

Relations Between the Inequality Indices Gini, Pietra and Kolkata: Theory and Data Analysis

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We study here relations between three inequality indices, namely the Gini (g), Pietra (p) and Kolkata (k) introduced in 1912, 1915 and 2014 respectively and all are derived from the Lorenz function $L(x)$ introduced in 1905. The Kolkata index (which corresponds to a fixed point of the complementary Lorenz function $L_c(x) \equiv 1 - L(x)$) gives the fraction of wealth k possessed by the richest $1 - k$ fraction of people ($k = 0.8$ corresponds to Pareto's 80-20 law from 1896). We show rigorously that the Pietra or Robin Hood index p should equal to the excess wealth fraction $2k - 1$ possessed by the richest $1 - k$ fraction of people. Our numerical data analysis for US IRS Income data (1983-2022), Bollywood (India) movie income data (1999-2024) and the citation inequalities across the publications by forty Nobel Laureates (2020-2025) in Economics, Physics, Chemistry and Medicine clearly shows that $p/(2k - 1)$ is always greater than unity but the deviation is never more than five percent. Assuming some simple analytic form for the Lorenz function, we also derived the relations $k = (1/2) + (3/8)g$ for small g values and $p/g = 3/4$. However, these relations generally deviate significantly for larger g or k values when compared with observations.

I. INTRODUCTION

Quantitative measurements of economic inequalities, specifically the income or wealth inequalities, in different societies or countries started with the introduction of Lorenz function [1] in 1905. The Lorenz function or curve is represented graphically by plotting the cumulative fraction of the income or wealth ($L(x)$) earned or possessed by the x fraction of the poorest individuals, when the population of the society is arranged in the ascending order of their income (from now on income will mean wealth of any kind of agent in countries, societies, institutions etc.; see Fig. 1). When everyone earns the same, the Lorenz curve becomes the dotted-dashed (black) diagonal in Fig. 1. Because of the inequalities among the agents (and their ordering from the poorest to the richest), the typical shape of the Lorenz curve will have the form of the red line (with $L(0) = 0$ and $L(1) = 1$). Although $L(x)$ contains all the information of inequality, typical values of the inequality indices help summarizing or characterizing the nature of inequality in the society. One of the oldest and still most popular one is the Gini index [2] (g) given by the normalized area between the equality line and the Lorenz curve (see Fig. 1). The Pietra index [3] (p), also known as [4] Robin Hood index or Hoover index or Schulz index, is given by the maximum vertical distance between the equality line and the Lorenz curve (see Fig. 1). This index (length value) corresponds to the percentage of the total population's income that would have to be redistributed to make everyone's income equal.

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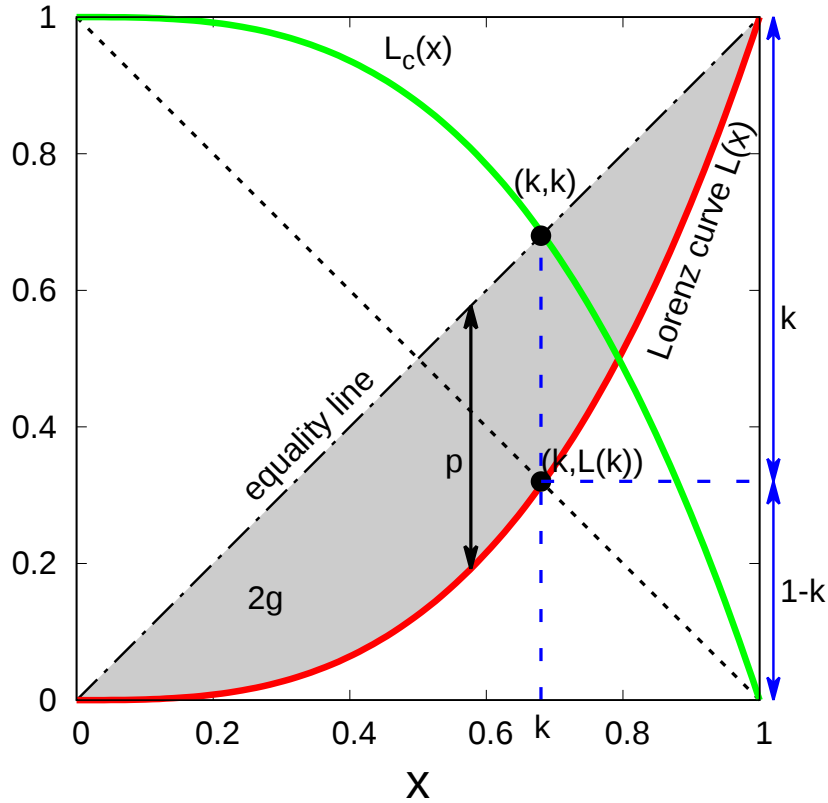


FIG. 1. The Lorenz curve or function ($L(x)$, in red) shows the proportion of total wealth owned by a fraction (x) of people in ascending order of wealth. The black dotted-dashed line represents a scenario of perfect equality in which everyone possesses the same amount of wealth. The Gini index (g) is calculated from the area between the Lorenz curve and the equality line (shaded region), normalized by the total area ($= 1/2$) under the equality line. The Pietra index p given by the length of the maximum vertical distance of the Lorenz curve from the equality line and indicated here by the solid vertical line in black. The complementary Lorenz function ($L_c(x) \equiv 1 - L(x)$) is shown in green. The Kolkata index (k) is determined by the fixed point of the complementary Lorenz curve: $L_c(k) = k$ or $L(k) = 1 - k$. Geometrically it gives the point at which the Lorenz curve intersects the diagonal line perpendicular to the equality line and it gives the fraction k of wealth that is possessed by the richest $1 - k$ fraction of people. As such $k = 0.8$ corresponds to Pareto's 80-20 law.

In 2005 Hirsch noted [5] that the success in citations of the papers by the scientists could be quantified by an index h (known as Hirsch index today) corresponding to the fixed point of the nonlinear (Ziff-like) citation function ($f(c)$) giving the number f of papers having citation c : $h = f(h)$. Soon this index became a very popular one to quantify the success inequalities among the scientists. Inspired by that, and also noting that the nonlinear Lorenz function $L(x)$ has trivial fixed points at $x = 0$ and $x = 1 - L(x)$, we defined [6] the complementary Lorenz function $L_c(x) \equiv 1 - L(x)$, which has a nontrivial fixed point at k such that $L_c(k) = k$, where $k \geq 1/2$ (see Fig. 1). This k is called the Kolkata index (see also [7, 8]) to epitomize the extreme economic inequality in this Indian city. A simple geometric argument for the Lorenz function then suggests that $1 - k$ fraction of the rich people possess k fraction of the total wealth. As such it generalizes then the Pareto's 80-20 law [9] where $k = 0.80$. Soon it was observed (see e.g., [8, 10]) that in physical systems with self-organized competitive dynamics among the constituent degrees of freedom the inequality levels (in all cluster or avalanche size distributions) tend to grow towards a universal level $g = k \simeq 0.87$ (somewhat above the Pareto value $k = 0.80$) and remains thereafter in the self-organized critical state of the system. Later, assuming [11] a minimal polynomial expansion of the Lorenz function $L(x)$, we could derive a simple linear relationship between the Gini and Kolkata indices growing up to $g = k = 0.80$. This

linear relationship of Kolkata (k) with Gini (g) indices agreed generally with our data analysis (see [12]) for lower values of g .

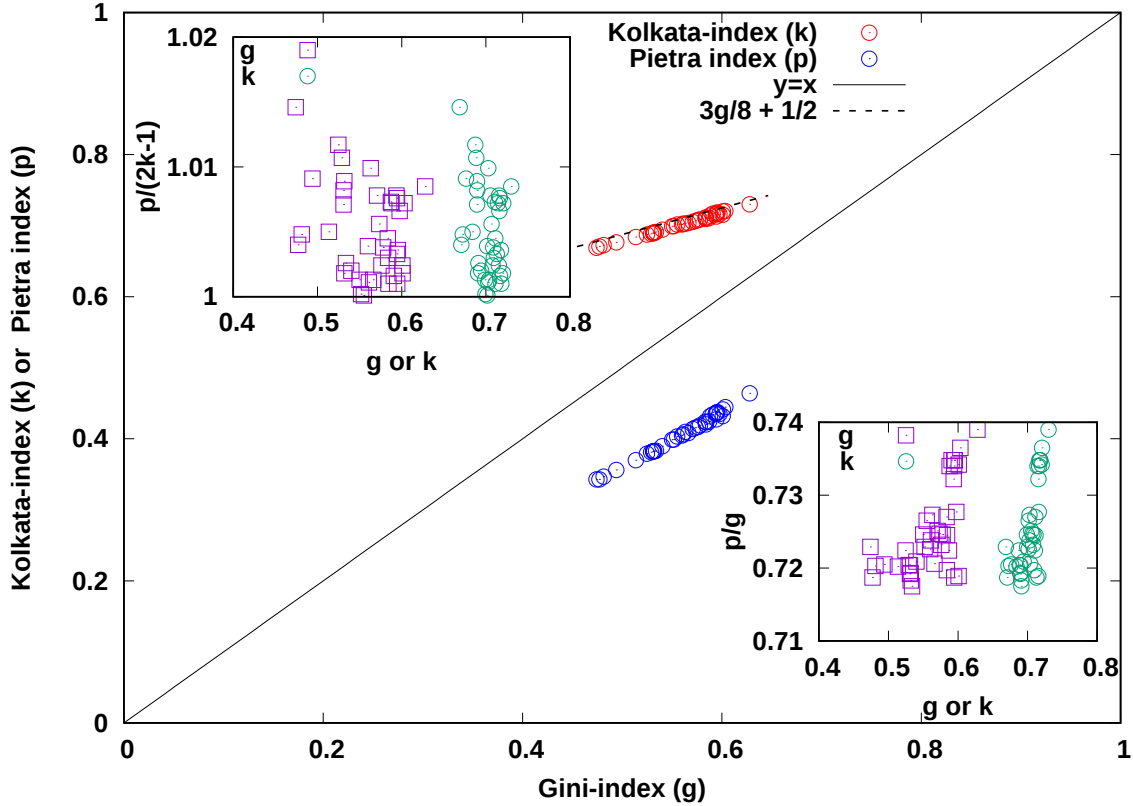


FIG. 2. Growths of Pietra (p) and Kolkata (k) indices against Gini (g) index values for US economy income data (IRS data [13, 14] for the period 1982-2022). The values of k and g are growing with time, because of increasing rate of withdrawal of public welfare programs. The upper left inset, showing the values of $p/(2k-1)$ against the years, indicate a value higher than unity as predicted by a rigid theoretical argument (relation (1)). The lower right inset shows the values of p/g against years and show values considerably different from $3/4$, as obtained from the theoretical relation (3) (obtained an additional assumption (2) of the minimal form of the Lorenz function). Details of the values of the inequality indices and of their relations are given in Table I of the Appendix.

II. THEORETICAL ANALYSIS OF INEQUALITY INDICES

We will first explore analytically if there are any relations among these three indices, namely Gini (g), Pietra (p) and Kolkata (k). To begin with, we note that since by construction the Kolkata index (k) is given by the fraction of the total wealth possessed by the $1-k$ fraction of richest people ($k > 1/2$; $k = 1/2$ corresponds to equality), they possess precisely an extra amount of $2k-1$ fraction of total wealth. The Pietra index [4] (or Robin Hood index) p then should equal to this excess amount, suggesting

$$p = 2k - 1. \quad (1)$$

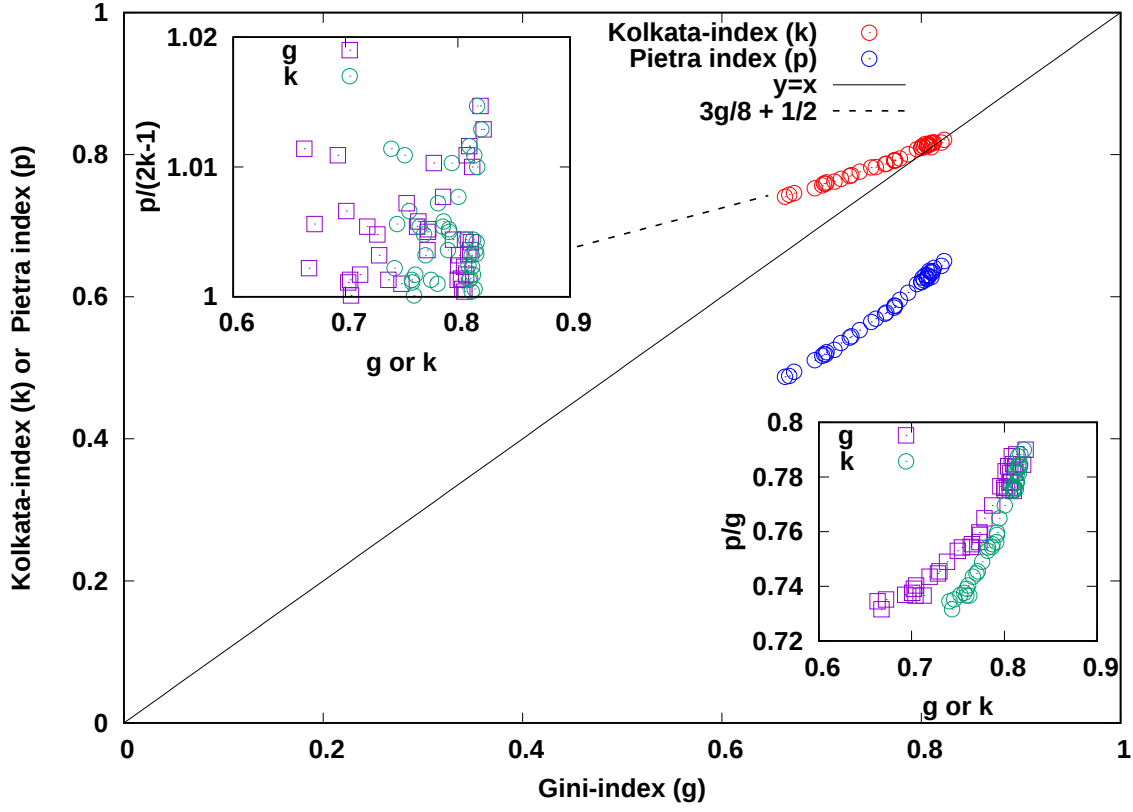


FIG. 3. Growths of Pietra (p) and Kolkata (k) indices against Gini (g) index values for US economy income tax return data (IRS data [13, 14] for the period 1982-2022). The values of k in the tax data (which can be argued to represent the prevailing inequality status better) seems to have grown a little beyond the Pareto value ($k = 0.80$) with increasing withdrawal of public welfare programs. The upper left and lower right insets, showing the values of $p/(2k - 1)$ against g and k respectively, indicate values slightly higher than unity (as predicted by a rigid theoretical argument; see relation (1)). The lower right inset shows the values of p/g against years and show values considerably different from $3/4$, as obtained from the theoretical relation (3) (obtained an additional assumption (2) of the minimal form of the Lorenz function). Details of the values of the inequality indices and of their relations are given in Table II of the Appendix.

In order to find theoretically the other plausible relations among those indices, let us proceed with a (Landau-like; see e.g., [10]) minimal polynomial expansion of the Lorenz function:

$$L(x) = Ax + Bx^2, \quad (2)$$

where $A > 0$ and $B > 0$, such that $L(x)$ becomes a monotonically increasing function of x and $A + B = 1$ to ensure $L(x) = 1$ for $x = 1$ (also ensuring $L(x) = 0$ at $x = 0$). One can then express the Gini index through

$$g = 1 - 2 \int_0^1 L(x) dx = 1 - A - (2/3)B = B/3.$$

The Pietra index p is given by the maximum value of the difference between x (equality line) and $L(x)$ (Lorenz curve) for variation of x within 0 to 1:

$$p = \max[x - L(x)] = \max[B(x - x^2)] = B/4,$$

giving,

$$p = (3/4)g. \quad (3)$$

Also noting that the Kolkata index k is given by the fixed point equation $L_c(k) = k$ or the complementary Lorenz function $L_c(x) \equiv 1 - L(x)$, giving (see also [8, 10])

$$k = 1/2 + (3/8)g, \quad (4)$$

for $g \rightarrow 0$.

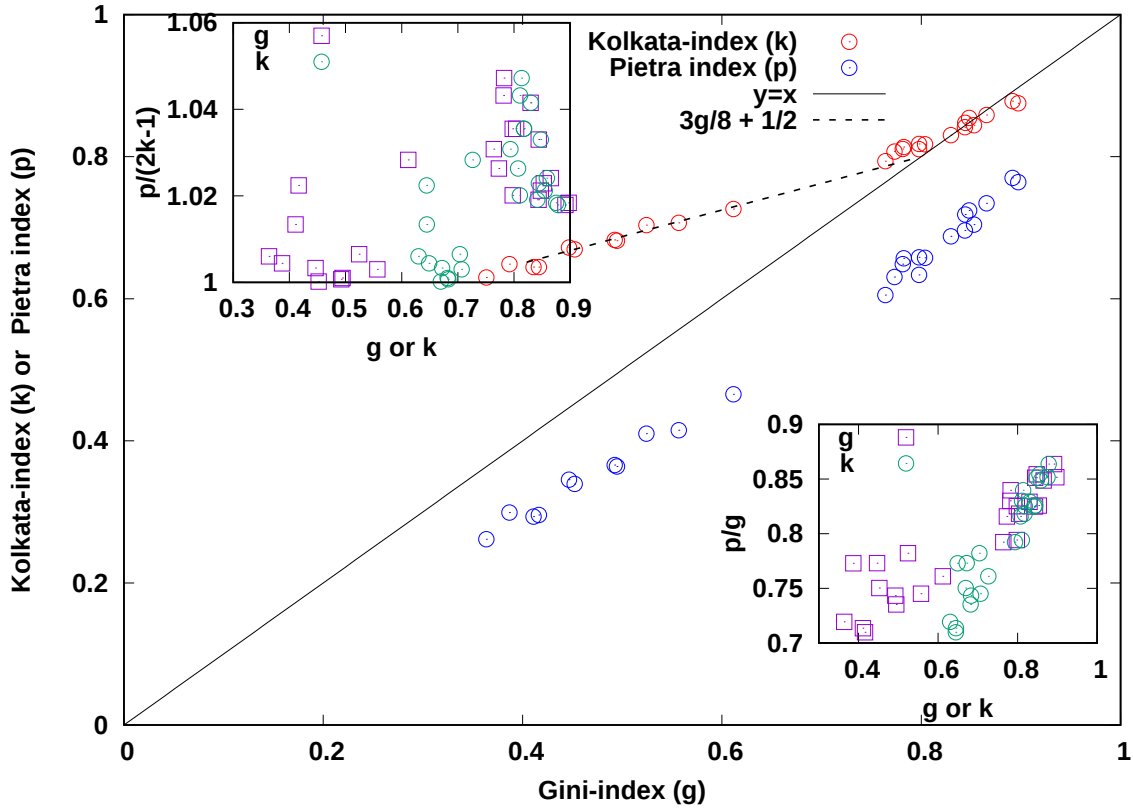


FIG. 4. Growths of Pietra (p) and Kolkata (k) indices against Gini (g) index values for movie income inequalities (Bollywood India data [15] for the period 1999-2024). The values of k in the tax data (which can be argued to represent the prevailing inequality status better) seems to have grown a little beyond the Pareto value ($k = 0.80$) with increasing withdrawal of public welfare programs. The upper left inset, showing the values of $p/(2k - 1)$ against the years, indicate values higher than unity as predicted by a rigid theoretical argument (relation (1)). The lower right inset shows the values of p/g against years and show values considerably different from $3/4$, as obtained from theoretical relation (3) (obtained an additional assumption (2) of the minimal form of the Lorenz function). Details of the values of the inequality indices and of their relations are given in Table III of the Appendix.

III. NUMERICAL DATA ANALYSIS

We will now analyze the extensive data sets from various income data sources (US IRS for the forty year period 1983 to 2022 [13, 14], Bollywood Box Office income data for the period 1999 to 2024 [15]), comparing how the above relations (2), (3) and (4) fit the results of our data analysis. We will analyze extensive citation data (from google scholar [16]) of the prolific Nobel laureate research scientists (physicists, chemists, medicinal scientists and economists) for the years 2020 to 2025.

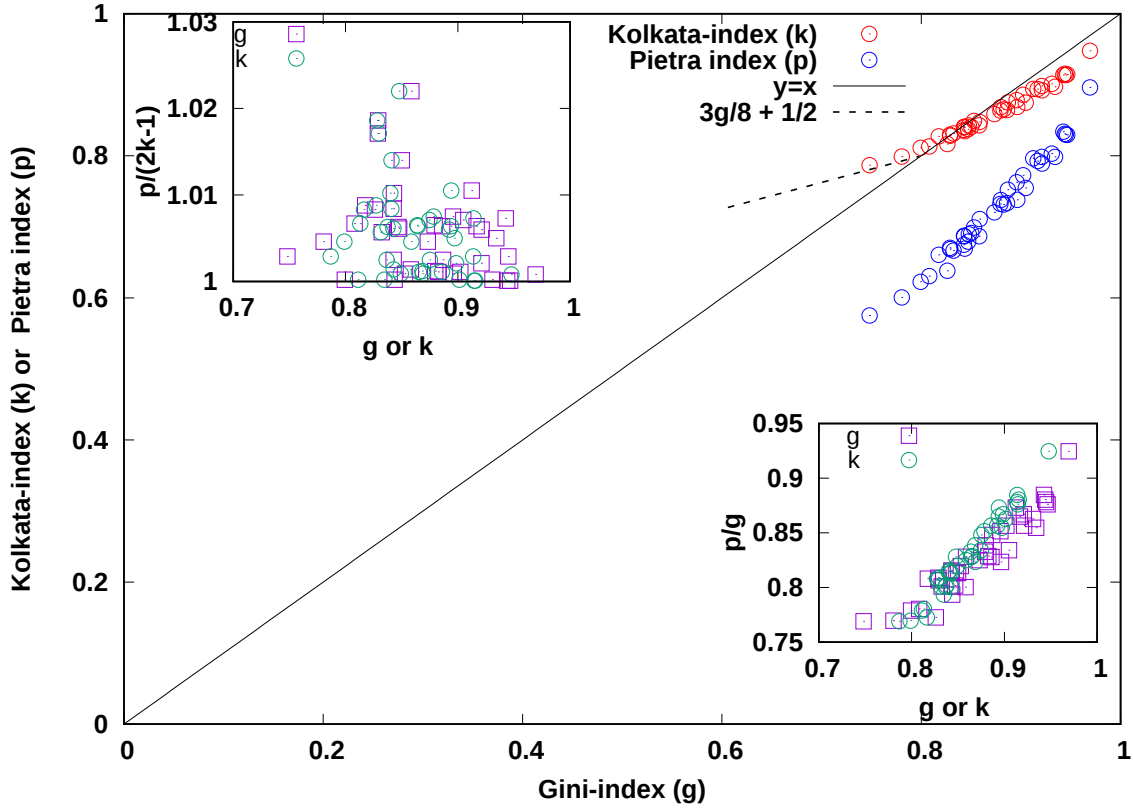


FIG. 5. Growths of Pietra (p) and Kolkata (k) indices against Gini (g) index values for the citation inequalities among the papers published by different Nobel Laureates in economics, physics, chemistry and medicine during the last six years (Google Scholar open-access data [16] for scientists, each having their own home page with verified e-mail address and more than 100 papers). The values of k (and also of g for the inequalities in citation distributions across the publications of individual Nobel laureates) have grown, because of extreme competition among the scientists, quite beyond the Pareto value ($k = 0.80$, and closer to self-organized critical system value [10, 12]) because of any public welfare kind of support system (for the producers) and the market being quite competitive. The upper left and lower right insets, showing the values of $p/(2k - 1)$ against g and k respectively, indicate values slightly higher than unity (as predicted by a rigid theoretical argument; see relation (1)). The lower right inset shows the values of p/g against years and show values considerably different from $3/4$, as obtained from the theoretical relation (3) (obtained an additional assumption (2) of the minimal form of the Lorenz function). Details of the inequality indices and of their relations are given in Table IV of the Appendix.

IV. SUMMARY AND CONCLUSION

As we discussed, all the three inequality indices Gini (g), Pietra (p) and Kolkata (k) are derived from the Lorenz function $L(x)$ (see Fig. 1). $2g$ is given by the area between the equality line and the Lorenz curve. p is given by the maximum value of $x - L(x)$ and is interpreted as a measure of the fraction of money the ‘rich’ people should transfer to the ‘poor’ people (neither rich or poor are specifically defined here), so that a redistribution would bring equality (Robin Hood index [4]). k is given by the fixed point of the Complementary Lorenz Function $L_c(x) \equiv 1 - L(x)$: $L_c(k) = k$. Geometrically (see Fig. 1) it gives the fraction k of wealth (citations) possessed by clearly defined $1 - k$ fraction of rich people (papers). We therefore argued the excess wealth of the rich is precisely equal to $2k - 1$, which if they transfer to the poor k fraction of people, then (on redistribution) equality would be achieved. As such $p = 2k - 1$ (relation (1)).

As we see from numerical data analysis (see Appendices I-IV) and upper-left insets of Figs. 2 - 5, the p is a little higher (at most 5% off) from that suggested by relation (1). Next we assumed a minimal analytic and polynomial form (2) for the Lorenz function $L(x)$ and calculated g and p from there, giving $p = (3/4)g$ (relation (3)). As we see from the tables I-IV and Figs. 2-5, there are large deviations from relation (2). Finally, solving for k from (2) and (3), in the small g limit, we got $k = (1/2) + (3/8)g$ (relation (3)). Numerical data analysis for the validity of this relation are indicated in each of the main parts and bottom right insets of Figs. 2-5.

We studied here relations between three inequality indices, namely the Gini (g) [2], Pietra (p) [3] and Kolkata (k) [6–8] introduced in 1912, 1915 and 2014 respectively and all are derived from the Lorenz function [1] $L(x)$ introduced in 1905. We showed rigorously that the Pietra or Robin Hood index p should equal to the excess wealth $2k - 1$ possessed by the richest $1 - k$ people, giving relation (1). Our numerical data analysis results for US IRS Income data (1983-2022; see Tables I, II of the Appendix, and Figs. 2,3), Bollywood (India) movie income data (1999-2024; see Table III of the Appendix and Fig. 4) and the citation inequalities across the publications by forty Nobel Laureates (2020-2025; see Table IV of the Appendix and Fig. 5) in Economics, Physics, Chemistry and Medicine clearly shows that $p/(2k - 1)$ is always slightly greater than unity and the deviation is never more than five percent. Assuming some simple analytic form (2) for the Lorenz function (cf. [11]), we also derived here the relations (3) $p/g = 3/4$ and (4) $k = (1/2) + (3/8)g$ for small values of g . However, these relations generally deviate significantly for larger g and k values (see Tables I-IV and Figs. 2-5) when compared with observations.

ACKNOWLEDGEMENT

We are grateful to Suchismita Banerjee and Shohini Sen for their valuable comments and suggestions.

APPENDIX: DETAILED NUMERICAL ESTIMATES OF INEQUALITY INDICES FROM DATA ANALYSIS

TABLE I. Gini-index (g), Pietra-index (p) and Kolkata-index (k) values for the income inequalities from movie for U.S. IRS Income Data (1983–2022) datasets collected from ref. [13, 14]. For each year, the total income collections of individuals are analyzed.

Year	Gini index (g)	Pietra index (p)	Kolkata index (k)	$p/(2k - 1)$	p/g	$(2k - 1)/g$
1983	0.47418	0.34280	0.66894	1.0146	0.7229	0.7126
1984	0.47711	0.34289	0.67076	1.0040	0.7187	0.7158
1985	0.48136	0.34672	0.67253	1.0048	0.7203	0.7168
1986	0.49412	0.35602	0.67640	1.0091	0.7205	0.7140
1987	0.51365	0.36991	0.68403	1.0050	0.7202	0.7166
1988	0.53394	0.38312	0.69106	1.0026	0.7175	0.7157
1989	0.53094	0.38250	0.68970	1.0082	0.7204	0.7146
1990	0.52898	0.38110	0.68854	1.0107	0.7204	0.7128
1991	0.52472	0.37906	0.68734	1.0117	0.7224	0.7141
1992	0.53185	0.38256	0.68960	1.0089	0.7193	0.7130
1993	0.53100	0.38191	0.68960	1.0071	0.7192	0.7141
1994	0.53198	0.38212	0.69071	1.0018	0.7183	0.7170
1995	0.54026	0.38946	0.69434	1.0020	0.7209	0.7194
1996	0.55188	0.39894	0.69943	1.0002	0.7229	0.7227
1997	0.55998	0.40463	0.70153	1.0039	0.7226	0.7198
1998	0.56631	0.40807	0.70376	1.0013	0.7206	0.7196
1999	0.57604	0.41659	0.70780	1.0024	0.7232	0.7215
2000	0.58418	0.42321	0.71140	1.0010	0.7245	0.7237
2001	0.56116	0.40616	0.70285	1.0011	0.7238	0.7230
2002	0.55009	0.39857	0.69902	1.0013	0.7246	0.7236
2003	0.55508	0.40325	0.70161	1.0001	0.7265	0.7264
2004	0.57073	0.41385	0.70533	1.0078	0.7251	0.7195
2005	0.58713	0.42413	0.71052	1.0073	0.7224	0.7171
2006	0.59445	0.42721	0.71290	1.0033	0.7187	0.7163
2007	0.60078	0.43191	0.71543	1.0024	0.7189	0.7172
2008	0.58395	0.42027	0.70950	1.0030	0.7197	0.7175
2009	0.56321	0.40960	0.70280	1.0099	0.7273	0.7202
2010	0.57349	0.41558	0.70664	1.0056	0.7247	0.7206
2011	0.57799	0.41882	0.70862	1.0038	0.7246	0.7219
2012	0.59759	0.43488	0.71601	1.0066	0.7277	0.7229
2013	0.58345	0.42418	0.71113	1.0045	0.7270	0.7237
2014	0.59374	0.43475	0.71569	1.0078	0.7322	0.7265
2015	0.59442	0.43629	0.71649	1.0076	0.7340	0.7284
2016	0.58799	0.43158	0.71424	1.0072	0.7340	0.7287
2017	0.59553	0.43759	0.71800	1.0036	0.7348	0.7321
2018	0.59473	0.43703	0.71829	1.0010	0.7348	0.7341
2019	0.59072	0.43407	0.71669	1.0016	0.7348	0.7336
2020	0.60100	0.44124	0.72022	1.0018	0.7342	0.7328
2021	0.62792	0.46403	0.73005	1.0085	0.7390	0.7327
2022	0.60345	0.44444	0.72064	1.0072	0.7365	0.7313

TABLE II. Gini-index (g), Pietra-index (p) and Kolkata-index (k) values for the tax-return inequalities from U.S. IRS Income Tax Data (1983–2022) datasets collected from ref. [13, 14]. For each year, the total tax collections of individuals are analyzed.

Year	Gini index (g)	Pietra index (p)	Kolkata index (k)	$p/(2k-1)$	p/g	$(2k-1)/g$
1983	0.66335	0.48721	0.74086	1.0114	0.7345	0.7262
1984	0.66753	0.48835	0.74363	1.0022	0.7316	0.7299
1985	0.67246	0.49438	0.74581	1.0056	0.7352	0.7311
1986	0.69308	0.51074	0.75262	1.0109	0.7369	0.7290
1987	0.70073	0.51685	0.75674	1.0066	0.7376	0.7328
1988	0.71296	0.52519	0.76215	1.0017	0.7366	0.7354
1989	0.70412	0.51864	0.75899	1.0013	0.7366	0.7356
1990	0.70247	0.51917	0.75930	1.0011	0.7391	0.7383
1991	0.70487	0.52181	0.76089	1.0001	0.7403	0.7402
1992	0.71938	0.53487	0.76601	1.0054	0.7435	0.7396
1993	0.72833	0.54241	0.76992	1.0048	0.7447	0.7412
1994	0.72995	0.54421	0.77123	1.0032	0.7455	0.7431
1995	0.73822	0.55293	0.77611	1.0013	0.7490	0.7480
1996	0.74976	0.56455	0.78198	1.0010	0.7530	0.7522
1997	0.75437	0.56893	0.78243	1.0072	0.7542	0.7488
1998	0.76372	0.57613	0.78651	1.0054	0.7544	0.7503
1999	0.77301	0.58454	0.79122	1.0036	0.7562	0.7535
2000	0.77856	0.59549	0.79470	1.0103	0.7649	0.7570
2001	0.76491	0.57785	0.78725	1.0058	0.7554	0.7511
2002	0.77313	0.58737	0.79221	1.0050	0.7597	0.7559
2003	0.77373	0.58709	0.79204	1.0052	0.7588	0.7549
2004	0.78684	0.60559	0.80048	1.0077	0.7696	0.7638
2005	0.79995	0.62076	0.80998	1.0013	0.7760	0.7750
2006	0.80278	0.62305	0.81109	1.0014	0.7761	0.7750
2007	0.80582	0.62481	0.81229	1.0004	0.7754	0.7751
2008	0.80036	0.62046	0.80949	1.0024	0.7752	0.7734
2009	0.80642	0.63018	0.81371	1.0044	0.7815	0.7780
2010	0.81101	0.63382	0.81576	1.0036	0.7815	0.7787
2011	0.79568	0.61789	0.80758	1.0044	0.7766	0.7731
2012	0.80744	0.62826	0.81359	1.0017	0.7781	0.7768
2013	0.80558	0.62664	0.81260	1.0023	0.7779	0.7761
2014	0.81165	0.63613	0.81674	1.0042	0.7837	0.7805
2015	0.80929	0.63505	0.81648	1.0033	0.7847	0.7821
2016	0.80136	0.62672	0.81236	1.0032	0.7821	0.7796
2017	0.80401	0.63025	0.81495	1.0006	0.7839	0.7834
2018	0.81284	0.64080	0.81722	1.0100	0.7883	0.7805
2019	0.80787	0.63630	0.81471	1.0109	0.7876	0.7791
2020	0.82292	0.65008	0.82091	1.0129	0.7900	0.7799
2021	0.82025	0.64352	0.81709	1.0147	0.7845	0.7732
2022	0.81013	0.62775	0.81029	1.0116	0.7749	0.7660

TABLE III. Gini-index (g), Pietra-index (p) and Kolkata-index (k) values for the inequalities from movie income datasets containing year-wise box office earnings (1999-2022) for Bollywood (India) movies, collected from ref. [15]. For each year, the total collections of individual films are recorded. Only years with more than 10 released movies are included to ensure reliable statistical representation. Here N represent the number of produced and released movies in each year.

Year	Tot. No. of movies	Gini index (g)	Pietra index (p)	Kolkata index (k)	$p/(2k-1)$	p/g	$(2k-1)/g$
1999	52	0.41093	0.29326	0.64469	1.0134	0.7136	0.7042
2000	51	0.41637	0.29554	0.64453	1.0224	0.7098	0.6942
2001	51	0.55679	0.41486	0.70681	1.0030	0.7451	0.7429
2002	51	0.36364	0.26156	0.63000	1.0060	0.7193	0.7150
2003	52	0.45222	0.33932	0.66963	1.0002	0.7503	0.7502
2004	51	0.44658	0.34524	0.67206	1.0033	0.7731	0.7706
2005	52	0.38679	0.29895	0.64882	1.0044	0.7729	0.7695
2006	50	0.52425	0.41003	0.70370	1.0065	0.7821	0.7771
2007	51	0.49243	0.36600	0.68287	1.0007	0.7433	0.7427
2008	51	0.49477	0.36377	0.68170	1.0010	0.7352	0.7345
2009	64	0.61159	0.46545	0.72633	1.0283	0.7610	0.7401
2010	140	0.77307	0.63066	0.80724	1.0263	0.8158	0.7949
2011	123	0.78239	0.65696	0.81366	1.0472	0.8397	0.8018
2012	133	0.78140	0.64864	0.81088	1.0432	0.8301	0.7957
2013	137	0.76403	0.60528	0.79360	1.0308	0.7922	0.7686
2014	146	0.80382	0.65775	0.81760	1.0355	0.8183	0.7902
2015	165	0.79784	0.65836	0.81791	1.0355	0.8252	0.7969
2016	216	0.82970	0.68791	0.83025	1.0415	0.8291	0.7961
2017	252	0.85300	0.70442	0.84432	1.0229	0.8258	0.8073
2018	219	0.84407	0.71848	0.84777	1.0330	0.8512	0.8240
2019	244	0.84798	0.72439	0.85467	1.0212	0.8543	0.8365
2020	76	0.86551	0.73448	0.85860	1.0241	0.8486	0.8286
2021	50	0.79775	0.63359	0.81054	1.0201	0.7942	0.7785
2022	165	0.84379	0.69608	0.84151	1.0191	0.8249	0.8095
2023	227	0.89157	0.77006	0.87826	1.0179	0.8637	0.8485
2024	230	0.89728	0.76409	0.87516	1.0184	0.8516	0.8362

TABLE IV. Gini-index (g), Pietra-index (p) and Kolkata-index (k) for the citation inequalities among the papers published by each of the Nobel Laureates (collected, for years 2020-2025, from Google Scholar [16]). Here h represents the Hirsch index [5] for the individual scientists listed.

Categories											
	Year	Name of Nobel laureates	Tot. no. of papers	Tot. no. of citations	Hirsch index (h)	Gini index (g)	Pietra index (p)	Kolkata index (k)	$p/(2k-1)$	p/g	$(2k-1)/g$
Economics	2020	Paul Milgrom	398	118799	83	0.9123	0.7965	0.8941	1.0105	0.8731	0.8640
	2020	Robert Wilson	259	34825	58	0.8799	0.7379	0.8685	1.0012	0.8386	0.8376
	2021	David Card	695	103999	117	0.8957	0.7627	0.8785	1.0075	0.8515	0.8452
	2021	Guido Imbens	393	119042	102	0.8869	0.7522	0.8751	1.0025	0.8481	0.8459
	2021	Josh Angrist	436	107740	92	0.9212	0.7891	0.8922	1.0060	0.8566	0.8515
	2022	Ben Bernanke	717	147600	118	0.9210	0.7984	0.8984	1.0021	0.8669	0.8651
	2022	Philip H. Dybvig	139	55939	41	0.9426	0.8339	0.9139	1.0073	0.8846	0.8782
	2024	Daron Acemoglu	1358	277596	183	0.9167	0.7928	0.8939	1.0064	0.8649	0.8594
	2024	James Robinson	845	131696	102	0.9465	0.8293	0.9146	1.0001	0.8761	0.8760
	2024	Simon Johnson	947	95164	64	0.9693	0.8962	0.9477	1.0008	0.9246	0.9238
	2025	Joel Mokyr	471	32139	71	0.9049	0.7548	0.8747	1.0071	0.8341	0.8282
	2025	Philippe Aghion	647	146570	145	0.8733	0.7205	0.8586	1.0046	0.8250	0.8212
Physics	2020	Roger Penrose	639	101446	102	0.9022	0.7727	0.8859	1.0011	0.8565	0.8555
	2021	Giorgio Parisi	1127	111103	136	0.8437	0.6694	0.8346	1.0002	0.7934	0.7933
	2021	Syukuro Manabe	298	49325	89	0.8291	0.6687	0.8282	1.0186	0.8065	0.7918
	2022	John F. Clauser	138	22474	33	0.9450	0.8298	0.9137	1.0029	0.8781	0.8756
	2022	Aspect Alain	772	41611	76	0.9342	0.7984	0.8972	1.0050	0.8546	0.8503
	2023	Anne LHuillier	514	36201	86	0.8470	0.6792	0.8375	1.0063	0.8018	0.7968
	2023	Ferenc Krausz	1122	90527	130	0.8860	0.7335	0.8644	1.0064	0.8279	0.8226
	2024	Geoffrey Hinton	751	975672	192	0.9440	0.8310	0.9155	1.0001	0.8803	0.8802
	2024	John Hopfield	306	94961	95	0.8964	0.7381	0.8687	1.0009	0.8234	0.8227
	2025	John Clarke	1081	50125	111	0.8501	0.6913	0.8409	1.0140	0.8132	0.8019
	2025	Michel Devoret	754	78163	133	0.8586	0.7110	0.8478	1.0220	0.8281	0.8102
	2025	Emmanuelle Charpentier	269	64602	65	0.9309	0.8030	0.9014	1.0002	0.8626	0.8624
Chemistry	2020	Jennifer Doudna	864	156101	164	0.8582	0.6868	0.8429	1.0014	0.8003	0.7992
	2021	Benjamin List	337	49436	103	0.7482	0.5753	0.7868	1.0029	0.7690	0.7667
	2021	David MacMillan	578	87442	134	0.8288	0.6704	0.8296	1.0171	0.8089	0.7952
	2022	Carolyn Bertozzi	1021	103476	153	0.8081	0.6306	0.8132	1.0067	0.7804	0.7752
	2022	Morten Meldal	412	32092	68	0.8261	0.6382	0.8165	1.0083	0.7726	0.7663
	2023	Louis Brus	468	92751	122	0.8175	0.6606	0.8274	1.0088	0.8081	0.8010
	2023	Moungi G. Bawendi	989	178538	189	0.8323	0.6666	0.8314	1.0057	0.8009	0.7964
	2024	Demis Hassabis	171	238294	100	0.8530	0.6991	0.8492	1.0009	0.8196	0.8189
	2024	David Baker	2690	201046	227	0.8431	0.6868	0.8399	1.0102	0.8146	0.8064
	2025	Omar M. Yaghi	741	275500	197	0.8478	0.6895	0.8427	1.0061	0.8133	0.8084
	2025	Susumu Kitagawa	1129	104460	146	0.7994	0.6226	0.8112	1.0002	0.7788	0.7787
	2025	Michael Houghton	546	61896	107	0.8429	0.6749	0.8366	1.0025	0.8007	0.7987
Medicine	2022	Svante Paabo	587	151556	179	0.7805	0.6006	0.7989	1.0046	0.7696	0.7660
	2023	Katalin Karikó	226	32576	66	0.8429	0.6874	0.8408	1.0084	0.8155	0.8087
	2024	Victor Ambros	179	73309	72	0.8827	0.7315	0.8653	1.0011	0.8287	0.8278
	2025	Shimon Sakaguchi	676	143255	136	0.8794	0.7323	0.8638	1.0065	0.8327	0.8274

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