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727

Identification number

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Write your **identification number** on each paper.

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Course name: Intermediate Development Economics

Date: 1<sup>st</sup> of december 2013

| Exam result  |     |
|--------------|-----|
| Total points | 100 |
| Grade        | A   |

Excellent!

(without credit 96/100)

Question points:

10<sup>++</sup>

Question number:

A.1

## Question A.1

The statement is generally false. The Solow model is indeed a model predicting the long-term growth rate of a country. Every country converges to a steady state equilibrium in the long-run, where the capital stock per capita stays the same and hence economic growth per capita is then zero. Anyway, to which steady state capital stock per capita a country converges, depends on different parameters like the saving rate, depreciation rate and population growth. Only if these parameters are the same, ~~then~~ we should observe that two (or more) countries are converging to a similar capital stock per capita (and therefore output per capita). That is called conditional convergence. In the short-run (even if parameters are similar) poor countries are expected to grow faster ~~due~~ due to the concave Cobb-Douglas function used in the Solow-Model. So there is no ~~prediction~~ prediction of unconditional convergence, a similar growth rate is only observable if the parameters are nearly the same.

It is possible one could argue in another way that according to the Solow model the long-run growth rate per capita is zero in every country and hence the statement is true, but I do think that is the crucial point of the question.



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Question points: (15)

Question number: A. ~~2~~

Question A-2

Hyperbolic discounting is one way to discount future cash flows, a theoretical model development <sup>or</sup> ~~present~~ due to the fact that traditional theory (exponential discounting) sometimes fails to explain the actual behavior of individuals.

The classical discounting theory is predicting time-consistent choices. The present value is defined as follows:

$$PV = x + px + p^2x + \dots + p^n x$$

$x$  is a fixed cash flow which is a income for a firm in every period from today to period  $n$ .  $p$  is the discount factor, which ~~is~~ accounts for the fact that cash flows in the future are worth less than today.

In fact we are sometimes observing a behavior of individuals making financial decisions which cannot be explained properly by this model. Individuals seem to be even more present-biased. This makes it necessary to develop the hyperbolic discounting model:

$$PV = x + \gamma px + \gamma p^2 x + \dots + \gamma p^n x$$

As you can see, in this model, an additional discounting factor is added, so that costs/benefits today become worth even more while even costs/benefits in the near future are discounted heavily.

It can actually explain why people are sometimes taking choices, which do not seem rational to us (for instance they smoke although they are well informed about the health hazards which are likely to occur later: The benefit is ~~in the~~ today and the cost is in the future) Choices which can be explained by hyperbolic discounting are time-inconsistent. That means one makes a decision their future-self regrets and would prefer not to make, even though it is still discounting hyperbolic (or loosely speaking: following the same logic.)



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Question points:

10

Question number:

A-23

### Question A.3

According to the theory of perfect markets, capital should be allocated ~~that way~~ so that its marginal revenue product is the same in every use. So if we are looking at two firms  $i$  and  $j$ , producing different products it should be true that

$$P_i \cdot \frac{\partial f_i(K_i, L_i)}{\partial K_i} = P_j \cdot \frac{\partial f_j(K_j, L_j)}{\partial K_j} \text{ holds.}$$

Real world observations tell us that this <sup>is not</sup> (always) the case, which also means that same capital stock per capita we have different GDP levels per capita in countries. So why ~~is~~ <sup>is</sup> capital often misallocated?

One reason is obviously corruption. Corruption is one of the common reason why we observe inefficient capital allocation. For instance, projects are not given to the cheapest and best firm, they are given to the firm which pays the highest amount to the decision maker (of course that transaction is kept secret). In development countries corruption is often a more severe problem, so that its effect on inefficient capital allocation becomes also stronger.

A second reason is moral hazard. This often discussed mechanism drives a lot of investments into social not optimal projects. Banks cannot observe the investment behavior of their borrowers and the resulting asymmetric information situation makes it more likely that individuals choose risky projects

with high payoffs in the case of success, even if their expected return is significantly smaller than that of a safe project, hence their <sup>the expected</sup> marginal revenue product of capital is lower for the risky projects.





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10<sup>++</sup>

Question number: \_\_\_\_\_

A. 4

## Question A.4

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I will focus on their study why <sup>good</sup> institutions cause a higher GDP. They had basically the following idea: At the time when European countries were sending settlers to other countries (colonialism), they build two different types of institutions: 'good' institutions and extractive institutions. In those countries where the settlers did not intend to stay (due to high mortality) but where they wanted to extract all the resources from the prosperous country, they decided to implement ~~extraction~~ extractive institutions (~~it was~~ local inhabitants had basically no rights and could be suppressed easily). In other countries where settlers actually decided to stay, they build 'good' institutions (sometimes even better ones than in their home countries) which should protect and enforce property rights and assure that expropriation was banned effectively.

In fact one can observe a strong correlation between 'good' institutions (for instance measured as risk of expropriation) and the GDP level. The problem is that this does not imply causality. There were two major problems: <sup>unobservable</sup>

- (1) There could be other factors which drive both (GDP and institutions) in one direction. That is the omitted variable bias problem.
- (2) It is not said that the direction of causality is clear. It could also be the case that a higher GDP allows to invest in 'good' institutions and makes them therefore possible. This is called reverse causality.

Acemoglu, Johnson and Robinson solved these problems using a statistical tool called instrumental variable (IV). An IV is a variable which separates the exogenous variation in the ~~exogenous~~ possible endogenous variable (here institutions) and therefore solves the two problems addressed above. Two conditions are therefore necessary:

- (1) The IV needs to shock the endogenous variable sufficiently and
- (2) the IV affects the dependent variable only through its effect on the endogenous variable, there may not be a direct effect as well.

Given these conditions a two-stage regression model can be used where the problematic variation in the former endogenous variable is ruled out.

They used as IV the settler mortality. At places with a high settler mortality (and local inhabitants are immune to the diseases, so settler mortality has no effect on the health today), settlers did not stay and implemented extractive institutions and vice versa.

That way they solved the problems and showed that there is actually a relation between GDP and institutions: 'Good' institutions cause a high GDP.



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Question points: 10

Question number: A-45

## Question A.5

This statement is not true. Conditional cash programs give money to parents <sup>who</sup> ~~make~~ <sup>make</sup> sure that ~~then~~ their children go to school and receive basic health services.

There are two <sup>possible</sup> reasons why a CCT is working well:

We have a incentive factor because of the fact that parents only receive money if they meet the above named obligations. We also have an income component of the CCT. The crucial question is which of those explanations account <sup>more</sup> for the effect, that where CCTs are implemented, secondary ~~school~~ school enrollment rates often increase.

To find that out three groups were formed:

Group 1 was receiving a CCT (as explained), Group 2 was receiving a certain amount of cash ~~regardless~~ without any obligations and Group 3 was the control group. ~~The data observed data~~ The findings:

In Groups 1 and 2 the dropout rate was 6 percent, only the control group has a higher dropout rate

~~of 11 percent~~ of 11 percent. So there is <sup>no</sup> ~~no~~ <sup>no</sup> given the dataset

no additional effect of the <sup>incentive</sup> ~~income~~ component, so that they were concluding that parents are facing a ~~proper~~ educational policy trap. This proves the statement in question 5 wrong.



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Question points: \_\_\_\_\_

20

Question number: \_\_\_\_\_

A. #6

## Question A. 6

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The Kuznet's hypothesis states that income inequality follows an inverse U-shaped curve. Kuznet's ~~is~~ constructed a two period model where the society changes due to industrialisation. With the new technology the demand of labourers in the new developed branches rose. At the beginning <sup>labour</sup> workers were cheap and the elites could hence suppress them and make a lot of money. When workers became scarce, their wages rose and the <sup>income</sup> inequality declines. That is Kuznet's basic idea. However the inverse U-shaped curve describes the data well, but only until the end of the second world war. Afterwards inequality was rising again. One could argue that the society is just facing another transition process, that more and more labourers are demanded in the service industry than. But there are some other reasons explaining the data correctly: If you subdivide income into a wage component and a capital component (as in France) you can see that the ~~data~~ decrease in inequality during 1900 to 1950 can be almost fully explained by diminishing capital income. That is not surprising taking into account two world wars and a major crisis. That also implies that ~~workers~~ there was no significant change in the wage inequality. Why was that the case? One explanation is, that Kuznet's failed to take the supply side into account. The demand for labourers in the industrial production rose, but they can only hire workers who are educated for their job. So we see that for instance the existence of proper

Goaling institutions matter to expand the supply side. In general Kuznet's theory based strongly on the data between 1900 and 1950 ~~just fails to explain~~ and because the theory could <sup>have</sup> explained the decline in inequality at that time one should not be too surprised seeing Kuznet's developing a wrong theory. Interesting is that he ~~was~~ was well aware of his theory being "95 percent wishful thinking".





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Date: 1<sup>st</sup> of december 2013

Question points: 20

Question number: B.1  
13.10.13

## Question B.1

Adverse selection is also (like moral hazard) a problem due to asymmetric information. In the basic model we have two types of investors, safe investor (S-Type) and risky investor (R-Type). Safe investors are investing in safe projects ~~is~~ and vice versa. Their fractions sum up to ~~be~~ one. The informational problem here is that a bank cannot observe if she is giving a loan to the S-Type or the R-Type. To avoid losses, the bank is forced to charge the interest rate  $\bar{r}$ :

$$s \cdot \bar{r} \cdot p_s + (1-s) \bar{r} p_R = r \quad s \equiv \text{fraction S-Type}$$

Hence we are in a situation where the charged interest rate is higher than  $r = \frac{r}{p_s}$  reducing the incentives of the S-Type to take up  $p_s$  a loan. Furthermore if we think of a alternative job (being employed at firm  $x$  earning wage  $m$ ) instead of investing in a project, with a rising interest rate the S-Type is more likely to stay out of the investment project branch. The more safe borrowers are leaving the market the higher is the ~~equilibrium~~ <sup>charged</sup> interest rate  $\bar{r}$  by the bank ( $s$  is decreasing). This is making the problem more and more severe. As a result we have a market dominated by the R-Type with high interest rates to cover losses and a low repayment rate due to the low success probability of the risky projects.

Kalain and Linnar (2011) were running a clever experiment, differentiating the effect ~~of~~ <sup>of</sup> moral hazard and adverse selection on ~~investment decision~~ <sup>the repayment probability</sup>. To make sure observed effects are due to adverse selection the idea was to implement a setting, where the offered interest rate differ (low and high) but the actual paid interest rates and everything

else is the same between two different groups.

According to this idea one group was offered a low interest rate and had in fact to pay a low interest rate, while the second group was offered a high interest rate but was charged also the low interest. ~~Changes~~ Different ~~effects~~ <sup>repayment</sup> rates are hence due to adverse selection since the only differentiating factor is the offered interest rate, while all factors after that announcement are similar (so it is 'controlled' for moral hazard). ~~But~~ The data ~~indeed~~ <sup>does not</sup> provides evidence that adverse selection has a significant effect on repayment rates. That the conclusion. ~~They could make that conclusion before only group 1 (offered low, low interest rates to pay)~~

had a significant higher repayment rate. Groups 2 and 3 ~~also~~ both have the same had repayment rate in the experiment (group 3 was a group which in comparison compared to group 2 ~~even~~ could have provided evidence about moral hazard), indicating that adverse selection does matter.

But we have to be careful here with our result because the sample was kind of pre-selected.

Only group 1 ~~was~~ (low interest rate offered, low interest ~~rate~~ <sup>higher</sup> rate paid) has a significant lower repayment rate, not giving any evidence for a substantial effect of adverse selection on the repayment rate (they do find some evidence that moral hazard plays an important role) (they there was also a third group implemented to account for moral hazard effects in comparison with group 2).

But we have to be careful with our conclusion since the sample was kind of pre-selected. They accepted only ~~those~~ individuals with a good repayment history (15% dropout rate), which seems to ~~get~~ ~~exclude~~

For adverse selection make it more difficult finding some evidence for adverse selection. A lot of risky individuals ~~are there for~~ <sup>therefore</sup> ~~likely to~~ will not be in the sample (at least that is likely), so that the experiment does not take the real fractions\* of S-Type and R-Type into account.

\* in the underlying distribution



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Anvisningar:

Skriv ditt **identifikationsnummer** på varje blad.

Varje fråga ska lämnas in i separat omslag.

Kursnamn: International Development Economics

Datum: 1<sup>st</sup> of December 2013

Poäng på denna fråga:

16<sup>+</sup>

Frågans nummer:

B. 73

### Question B.3

Agriculture tenants might not spend the socially optimal amount of effort when working on the field due to the fact that they do not receive the full profits of their work. Often they are hired workers getting a fixed wage regardless of how much energy and effort spend. This problem can be addressed by "share-cropping" contracts where tenants get  $x$  percent of the harvest profit and  $(1-x)$  of the profit receives the land owner. However a "share-cropping" contract facing the struggle that poor, risk-averse farmers want to reduce risk while it would be optimal from an incentive perspective to give them full participation of profits (and losses).

Operation 'BARUA' was a natural experiment observed by Banerjee, Kertler and Chhabala. The government gave farmers the chance to register and afterwards they can keep 75 percent of the profits harvest profits (giving 'only' 25 percent to the land owners).

~~They state~~ The ~~historical~~ data provides evidence for an increase in agriculture productivity after the reform was implemented. ~~But~~ The problem was that Banerjee et al. could only observe the ~~exact~~ harvest output and could only measure the total effect of the reform. An interesting question to answer is which part of the total effect can be attributed to the following two effects

- (1) The mere existence of property rights. ~~For~~ Farmers do have a governmental promise that they can keep  $x$  percent of the land's profits. They are protected from expropriation and do not have to spend effort protecting their property.

(2) An increase of the tenants' share of output. Prior they received <sup>at</sup> less than 75 percent of the output, now their share increases. The fact the data shows that ~~not~~ even after the reform was implemented not every tenant receives at least 75 percent of the output/profits. But still it's a significant increase in the share and it would be interesting to know, how important the incentive component to work harder <sup>and to</sup> spend more effort is for the total effect.

Since Banerjee et al. only observed the total effect, this question still remains. ~~From as these~~ We do not know so far how strong the empirical support for either of those two effects is.