ECON4271
Spring 2015
Seminar 5

**Exercise 1: Alternative presentation of the Lorenz curve**

(i)    Explain how the information content of the Lorenz curve can be given an alternative presentation which is consistent with the notion of inequality captured by the Lorenz curve.

(ii)   The alternative representation of the Lorenz curve, called the scaled conditional mean curve (the M-curve), shows to possess several attractive properties. Explain these properties.

**Exercise 2: Measures of inequality for empirical applications**

(i)    Provide a justification for why the moments of the M-curve can be considered to form a family of inequality measures that uniquely determines the M-curve and the Lorenz curve.

(ii)   The standard approach in empirical work is to employ the Gini coefficient in combination with measures from the Atkinson family and/or the Theil family. Discuss whether this is a suitable approach

(iii)  Provide arguments for why it might be attractive to employ moments of the M-curve to summarize inequality exhibited by an income distribution.

(iv)   Let $C_1$, $C_2$ and $C_3$ denote the three first moments of the M-curve. Show that these three measures can be given the following expression in terms of the distribution function F:

$$C_1 = \frac{1}{\mu}\int_0^\infty F(x)\log F(x)dx , \quad C_2 = G = \frac{1}{\mu}\int_0^\infty F(x)(1-F(x))dx , \quad C_3 = \frac{1}{2\mu}\int F(x)(1-F^2(x))dx .$$

(v)    Show that $C_1$, $C_2$ and $C_3$ can be given explicit expressions in terms of social welfare and that the associated social welfare functions can be decomposed with regard to the mean and inequality.

(vi)   The (empirical) Gini coefficient can be estimated as
   a.  Twice the area between the Lorenz curve and the 45° line
   b.  $G^b = \frac{\sum_{j=1}^n \sum_{k=1}^n |y_j - y_k|}{2n^2\mu}$
   c.  $G^c = 2\frac{\sum_{i=1}^n iy_i}{n^2\mu} - \frac{n+1}{n}$

   where $y_1, \ldots, y_n$ are the incomes in society, given in increasing order.

**Exercise 3 Inequality and poverty**

(i)     Explain what we mean by poverty and how it can be measured.

(ii)    Compare and contrast measures of poverty, inequality, and miserliness

(iii)   To study each of the following societal issues, which of the above mentioned measure would be most suitable:

    a.   Misery in a poor country

    b.   Is it necessary that the global community helps a country to alleviate poverty

    c.   Political instability due to tensions among rich and poor

    d.   The possibility of the poor to benefit from redistribution

    e.   The prevalence of poverty traps