

UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Postponed exam: **ECON4271 – Distributive Justice and Economic Inequality**

Date of exam: Monday, May 29, 2017

Time for exam: 09:00 a.m. – 12:00 noon

The problem set covers 4 pages (incl. cover sheet)

Resources allowed:

- No written or printed resources – or calculator - is allowed (except if you have been granted use of a dictionary from the Faculty of Social Sciences)

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

**EXAM ECON4271 : DISTRIBUTIVE JUSTICE AND
ECONOMIC INEQUALITY**

The exam consists of four parts, which are divided into several questions. Each part carries the percentage weight indicated. Each question within each part carries the same weight. Start by reading through the whole exam, and make sure that you allocate time to answering problems you find easy. You can get a good grade even if there are parts of problems that you do not have time to solve.

Part 1 (30%).

(a) Briefly discuss the differences between the Bergson-Samuelson SWF and the Arrowian SWF.

(b) Which of Arrow's axioms cannot be imposed on Bergson-Samuelson SWFs? Briefly explain why.

(c) How does the standard characterization of utilitarianism avoid Arrow's impossibility result?

(d) Assume a social welfare ordering satisfies anonymity* and $\text{inv}^*(a_i + bu_i)$. Show that this SWO is indifferent between the following two vectors of utilities $u = (1, 2, 5)$ and $v = (2, 3, 3)$. [Hint: anonymity* tells that permuting the utilities across individuals does not change the level of social welfare; $\text{inv}^*(a_i + bu_i)$ tells that changing the utilities of each individual i by an additive factor a_i and by a common rescaling factor $b > 0$ does not change the level of social welfare]

(e) What is an allocation rule? How does it avoid Arrow's impossibility result?

Part 2 (25%).

(a) Give an account of the major difference between the primal and the dual social welfare functions, and present and discuss the basic conditions that have been used to justify these two families of social welfare functions.

(b) Provide a justification for why the dual social welfare functions, as opposed to the primal social welfare functions, can directly be used as a basis for defining a family of inequality measures.

(c) What restrictions does first-degree stochastic dominance impose on the primal and dual social welfare functions?

(d) What restrictions does first-degree Lorenz dominance impose on the primal and dual families of inequality measures.

Part 3 (25%). Consider the question of how to rank infinite streams of well-being by means of a reflexive and binary social welfare relation (SWR) \succsim .

An SWR satisfies the *Strong Pareto* (SP) axiom if

$$(x_1, x_2, \dots, x_t, \dots) \succ (y_1, y_2, \dots, y_t, \dots)$$

whenever $x_t \geq y_t$ for all t and $x_{t'} > y_{t'}$ for some t' . An SWR satisfies the *Weak Pareto* (WP) axiom if

$$(x_1, x_2, \dots, x_t, \dots) \succ (y_1, y_2, \dots, y_t, \dots)$$

whenever $x_t > y_t$ for all t .

An SWR satisfies the *Strong Anonymity* (SA) axiom if $(x_1, x_2, \dots, x_t, \dots)$ is equally good as any re-order of the elements in $(x_1, x_2, \dots, x_t, \dots)$. An SWR satisfies the *Finite Anonymity* (FA) axiom if $(x_1, x_2, \dots, x_t, \dots)$ is equally good as any re-order of the elements in $(x_1, x_2, \dots, x_t, \dots)$ where only a finite number of elements change position.

(a) Why does SP imply WP, and why does SA imply FA?

(b) Use the two streams

$$\begin{array}{cccccccc} 1 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & \dots \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & \dots \end{array}$$

to show that no SWR can satisfy both SP and SA.

(c) The *time-discounted utilitarian* (TDU) SWR is represented by the social welfare function:

$$W(x_1, x_2, \dots, x_t, \dots) = (1 - \beta) \sum_{t=1}^{\infty} \beta^{t-1} u(x_t),$$

where u is a continuous and increasing function that transforms wellbeing into (generalized) utility, and β is a utility discount factor between 0 and 1. Which of the axioms SP, WP, SA and FA does the TDU SWR satisfy (explaining why for the axioms it satisfies and providing a counter-example for the axioms it does not satisfy).

(d) How can the TDU SWR be defended in a model without resource constraints (the Ramsey model)? Why does not this defense carry over to a model with resource constraints (the Dasgupta-Heal-Solow model)?

Part 4 (20%).

(a) Discuss some factors that can explain why there is inequality in labor earnings among ordinary wage earners. To what extent can these factors explain the increase in inequality observed in many Western countries since the 1980s?

(b) What was the evolution of top incomes over the same period? Are there different processes driving the evolution of these?

(c) Discuss whether the change in incomes discussed in (a) and (b) should be seen as fair or unfair.