Economic and Social Commission for Western Asia

Distribution-biased growth: Inequality scenarios for poverty projection

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Shared Prosperity **Dignified Life**

Motivation

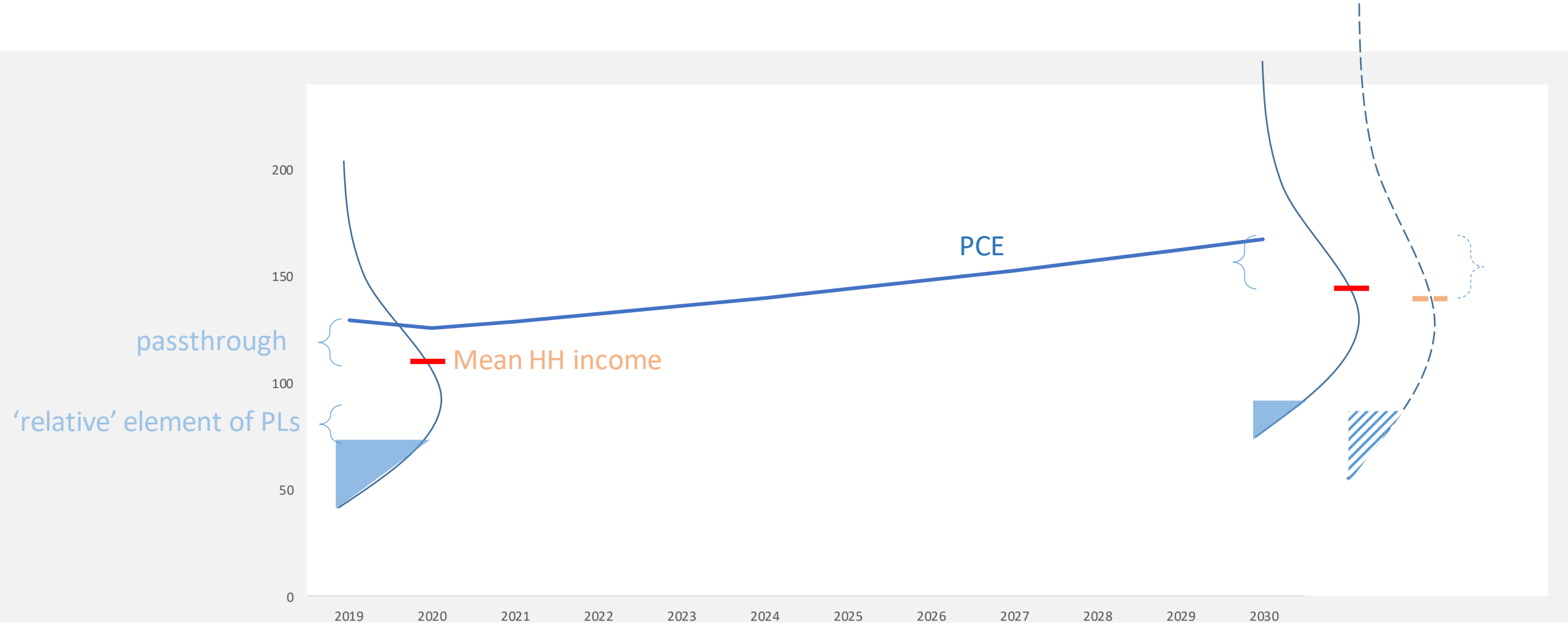
- Is inequality expected to change over the next ten years?
- In what direction, by how much, and at what rate across individual years?
- What is the relevant metric to study inequality, using what data?
- What are the implications for middle- and low-income households, and their classification as poor?

Why care?

- There is a direct effect of inequality on the mass of households under a poverty line (poverty rates), and their linear & squared distance to the poverty line
- There is an indirect effect on growth passthrough rates (both conceptually and as identified by our clustering exercise) and thus on mean household incomes
- This may affect the 'relative' element of the modeled poverty lines (or their covariates (median income, Gini…), and thus also the evolution of poverty lines.

- Given the estimated growth- and inequality- elasticities of poverty, we must improve our understanding of inequality trends to catch up with our understanding of growth.
- Since SDG 1.1 & 1.2 may not be achieved under distribution-neutral growth, can we place our hope in pro-poor evolution of inequality?

Illustration



Projections

- Projections of inequality are done rarely and inconsistently
- Projections should vary by time spell
  - Year-to-year cyclicality subject to within-country mean reversion (e.g., continuation of fiscal programmes, technical shocks and corrections, measurement issues)
  - 5-10 year cyclicality based on economic and fiscal cycles
  - Longer-term cyclicality following sectoral transformation

- Projections should be based on
  - relevant theory (e.g., Kuznets curve)
  - available historical within-country evidence (e.g., spells analysis)
  - heuristic information (e.g., no change, upper/lower bounds, cross-country convergence)

Existing practices

- distribution-neutral growth (Birdsall et al. 2014; Karver et al. 2012; Hellebrandt and Mauro 2015)
- distribution-neutral growth at new counterfactual levels of inequality (Ravallion 2013; Edward and Sumner 2014)
- distributional changes for specific narrow income groups (Higgins and Williamson 2002; Hillebrand 2008; Chandy et al. 2013; Edward and Sumner 2014; Ncube et al. 2014; Lakner et al. 2014, 2019, 2020)

ESCWA's contributions

- We model distributional changes and mean income growth rate changes separately.

- We strive to ground our projections on:
  - Kuznets curve - change in inequality depends on the initial level of development and the projected growth trend
  - Large changes in inequality are unsustainable over many years
  - Cross-country convergence of inequality is expected (i.e., dependence on initial inequality)

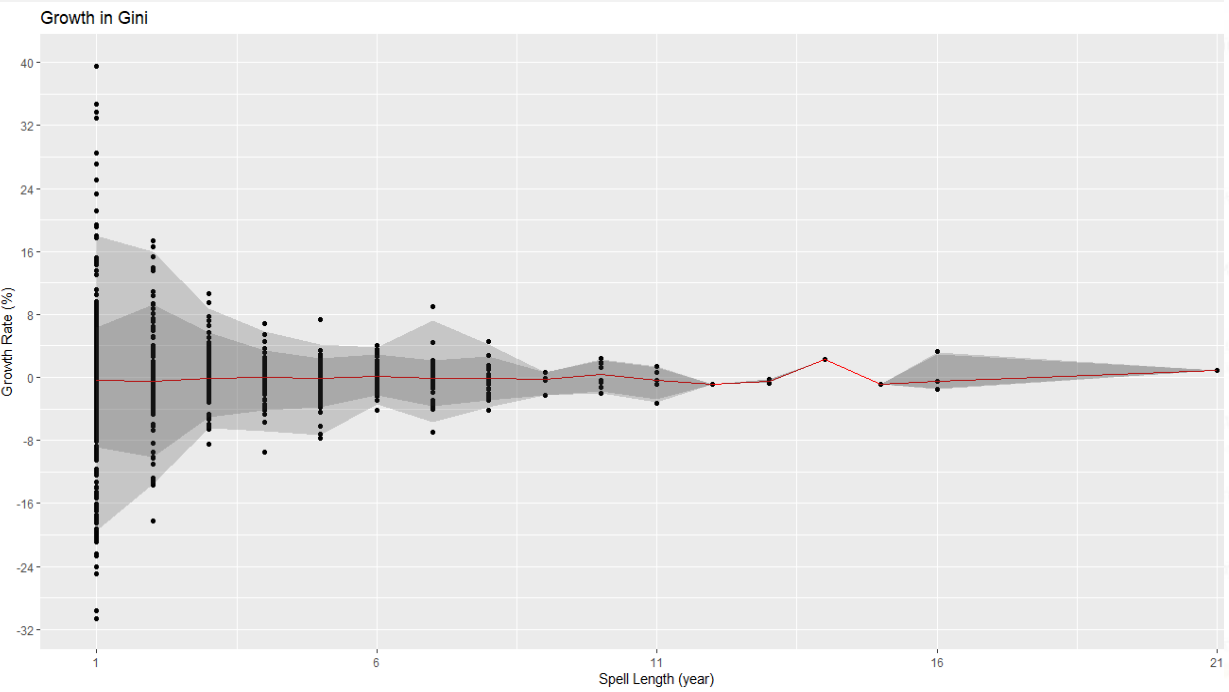
- Relative changes in inequality more plausible than absolute changes

Empirical evidence

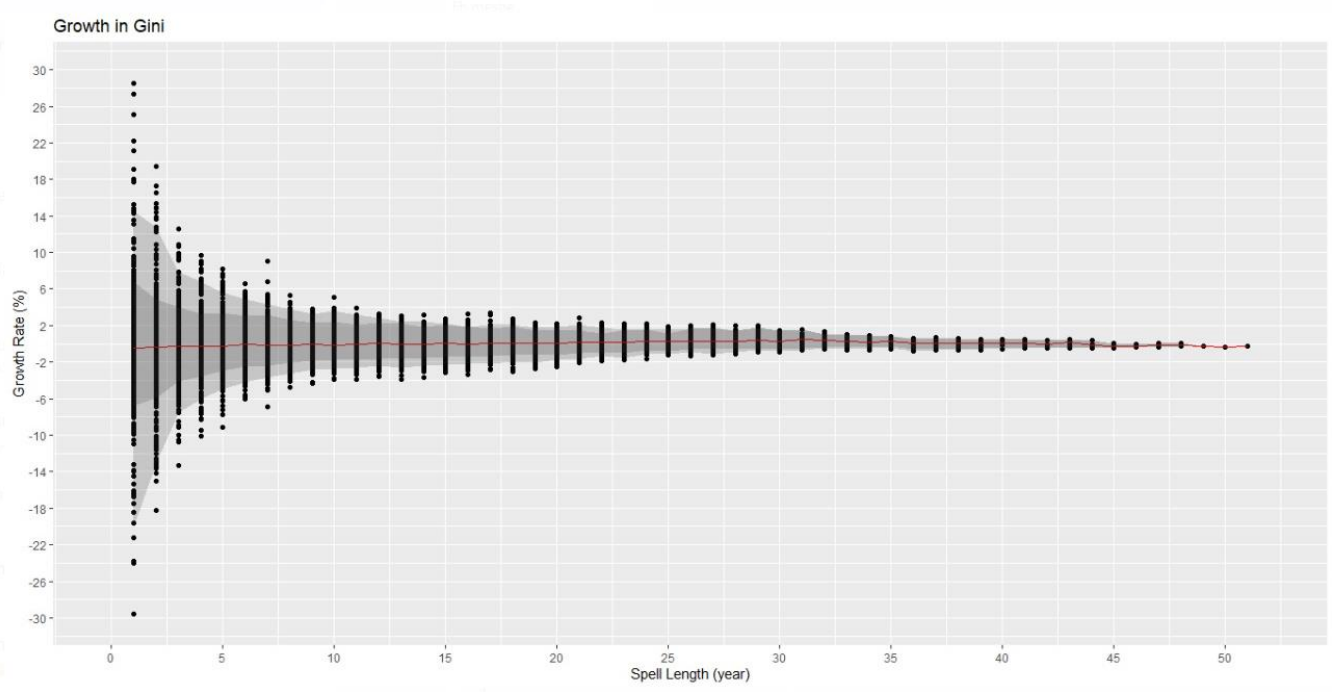
- Time spell analysis:
  - study how inequality has changed over the past years, and how the rate of change varies across world regions, across countries in different circumstances/characteristics, over different points in time, and across different time-spells
  - if balanced panel data of equal time frequencies are unavailable, compute the annualized percentage change in inequality for different time spells across successive surveys

Annualized change in Gini by time spell

Pairs of successive surveys



Pairs of all surveys



- Gini changes are bounded in [±35%] for short spell lengths, and in [±4%] for a spell lengths of 11 or more years.
- 95% of survey pairs are within [±8%].
- Changes are as likely to be negative as positive.
- Median is approximately zero: global inequality is only gradually changing relatively to country-specific changes

Heuristics

- For a spell length of 11 years such as 2019-2030, change in the Gini of 0% [±2%] is plausible.

- However, this could be recomputed using the time-spell analysis by decade, or only for most recent successive surveys

Data on inequality

- Statistical offices provide full microdata from which any inequality measure can be computed
- PovcalNet repository of national surveys provides selective data quantiles, and Gini
- PSE's World Inequality Database (WID) provides only a few Lorenz coordinates – the top 50%, 10% and 1% income shares (notable ignoring the bottom tail)
- UNU WIDER World Income Inequality Database (WIID) provides income deciles.
- Custom corrections of top/bottom income issues can be performed using within- and out-of-survey corrections.

Metric

- Gini index has been used most frequently in studies, and data are most abundantly available
- However, alternative indices such as Palma ratio, coefficient of variation, Theil indices, or income shares have also been promoted, and made available from data sources

- For understanding the (direct) effect on poverty rates, metrics sensitive to the bottom dispersions are critical.
- For understanding the (indirect) growth passthrough, metrics sensitive to the top dispersions may be relevant.

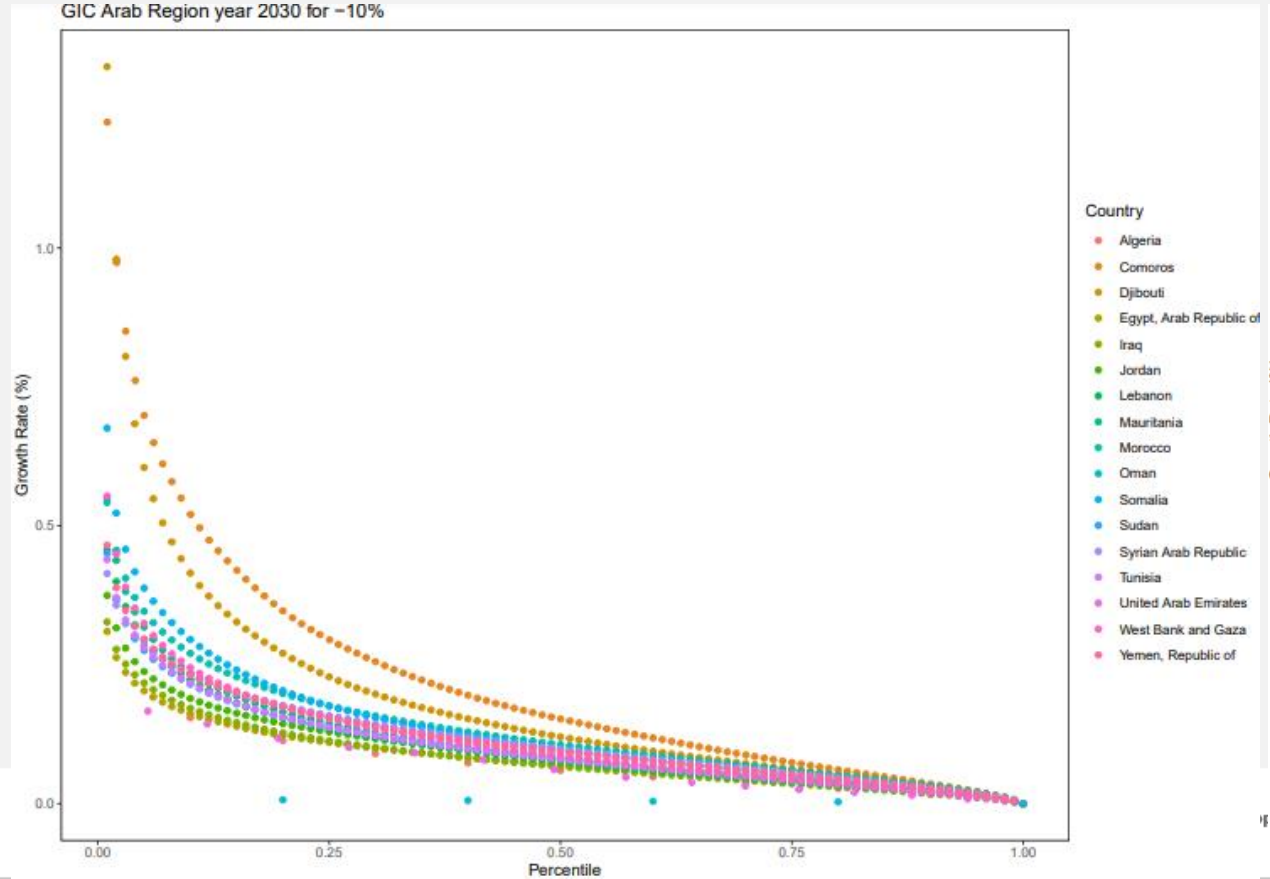
Beyond Gini: Growth incidence

- Any given change in an inequality metric can be achieved using infinitely many possible realizations of growth incidence.
- Thus, diverse distributional assumptions can be consistent with a given change in a Gini
- This can be investigated using empirical or simulated growth incidence curves (GIC)
- In fact, GICs may not be continuous or monotonic or even pro-poor to yield a decrease in the Gini

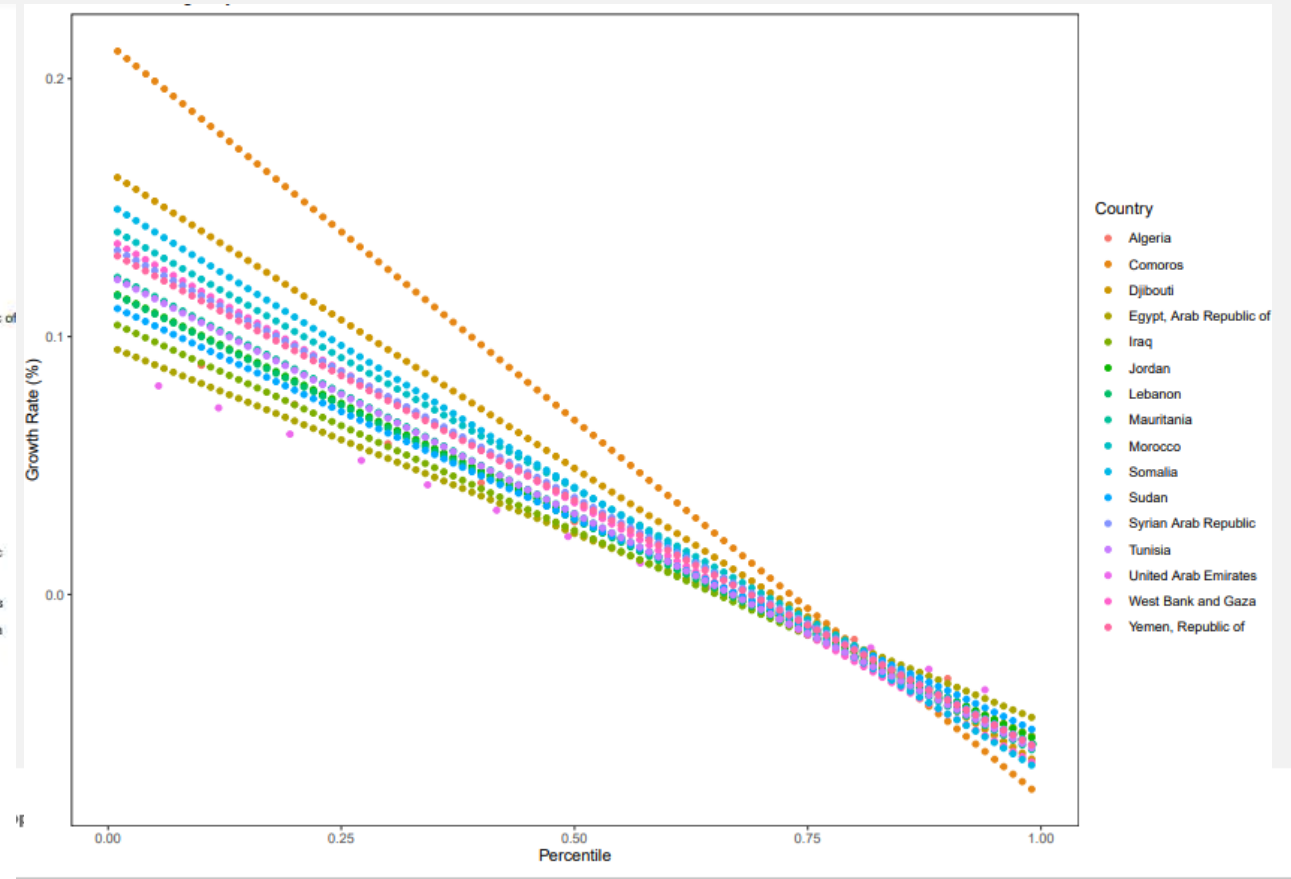
- The functional forms dictating the shapes of the GICs may vary
  - by the degree of pro-poorness (and the compensating against-richness) of the inequality-reduction process
  - by the incidence of income changes across population groups and labour-market segments
  - by the assumed resulting distribution of incomes after inequality change
  - …

Illustration: 10% reduction in Gini

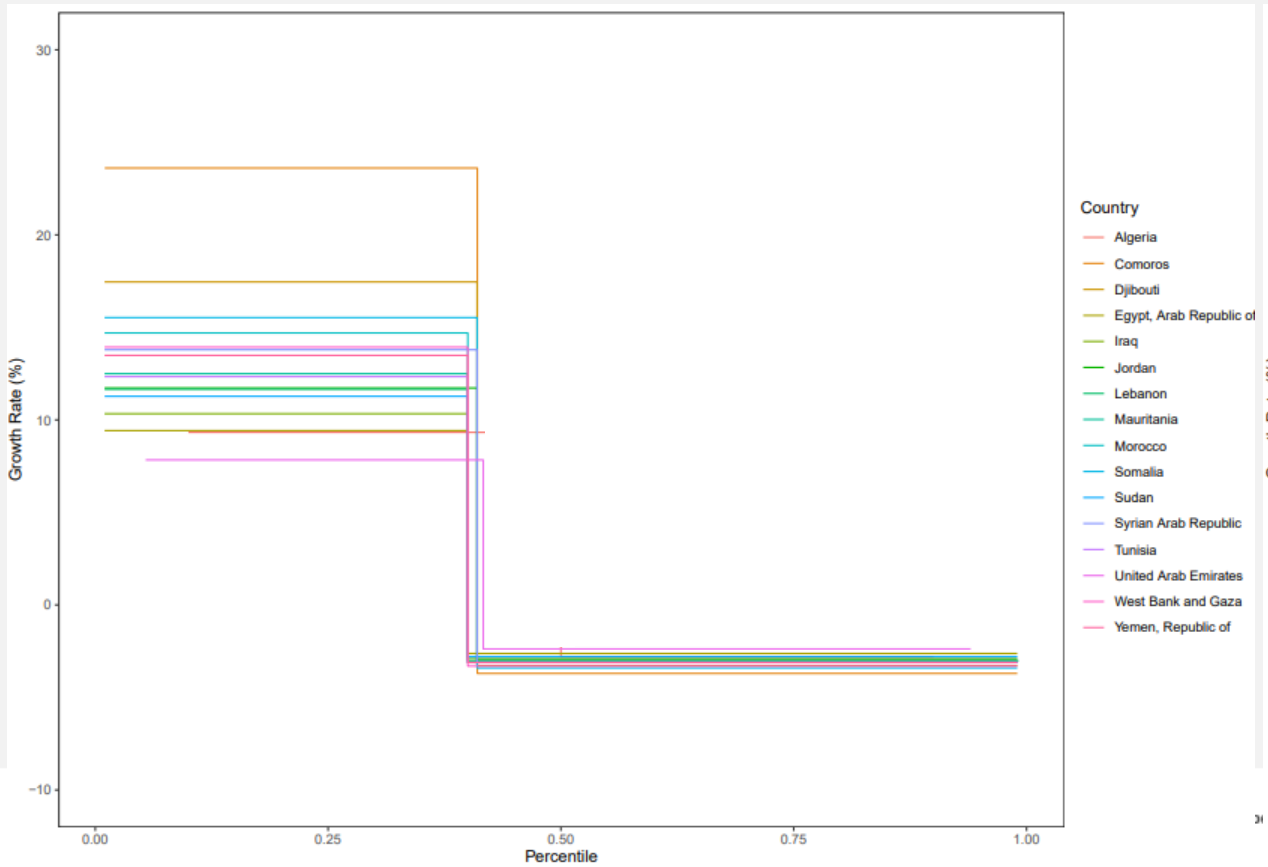
Convex GIC consistent with a 10% tax & transfer programme (Kakwani 1993; Ferreira and Leite 2003)



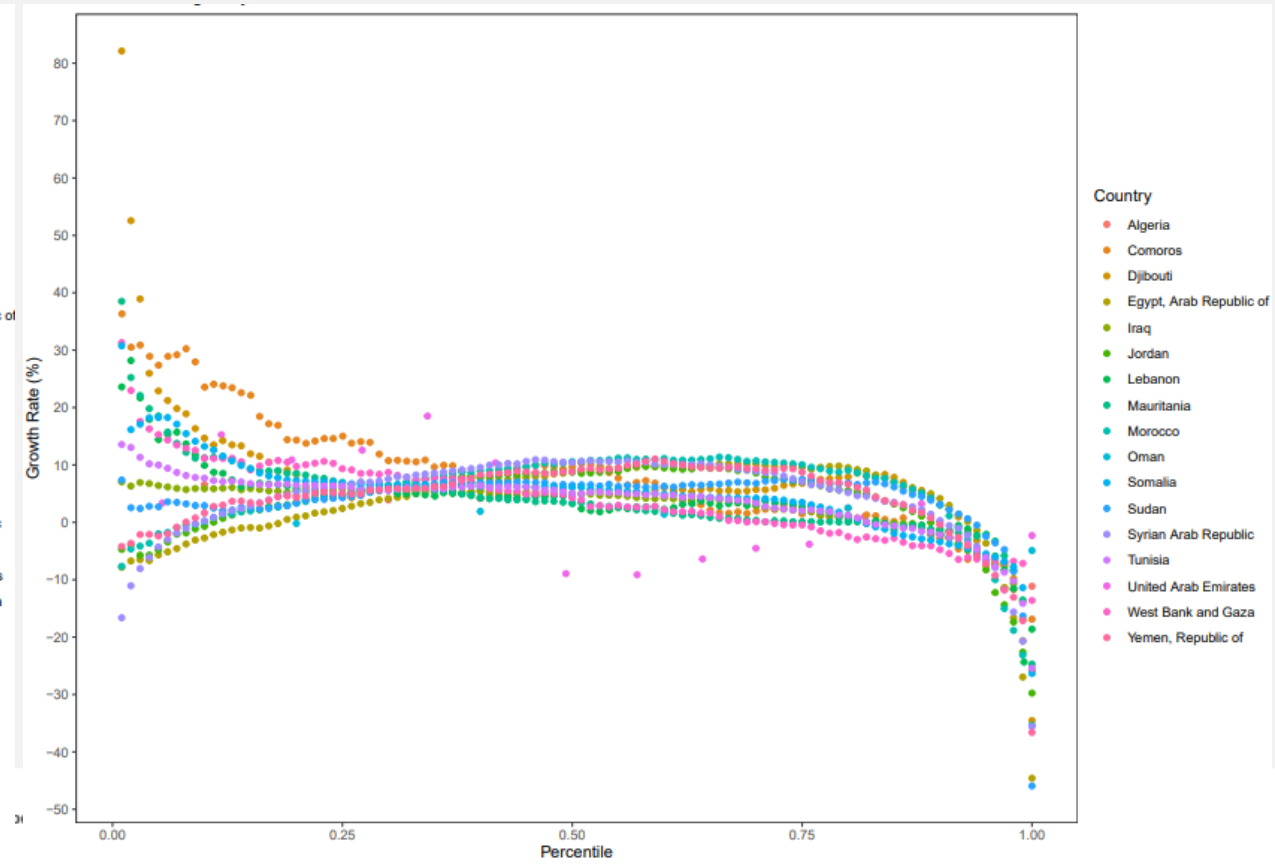
Linear GIC consistent with proportional tax & transfer programmes (Lakner et al. 2014)



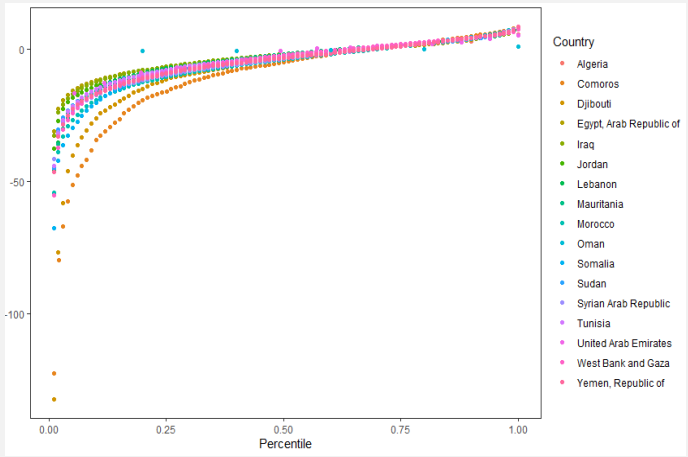
Step-function GIC consistent with sectoral programmes

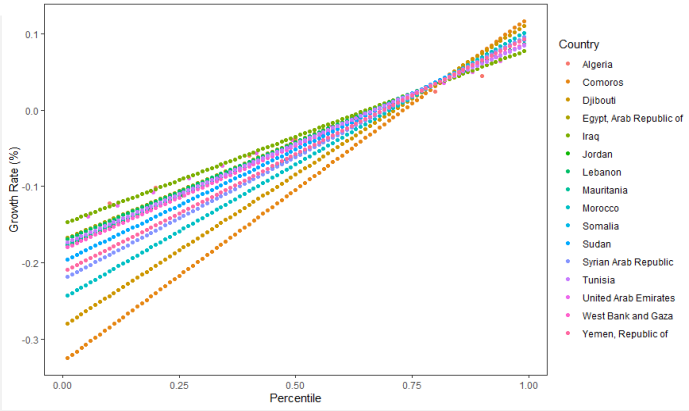


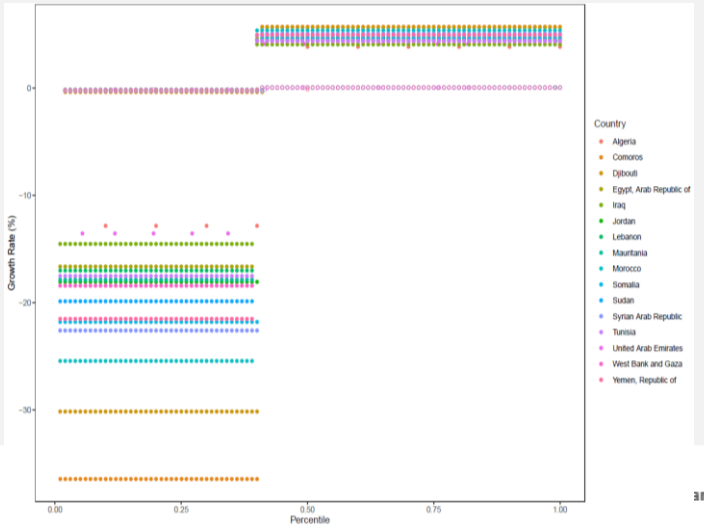
GIC consistent with lognormal distribution of income pre & post change (Aitchison & Brown 1996; López & Servén 2006)



An equivalent increase in the Gini







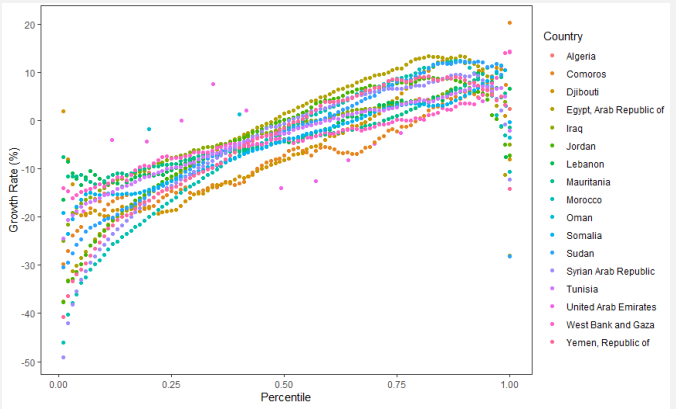
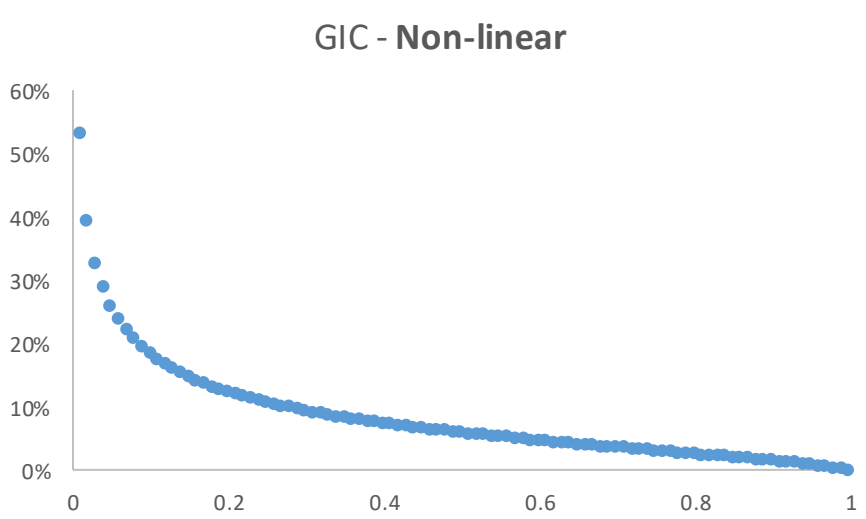
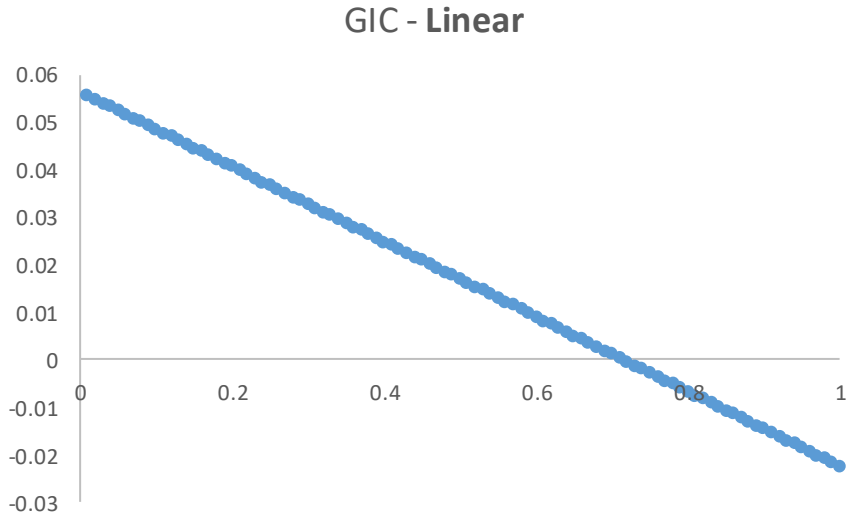


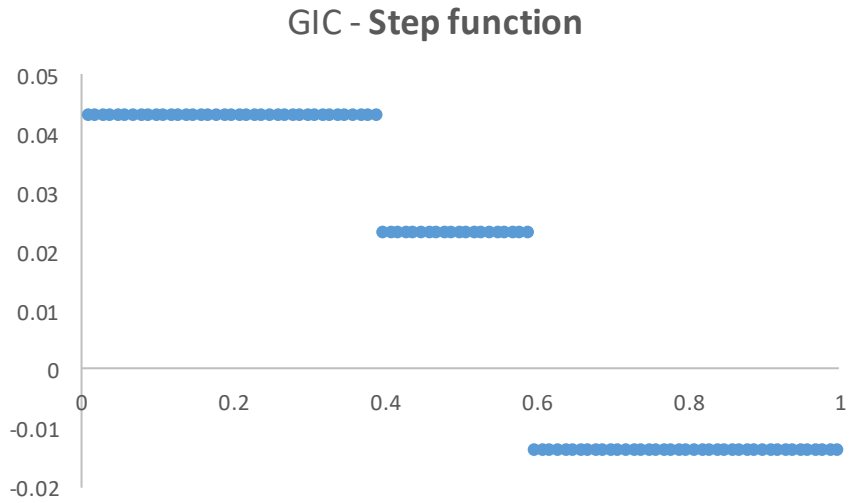
Illustration: Poverty impact of a 5% reduction in Gini

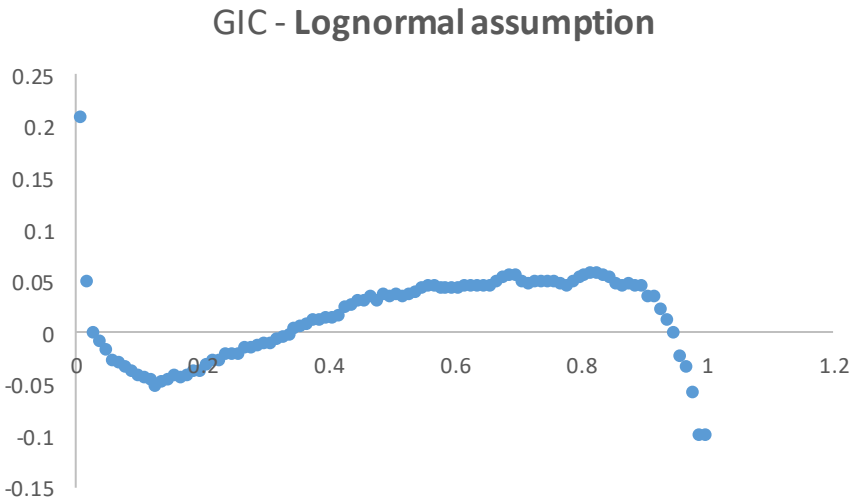
	Headcount poverty ratio		Poverty Gap	
GIC forms	2020	Baseline year 2019	2020	Baseline year 2019
Linear	23.12	24.67	6.99	7.79
Step function	22.89		6.79	
Convex	21.95		5.93	
Log-normal	24.54		7.78	

Convex appears too optimistic, as it is very pro-poor, but it has some advantages as it relates to a simple tax and transfer scheme, and is analytically related directly to changes in the Gini index.
Linear and step functions are more conservative, and results are sensitive to the initial level of inequality.


GIC - Non-linear
60%
50%
40%
30%
20%
10%
0%
0
0.2
0.4
0.6
0.8
1


GIC - Linear
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02
-0.03
0
0.2
0.4
0.6
0.8
1


GIC - Step function
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02
0
0.2
0.4
0.6
0.8
1


GIC - Lognormal assumption
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
0
0.2
0.4
0.6
0.8
1
1.2

Conclusions

- Modeling inequality changes for the purpose of projecting poverty requires paying attention to redistribution at the bottom (and top) of the income distribution, and requires the consideration of the political-economy processes involved.
- Empirically, inequality change depends on the state of development, on the growth rate, and on the starting level of inequality (relative to other countries)
- Sectoral and fiscal reforms may achieve different incidence of income changes, and degrees of pro-poorness intentionally as well as inadvertently through uncertainties and moral hazard.