On measuring dependence of income distribution and crime

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Background

- The effects of income distribution are a politically important and current topic

- Studies suggest that income inequality lowers GDP growth

- Studies on the effects on crime have been somewhat limited in scope

- Do different sorts of income distributions explain different sorts of crime?

Income distribution

- Most commonly used index is Gini coefficent

- Based on Lorenz curve (cumulative portion of total disposable income)

- Describes the equality of the distribution

- Different distributions can have the same Gini coefficent

- Other indices might explain crime better

Gini coefficent
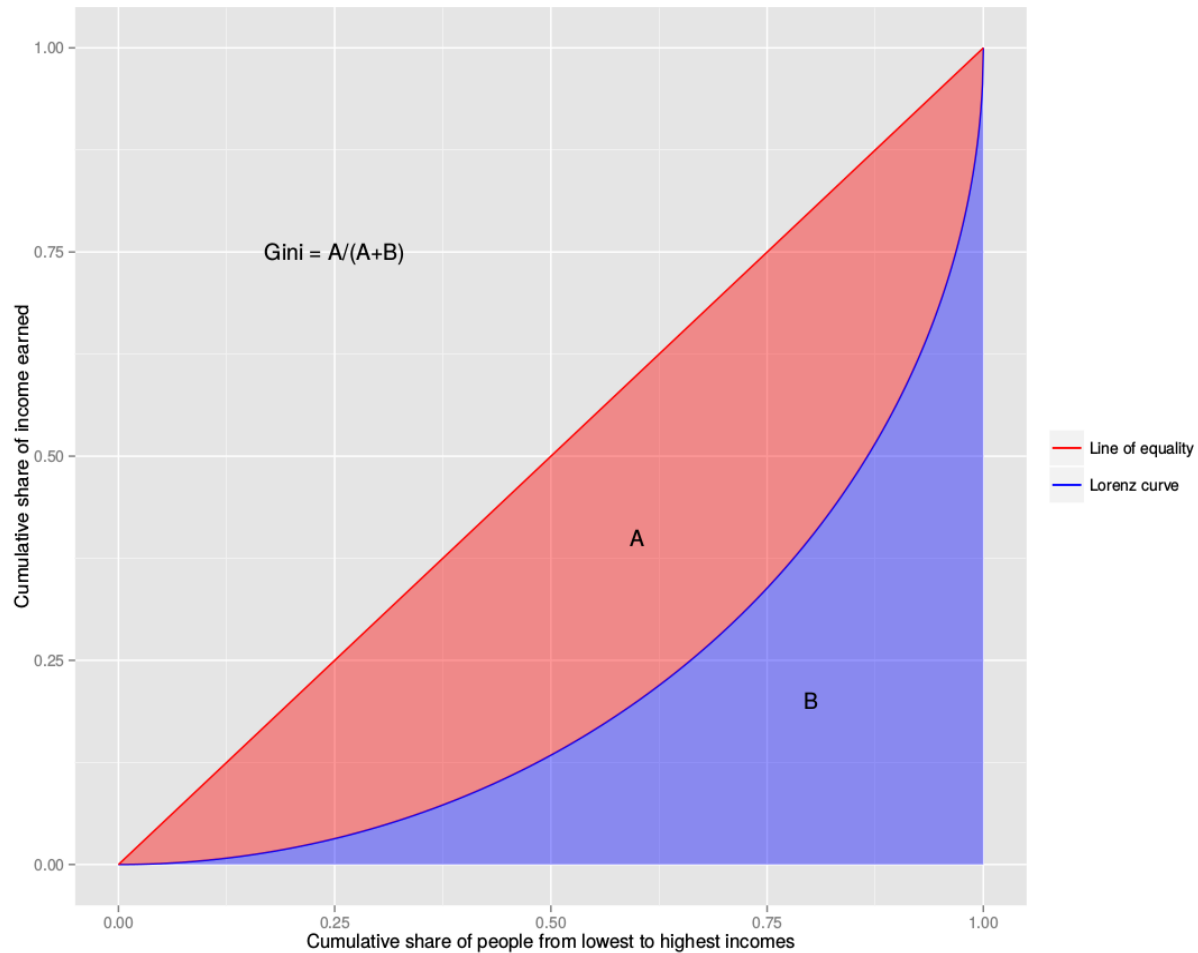
Other indices used for income distribution

- Percentile ratios (P90/P10, P90/P50...)
- Share ratios (S90/S10)
- Atkinson index

$$A_\varepsilon(y_1,...,y_N) = \begin{cases} 1 - \frac{1}{\mu}\left(\frac{1}{N}\sum_{i=1}^{N} y_i^{1-\varepsilon}\right)^{\frac{1}{(1-\varepsilon)}} & 0 \le \varepsilon \neq 1 \\ 1 - \frac{1}{\mu}\left(\prod_{i=1}^{N} y_i\right)^{\frac{1}{N}} & \varepsilon = 1 \end{cases}$$
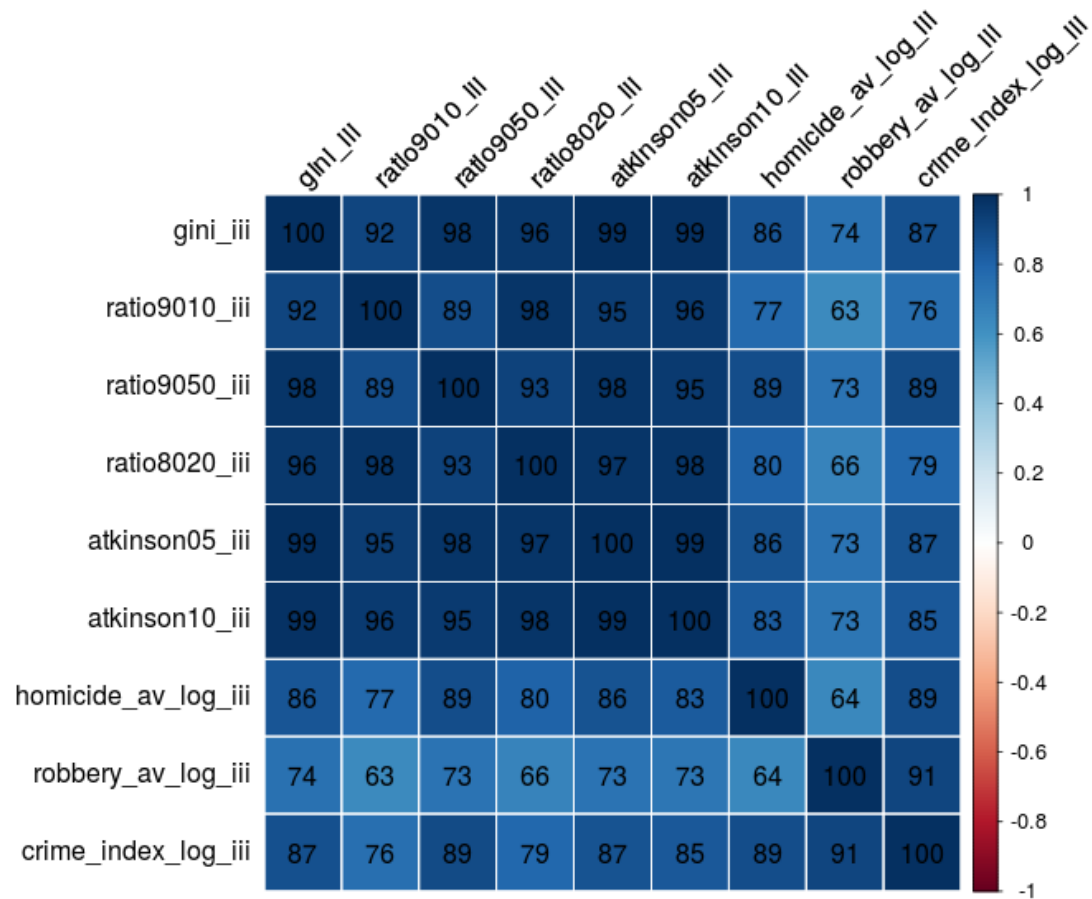
Crime

- Unequal income distribution is one possible macro-level crime determinant

- Only intentional homicides and robberies were studied due to lack of reliable data

- Both crime types were also combined to a crime index to approximate overall (violent) crime rate

- Crime index = log(homicide rate/average of homicide rates + robbery rate/average of robbery rates)

Methods

- Part I: observing correlations during three different periods in the 21st century

- Do we find differences between the correlations of different indices?

- Part II: multiple linear regression analysis for OECD countries to study possible causation better

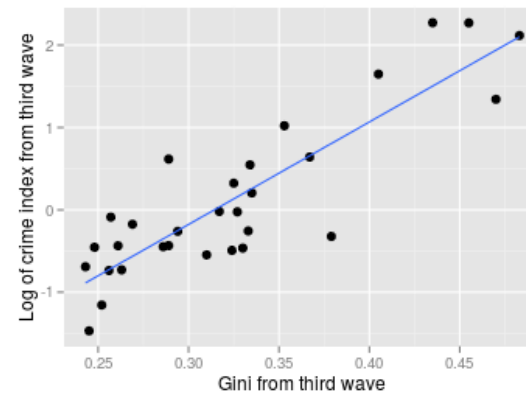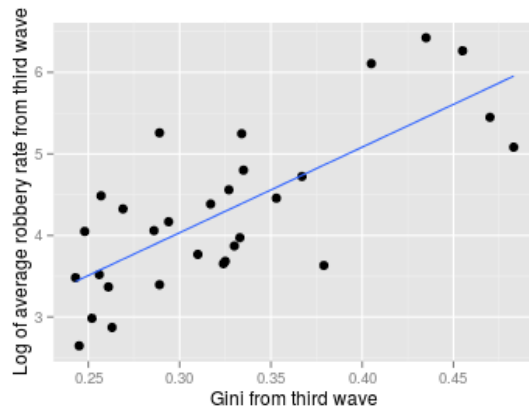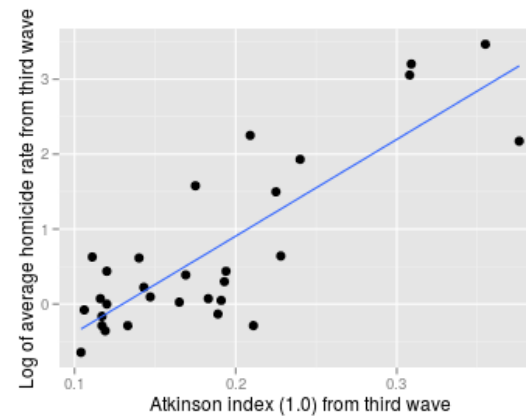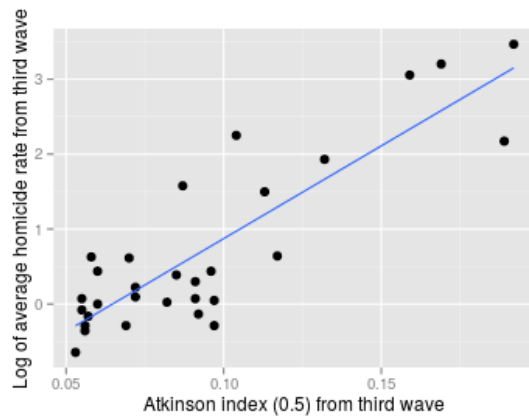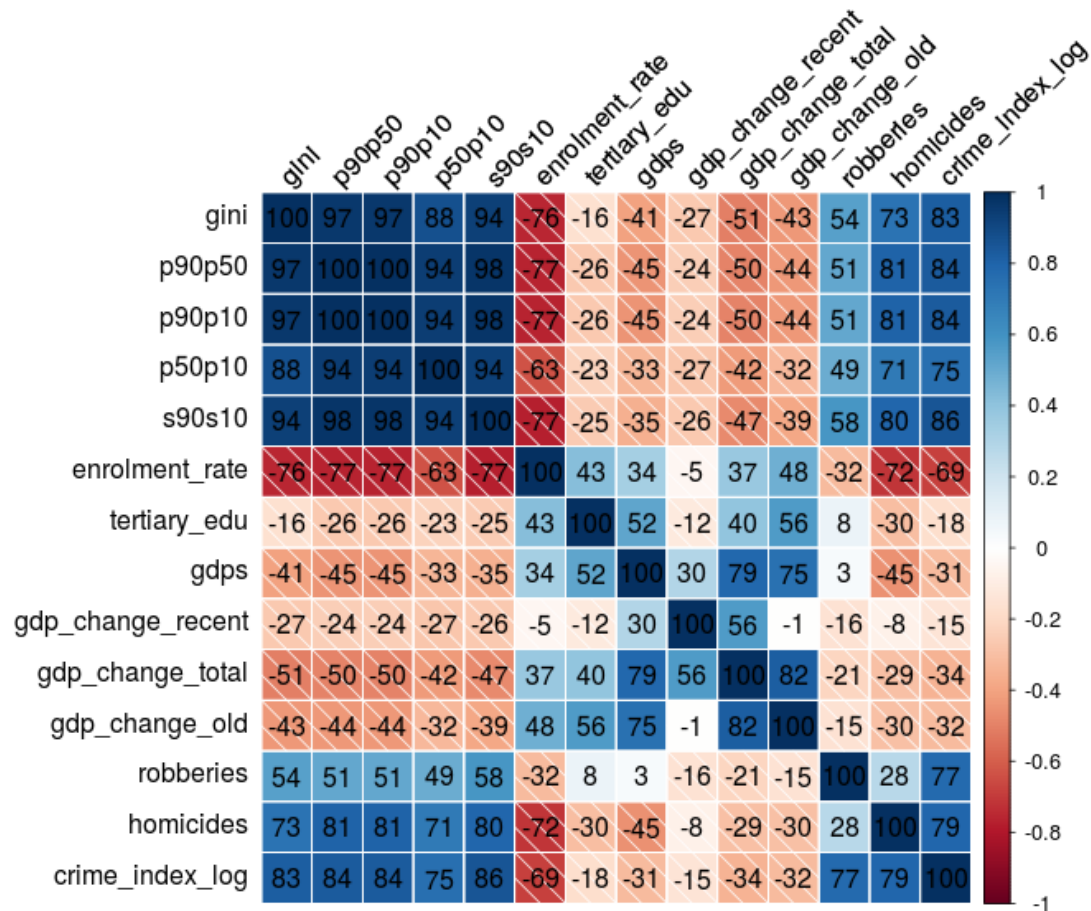- Other explanatory variables: GDP, GDP growth, education

Results (I)

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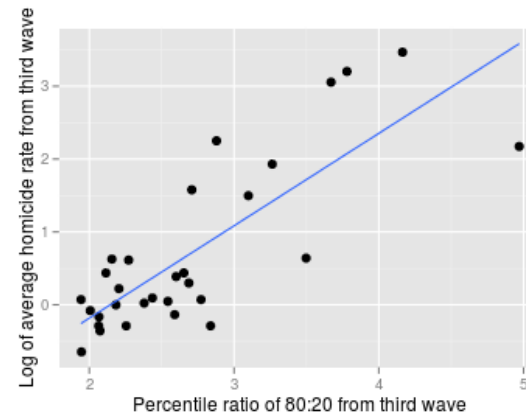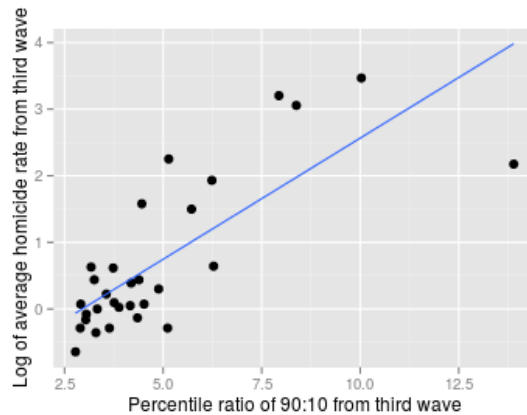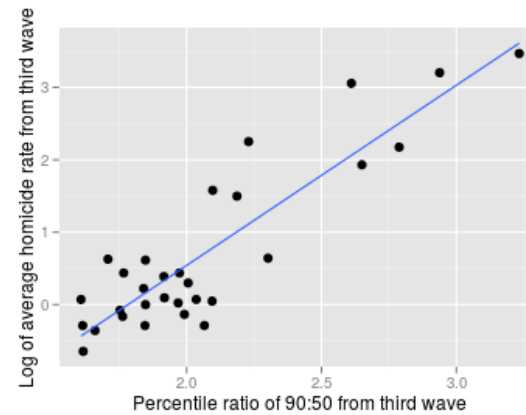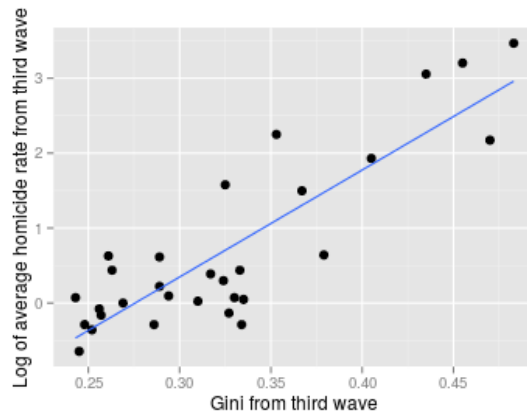
Results (I)

Results (II)

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- Income distribution remained the main and statistically significant contributor to violent crime

- Robbery rates are harder to explain by macro-level factors (reliability)

- Enrolment rates for 15-19 year-olds are highly linked with income distribution

Conclusions

- There is a clear and strong link between income distribution and crime

- Letting inequality of income distribution rise will likely lead to higher crime rates

- All indices for income distribution explain crime roughly as well on macro-level

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