

Environmental and Climate Economics

Defining and Measuring Common Prosperity

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Tsinghua University

Spring 2024

Outline of the course

1. Common Prosperity

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1. Common Prosperity
2. Climate Policy Mix

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3. International Climate negotiations

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3. International Climate negotiations
4. Ask Me Anything

What is Common Prosperity?

Xi Jinping (2021), *Solidly promoting common prosperity*:

“Prosperity is the essential requirement of socialism and an important feature of Chinese modernization. (...)

It is necessary to promptly formulate an action plan for promoting common prosperity and propose a scientific and feasible indicator system and assessment method that is consistent with national conditions.”

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共同富裕是社会主义的本质要求，是中国式现代化的重要特征。(...)

到本世纪中叶，全体人民共同富裕基本实现，居民收入和实际消费水平差距缩小到合理区间。要抓紧制定促进共同富裕行动纲要，提出科学可行、符合国情的指标体系和考核评估办法。

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So, what is common prosperity? How to measure it?

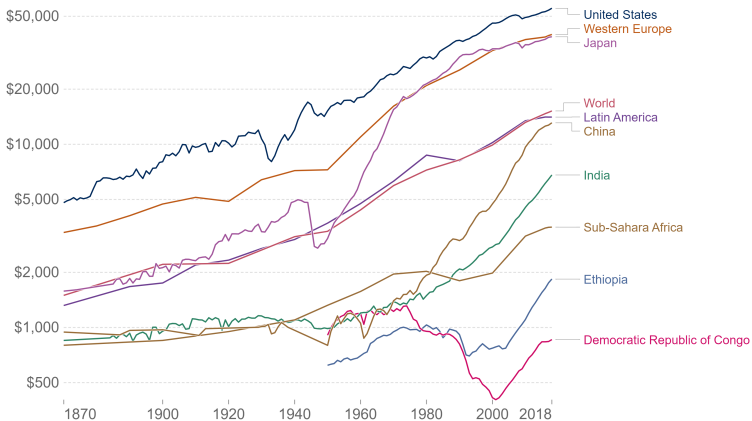
Our situation and actions: the Economic Circuit

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Prosperity as production: Gross Domestic Product

GDP per capita, 1870 to 2018

This data is adjusted for differences in the cost of living between countries, and for inflation. It is measured in constant 2011 international-\$.
Our World in Data

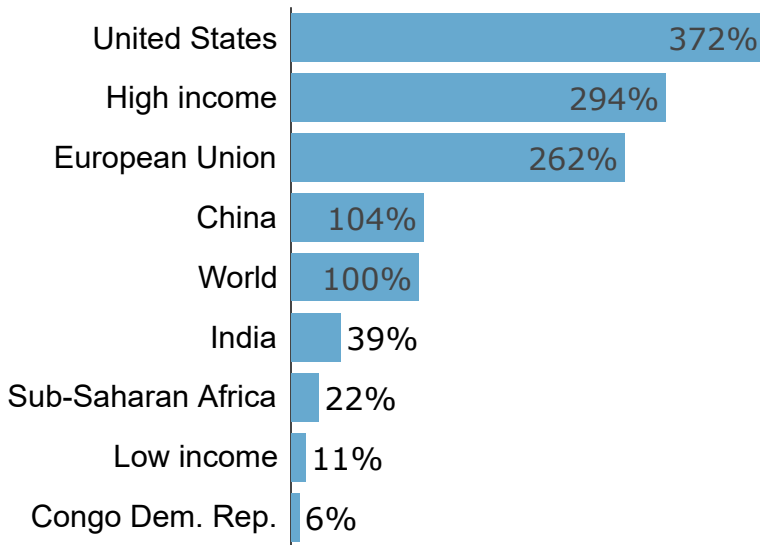


Source: Maddison Project Database 2020 (Bolt and van Zanden, 2020)

OurWorldInData.org/economic-growth • CC BY

Prosperity as production: Gross Domestic Product

GDP per capita in Purchasing Power Parity (PPP) compared to world average (2022).



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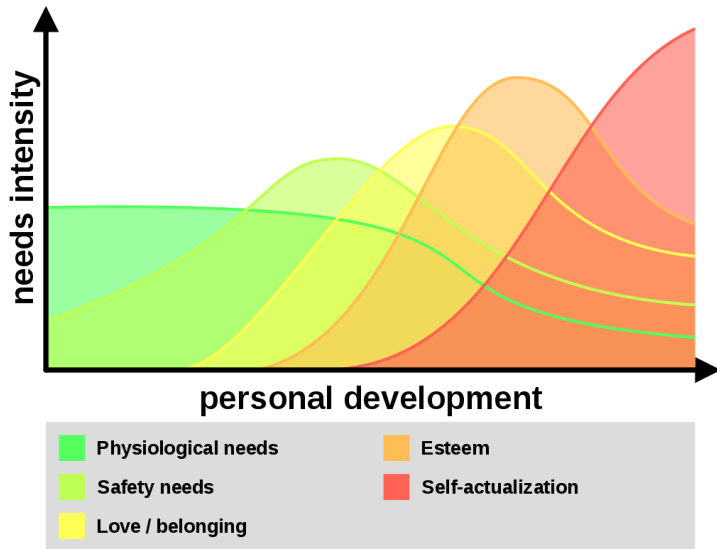
Is GDP p.c. a good proxy for common prosperity?

Why do we produce? Needs, capabilities, and human development

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Public services, redistribution, and popular pressure make Kerala's HDI on par with China's (at 0.78), with half the income.

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This can be estimated using survey of well-being during each activity and time schedule.

Mean affect by activity (Kahneman et al., 04)

Activity	Percentage of sample	Time spent (hours)	Net affect
Intimate relations	11	0.21	4.74
Socializing after work	49	1.15	4.12
Dinner	65	0.78	3.96
Relaxing	77	2.16	3.91
Lunch	57	0.52	3.91
Exercising	16	0.22	3.82
Praying	23	0.45	3.76
Socializing at work	41	1.12	3.75
Watching TV	75	2.18	3.62
Phone at home	43	0.93	3.49
Napping	43	0.89	3.27
Cooking	62	1.14	3.24
Shopping	30	0.41	3.21
Computer at home	23	0.46	3.14
Housework	49	1.11	2.96
Childcare	36	1.09	2.95
Evening commute	62	0.62	2.78
Working	100	6.88	2.65
Morning commute	61	0.43	2.03

Notes: Net affect is the average of three positive adjectives (enjoyment, warm, happy) less the average of five negative adjectives (frustrated, depressed, angry, hassled, criticized). All the adjectives are reported on a 0–6 scale, ranging from “not at all” to “very much.” The “time spent” column is not conditional on engaging in the activity. The sample consists of 909 employed women in Texas.

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Imagine one country enjoys listening to music rather than buying stuff ⇒ works less ⇒ lower GDP.

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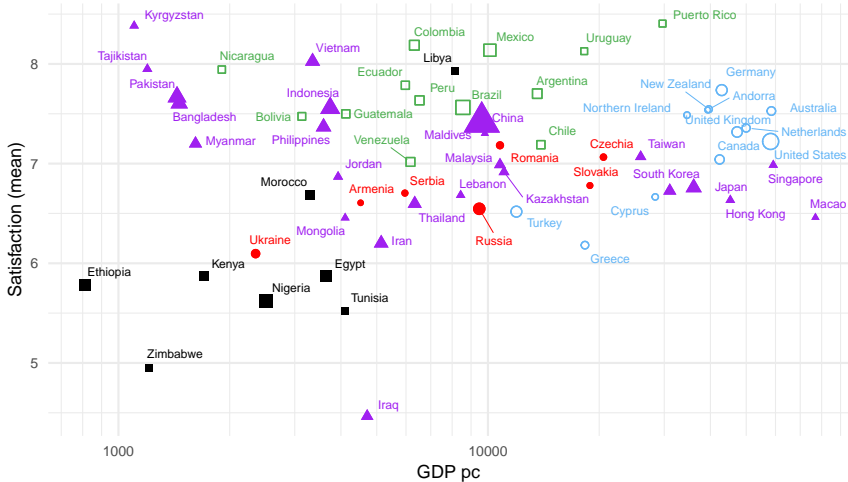
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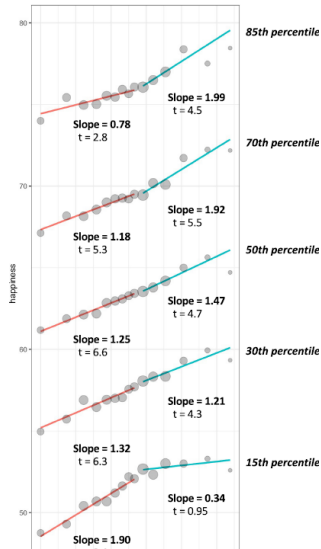
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U.S. emotional well-being distribution per income category (Killingsworth et al., 2023).



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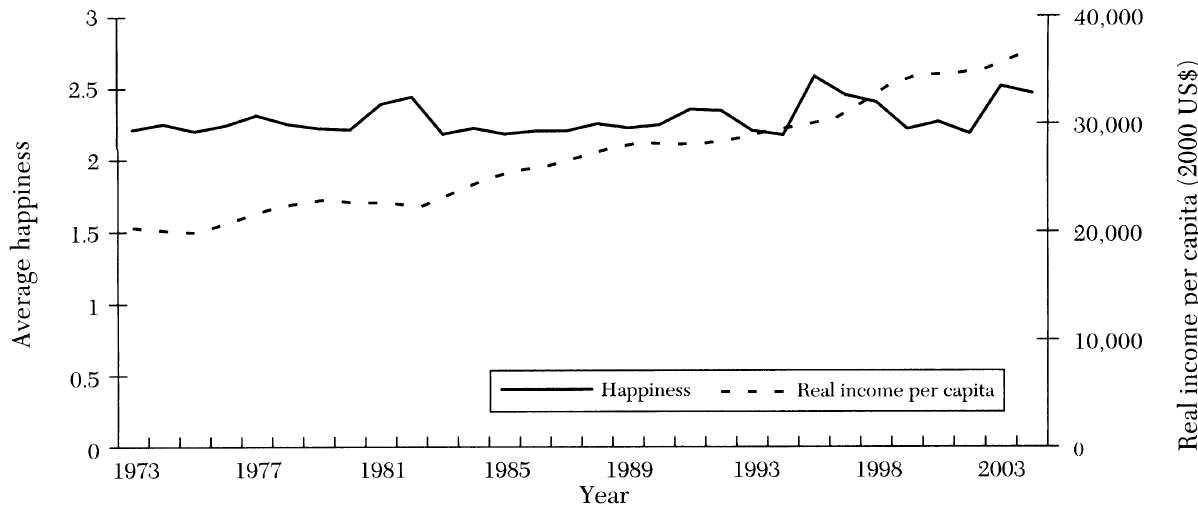


Figure 1. Happiness and Real Income Per Capita in the United States, 1973–2004

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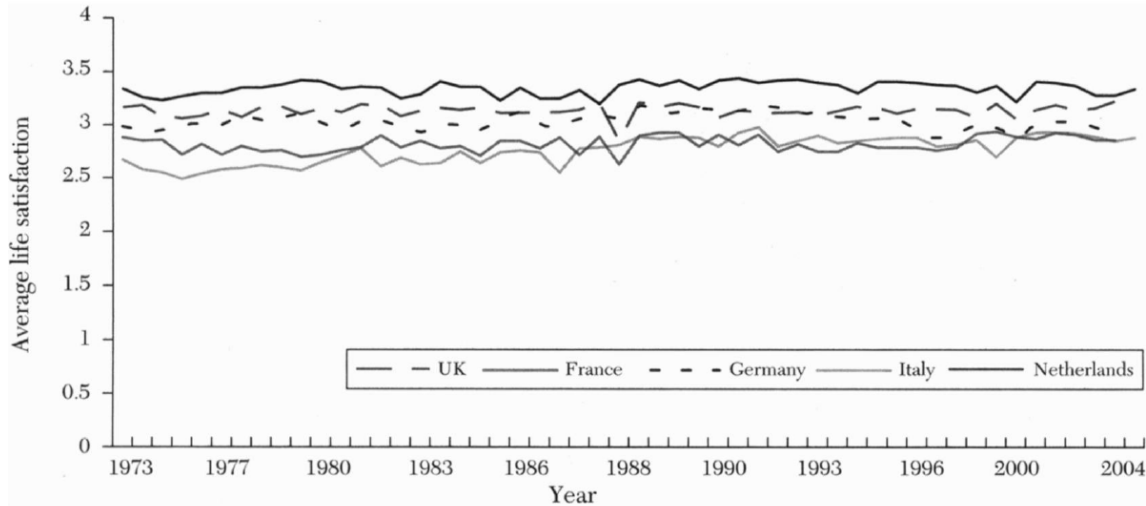
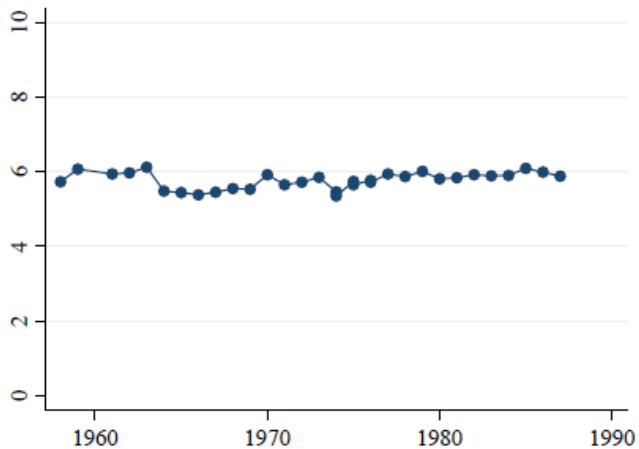


Figure 2. Life Satisfaction in Five European Countries, 1973–2004

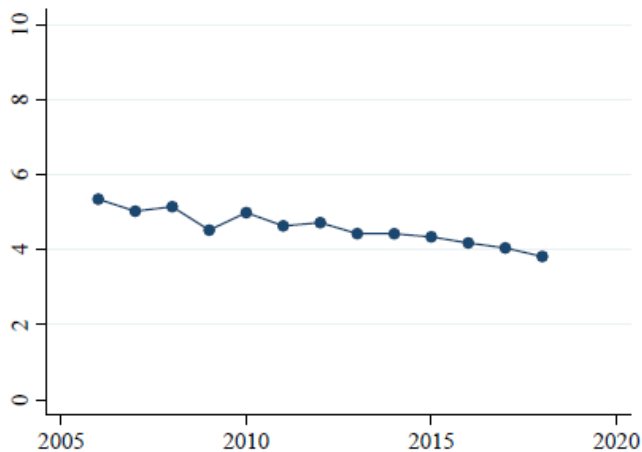
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Japan 1958-1987



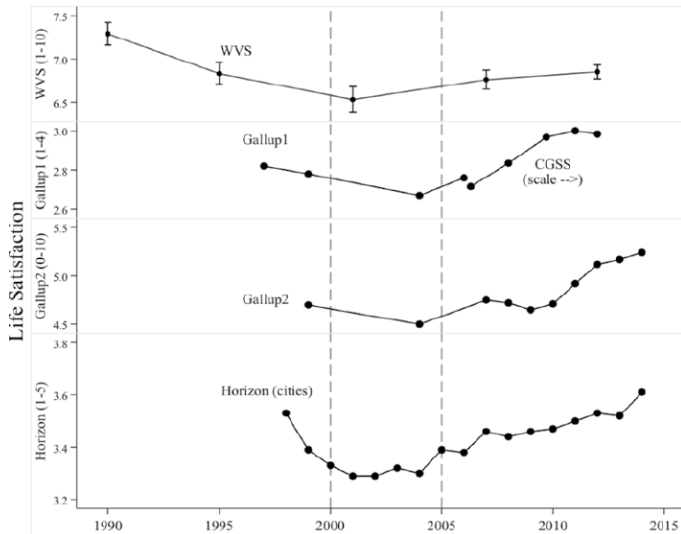
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India 2006-2018



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Evolution of well-being in China.



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A country growth rarely materializes into higher satisfaction: **paradox of Easterlin** (1974).

Kahneman & Deaton (2010) ranked correlates of well-being in the U.S. by strength: loneliness (-), headache (-), illness (-), religiosity (+), leisure time (+), smoking (-), high income (+), age (+), married (+)...

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As the correlates are mostly personal, it is difficult to use this measure to guide policy. It may work better to directly ask people what policy they want.

The limits of overconsumption: a zero-sum game?

How can we reconcile the correlation between one's income and satisfaction with the stability of mean satisfaction as a country grows?

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⇒ One's satisfaction is largely relative to a group or situation of reference (Clark et al., 2008).

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⇒ Once basic needs are fulfilled, “increasing the income of all increases the happiness of no one.”

If all engage in conspicuous/status-seeking consumption through more work effort, it can even decrease everyone's happiness (as status doesn't change but leisure reduces).

The limits of overconsumption: its environmental impact

Economic activity does not only involve work and made-man capital, but also resources and waste. This entails environmental externalities: pollution and resource depletion.

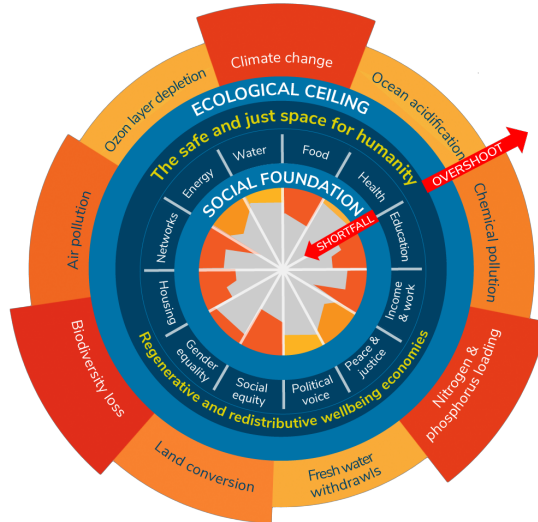
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The “doughnut”, a safe space for humanity: above social floor and below ecological ceiling (Raworth, 2017).



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The “doughnut” offers a multicriteria dashboard to assess common prosperity.

What Common Prosperity Is

Xi Jinping (2021), *Solidly promoting common prosperity*:

“The common prosperity we are talking about means the common prosperity of all people. It means the prosperity of the material and spiritual lives of the people. It is not the prosperity of a few people, nor is it uniform egalitarianism. (...) The new round of technological revolution and industrial transformation has powerfully promoted economic development and has also had a profound impact on employment and income distribution, including some negative impacts that need to be effectively addressed and resolved.

By the middle of this century, common prosperity for all people will be basically realized, and the gap between residents' income and actual consumption levels will be narrowed to a reasonable range.

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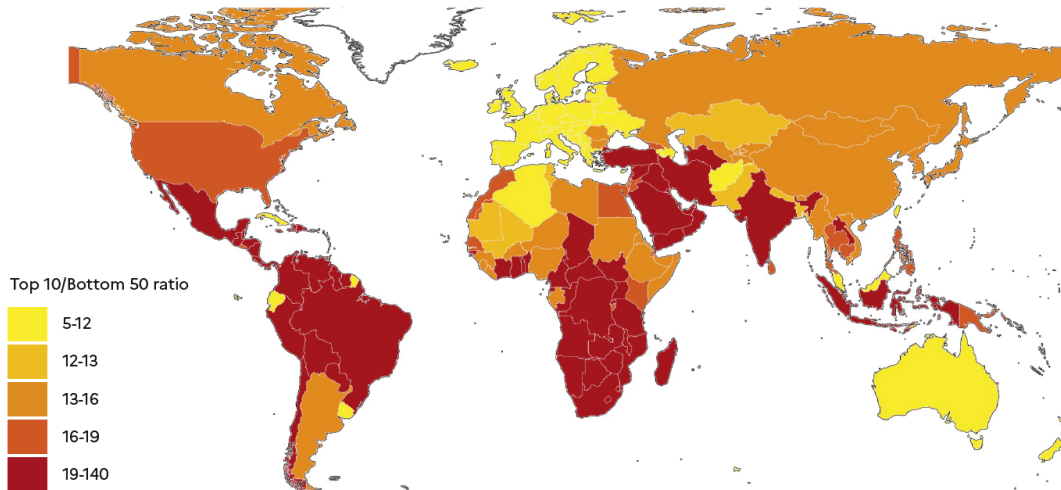
Capital owners are richer \Rightarrow can command more work (through consumption) than what they provide: capitalistic exploitation.

Rich people can accumulate capital and transmit it with low taxes to their children \Rightarrow inequality.

Prosperity of everyone? Setting the goal, trading off equity and efficiency

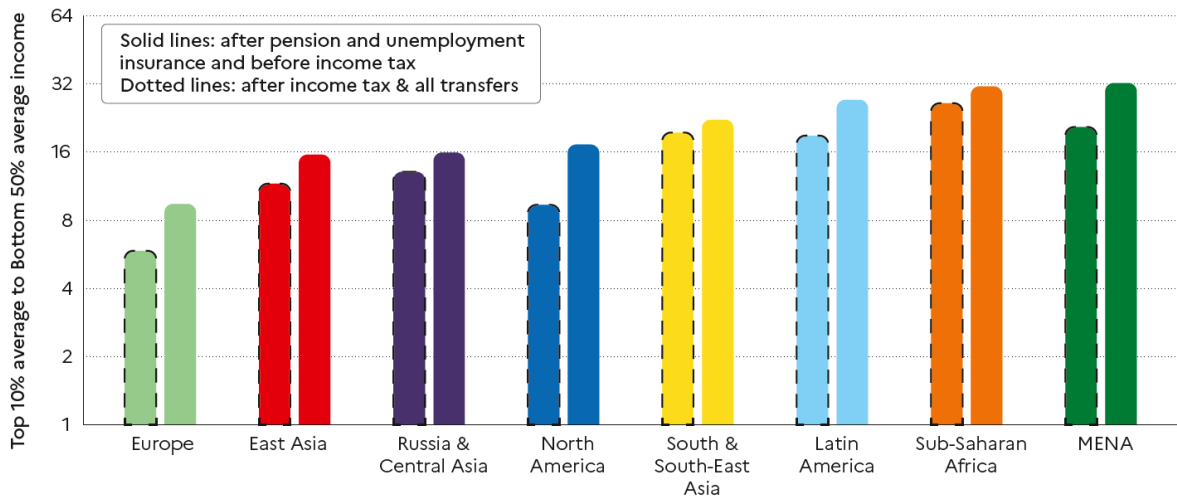
Inequality by country (World Inequality Report, 2022).

Figure 1.5 *Top 10/Bottom 50 income gaps across the world, 2021*



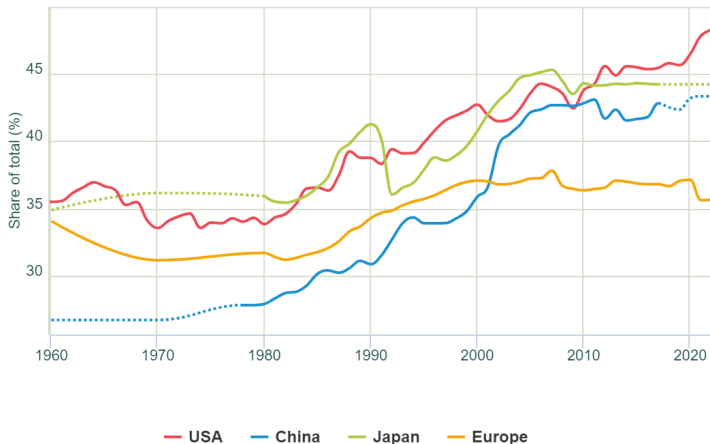
Prosperity of everyone? Setting the goal, trading off equity and efficiency

Figure 1.9a *Inequality across the world, 2018-2021: the uneven impact of redistribution on inequality*



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Top 10% national income share



Graph provided by www.wid.world

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To address inequality, wealth and inheritance taxes are also key (Piketty et al., 2023).

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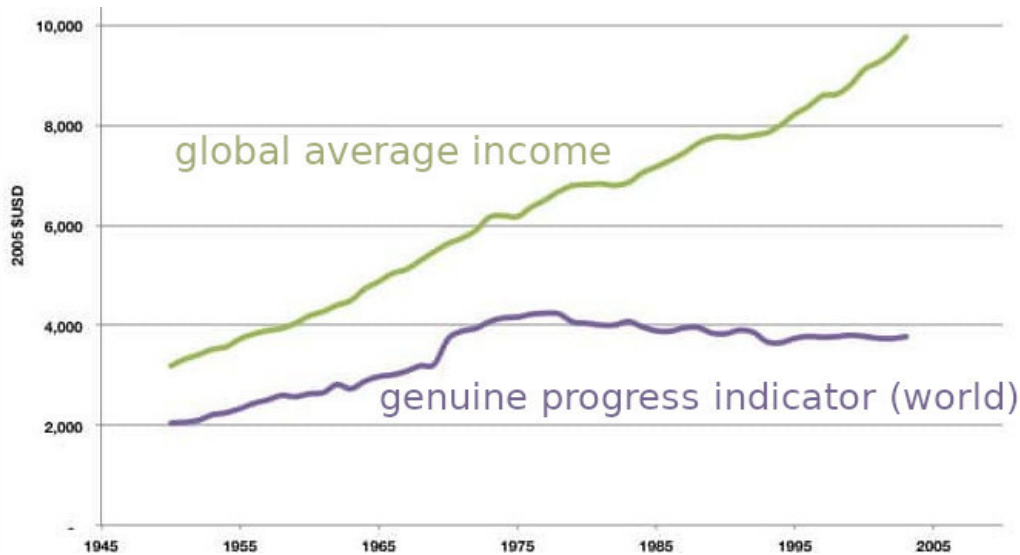
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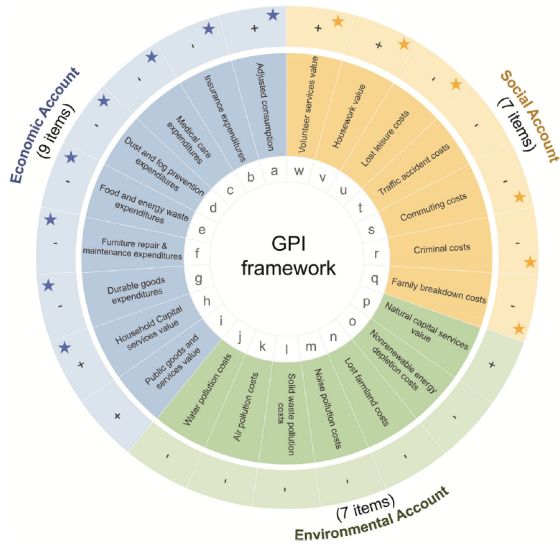
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Evolution of World's Genuine Progress Indicator (Kubiszewski et al., 13)



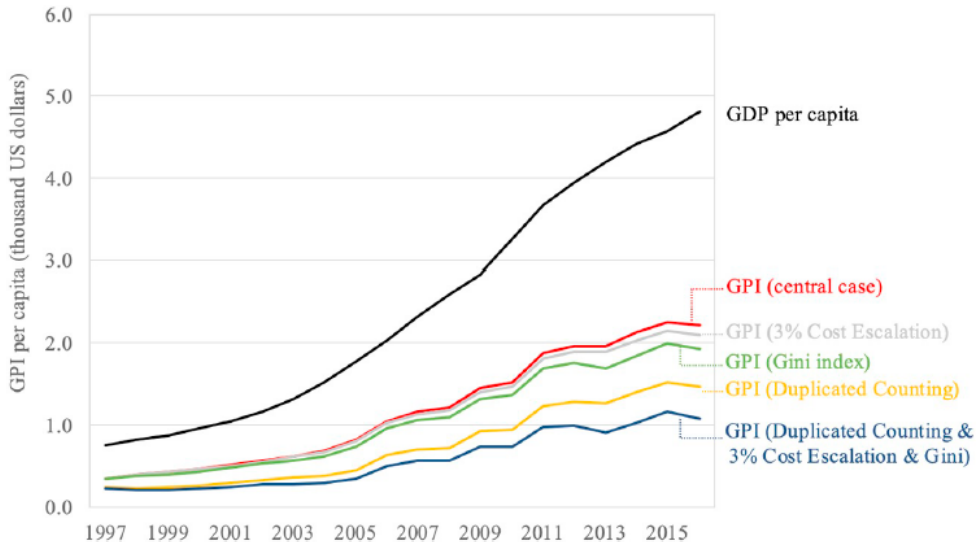
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Components of the GPI (Guan et al., 2021)



Measuring economic welfare: the Genuine Progress Indicator

China's GPI [just look at central case] (Long & Ji, 2019)



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Decomposition of China's GPI (Long & Ji, 2019)

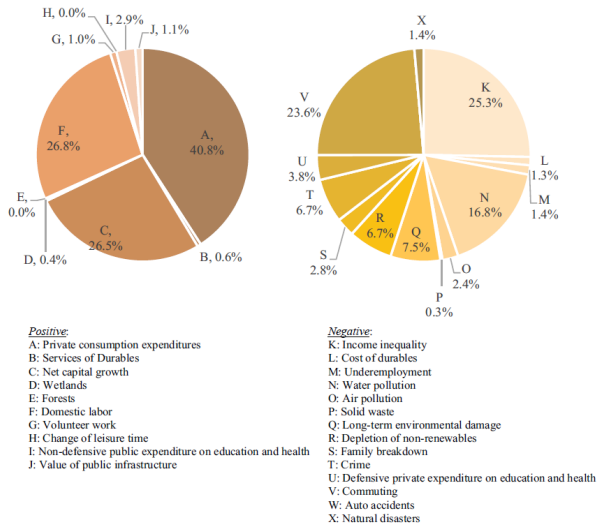
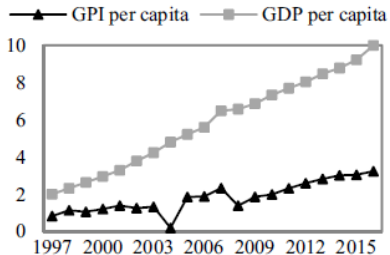


Fig. 7. Detailed GPI breakdown (left: positive items; right: negative items).

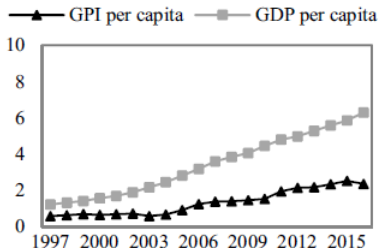
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Selected Chinese provinces' Genuine Progress Indicator (Long & Ji, 2019)

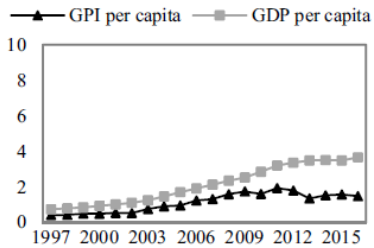
Beijing



Guangdong



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$$\begin{aligned} \text{GPI} = & \text{GDP} \times (1 - \text{inequality}) + \text{home production} + \text{volunteer work} + \text{leisure time} \\ & - \text{pollution} - \text{resource depletion} - \text{crime costs} - \text{workplace/road accidents} \\ & - \text{commuting costs} - \text{unemployment psychological costs} \\ & - \text{defensive spending (military, police, health protection)} \quad (\text{e.g., Long \& Ji, 2019}) \end{aligned}$$

While GDP increases, GPI usually plateaus at a GDP of \$15,000–\$20,000 (Max-Neef, 1995).

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The GPI also has limitations: does not account for human capital (knowledge), international inequality, or non-economic well-being (e.g. relationships); valuation methods of different costs require extensive data and ethical assumptions.

Appendix

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Example: impacts of producing a car. Final demand: $\mathbf{y} = \mathbb{1}_{car}$.

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Production: final demand \mathbf{y} , inputs for final demand $\mathbf{A}\mathbf{y}$, inputs for these inputs $\mathbf{A}^2\mathbf{y}$, etc.

Corresponds to a *Leontief production function*: production is like a strict recipe.

Not well suited to model substitution between factors/products. Static model. Limited data quality.

Used in trade: multi-regional input-output tables.

Used in macroeconomic modeling.

Used in Life Cycle Analysis, e.g. to compute the carbon footprint of a product. How?

c_{ij} : effect on/requirement of i from producing 1 unit of j ; $\mathbf{C} = (c_{ij})$: characterization matrix.

Example: impacts of producing a car. Final demand: $\mathbf{y} = \mathbb{1}_{car}$.

Production required for a car: $\mathbf{x} = \mathbf{y} + \mathbf{A}\mathbf{y} + \mathbf{A}^2\mathbf{y} + \dots$

8₇₃ Wassily Leontief and input-output analysis

Though *Tableau économique* of Quesnay (1758) was a precursor,

Leontief was the first to represent a production system by a matrix representation:

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Impacts $\mathbf{C}\mathbf{x}$: carbon footprint, number of hours of work, tons of iron extracted... for one car.

Karl Marx and capital accumulation

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Marxism was blind to the importance of self-interested motives, free enterprise and democracy.

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Schor (91) proposes to take “productivity increases in the form of leisure time rather than increased output.”

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Tropics should seize the opportunity of industrialized countries protecting *aristocratic* wages by outsourcing manufacturing, as their unskilled labor force becomes scarce.

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The [Mincer equation](#) computes the returns to education: they are higher than asset returns.

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