UNIVERSITETET I OSLO
ØKONOMISK INSTITUTT

Eksamen i: ECON1910 - Fattigdom og fordeling i utviklingsland
Exam: ECON1910– Poverty and distribution in developing countries

Eksamensdag: Onsdag 26. mai 2010   **Sensur kunngjøres: Mandag 14 juni, ca. 16**
Date of exam: Wednesday May 26, 2010   ***Grades will be given: Monday June, 16. appr. 4 p.m.***

Tid for eksamen: kl. 14:30 – 17:30
Time for exam: 2:30 p.m. – 5:30 p.m.

Oppgavesettet er på 4 sider
The problem set covers 4 pages   ***English version on page 3***

Tillatte hjelpemidler:
- Ingen tillatte hjelpemidler
Resources allowed:
- *No resources allowed*

Ved sensuren teller oppgave 1 50% og oppgave 2 og 3 teller 25% hver
Question 1 counts 50% and questions 2 and 3 count 25 % each in the evaluation

Eksamen blir vurdert etter ECTS-skalaen. A-F, der A er beste karakter og E er dårligste ståkarakter. F er ikke bestått.

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

Oppgave 1 (50 % vekt)

Svar på alle spørsmålene (en halv til en side på hvert spørsmål).

   A. Hva er et komparativt fortrinn? Gi kort noen forklaringer på hvorfor et land kan ha et komparativt fortrinn.

   B. Forklar hvordan størrelsen på den uformelle urbane sektoren påvirker forventet lønn for en som flytter til byen og på den måten fungerer som en likevektsskapende faktor i by-land migrasjon.

   C. Hva er Human Development Index (HDI)?

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D. Skriv ned ligningen for vekst i Solow-modellen med teknisk fremgang. Forklar hvordan spareraten og befolkningsvekstraten påvirker langtidslikevekten for inntekt per person. Hva bestemmer vekstraten i inntekt per person på lang sikt?

E. Ville fattige lands inntekt sett bedre ut, målt ved valutakursmetoden (exchange-rate method) eller ved PPP-metoden? Begrunn svaret.

Oppgave 2 (25 % vekt)

Land X og Y har følgende inntektsfordeling

Kvintil	Prosentandel av inntekt Land X	Prosentandel av inntekt Land Y
Første (laveste) kvintil	2 %	4 %
Andre kvintil	6 %	6 %
Tredje kvintil	11 %	9 %
Fjerde kvintil	19 %	12 %
Femte (høyeste) kvintil	62 %	69 %

A. Tegn Lorenz-kurvene, og sett navn på aksene.

B. Er det mulig å si at ulikheten er større i det ene landet enn i det andre, kun basert på Lorenz-kriteriet? Hvorfor/hvorfor ikke?

C. Beskriv minst to Lorenz-konsistente ulikhetsmål.

Oppgave 3 (25 % vekt)

A. Vanlige økonomiske forklaringer på forskjeller i inntektsnivå mellom land er forskjeller i fysisk kapital, forskjeller i humankapital eller forskjeller i teknologi. Det hevdes av og til at disse faktorene er mellomliggende (proximate) årsaker, i motsetning til fundamentale årsaker til forskjeller i velstand. Diskuter forskjellen mellom mellomliggende og fundamentale årsaker, og beskriv potensielle fundamentale årsaker til forskjeller i velstand.

B. Hvilken av de fundamentale årsakene er konsistent med reverseringen i velstand (reversal of fortunes) blant tidligere europeiske kolonier?

Problem 1 (weight 50%)

Answer all of the following questions (about one half to one page on each question)

A. What is a comparative advantage? Mention briefly some explanations for why a country may have a comparative advantage.

B. Explain how the size of the urban informal sector affects the expected wage for a migrant to the city and hence works as an equilibrating factor in rural-urban migration.

C. What is the Human Development Index (HDI)?

D. Write down the fundamental equation of growth from the Solow model with technical progress. Explain how the saving rate and the rate of population growth affect the steady-state level of income per capita. What determines the steady-state rate of growth of income per capita?

E. Would poor countries' income look better when measured by the exchange-rate method or by the PPP method? Explain your answer.

Problem 2 (weight 25%)

Country X and Y has the following income distribution data

Quintile	Percent Share of income Country X	Percent Share of income Country Y
First (lowest) Quintile	2%	4%
Second Quintile	6%	6%
Third Quintile	11%	9%
Fourth Quintile	19%	12%
Fifth (highest) Quintile	62%	69%

A. Draw the Lorenz curves, labeling the axes.

B. Just based on the Lorenz criteria, is it possible to claim that inequality is higher in one country than the other? Why or why not?

C. Describe at least two Lorenz-consistent inequality measures

Problem 3 (weight 25%)

A. Standard economic explanations for differences in income levels across countries are differences in physical capital, differences in human capital or technology differences. It is sometimes argued that these factors are proximate causes as opposed to fundamental causes of differences in prosperity. Discuss the difference between proximate and fundamental causes, and describe potential fundamental causes of differences in prosperity.

B. Which of the potential fundamental causes of differences in prosperity is consistent with the reversal of fortune within former European colonies?

Problem 1 – A: Readings Ray "Development Economics" chapter 16

Answer: A country has a comparative advantage in the production of a good if the relative cost of producing a good (relative to the cost of producing other goods) is lower in this country than in another country.

Alternative: If a country has got a lower relative autarky price on one good, then this country have a comparative advantage in the production of that good.

Student can explain this with graphs, examples and/or words.

The most important explanations for comparative advantages are differences in technology and factor endowments.

Differences in preferences and market size (in the case of increasing returns) are also sources that can cause the relative autarky price to be different, and might therefore also be mentioned.

Problem 1 – B: Readings Ray "Development Economics" chapter 10

Answer: In the urban sector, employers must pay at least the mandated minimum wage, which introduces the possibility of an informal urban sector.

Worker choose between remaining in the rural/agricultural sector and a sure wage and moving to the urban area with a positive probability of landing a job in the formal sector, but also with a positive probability of ending up unemployed or working in the informal sector.

Because the fate of a potential migrant is not known, we must consider the expected income from migration and compare it with the actual income received in agriculture.

Expected income from migration:

$$\frac{\bar{L}_F}{\bar{L}_F + L_I}\bar{w} + \frac{L_I}{\bar{L}_F + L_I}w_I$$

$\bar{w} > w_I$ - Formal wage is higher than the informal wage

$\bar{L}_F$ – Number of formal jobs (determined by the minimum wage)

L_I – Informal employment

$\bar{L}_F + L_I$ – Number of potential job seekers

We see directly from the expected wage equation that the size of the urban informal sector reduces the expected wage for a migrant to the city.

Migration to the city will take place until the expected income from migration is the same as income in agriculture (rural wage)

$$\frac{\bar{L}_F}{\bar{L}_F + L_I}\bar{w} + \frac{L_I}{\bar{L}_F + L_I}w_I = w_A$$

The size of the urban informal sector therefore works as an equilibrium factor in rural-urban migration. As long as there is an positive size of the informal sector, we will have equilibrium even if the formal wage is higher than the wage in agriculture.

Graphical illustration:
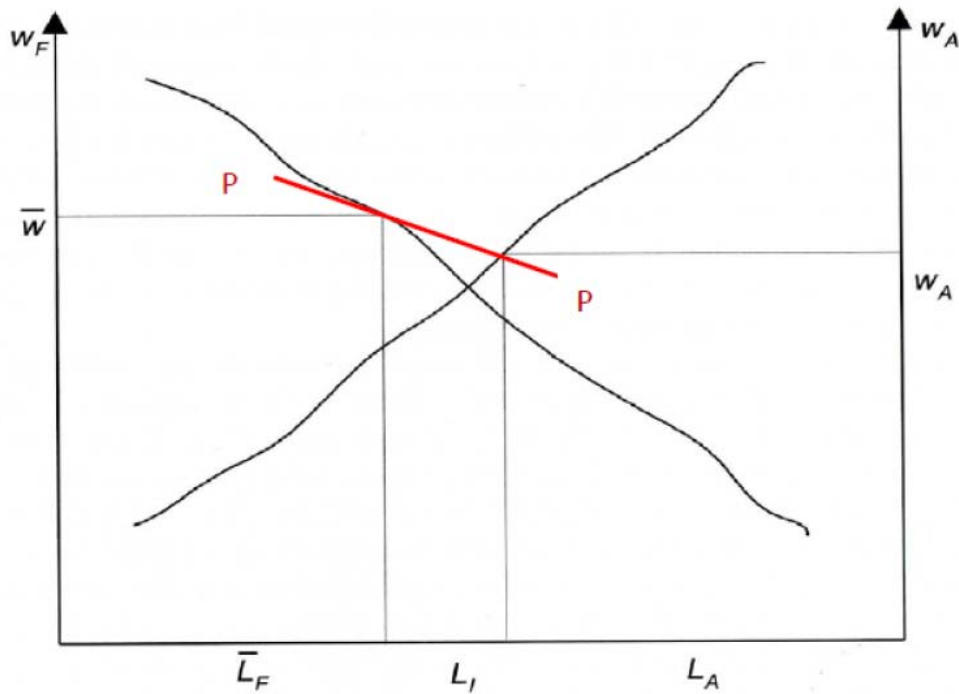
Students must at least discuss that migration is based on expected wage, and that a higher urban informal sector reduces the expected wage.

Problem 1 – C: Readings Ray "Development Economics" chapter 2

The Human Development Index (HDI) is a combined indicator of human development.

The HDI has three components:
1. Life expectancy at birth (1/3)
2. A measure of educational attainment of the society (1/3)
   Average of adult literacy (with weight 2/3);
   Combination of enrollment rates in primary, secondary and tertiary education (with weight 1/3)
3. A measure of per capita income in PPP $ (1/3)

Problem 1 – D: Readings Ray "Development Economics" chapter 3

See chapter 3 for notation.

In the Solow model with technical progress, capital per effective labor changes according to

$$\Delta \hat{k} = sf(k) - (\delta + n + \pi)\hat{k}$$

$$\text{If } sf(\hat{k}) > (\delta + n + \pi)\hat{k} \quad \rightarrow \Delta\hat{k} > 0$$
$$\text{If } sf(\hat{k}) < (\delta + n + \pi)\hat{k} \quad \rightarrow \Delta\hat{k} < 0$$
$$\text{If } sf(\hat{k}) = (\delta + n + \pi)\hat{k} \quad \rightarrow \Delta\hat{k} = 0$$

Steady-state:

$$sf(\hat{k}^*) = (\delta + n + \pi)\hat{k}^*$$

Higher s → higher $\hat{k}^*$ and $\hat{y}^*$ (steady-state level of income per effective labour)
Lower n → higher $\hat{k}^*$ and $\hat{y}^*$ (steady-state level of income per effective labour)

In the long run (steady-state) income per effective labor is constant.

Growth of production measured per "effective worker" is zero in the long run.

But the "effective worker" becomes more and more productive. Therefore, output per person is steadily increasing.

$$\hat{y} = \frac{Y}{EP}$$

$$\hat{y}E = \frac{Y}{P}$$

Even though y^ is constant in the long run, (Y/P) income per capita is growing at the same rate as E. Hence the steady-state rate of growth of income per capita is π.

Even though capital per effective worker converges to a stationary steady state, the amount of capital per member of the working population increases. The long-run increase in per capita income takes place precisely at the rate of technical progress.

The book illustrates this slightly differently than I did in the lecture notes, so some students might illustrate this slightly differently. A graphical illustration is also ok.
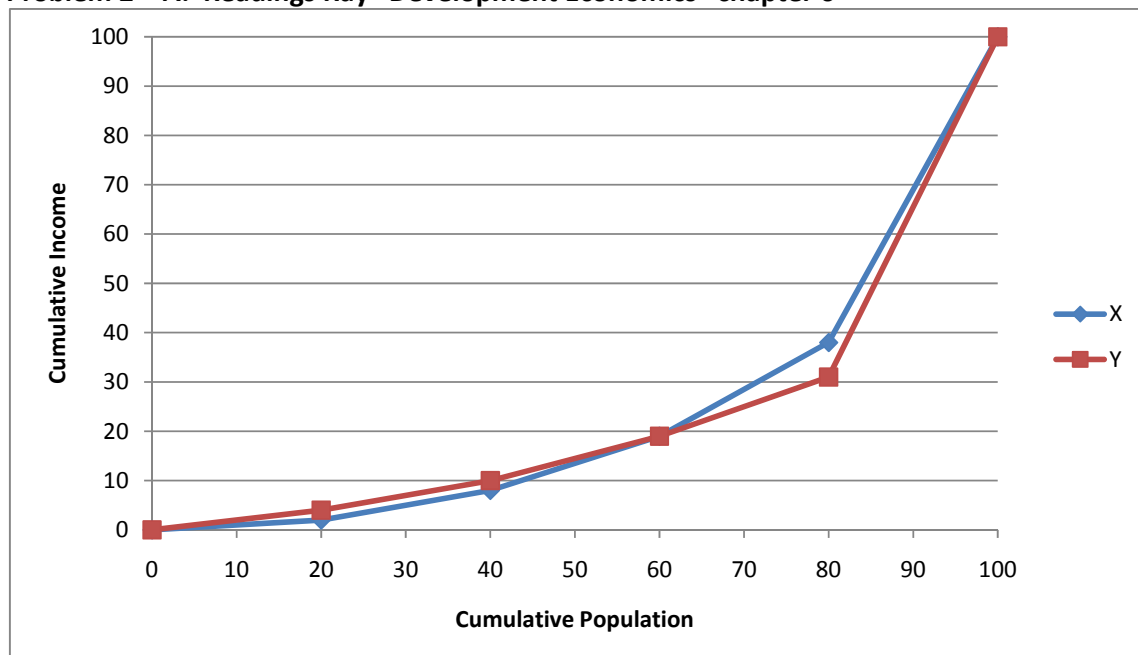

Problem 1 – E: Readings Ray "Development Economics" chapter 2

Measured in PPP dollars, developing countries do better relative to richer countries than if measured in exchange rate dollars.

An example or a definition of PPP will explain the answer.

Example: A U.S. dollar spent in India will buy more haircuts than a dollar spent in the United States; PPP takes into account this lower cost of living and adjusts for it as though all income was spent locally. The exchange rate only reflects traded goods in contrast to non-traded ones.

Problem 2 – A: Readings Ray "Development Economics" chapter 6

Problem 2 – B: Readings Ray "Development Economics" chapter 6

No, it is not possible to claim that inequality is higher in one country than the other because the Lorenz curved are crossing.

If Lorenz curves are crossing, the Lorenz criterion does not apply.

Reason:
The Dalton principle does not apply. There must be both "progressive" and "regressive" transfers in going from one distribution to the other.

Problem 2 – C: Readings Ray "Development Economics" chapter 6

An inequality measure is Lorenz-consistent if the 4 following criteria are simultaneously holding:

❶ Anonymity principle

- It does not matter who is earning the income.

❷ Population principle

- Population size does not matter, only the proportions of the population that earn different levels of income.

❸ Relative income principle

- Only relative income should matter, not the absolute ones.

❹ Dalton principle

- If one income distribution can be achieved from another by a sequence of regressive transfers, then the former distribution must be deemed more unequal than the latter.

Two Lorenz-consistent inequality measures:

The Coefficient of variation:

$$M = \frac{1}{n\mu} \sqrt{\sum_{j=1}^{m} n_j \left(y_j - \mu\right)^2}$$

The Gini-coefficient:

$$G = \frac{1}{2n^2\mu} \sum_{j=1}^{m} \sum_{k=1}^{m} n_j n_k \left|y_j - y_k\right|$$

They do not have to remember the exact equations; it is enough to explain them.

**Problem 3 – A: Readings "Institutions as a Fundamental Cause of Long-Run Growth"
By Daron Acemoglu, Simon Johnson, and James A. Robinson (see attachment). I have also attached the lecture notes for this part. Below, I highlight some of the main points that are relevant for this exercise. See the article and the lecture notes for more on this.**

The proximate causes, e.g. physical capital, human capital and technology, do not explain differences in income level across countries because they do not provide an answer for why the accumulation of these differs. There must be some underlying factors that explain why the proximate causes differ across countries. This is related to the fundamental causes. Why do some countries invest less in physical and human capital? And why do some countries fail to adopt new technologies and to organize production efficiency? The answers to these types of questions are the fundamental causes.

The fundamental causes explain/drive variations in the proximate causes that again manifest themselves in differences in growth and income differences.

The potential fundamental causes that are discussed in the readings are:

- Institutions (humanly-devised rules shaping incentives)
- Geography (exogenous differences of environment)
- Culture (differences in beliefs, attitudes and preferences)

Institutions as fundamental causes:
Institutions: the rules of the game in economic, political and social interactions.

Economic institutions: e.g., property rights, contract enforcement, etc.
• shape economic incentives, contracting possibilities, distribution.

Political institutions: e.g., form of gov., constraints on politicians and elites, separation of powers, etc.
• shape political incentives and distribution of political power.

Three crucial elements of good institutions are:
1. Enforcement of property rights for a broad cross-section of society, so that a variety of individuals have incentives to invest and take part in economic life.
2. Constraints on the actions of elites, politicians and other powerful groups so that these people cannot expropriate the incomes and investments of others in the society.
3. Some degree of equal opportunity for broad segments of the society, so that they can make investments, especially in human capital, and participate in productive economic activities.

There is plenty evidence of correlations between institutions and economic development.

Geography as a fundamental cause:

Geography, climate, and ecology of a society's location shape both its technology and the incentives of its inhabitants.

There are at least three main versions of the geography hypothesis:

1. Climate may be an important determinant of work effort, incentives, or even productivity. The heat of the climate can be so excessive that the body there will be absolutely without strength.

2. Geography may determine the technology available to a society, especially in agriculture.

3. The third variant links poverty in many areas of the world to their "disease burden".

If we locate the poorest places in the world, we will find almost all of them close to the equator. If we look at some recent writings on agricultural productivity; ecologists and economists claim that the tropical areas do not have enough frost to clean the soil and are suffering from soil depletion because of heavy rains. Given the word *tropical* disease, areas infested with these diseases are at the tropics and much poorer than the United States and Europe, where such diseases are entirely absent.

Culture as a fundamental cause:

Culture is a relatively fixed characteristic of a group or nation, affecting beliefs and preferences.

Example: religion
At some level, culture can be thought to influence equilibrium outcomes for a given set of institutions. The most famous link between culture and economic development is that proposed by Weber (1930) who argued that the origin of industrialization in Western Europe could be traced to the Protestant reformation and particularly the rise of Calvinism.

The argument is that Protestantism led to a set of beliefs which emphasized hard work, thrift, saving, and where economic success was interpreted as consistent with (if not actually signaling) being chosen by God. Weber contrasted these characteristics of Protestantism with those of other religions, such as Catholicism, which he argued did not promote capitalism. E.g. Barro and McCleary (2003) provide evidence of a positive correlation between the prevalence of religious beliefs, notably about hell and heaven, and economic growth.

Problem 3 – B: Readings "Institutions as a Fundamental Cause of Long-Run Growth"
By Daron Acemoglu, Simon Johnson, and James A. Robinson (see attachment). I have also attached the lecture notes for this part. . Below, I highlight some of the main points that are relevant for this exercise. See the article and the lecture notes for more on this.

The reversal of fortune within former European colonies:
There is a strong negative relationship between urbanization in 1500 and income today among former European colonies. And there is a strong negative relationship between population density in 1500 and income today among former European colonies.

These negative relationships indicate a reversal in the rankings in terms of economic prosperity between 1500 and today.

In 1500 the temperate areas were generally less prosperous than the tropical areas. This reversal is evidence against the geography hypothesis. It cannot be that the climate, ecology or disease environments of the tropical areas condemn them to poverty today, since these areas with the same climate, ecology and disease environments were *richer* than the temperate areas 500 years ago. This reversal is also not consistent with the culture hypothesis. The colonial experiment was sufficiently radical to have caused major changes in the cultures of many countries that fell under European rule, but this cannot explain the reversal. E.g. it is not the case that all former British colonies did differently than other colonies. Although no Spanish colony has been as successful economically as British colonies such as the United States, it is also important to note that Britain had many unsuccessful colonies (in terms of per capita income), such as in Africa, India and Bangladesh.

The reversal is consistent with institutions as the fundamental cause.

Relatively better institutions "emerged" in places that were previously poor and sparsely settled. E.g., compare the United States vs. the Caribbean or Peru.

Thus an *institutional reversal*
 Richer societies ended up with worse institutions. Europeans introduced relatively good institutions in sparsely-settled and poor places, and introduced or maintained previously-existing bad institutions in densely-settled and rich places. Institutions have persisted and affected the evolution of income, especially during the era of industrialization (the timing of the reversal).

Reversal in prosperity resulting from the institutional reversal, combined with persistence in institutions. Countries with "better" institutions prosper, while those with "bad" institutions stagnate or decline.

Why an institutional reversal:

More profitable to set up good institutions when Europeans themselves will benefit. Better institutions in places where Europeans settle and become a significant fraction of population (typically places with low initial population density). More profitable to set up

good institutions when little to expropriate. Better institutions in places with low population density and/or fewer resources to extract (i.e., low prosperity, low urbanization).

Why did the reversal take place in the 19th century?
Coercive institutions imposed by Europeans not extremely costly when they dominated the major productive opportunities. The major cost of these institutions arises when new opportunities, in this instance in industry and commerce, require investment by new groups and broad-based participation.