **27** (3), 35–56.

Krugman, P. (2008) "Trade and Wages, Reconsidered," *Brookings Papers on Economic Activity* **2008**, 103–137.

Lee, Keun and Hochul Shin (2021) "Varieties of Capitalism and East Asia: Long-term Evolution, Structural Change, and the End of East Asian Capitalism," *Structural Change and Economic Dynamics* **56**, 431–437.

von Lyncker, K. and R. Thoennessen (2017) "Regional Club Convergence in the EU: Evidence from a Panel Data Analysis," *Empirical Economics* **52**, 525–553.

Mendoza-Velázqueza, Alfonso, Vicente German-Soto, Mercedes Monfort, and Javier Ordóñez (2020) "Club Convergence and Inter-Regional Inequality in Mexico, 1940-2015," *Applied Economics* **52** (6), 598–608.

Monfort, Mercedes, Juan Carlos Cuestas, and Javier Ordóñez (2013) "Real Convergence in Europe: A Cluster Analysis," *Economic Modelling* **33**, 689–694.

Monfort, Mercedes, Javier Ordóñez, and Hector Sala (2018) "Inequality and Unemployment Patterns in Europe: Does Integration Lead to (Real) Convergence?" *Open Economies Review* **29**, 703–724.

Montañés, A. and L. Olmos (2013) "Convergence in US House Prices," *Economics Letters* **121**, 152–155.

Panizza, U. (2001) "Convergence in Income Inequality," *Journal of Income Distribution* **10**, 5–12.

Phillips, Peter C. and Donggyu Sul (2007) "Transition Modelling and Econometric Convergence Tests," *Econometrica* **75** (6), 1771–1855.

Pritchett, L. (1997) "Divergence, Big Time," *Journal of Economic Perspectives* **11** (3), 3–17.

Ravallion, Martin (2003) "Inequality Convergence," *Economics Letters* **80**, 351–356.

Roine, Jesper, Jonas Vlachos, and Daniel Waldenström (2009) "The Long-run Determinants of Inequality: What Can We Learn from Top Income Data," *Journal of Public Economics* **93**, 974–988.

Rosen, Sherwin (1981) "The Economics of Superstars," *American Economic Review* **71** (5), 845–858.

Tanndal, Julia and Daniel Waldenström (2018) "Does Financial Deregulation Boost Top Incomes? Evidence from the Big Bang," *Economica* **85** (338), 232–265.

Tian, Xu, Xiaoheng Zhang, Yingheng Zhou, and Xiaohua Yuc (2016) "Regional Income Inequality in China Revisited: A Perspective from Club Convergence," *Economic Modelling* **56**, 50–58.

Appendices

Table A1 Country classification

Developed countries(32)	**Developing countries(125)**
AT(Austria), AU(Australia), BE(Belgium), CA(Canada), CH(Switzerland), CY(Cyprus), DE(Germany), DK(Denmark), EE(Estonia), ES(Spain), FI(Finland), FR(France), GB(United Kingdom), GR(Greece), HK(Hong Kong), IE(Ireland), IL(Israel), IT(Italy), JP(Japan), KR(Korea), LT(Lithuania), LV(Latvia), NL(Netherlands), NO(Norway), NZ(New Zealand), PT(Portugal), SE(Sweden), SG(Singapore), SI(Slovenia), SK(Slovakia), TW(Taiwan), US(United States)	AE(United Arab Emirates), AF(Afghanistan), AL(Albania), AM(Armenia), AO(Angola), AR(Argentina), AZ(Azerbaijan), BA(Bosnia and Herzegovina), BD(Bangladesh), BF(Burkina Faso), BG(Bulgaria), BH(Bahrain), BI(Burundi), BJ(Benin), BO(Bolivia), BR(Brazil), BW(Botswana), BY(Belarus), CD(DR Congo), CF(Central African Republic), CG(Congo), CI(Cote d'Ivoire), CL(Chile), CM(Cameroon), CN(China), CO(Colombia), CR(Costa Rica), CU(Cuba), CZ(Czech Republic), DO(Dominican Republic), DZ(Algeria), EC(Ecuador), EG(Egypt), ET(Ethiopia), GA(Gabon), GE(Georgia), GH(Ghana), GM(Gambia), GN(Guinea), GQ(Equatorial Guinea), GT(Guatemala), GW(Guinea-Bissau), HN(Honduras), HR(Croatia), HT(Haiti), HU(Hungary), ID(Indonesia), IN(India), IQ(Iraq), IR(Iran), JM(Jamaica), JO(Jordan), KE(Kenya), KG(Kyrgyzstan), KH(Cambodia), KP(North Korea), KW(Kuwait), KZ(Kazakhstan), LA(Lao PDR), LB(Lebanon), LK(Sri Lanka), LR(Liberia), LS(Lesotho), LY(Libya), MA(Morocco), MD(Moldova), MG(Madagascar), MK(North Macedonia), ML(Mali), MM(Myanmar), MN(Mongolia), MR(Mauritania), MU(Maldives), MW(Malawi), MX(Mexico), MY(Malaysia), MZ(Mozambique), NA(Namibia), NE(Niger), NG(Nigeria), NI(Nicaragua), NP(Nepal), OM(Oman), PA(Panama), PE(Peru), PG(Papua New Guinea), PH(Philippines), PK(Pakistan), PL(Poland), PS(Palestine), PY(Paraguay), QA(Qatar), RO(Romania), RS(Serbia), RU(Russia), RW(Rwanda), SA(Saudi Arabia), SD(Sudan), SL(Sierra Leone) SN(Senegal), SO(Somalia), SS(South Sudan), SV(El Salvador), SY(Syrian Arab Republic), SZ(Swaziland), TD(Chad), TG(Togo), TH(Thailand), TJ(Tajikistan), TL(Timor-Leste), TM(Turkmenistan), TN(Tunisia), TR(Turkey), TT(Trinidad and Tobago), TZ(Tanzania), UA(Ukraine), UG(Uganda), UY(Uruguay), UZ(Uzbekistan), VE(Venezuela), VN(Viet Nam), YE(Yemen), ZA(South Africa), ZM(Zambia), ZW(Zimbabwe)

Table A2 Top 10% income share convergence: developed countries (1980-2020), r=0.2

Clubs	Country	Log t	t-stat
1	CA, DE, EE, FI, GB, HK, IL, JP, KR, LT, LV, NO, PT, SG, TW, US	-0.073	-0.600
2	AT, AU, BE, CH, CY, DK, ES, FR, GR, IE, IT, NL, NZ, SE, SI, SK	0.582	3.448
1+2		-0.443	-6.209

Table A3 Top 10% income share convergence: developing countries (1980-2020), r=0.2

Clubs	Country	Log t	t-stat
1	AE, AO, BA, BD, BF, BG, BH, BI, BJ, BO, BR, BW, CD, CF, CG, CI, CL, CM, CN, CO, CR, DO, EG, GE, GH, GM, GQ, GT, GW, HN, HT, HU, ID, IN, IQ, IR, JM, JO, KE, KH, KP, KW, KZ, LA, LB, LK, LS, LY, MA, MG, MM, MN, MU, MW, MX, MZ, NA, NG, NI, OM, PA, PE, PG, PH, PK, PL, PS, PY, QA, RO, RS, RU, RW, SA, SD, SL, SN, SO, SS, SV, SY, SZ, TD, TG, TH, TJ, TM, TR, TT, TZ, UG, UZ, VE, VN, YE, ZA, ZM, ZW	0.036	1.431
2	AF, AL, AM, AR, AZ, BY, CU, CZ, DZ, EC, ET, GA, GN, HR, KG, LR, MD, MK, ML, MR, MY, NE, NP, TL, TN, UA, UY	0.286	2.902
1+2		-0.254	-9.745

Table A4 Top 1% income share convergence: developed countries (1980-2020), r=0.2

Clubs	Country	Log t	t-stat
1	AU, CA, CH, CY, DE, DK, EE, ES, FI, GB, GR, HK, IE, IL, IT, JP, KR, LT, LV, NO, NZ, PT, SG, SI, SK, TW, US	0.006	0.089
2	AT, BE, FR, NL, SE	-0.053	-0.261
1+2		-0.172	-2.105

Table A5 Top 1% income share convergence: developing countries (1980-2020), r=0.2

Clubs	Country	Log t	t-stat
1	AE, AF, AL, AM, AO, AR, AZ, BA, BD, BF, BG, BH, BI, BJ, BO, BR, BW, BY, CD, CF, CG, CI, CL, CM, CN, CO, CR, CU, CZ, DO, DZ, EC, EG, ET, GA, GE, GH, GM, GN, GQ, GT, GW, HN, HR, HT, HU, ID, IN, IQ, IR, JM, JO, KE, KG, KH, KP, KW, KZ, LA, LB, LK, LR, LS, LY, MA, MD, MG, MK, ML, MM, MN, MR, MU, MW, MX, MY, MZ, NA, NE, NG, NI, NP, OM, PA, PE, PG, PH, PK, PL, PS, PY, QA, RO, RS, RU, RW, SA, SD, SL, SN, SO, SS, SV, SY, SZ, TD, TG, TH, TJ, TL, TM, TN, TR, TT, TZ, UA, UG, UY, UZ, VE, VN, YE, ZA, ZM, ZW	-0.005	-0.136

Table A6 Top 10% income share convergence: developed countries (1980-2020), r=0.4

Clubs	Country	Log t	t-stat
1	CA, DE, DK, HK, IL, JP, KR, LT, SG, TW, US	0.219	1.137
2	AT, AU, BE, CH, CY, EE, ES, FI, FR, GB, GR, IE, IT, LV, NL, NO, NZ, PT, SE, SI, SK	0.577	3.927
1+2		-0.799	-8.547

Table A7 Top 10% income share convergence: developing countries (1980-2020), r=0.4

Clubs	Country	Log t	t-stat
1	AO, BH, BJ, BO, BR, BW, CD, CF, CG, CI, CL, CM, CO, CR, DO, EG, ET, GE, GH, GQ, GT, GW, HN, HT, IN, IQ, JM, KW, LA, LB, MA, MG, MU, MW, MX, MZ, NA, NI, OM, PA, PE, PS, PY, QA, RW, SA, SD, SO, SS, SY, SZ, TD, TG, TH, TM, TR, TT, UG, UZ, VE, YE, ZA, ZM, ZW	-0.070	-1.419
2	AE, AF, AL, AM, AR, AZ, BA, BD, BF, BG, BI, BY, CN, CU, CZ, DZ, EC, GA, GM, GN, HR, HU, ID, IR, JO, KE, KG, KH, KP, KZ, LK, LR, LS, LY, MD, MK, ML, MM, MN, MR, MY, NE, NG, NP, PG, PH, PK, PL, RO, RS, RU, SL, SN, SV, TJ, TL, TN, TZ, UA, UY, VN	0.360	4.128
1+2		-0.527	-14.772

Table A8 Top 1% income share convergence: developed countries (1980-2020), r=0.4

Clubs	Country	Log t	t-stat
1	AU, CA, CH, CY, DE, DK, EE, ES, GB, GR, HK, IE, IL, IT, JP, , KR, LT, LV, NO, NZ, PT, SG, SK, TW, US	-0.126	-0.837
2	AT, BE, FI, FR, NL, SE, SI	0.782	3.766
1+2		-0.443	-3.004

Table A9 Top 1% income share convergence: developing countries (1980-2020), r=0.4

Clubs	Country	Log t	t-stat
1	AE, AF, AL, AM, AO, AR, AZ, BA, BD, BF, BG, BH, BI, BJ, BO, BR, BW, BY, CD, CF, CG, CI, CL, CM, CN, CO, CR, CU, CZ, DO, DZ, EC, EG, ET, GA, GE, GH, GM, GN, GQ, GT, GW, HN, HR, HT, HU, ID, IN, IQ, IR, JM, JO, KE, KG, KH, KP, KW, KZ, LA, LB, LK, LR, LS, LY, MA, MD, MG, MK, ML, MM, MN, MR, MU, MW, MX, MY, MZ, NA, NG, NI, NP, OM, PA, PE, PG, PH, PK, PL, PS, PY, QA, RO, RS, RU, RW, SA, SD, SL, SN, SO, SS, SV, SY, SZ, TD, TG, TH, TJ, TL, TM, TN, TR, TT, TZ, UA, UG, UY, UZ, VE, VN, YE, ZA, ZM, ZW	-0.206	-1.633
No convergence	NE		
1+NE		-0.231	-1.804