INEQUALITY OF OPPORTUNITY IN INCOME AND CONSUMPTION IN EGYPT: A COMPARATIVE PERSPECTIVE

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Based on papers prepared for the ERF Research Project “Inequality of Opportunity in Income and Consumption in MENA:


INTRODUCTION

• There is a great deal of public debate in Egypt about whether high income inequality is a real problem and about whether inequality is rising or falling?
• Public perceptions, especially in light of January 25th uprisings, is that it is both high and rising
• Available data do not support these perceptions:
  • Inequality of consumption in Egypt does not appear to be particularly high by international standards and appears to have fallen over time (World Bank 2014, Verme et al. 2014)
  • Some doubts remain about measurement
    • Consumption inequality may understate income inequality
    • Questions remain about quality of measurement of consumption of upper 5-10% of income distribution, although some of those doubts are being dispelled by papers presented in this very conference
INEQUALITY TRENDS IN EGYPT

Gini Coefficient of Consumption, Egypt, Various Years

Egypt has relatively low inequality compared to other Arab countries. Worldwide, Egypt’s Gini in 2008/09 is at the 40\textsuperscript{th} percentile of the world distribution of Gini coefficients.

Source: Belhaj Hassine 2015
Could it be that expressed grievances are not about inequality per se but about a growing sense that the economic game is rigged?

Is it possible that subjective grievances are more concerned about inequality of opportunity than about inequality of outcomes?
Introduces Inequality of Opportunity Framework and Measures

Examines trends in Inequality of Opportunity (IOp) in Wages and Consumption in Egypt from 1988-2012

Investigates which circumstances contribute most to inequality of opportunity

Exploits panel data from Egypt Labor Market Panel Survey to investigate additional dimensions of IOp

Provides comparisons between IOp Measures in Egypt and other countries
Inequality of opportunity is that part of inequality of outcomes that is due to circumstances beyond an individual’s control, as opposed to inequality resulting from an individual’s own choices and effort.

<table>
<thead>
<tr>
<th>Circumstances include:</th>
<th>Effort includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Socioeconomic status of family in which the individual was raised</td>
<td>• Choices about how much education to get</td>
</tr>
<tr>
<td>• Gender</td>
<td>• What occupation to enter</td>
</tr>
<tr>
<td>• Location of birth</td>
<td>• How much to study</td>
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<tr>
<td>• Race and ethnicity</td>
<td>• How hard to work</td>
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INEQUALITY OF OPPORTUNITY (IOp)

Inequality due to circumstances is morally unjustifiable.

But inequality due to individual choices and effort is ethically admissible and may actually be efficient and good for growth.

Outcomes over which inequality is calculated can vary.

- Here I consider three outcomes:
  - Income, wages, and consumption
  - Data for wages and income are from the Egypt Labor Market Panel Survey (ELMPS)
  - Consumption is imputed using two-sample technique using corresponding Household Income, Expenditure and Consumption Survey and ELMPS.
1. Effort is hard to measure
2. Circumstances are only measured imperfectly
3. Effort is itself a function of circumstances
4. Some circumstances such as native ability are hard to distinguish from effort

- We therefore treat effort as a residual. What we cannot explain by observed circumstances
- This provides lower bound estimates of the share of inequality due to circumstances since there are many unobserved circumstances that are captured in the residual
DEFINING TYPES

A type is a set of persons having the same set of measurable circumstances.

The more circumstances we take into account, the finer the typology of individuals.

- However, we quickly run into data limitation problems.
- A distribution of an outcome, such as income, within a type is assumed to be the result of the distribution of effort.
- Differences in outcomes between types reveals inequality of opportunity.
NON-PARAMETRIC DECOMPOSITION OF INEQUALITY

• It is possible to decompose inequality into inequality between types and inequality within types
• Need to use decomposable inequality measure such as the General Entropy class of inequality measures
  • Gini index is not decomposable
  • We use the mean log deviation (GE(0)), but it can also be done using Theil-T (GE(1)) or half the square of the coefficient of variation (GE(2)).
<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
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<tbody>
<tr>
<td>Ratio of mean outcome of lowest type to that of highest type</td>
<td></td>
</tr>
<tr>
<td>Ratio of mean outcome of lowest type to that of all other types</td>
<td></td>
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<tr>
<td>Share of between-type inequality to total inequality (IOp share)</td>
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</tbody>
</table>
Measuring the IOP Share in Practice
Non-parametric approach

- Following Ferreira and Gignoux (2008)
- Define a “smoothed” distribution as follows:
  - $\{\mu_i^k\}$ is the distribution that results by replacing every $y_i$ in $\{y_i^k\}$ with the average $y$ in the type $k$.
    - i.e. eliminate all within-type inequality
- Define a “standardized” distribution as follows:
  - $\{v_i^k\}$ is the distribution that results by replacing every $y_i$ in $\{y_i^k\}$ with $y_i(\mu/\mu_k)$ where $\mu$ is the overall mean of $y$ and $\mu_k$ is the mean of $y$ in type $k$.
    - i.e. eliminate all between-type inequality
TWO PATHS TO MEASURE OF IOp SHARE

\[ \theta_d = \frac{I(\{\mu_i^k\})}{I(\{y_i^k\})} \]

Ratio of inequality of the smoothed distribution to total inequality. This directly summarizes between-type inequality

\[ \theta_r = 1 - \frac{I(\{y_i^k\})}{I(\{y_i^k\})} \]

One minus the ratio of inequality of the standardized distribution to the total inequality. This is a residual way of calculating between-type.
ARE THE TWO PATHS EQUIVALENT?

• Among all decomposable inequality indices that satisfy the Pigou-Dalton Sensitivity axiom, the only one that is “path-independent” is GE(0), the mean log-deviation.

• For $I = GE(0)$, $\theta_r = \theta_d$

• All other decomposable inequality measures, like other GE measures and Atkinson measures, are not path-independent
Measuring the IOp Share in Practice

Parametric Approach

- Regress outcome variable on a set of observable circumstances \( \ln y_i = C_i \varphi + \varepsilon_i \)
- Obtain the estimated residuals from this regression \( \hat{\varepsilon}_i \)
- Set all circumstances to their mean to predict outcomes for standardized distribution (i.e. eliminate effect of circumstances) \( \tilde{y}_i = \exp(\tilde{C} \hat{\varphi} + \hat{\varepsilon}_i) \)
- IOp share \( \theta^P_r = 1 - \frac{I(\{\tilde{y}_i\})}{I(\{y_i\})} \)

- Partial effects capturing the contribution of particular circumstances to inequality can be obtained in order to assess contribution of each set of circumstances to inequality of opportunity
DATA SOURCES


Outcomes:
• Imputed consumption only available for 1998, 2006, and 2012 (sample of Household Heads)
• Wages available for 1988-2012 (males 30-49)
• “Adjusted” wages (doubled for formal jobs based on Assaad 1999)
• Full income (including self-employment income) is only available from ELMPS 2012

Panel sample:
• Observed in natal household in 1998 (used to measure natal household wealth and grandparents’ characteristics)
• 26-36 in 2012 (12-22 in 1998)
• Outcomes observed in 2012
START WITH SIMPLE TYPOLOGY BASED ON FATHER’S AND MOTHER’S EDUCATION ONLY

- Father’s and mother’s education expressed in 5 categories each
  - Illiterate, literate, basic, secondary/post-second, university
- Sum of father’s and mother’s education yields numbers from 2-10
  - **Type I:** sum of 2 (both parents illiterate)
  - **Type II:** sum of 3-5 (from one parent literate, to one parent secondary)
  - **Type III:** sum of 6-7 (from both parents having basic education to one parent having university education)
  - **Type IV:** sum of 8-10 (from both parents secondary to both parents university)

- **1988**: Sum of 2: 6, Sum of 3-5: 38, Sum of 6-7: 54
- **1998**: Sum of 2: 5, Sum of 3-5: 43, Sum of 6-7: 49
- **2006**: Sum of 2: 6, Sum of 3-5: 40, Sum of 6-7: 49
- **2012**: Sum of 2: 6, Sum of 3-5: 37, Sum of 6-7: 51
EVOLUTION OF THE CONSUMPTION AND WAGE DISTRIBUTIONS OVER TIME

Distribution of Consumption (Household Heads)

Distribution of Wages (Male Wage Earners 30-49)
CUMULATIVE DISTRIBUTION OF WAGES BY TYPE OVER TIME (MALES 30-49)
RATIO OF MEAN WAGES AND CONSUMPTION OF BOTTOM TYPE TO TOP TYPE AND BOTTOM TYPE TO ALL OTHER TYPES
RATE OF CHANGE OF REAL WAGES BY TYPE, 1988-2006

1988-1998: -3.1, -4.0, -4.8, -5.7
1998-2006: 4.1, 4.2, 0.8, 3.5, 4.1
2006-2012: 1.0, -0.6, 1.2, 0.9, 0.5

Legend:
- Green: Sum of 2
- Red: Sum of 3-5
- Yellow: Sum of 6-7
- Brown: Sum of 8-10
- Orange: Total
THE EVOLUTION OF TOTAL INEQUALITY IN CONSUMPTION AND WAGES
LOG MEAN DEVIATIONS (GE(0))
A MORE FINE GRAINED TYPOLOGY OF CIRCUMSTANCES

• We develop another 36-type typology of circumstances for our non-parametric analysis
  • We maintain the 4 types of parental education
  • Three categories of region of birth: metropolitan, provincial urban and provincial rural
  • Three categories of father’s occupation when respondent was 15: white collar, non-agricultural blue collar, agricultural
• 4 parental ed. X 3 regions X 3 father occupation = 36 types
Shares of Consumption Inequality

Various Measures
IOp Shares of Wage Inequality

Inequality due to circumstances (percentage)

- 1988
- 1998
- 2006
- 2012

4 types / total
4 types / max
36 types / total
36 types / max
FORMALITY-ADJUSTED WAGES
(MULTIPLY FORMAL WAGES BY 2 TO ACCOUNT FOR NON-WAGE BENEFITS OF FORMAL JOBS)

See Assaad (1999) for justification of factor of 2
PARTIAL EFFECTS OF DIFFERENT SETS OF CIRCUMSTANCES ON INEQUALITY OF WAGES AND CONSUMPTION – PARAMETRIC ESTIMATION

Percentage of total inequality

<table>
<thead>
<tr>
<th>Year</th>
<th>Wages</th>
<th>Consumption</th>
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<tbody>
<tr>
<td>1988</td>
<td>2%</td>
<td>21%</td>
</tr>
<tr>
<td>1998</td>
<td>14%</td>
<td>3%</td>
</tr>
<tr>
<td>2006</td>
<td>0%</td>
<td>8%</td>
</tr>
<tr>
<td>2012</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>1998</td>
<td>25%</td>
<td>15%</td>
</tr>
<tr>
<td>2006</td>
<td>15%</td>
<td>3%</td>
</tr>
<tr>
<td>2012</td>
<td>15%</td>
<td>3%</td>
</tr>
</tbody>
</table>

- Parents’ occupation
- Region
- Parents’ education
What would happen to the IOp share if we could observe more circumstances?

Panel data sample which was observed continuously from 1998 to 2012 allows us to do this.

We limit sample to individuals who were observed in their natal household in 1998.

• For these individuals, we can observe parental wealth in 1998 and grandfather’s education and occupation.

Wage outcome is observed in 2012.
PARTIAL EFFECTS FROM AUGMENTED SPECIFICATIONS – PARAMETRIC ESTIMATION

- Grandfather's characteristics
- Natal wealth
- Family's employment
- Region
- Parents' education

Percentage of total inequality

Spec. 1: 13%  
Spec. 2: 13% -1%  
Spec. 3: 2% -3%  
Spec. 4: 2% 3% -1% 12%
CONCLUSIONS

Like overall inequality, IOp is not unusually high in Egypt by global standards and appears to be declining over time.

But, drop in inequality of opportunity appears to be due to middle classes converging toward poor.

Relative position of elites has remained stable.

Need measures that compare position of middle classes relative to elites.

Inequality of formality-adjusted wages has increased as middle groups find it increasingly more difficult to obtain formal jobs.

Panel data results suggest that we may be missing in earlier years important dimensions of circumstances that are contributing to inequality of opportunity.