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The Extreme Wealth-Income Ratio (EWIR): the Joker Smile Curve (JSC) and the New Age of Extremes

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The extreme wealth-income ratio (EWIR): the Joker Smile Curve (JSC) and the new age of extremes

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Abstract (179 words)

Is it possible to observe explosive economic inequality, even if the Gini indices of income and of wealth remain stagnant? The answer is yes. The Extreme wealth-income ratio (EWIR), that compares the top quantiles of wealth accumulation to the median income level (among other similar variants), expresses the number (thousands) of years the richest fractions of the wealthy can buy of the average layperson's income. This new indicator brings to light new inequalities that no traditional indicator detects. Building on the traditional wealth-income ratio (WIR, Stiglitz, 1969) and the Top Wealth-Income Ratio (TWIR) recently developed by Chauvel et al. (2021), a new generalization is here proposed to provide a better measurement of the extremization of socioeconomic inequalities based on developments at the top of society.

The EWIR is applied to various examples: decades of British, French, and American trends, global data from the last 20 years, and comparisons with data from large-scale surveys (LWS, EU-HFCS, and PSID, among others). The EWIR confirms that the Gini indices of income and wealth are not sufficient measurements for identifying extreme social inequalities.

Keywords: inequality; wealth; income; middle class; wealth-to-income ratio.

1- From TWIR to EWIR

In previous research characterizing middle class dynamics (Chauvel et al., 2021, see also Gornick & Jäntti, 2013), we defined the TWIR as the ratio of the average net wealth of the top 1% to the average income of the population (see Appendix 1). This ratio characterizes the elites' accumulated economic means in terms of years of laypeople's incomes. Typically, in the U.S., this ratio rose from 100 income-years in 1980 to 250 in 2020, an indication of the increasing distance in level of living between the top 1% in wealth and those of average income.

The TWIR is a simple indicator of inequality between the top 1% and the common population (laypeople, median class, majority class, etc.) and offers a better sense of inequality than the

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elementary wealth–income ratio (WIR) that simply expresses the imbalance between income and capital (Stiglitz, 1969; Piketty & Zucman, 2014; Alvaredo, 2018; Waldenström, 2021). The TWIR conveys more than this imbalance, since it presents how the top tail of accumulation of ownership prevails over the majority class. TWIR might be defined different ways. It is normally the ratio of the threshold characterizing the top 1% wealthiest population to the average income of the population. Other definitions might be proposed depending on the availability of data. The numerator may be replaced by the top 1% average wealth instead of its threshold. The denominator might be replaced by the median income, or the avergage GDP per capita. The idea is to compare systematically the upper tail of wealth to a measure of central location of the income distribution. This is the most effective way to consider the joint income and wealth distributions (Jäntti et al., 2008, Killewald et al., 2017, Semyonov & Lewin-Epstein, 2013).
The unit of the TWIR indicator is expressed in years, because it represents the number of years of average income that the typical member of the top 1% wealthiest people can buy. Otherwise, this represents the number of years of average income needed to reach the average wealth of the top 1%. Roughly expressed, it is a distance between the middle class in income and the wealth of the wealthy elite class.
If the WIR (the ratio of average wealth to average income) is a convenient aggregated indicator of capital predominance over labor (Stiglitz, 1969), TWIR is required to measure the dominance of the wealthy elite over common people's incomes (Chauvel et al., 2021).

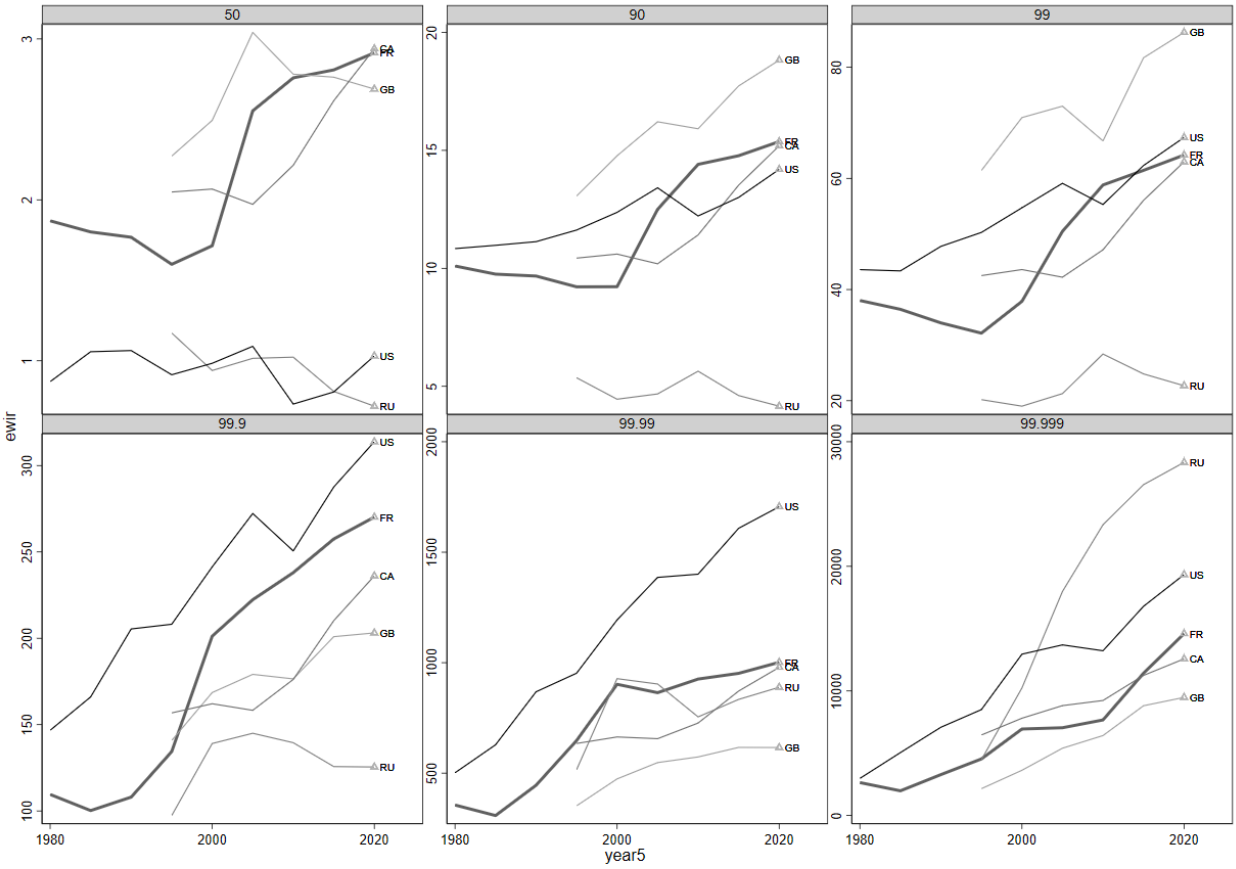
The purpose of the **Extreme Wealth to Income Ratio (EWIR)** is to extend this measure to any extreme percentile p of the wealth distribution, whereby $EWIR_{99.999\%}$ denotes the average wealth of the top 0.001% (1 in 100,000 people) relative to average yearly income. $EWIR_p$ thus generalizes the TWIR to extreme percentiles at the top of the wealth tail, vis-à-vis laypeople (see figure 1).

$EWIR_p$=(some measure of the top distribution of wealth at level p) / (some measure of central location of income)

The EWIR unit is years, and its values express wealth size in average-income years. The highest known value of $EWIR_{99.999\%}$ is observed in Russia in recent years and represents 30,000 average-income years: the average wealth stock of the wealthiest 1 in 100,000 Russians is equal to 30 millennia of average yearly Russian income. Russia is particularly interesting because there is a strong inconsistency between TWIR (=$EWIR_{99\%}$) that remains modest, and the extreme value of the Russian $EWIR_{99.999\%}$ that has no worldwide equivalent, meaning an extreme accumulation of

wealth in the oligarchic top of Russian society. At least this is what we find in the World Inequality Database (WID.world). The $EWIR_p$ nuances, completes, and extends the information provided by the Gini coefficient of wealth—which only focuses on wealth distribution—with an indication of how superior wealth stock exceeds the layperson's level of living.

Figure 1. Extreme-Wealth to Income Ratio (EWIR) of wealth thresholds at the median (level 50), top 10% (90), top 1% (99), and then to the extreme levels of 99.9, 99.99, and 99.999% (1980-2020, in groups of 5 years (year5))



Source: My own elaboration on WID project open data, https://wid.world/data/ Country codes are the standard ISO codes of countries; see https://wid.world/codes-dictionary/

Compared to TWIR (=$EWIR_{99\%}$), the extreme values of $EWIR_{99.999\%}$ (see figure 1) characterize better the degree to which the highest spheres of wealth accumulators dominate common people's level of living. Typically, the threshold needed to enter the realm of the most wealthy 1 per 100,000 people (typically the richest person in a town) can be represented by a long period of savings (see table 1). In Russia, the value 30,000 years (precisely 28.3 K-years, see table 1) for $EWIR_{99.999\%}$

means that a family of average income would have had to begin its 100% savings plan at the time of Cro-Magnon to reach the wealth of the wealthiest 1 in 100,000 people. To provide an idea of this magnitude, the richest family in a Russian town owns more than what one family could accumulate throughout the complete history of humanity. In Great Britain, however, the same figure is shorter in length: just less than 10,000 years, i.e. savings from the Neolithic times. Obviously, those rather absurd values numbers tend to demonstrate how top wealth is simply not sound. The reality indeed is not a question of savings, but of the relative value of work and accumulated capital (Stiglitz, 1969): the curves in figure 1 simply express the dynamics of the past 40 years' price scissors effect between work and capital. Scissors are not completely meaningful in front of this "shear effect" change.

Table 1. Extreme-Wealth to Income Ratio (EWIR) at levels 50, 90, 99, 99.9, 99.99, and 99.999% in 2020

	50	90	99	99.9	99.99	99.999
CA	2.9	15.2	63	236.1	979	12570.4
FR	2.9	15.4	64.2	270.2	1001.7	14598.8
GB	2.7	18.8	86.3	203.1	616	9481.3
RU	0.7	4.2	22.7	125.5	888.8	28340.1
US	1	14.2	67.4	313.8	1705.8	19334.2

Source: My own elaboration on WID project open data, https://wid.world/data/ Country codes are the standard ISO codes of countries; see https://wid.world/codes-dictionary/

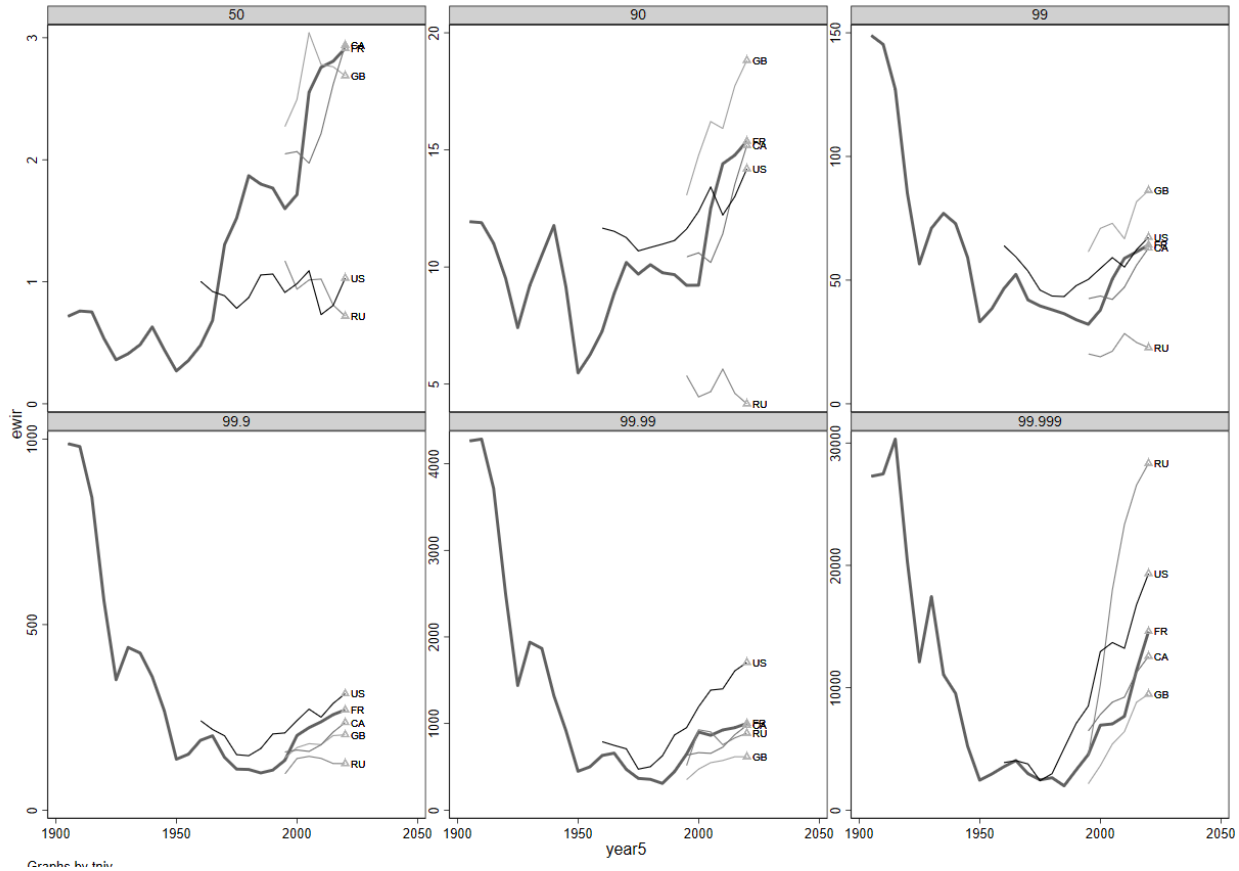
Logically, as one climbs the ladder of social ranks, the EWIR values increase exponentially. More precisely, EWIR at level p is $EWIR_p$=exp(.64 logit(p) + 2.04) R2=91%, but the slope of increase depends on the country: in the extreme example of Russia, even if TWIR is only 23 years (the lowest value in this comparison), Russian $EWIR_{99.999\%}$= 28 K-years.

2- EWIR across a century: the Joker Smile Curve (JSC)

The wid.world database presents some examples of old series beginning in the early 20th century. Figure 2 depicts curves similar to the typical illustration on Piketty's (2014) *Capital*, but these curves are novel, because they are not illustrating the pure income or pure wealth shares or thresholds but the time assets of the wealthiest populations: that is, crystallized time of work that the wealthiest control.

In particular, $EWIR_{99.999\%}$ gives a clear message in terms of bouncing extreme inequalities. I agree that only France covers the past of this frightening U-curve, so this looks short. In a seminar I gave last year in the London School of Economics(LSE) I had a complete curve on the 20th century for France, Great Britain, and the U.S., for the share (not the threshold) of the top 1% (see figure 4 from February 18, 2021, at www.louischauvel.org/LSE_JOCS_inequity_chauvel_v4.pptx see slide 8). The current WID data have been trimmed or suppressed in the current wid.world data (May 03 2022) but I will compete the series as soon as it is once again available in the database.

Figure 2. Extreme-Wealth to Income Ratio (EWIR) of wealth thresholds at the median (level 50), top 10% (90), top 1% (99), and then to extreme levels 99.9, 99.99, and 99.999% (1900-2020 in groups of 5 years: year5)

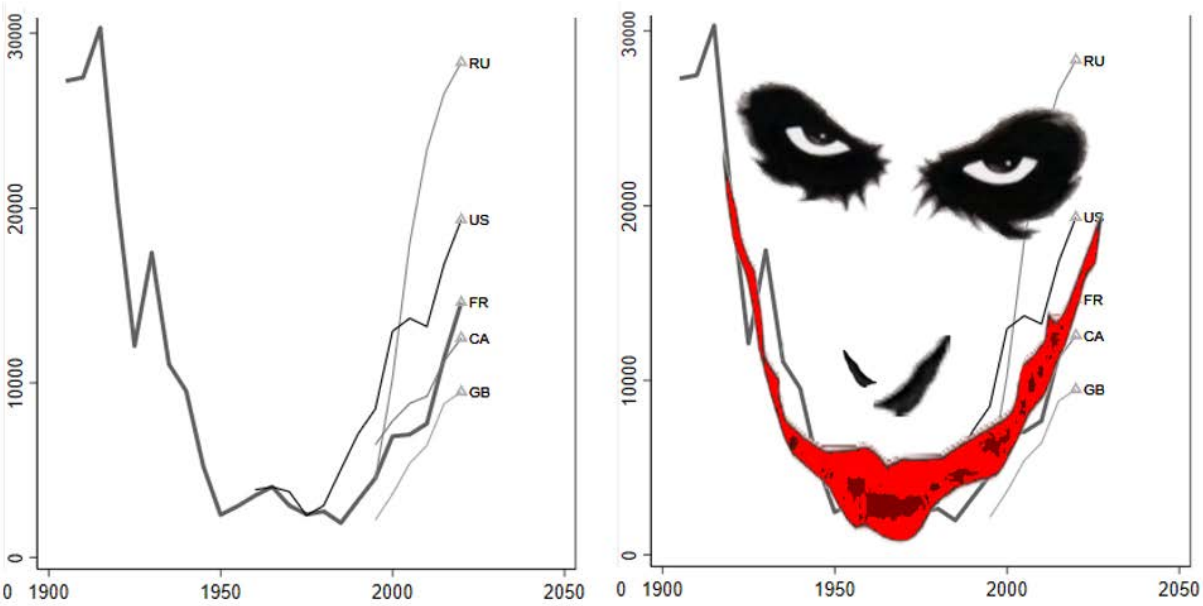


Source: My own elaboration on WID project open data, https://wid.world/data/

In short, the most important message here in this respect is that extreme inequalities are back. As a nuance, the bounce of France on the right side is modest compared to Russia. Conversely, France is the only one with a curve on the left. So there is room for debate. Specifically,

$EWIR_{99.999\%}$ gives a frightening message on the current times of wealth recovery: we are simply now back to the world of the 19th century "Age of Extremes" that finished badly (Hobsbawm, 1994), to formulate this in a sophisticated way. Another way to keep this in mind— to please the citizens of Gotham City—is to coin it the "Joker Smile Curve" (JSC) that appears in (de)figure(d) 3. A way to suggest higher EWIR is evil. But this comparison could be misleading because there must (or should?) be a stabilization of the trend, at some point, with a horizontal (or any other shape) on the right. The left of the curve in the 19th century is still globally unknown.

Figure 3. The "Joker Smile Curve" (JSC) from $EWIR_{99.999\%}$ (1900-2020)



Source: My own elaboration on WID project open data, https://wid.world/data/

3- $EWIR_{99}$ from aggregated sources

Based on aggregated data, the $EWIR_{99}$ (=TWIR) is computed as the ratio of average wealth of the top 1% by average income (GDP), either per capita or by adult.

3.a World Inequality Database: 120 years of EWIR$_{99}$ in France, Great Britain, and the United States (FR/GB/US)

The graph presented here is a long-term TWIR= EWIR$_{99}$ graph already published (Chauvel et al., 2021) where we focused on the period 1990-2015. This long-term graph based on data retrieved from the *World Inequality Database* (https://wid.world/) (Alvaredo et al., 2017), describes the EWIR$_{99}$ evolution from the early 20th century until today in three countries: France, Great Britain and the U.S.

Figure 4. EWIR$_{99}$ in France (bold), Great Britain (dashed), and the U.S (1900-2015) based on average level of the top 1% to GDP per capita

Source: My own elaboration on WID project open data, https://wid.world/data/

Replication file: www.louischauvel.org/twir_lse.do

The main message from the WID source is the deep U curve that, extends through the EWIR$_{99,}$ magnifies Piketty's (2014) "wealth is back" diagnosis. Top wealth compared to average income was maximal before WWI, then massively declined until the U.S.'s "Affluent society" (Galbraith, 1958) and France's "Trente Glorieuses" (Fourastié, 1979) period of postwar regulated welfare capitalism, with the EWIR$_{99}$ increasing massively after the 1980s to the point where we now have caught up with the 1913 levels.

The trends in terms of $EWIR_{99}$ detect increasing gaps that traditional tools like Income and Wealth Gini indices fail to find. Bourguignon (2015) shows the incredible stability of Gini indices in France across the last four decades. For France, for instance, between 2000 and 2015, the $EWIR_{99}$ increased from 111 to 140 years. The French Gini index of income stagnated near 32% with fluctuations of +/- 2% (Chauvel, 2019), and the French Gini index of gross wealth is stable, remaining close to 64-65% from 1998 to 2015 (INSEE, 2017, table CH5_3). In the same way, the Gini indices of wealth in a country are relatively stable across time (Cowell & Van Kerm, 2015; Cowell et al., 2017). The inaptitude of Gini indices to detect the gaps revealed by $EWIR_{99}$ comes from the general increase of wealth over incomes (Chauvel et al., 2021, fig. 1): income inequality measured by the Gini index is simply a secondary aspect of a deeper transformation of socioeconomic inequality enjoyed by the wealthy elite.

3.b "Global Wealth project" of Crédit Suisse: large scale international comparisons, 2000-2019

At the global level, the most complete source of information on wealth comes from the annual report of *Crédit Suisse* (Davies et al., 2019) of the "Global Wealth Project". The project's yearly databook on global wealth permits systematic computations of $EWIR_{99}$ measures across time and countries. The latest databook—available today (March 3, 2021) —presents figures from 2000 and 2019, i.e. before the outbreak of the COVID-19 pandemic.

Table 2. Global *EWIR*$_{99}$ (=TWIR) computation from the Global Wealth Project

Year	Top 1% wealth share	Gini wealth	Total wealth billions	Total GDP billions	Adult population billions	Average wealth	Average income	Average wealth top 1%	WIR	TWIR
Year	%	%	current USD	current USD	count	current USD (D/F)	current USD (E/F)	current USD (B*D/F)	Year (G/H)	Year (I/H)
A	B	C	D	E	F	G	H	I	J	K
2000	46.9	91.9	116,907	33,624	3.72	31,415	9,035	1,473,346	3.5	163.1
2001	47.3	91.8	113,694	33,431	3.78	30,052	8,837	1,421,454	3.4	160.9
2002	44.6	91.4	125,234	34,712	3.85	32,561	9,025	1,452,225	3.6	160.9
2003	44.8	91.6	149,086	38,948	3.91	38,129	9,961	1,708,183	3.8	171.5
2004	44.7	91.6	171,028	43,875	3.98	43,026	11,038	1,923,255	3.9	174.2
2005	45.3	91.2	178,652	47,527	4.04	44,209	11,761	2,002,677	3.8	170.3
2006	44.9	91.1	203,761	51,512	4.11	49,598	12,539	2,226,973	4.0	177.6
2007	43.8	90.5	228,289	58,044	4.18	54,661	13,898	2,394,138	3.9	172.3
2008	41.7	89.5	209,638	63,690	4.25	49,375	15,000	2,058,917	3.3	137.3
2009	41.9	89.5	226,976	60,410	4.32	52,584	13,995	2,203,279	3.8	157.4
2010	42.1	89.3	238,958	66,126	4.39	54,455	15,069	2,292,566	3.6	152.1
2011	41.3	88.9	253,019	73,460	4.46	56,717	16,467	2,342,416	3.4	142.2
2012	41.8	88.7	268,696	75,162	4.54	59,247	16,573	2,476,515	3.6	149.4
2013	43	89	288,735	77,316	4.61	62,625	16,769	2,692,862	3.7	160.6
2014	44.4	88.8	289,017	79,453	4.69	61,661	16,951	2,737,759	3.6	161.5
2015	44.8	88.6	289,934	75,218	4.77	60,846	15,785	2,725,892	3.9	172.7
2016	45.2	88.6	307,325	76,369	4.84	63,441	15,765	2,867,547	4.0	181.9
2017	44.1	88.1	351,518	81,306	4.92	71,378	16,510	3,147,770	4.3	190.7
2018	44.9	88.5	351,515	86,439	5.01	70,211	17,265	3,152,461	4.1	182.6
2019	45	88.5	360,603	87,799	5.09	70,849	17,250	3,188,189	4.1	184.8

Source: (Davies et al., 2019) and World Bank WDI Database through wbopendata (Azevedo, 2011). Author's computations

Note: The table presents variables in columns A to K, and their units and/or formulae. All the data are taken from (Davies et al., 2019), with exception of Column E: series NY.GDP.MKTP.CD from World Bank Data through the STATA command wbopendata / Column B, C: tab 5-1 / Column D, F: tab 2-4.

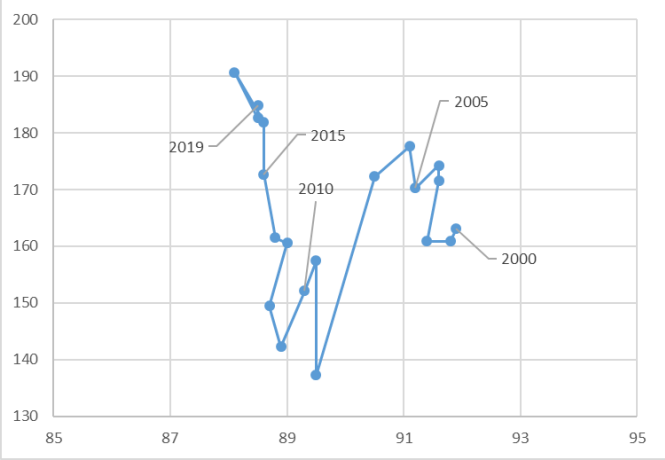
The first focus here is on Global *EWIR*$_{99}$, taken at the world level, considering the world as a single unit: Global *EWIR*$_{99}$ is the ratio of the world's 1% richest population by the average GDP of the planet, both measured per adult from the source (Davies et al., 2019).

The Global EWIR$_{99}$ ratios show an increase by 13% (from 163 years to 185 years): If the Great Recession period after 2008 shows clear fluctuations, a steady trend of increase of the EWIR$_{99}$ is observed from 2011 to 2019. The EWIR$_{99}$ evolution leads to this diagnosis: Global inequalities between the wealthiest elite and average incomes increased from 2000 to 2019, that stands in contrast with the steady decline of the wealth Gini index of 3.4 percentage points (from 91.9 to 88.5%).

The explanation of these divergent paths comes from the role of WIR in this case: if wealth distribution is (moderately) less unequal, the top wealthy population benefits in any case from increasing average wealth over incomes that the increasing WIR detects (from 3.5 to 4.1). Top

positions in wealth are closer to median wealth, but they gain distance with average income positions. From this result, one cannot claim that global socioeconomic inequalities are declining. Wealth Gini declined (top wealth is closer to median wealth), moderately, over the period (Davies & Shorrocks, 2018). In Parallel, Income Gini indices declined (top incomes are closer to median incomes), relatively (Bourguignon, 2015; Milanovic, 2016). But the the overall effect of WIR expansion means, due to composition effects, a wider gap between the top wealthy and average incomes. As a result, even if the post-2008 Great Recession years meant a decline in the $EWIR_{99}$, more recent years show a strong expansion of the top wealth to income gap. The richest can buy an increasing number of centuries of laypersons' income.

Figure 5. *$EWIR_{99}$* (vertical axis) and global Wealth Gini index (horizontal axis), 2000-2019

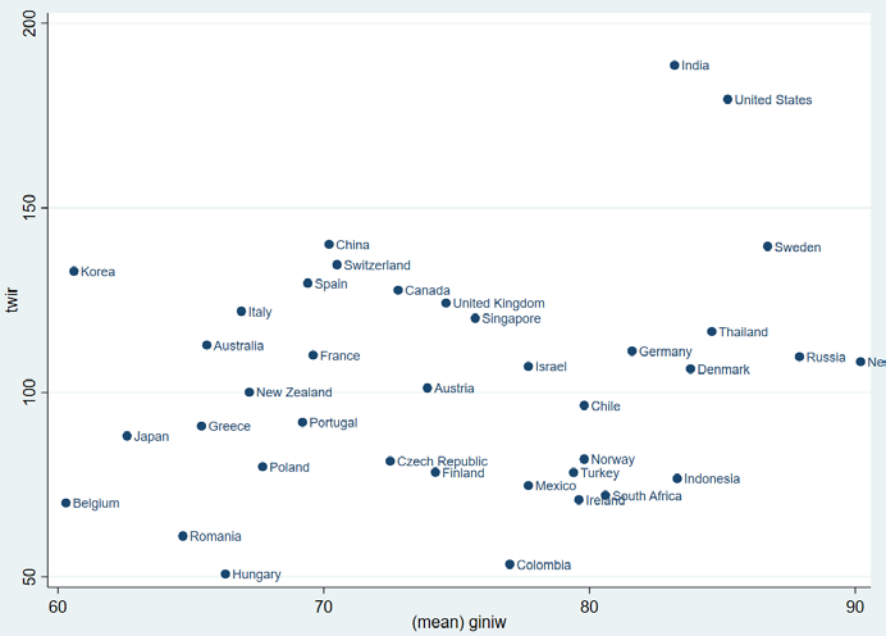


Source: See table 2

From the same source, for year 2019, the $EWIR_{99}$ is computed for 38 countries, and the results are compared to the Gini indices of wealth. Highest levels of $EWIR_{99}$ are measured for India and the U.S. where the wealthy elite accumulates the equivalent of 170 years of average income. These two countries are followed by China, Sweden, Switzerland, and South Korea. For Sweden, those results confirm, and also complexify, the paradox of wealth in social democratic welfare regimes (Skopek, 2015): Sweden is characterized by an exceptionally high Gini of wealth. Nevertheless, its relatively high $EWIR_{99}$ is not so exceptional. The extreme Swedish Gini means that common people in Sweden can live with low, no, or even negative wealth without adverse consequences.

Thus, the wealthiest people aggregate a rather modest amount of years of common people's income. The Swedish paradox in wealth is: the less that wealth is strategic, the stronger the Wealth Gini might be. In terms of $EWIR_{99}$, Sweden is in the European norm. Countries that are found on the side of low $EWIR_{99}$ are Ireland, Belgium, Colombia, Romania, and Hungary.

Figure 6. $EWIR_{99}$ and Wealth Gini index in 38 countries, 2019



Source: Table 2. Top 1% shares from tab 7-5, income and wealth from tab 2-1, Gini of wealth from tab 3-1 in (Davies et al., 2019)
The "Netherlands" point in the Davies et al. data source might be spurious.

The value of square linear correlation R^2 between the two series is 5%: The Wealth Gini has an intrinsic interest to measure the distributional inequality of wealth accumulation, but it is not a relevant measure of the gap between the wealthy elite and the average income population. The $EWIR_{99}$ measure and the Gini index provide similar relative levels for India and the U.S. on the side of the most unequal countries, and of Belgium, Hungary, Romania, and Japan for the least unequal ones. Anyway, $EWIR_{99}$ (compared to Gini) underlines larger gaps between the wealthy and average incomes for Korea, China, Switzerland, Italy, and Spain. In contrast, Netherlands, Russia, Indonesia, Ireland, and South Africa, show stronger values of Gini than $EWIR_{99}$ (in relative terms). The Gini index must be complemented by the $EWIR_{99}$ to provide a complete diagnosis. At this point we must notice the high Wealth Gini of the Netherlands is certainly a mistake in (Davies et al., 2019).

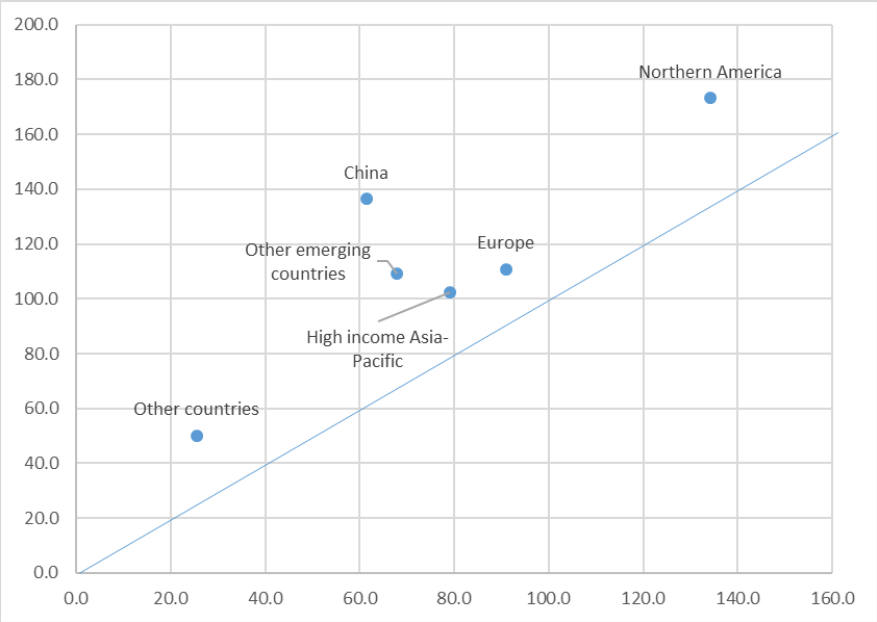
At the regional level of the globe (fig. 4), the $EWIR_{99}$ evolutions confirm that top wealth inequalities over average incomes increased substantially in 19 years, i.e. 2000-2019. The Chinese transformations are particularly remarkable since they could mean a rapid convergence with the American levels of $EWIR_{99}$.

Table 3. Change in country/region $EWIR_{99}$ from the Global Wealth Project

Country/Region	Year	Top 1% wealth share	wir	twir	Year	Top 1% wealth share	wir	twir
China	2000	20.5	3.0	61.6	2019	30.3	4.5	136.4
Other emerging countries	2000	32.4	2.1	67.9	2019	39.0	2.8	109.1
Europe	2000	25.3	3.6	91.0	2019	25.2	4.4	110.7
High income Asia-Pacific	2000	20.3	3.9	79.1	2019	21.3	4.8	102.4
Northern America	2000	32.7	4.1	134.2	2019	34.7	5.0	173.3
Other countries	2000	28.4	0.9	25.5	2019	29.4	1.7	50.0

Source: See table 2, from tab 5-3 and tab 4-6

Figure 7. $EWIR_{99}$ from 2000 to 2019 in 6 countries/regions



Source: see table 3.

Contrary to the verdict provided by the Gini indices or from top shares of income (Bourguignon, 2015; Milanovic, 2016) or on wealth (Davies & Shorrocks, 2018), converging to an obvious conclusion of declining global inequality, the $EWIR_{99}$ provides doubts in this respect: The gaps

between the top wealthy and standard incomes increased or, certainly, did not decline in the recent decades.

4- $EWIR_{99}$ from comparative microdata sources

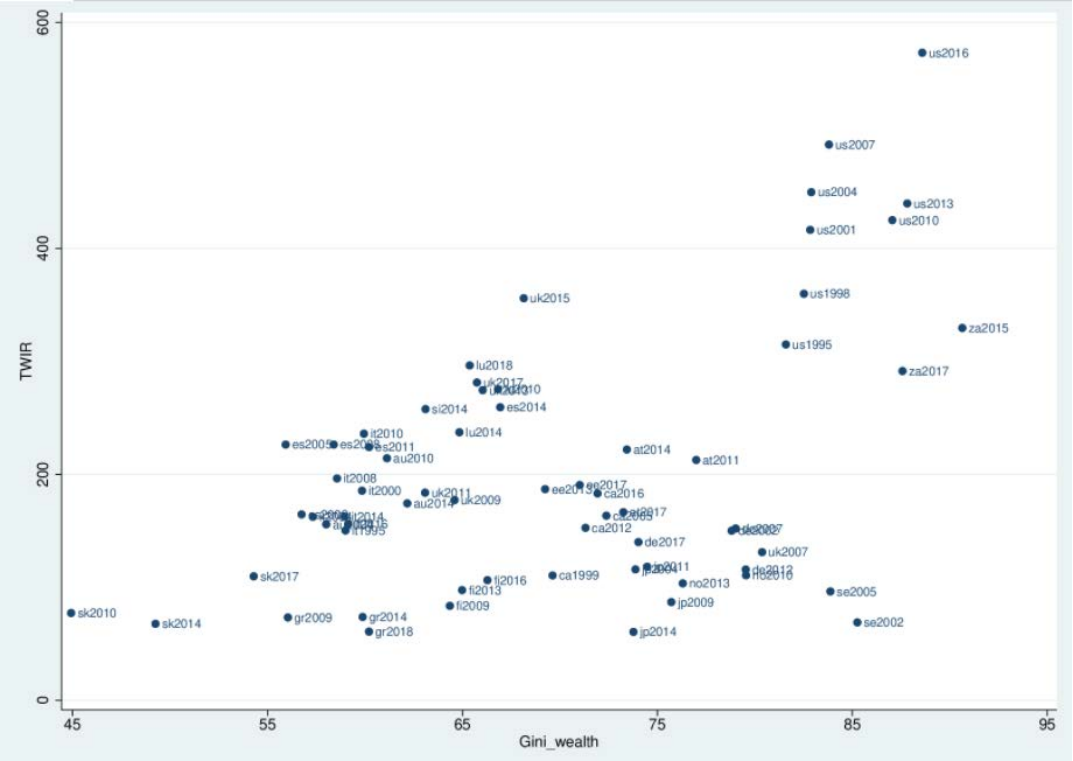
With aggregated data (part 1), the $EWIR_{99}$ was implemented on the base of top net wealth to GDP per capita (or adult population). With microdata, the (equivalized disposable) incomes of households are the usual norm of measurement, in relation with the average net wealth of the richest households. Therefore, the concept of microdata-based $EWIR_{99}$ is rather different, in particular on the side of incomes: the national GDP per capita generally overestimates the reality of households' level of living, after tax and transfers (Nolan et al., 2016).

As a result, compared to aggregated sources, incomes in microdata are significantly lower to GDP per capita, and so $EWIR_{99}$ is higher due to a smaller divisor. Conversely, net wealth from microdata is usually underestimated in several ways, with a variable bias depending on country's cultural traits of moderation when providing private information.

4.a Luxembourg Wealth Study (LWS)

The LWS microdata database currently includes 65 country-year samples with information on incomes and wealth. The $EWIR_{99}$ *versus* Gini scatterplot (R2=20.3%) could support the idea of four types of countries.

Figure 8. EWIR$_{99}$ and Gini in the LWS database



Source: Author's calculations based on Luxembourg Wealth Study (LWS)

Luxembourg Wealth Study (LWS) Database, http://www.lisdatacenter.org (multiple countries; April 2022 – May 2022). Luxembourg: LIS.

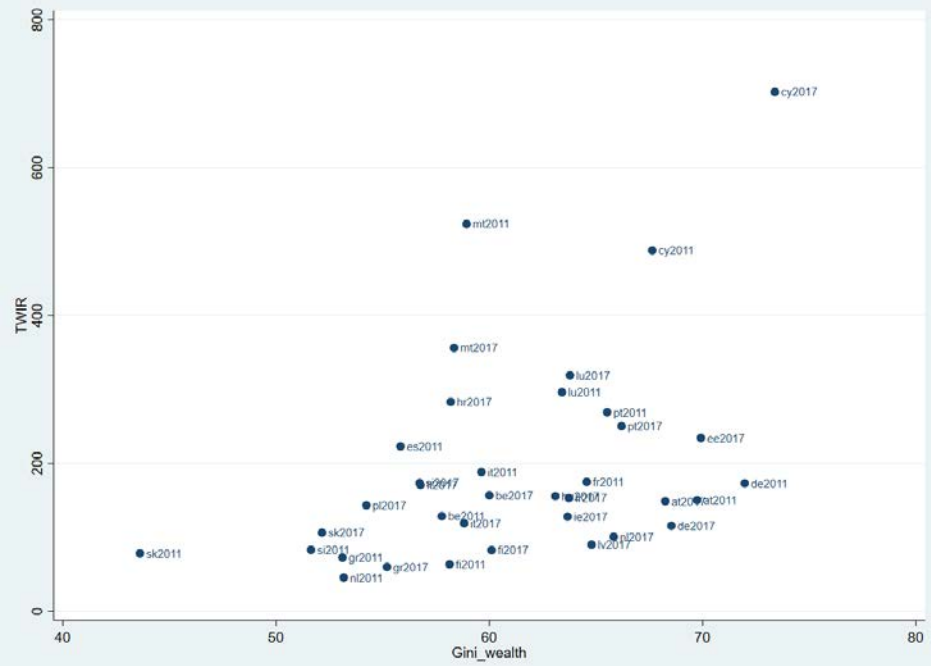
The first group has both high Gini of wealth and high EWIR$_{99}$: the U.S. and South Africa. A second group is characterized by low Gini of wealth and low EWIR$_{99}$: Slovakia and Greece. A third group presents intermediate values on EWIR$_{99}$ and on Gini: Southern Europe, Luxembourg, Slovenia, and the U.K. A fourth group is paradoxical, with relatively high Gini, and low EWIR$_{99}$: Nordic European countries, Japan, and Germany. This group's specific position with Gini higher than in southern European countries means a stronger concentration of wealth due to weaker wealth accumulation in the middle classes (partly due to low levels of home ownership), and the low EWIR$_{99}$ comes from lower asset values in general. The WIR in Germany and Japan is close to 7, compared to 14 in Italy.

4.b European Household Finance and Consumption Survey (EU-HFCS), 2011-2017

Following reasoning similar to that in the LWS, the $EWIR_{99}$ can be computed here as the average (euro) value of the wealth of the 1% wealthiest population divided by the average level of living of the population. The *EU-HFCS 2011/2017* microdata primarily focuses on European countries, and in a large majority euro countries, with exceptions. In this set of countries, no Gini index is above 75%: There is no equivalent here to the U.S. in the LWS set of countries, with its Gini close to 85%.

Once again, the lowest values of both Wealth Gini and $EWIR_{99}$ are observed in Greece, Slovenia, Slovakia, and the Netherlands in 2011. High values of $EWIR_{99}$ and Wealth Gini are typical of Malta and Cyprus, but the measured levels of Gini are much below that of the U.S.. There is a third type of countries confirming the structures in the LWS set of countries: relatively high Gini and low $EWIR_{99}$, typical of Germany, Austria, and Netherlands in 2017.

Figure 9. $EWIR_{99}$ and Gini in the EU-HFCS 2011-2017 database



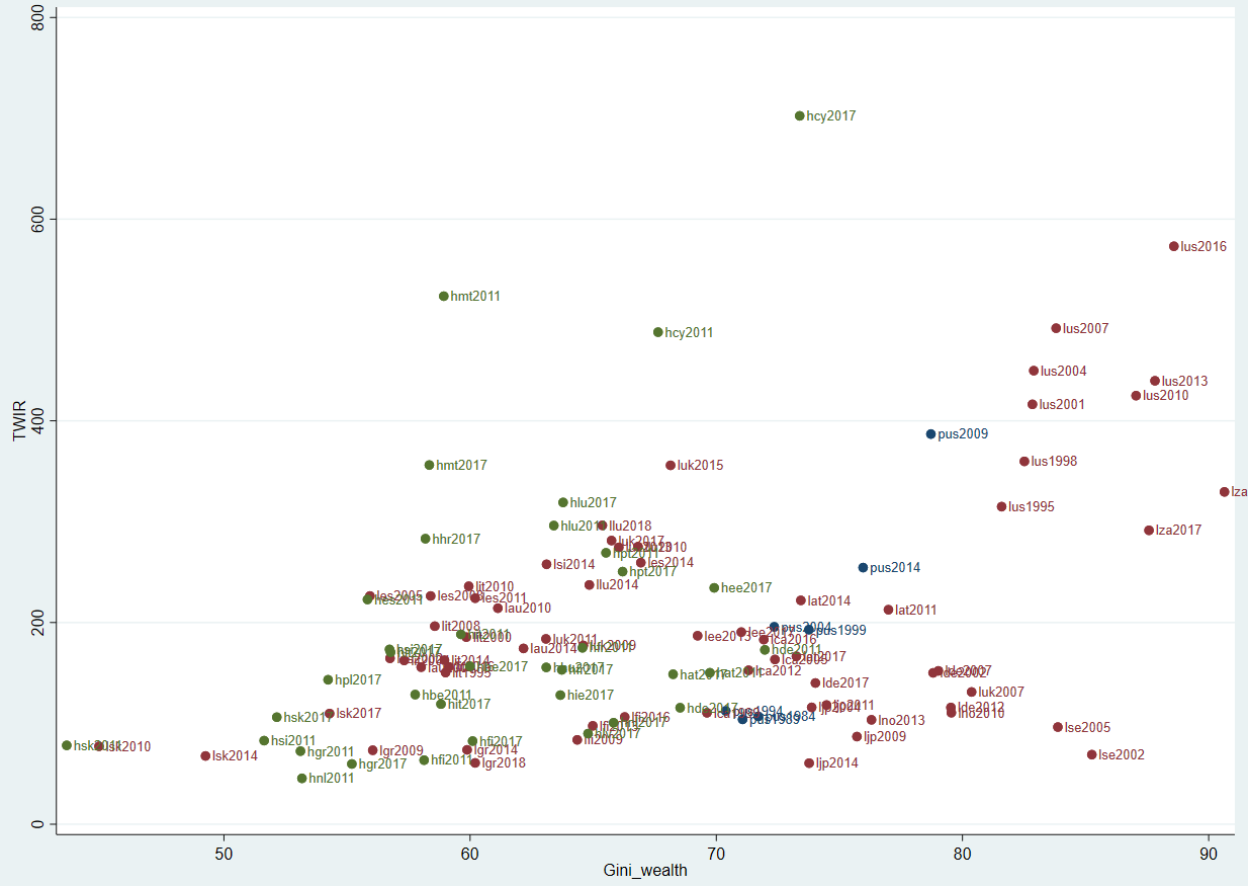
Source: Author's calculations based on EU-HFCS 2011 and 2017

4.c A merge of LWS and EU-HFCS with the PSID

A more systematic analysis comes from a compilation of the LWS (l), *EU-HFCS* (h) results along

with PSID (Panel Study of Income Dynamics) wealth data (p). On these bases, a set of 108 country-years is constituted. The R squared of the Wealth Gini and TWIR is once again 16.1%: significantly higher than zero, but less than expected if socioeconomic inequality had a simple consistent logic link with Gini indices (see Pfeffer & Waitkus, 2021).

Figure 10. EWIR$_{99}$ and Gini in the LWS, EU-HFCS, and PSID databases



Source: Author's calculations based on Luxembourg Wealth Study (LWS) Database, http://www.lisdatacenter.org (multiple countries). Luxembourg: LIS. EU-HFCS microdata. PSID microdata. red: l=LIS, blue: p=PSID, green: h=HFCS

This graph helps detect some data issues. First, the PSID series underestimates the Gini of wealth by 10 percentage points compared to the LWS (Survey of Consumer Finance source) and the EWIR$_{99}$ by a factor of 2. Whatever the source, levels of wealth inequality in the U.S. implies something exceptional. Some detailed results raise questions regarding specific samples: The point U.K. 2017 (LWS) is an outlier of the U.K. series, and the changes in the Gini of Netherlands (HFCS) raises doubts.

5- *Conclusion:* **EWIR** *as an indicator of extreme inequalities, in the new age of extremes*

$EWIR_p$ proposes a measurement of the gap between wealth accumulation at the very top and common people's incomes. Based on different sources of data, measurements could differ, but results are generally convergent. The proposal here is based on the top p (fractional percentile) threshold (respectively, average value when the threshold is not available). The $EWIR_{99}$ (or TWIR, top wealth to income ratio) is the most commonly available level, but the percentage may be adapted on demand to denote extreme concentrations of wealth at extreme fractions of the wealthiest people.

Whatever the choice, the EWIR gap could provide diagnoses of socioeconomic inequality trends that diverge from the Gini indices that measure inequality in a single dimension, income or wealth. $EWIR_p$ focuses on the wealthiest people to middle class gap, and is thus a mixture of strict wealth inequality and wealth/income comparison. In a global context of increasing WIR, even a decline in the Wealth Gini can be ascertained in cases of higher inequality between the wealthiest and the average income. The current finding is a general increase of $EWIR_p$ by region of the world and at a global level, with specific, massive growths of $EWIR_p$ in the U.S. and in Russia, in particular at the highest levels of p.

As a substantial open conclusion, we should take a deeper look into the accumulation of wealth at the top of society and its consequences. This is not simply rewards to the most talented members of human civilization, but rather may instead be based on capacity to hoard opportunities (Hacker & Pierson, 2010; Huber et al., 2019). In thirty years, these amounts of wealth will reward their children's efforts to prolong their lives. More seriously, these incredible lengths of time—thousands of years of work for laypersons—mean the capacity of some human beings to crystallize millennia of human production (wages) to deploy these resources at their own will. In this respect, Atkinson (2016) asked an urgent question: how can wealth be spread?

If we follow Robert Merton, in the middle class, like elsewhere, the common reference group one has at one's disposal to judge one's success is the fate of the people "higher" on the social pyramid. For wage earners in the middle class, "above" becomes infinite. With the return of extreme wealth accumulation at the top, the middle class is now located incredibly below the top wealth thresholds.

In the U.S., the top 1 in 100,000 people (there would be approximately 500 such people from Washington to Boston, in Jean Gottmann's (1961) Northeast megalopolis) owned 8.5 K-years of median income in 1995, and 19.3 K-years in 2020 (table 4.). Extreme wealth inequality also means extreme frustrations, and potentially extreme violence (Chauvel, 2021): socioeconomic imbalances generated by extreme inequalities might cause revolutions, collapse of states, epidemics and wars (Scheidel, 2017). This potentially means the coming of a new age of extremes (Hobsbawm, 1994). In this respect, extreme EWIR might be accompanied by extreme evil. The Gotham City median class faces the Joker Smile Curve grin.

Table 4. Extreme Wealth to Income Ratios (EWIR) at levels 50, 90, 99, 99.9, 99.99, and 99.999% in 1995 and 2020

	1995					
	50	90	99	99.9	99.99	99.999
CA	2	10.4	42.5	156.8	634.4	6462.8
FR	1.6	9.2	32.2	134.4	647.5	4542.8
GB	2.3	13.1	61.4	140.8	352.3	2156.5
RU	1.2	5.4	20.2	97.4	515.4	4481.5
US	0.9	11.6	50.3	208.1	952.4	8502.9
	2020					
	50	90	99	99.9	99.99	99.999
CA	2.9	15.2	63	236.1	979	12570.4
FR	2.9	15.4	64.2	270.2	1001.7	14598.8
GB	2.7	18.8	86.3	203.1	616	9481.3
RU	0.7	4.2	22.7	125.5	888.8	28340.1
US	1	14.2	67.4	313.8	1705.8	19334.2

Source: my work on WID project open data, https://wid.world/data/

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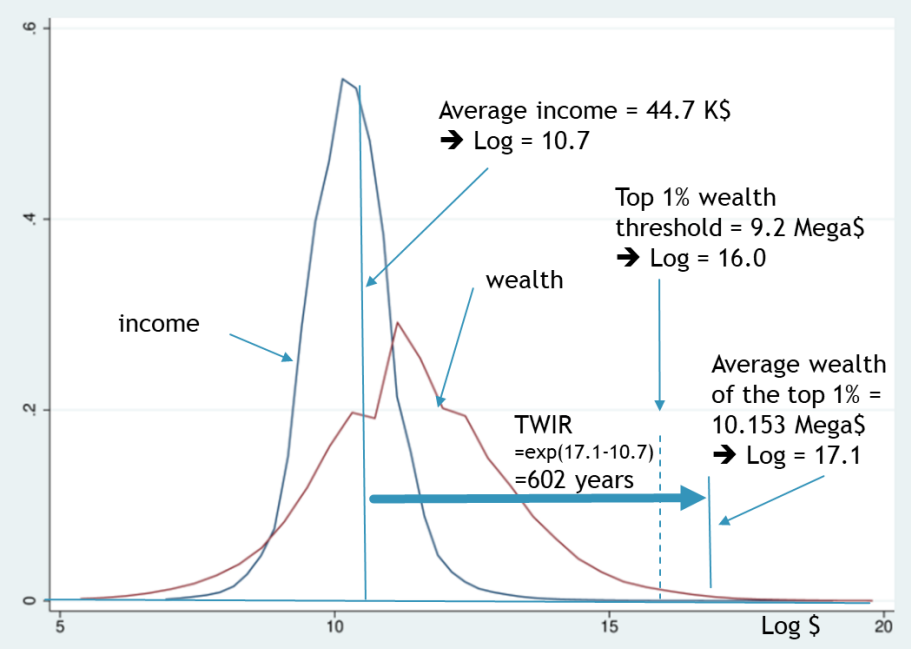
Appendix 1

On figure 0, an example of TWIR calculation is presented with the U.S. LWS sample of the SCF 2016. The TWIR is the ratio of the average wealth of the 1% upper tail by average level of living. This simple indicator provides opportunities of comparison across time and countries. In this paper, the focus is on the general structure of inequality through TWIR. Further research will try explain these differences, for instance, through the role of housing (Causa et al. 2019, Pfeffer & Waitkus, 2021). First presented are results based on aggregated resources (1) where TWIR is easily computed as the WIR times the percentage share of the top 1%, where WIR is the average net wealth divided by the GDP per capita. Then, based on microdata (2), TWIR can be expressed as the ratio of average net wealth of the top 1% by the populations' average level of living. As a conclusion on these results, further development of TWIR indices are proposed.

Figure A1. TWIR concept on the U.S. SCF 2016 data (LWS) with density of log income and wealth



Source: LWS, densities of income (level of living) and net wealth data are estimated with STATA module akdensity (Van Kerm, 2005).