

Name: _____

Vorname: _____

Matrikel-Nr.: _____

Klausur: Modul 32721 International Trade and Economic Development

Termin: 19.09.2017, 09:00–11:00

Prüfer: Prof. Dr. Hans-Jörg Schmerer

Note: _____

Datum: _____

Unterschrift des Prüfers: _____

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Fakultät für Wirtschaftswissenschaft

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Pay attention to the following points!

The distributed exam should have **15** pages with questions plus additional sheets of paper. Please check immediately if you have all pages and write your name and matriculation number on the title page.

Write your answers on the free space under the questions or on the additional sheets. If you need additional space, you can use the reverse side.

The exam consists of **three** questions. You have to answer all questions. You can achieve a maximum number of **120** points. The exam is passed if you achieve at least **60** points.

Permitted are dictionaries (German - English / English - German) for the sole purpose of translation; not allowed are lexica, technical dictionaries, or monolingual dictionaries as well as collections of sheets, handwritten, copied or printed from the internet. Additional entries (particularly remarks, underlining, and stickers) are not permitted.

The use of a pocket calculator is only allowed if and only if it belongs to one of the following model series:

- Casio fx86 or Casio fx87,
- Texas Instruments TI 30 X II,
- Sharp EL 531.

The use of other pocket calculator models will be rated as attempt to deceive and sanctioned with the grade "unsatisfactory" (5,0). You can check if a pocket calculator belongs to one of the model series stated above by comparing the model name attached to the pocket calculator with one of the names above: if there is full accordance, the model is allowed. If the model name on the calculator is more extensive but contains one of the model names stated above in full, the model is permitted, too. In all other cases the model is not permitted. Previous or successor models, which are not stated in the list above, are not permitted, too.

Hinweise zur Klausur – Bitte unbedingt beachten!

Die ausgeteilten Klausurunterlagen bestehen aus insgesamt **15** Seiten zu den eigentlichen Fragen plus Extrapapier. Bitte kontrollieren Sie sofort, ob Sie ein vollständiges Klausurexemplar erhalten haben und tragen Sie auf dem Deckblatt Ihren Namen und Ihre Matrikelnummer ein.

Notieren Sie Ihre Lösungen auf den Lösungsbögen. Sollten Sie zusätzlichen Platz benötigen, können Sie auch die Rückseite der Lösungsbögen oder das Zusatzpapier ab Seite 16 verwenden.

Die Klausur besteht aus **drei** Aufgaben. Es sind alle Aufgaben zu beantworten. Die maximal erreichbare Punktzahl beträgt **120**. Die Klausur ist bestanden, wenn Sie mindestens **60** Punkte erzielen.

Zugelassen sind Wörterbücher (Deutsch - Englisch / Englisch - Deutsch) zum Zwecke der Übersetzung; nicht zugelassen sind Lexika, Fachwörterbücher oder einsprachige Wörterbücher sowie handgeschriebene, aus dem Internet ausgedruckte, oder kopierte Blattsammlungen. Zusätzliche Eintragungen (insbes. Anmerkungen, Unterstreichungen und Klebezettel) sind nicht erlaubt.

Die Verwendung eines Taschenrechners ist dann und nur dann erlaubt, wenn dieser einer der folgenden Modellreihen angehört:

- Casio fx86 oder Casio fx87,
- Texas Instruments TI 30 X II,
- Sharp EL 531.

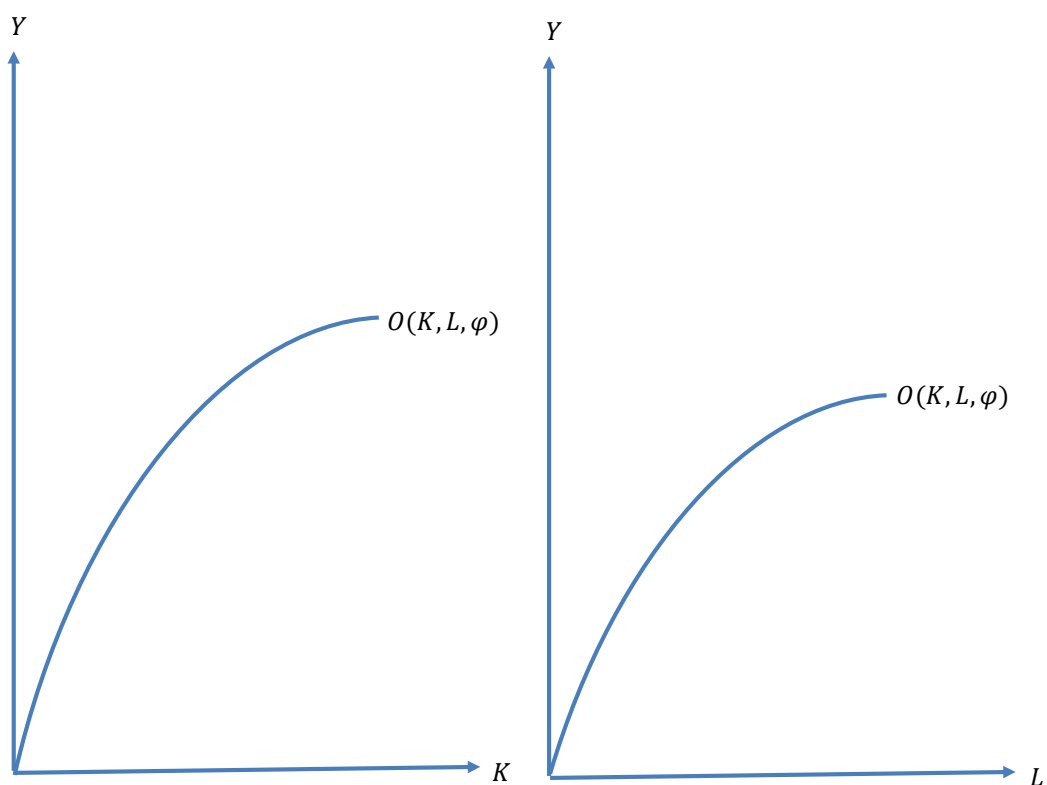
Die Verwendung anderer Taschenrechnermodelle wird als Täuschungsversuch gewertet und mit der Note „nicht ausreichend“ (5,0) sanktioniert. Ob ein Taschenrechner einer der Modellreihen angehört, können Sie selbst überprüfen, indem Sie die vom Hersteller auf dem Rechner angebrachte Modellbezeichnung mit den oben angegebenen Bezeichnungen vergleichen: Bei vollständiger Übereinstimmung ist das Modell erlaubt. Ist die auf dem Rechner angebrachte Modellbezeichnung umfangreicher, enthält aber eine der oben angegebenen Bezeichnungen vollständig, ist das Modell ebenfalls erlaubt. In allen anderen Fällen ist das Modell nicht erlaubt. Eventuelle Vorgänger- oder Nachfolgermodelle, die nicht in der oben aufgeführten Liste enthalten sind, sind ebenfalls nicht erlaubt.

Question 1

[40 points]

You are supposed to analyze economic growth potentials for a country that produces with a production technology best described by the following graph:

Figure 1: Production functions



The input factors capital and labor, that are used to produce aggregate output, are denoted by K and L .

- a) Give a detailed description of the production process and its properties without imposing any functional form of the production function.

[5 points]

b) The capital stock adjusts according to

$$K(t + 1) = (1 - \delta)K(t) + I(t) \quad , \quad (1)$$

where $K(t + 1)$ denotes the capital stock in the next period, δ denotes the depreciation rate, $K(t)$ denotes the current capital stock, and $I(t)$ denotes the current investment. Give an intuitive explanation of this relationship and explain the link between depreciation and investment. What determines the level of investment every period?

[5 points]

c) Derive the *fundamental law of motion in the Solow model* without technological change or population growth.

[5 points]

d) Suppose that the depreciation rate of capital is zero. Can you characterize the equilibrium?

[5 points]

- e) Compute the per capita *fundamental law of motion in the Solow model* for the case when the depreciation rate is positive.

[5 points]

- f) Compute the steady state equilibrium and illustrate your results in an appropriate graph.

[5 points]

g) Use the Implicit Function Theorem and show how per capita capital stock reacts to a higher saving rate s . Explain your result intuitively.

[5 points]

h) Explain why economies don't grow beyond it's steady state level of output.

[5 points]

Question 2

[40 points] Suppose a 2×2 economy. Two goods are produced by input of labor and capital under perfect competition. Assume that industry 1 is capital intensive, whereas industry 2 is labor intensive. Home is labor abundant.

a) Use the zero profit conditions to determine factor prices graphically.

[5 points]

b) Derive the total differential of the following zero profit conditions

$$c_1(w, r) = wa_{1L} + ra_{1k} = p_1 \quad , \quad (2)$$

$$c_2(w, r) = wa_{2L} + ra_{2k} = p_2 \quad . \quad (3)$$

[5 points]

c) Express everything in percentage changes using the "hat notation" and give a brief verbal explanation.

[5 points]

- d) Simplify the total differential using labor- and cost-shares. Can you say anything about the relation between the different cost shares?

[10 points]

- e) Show how factor prices change when Home opens up to international trade.
[15 points]

Question 3

[40 points]

Refer to the model of Borjas. Derive the earnings in the origin country, conditional on migration, i.e.

$$E(\ln w_0 | I > 0) = \mu_0 + Q_0. \quad (4)$$

Similarly, derive the earnings in the destination country, conditional on migration, namely

$$E(\ln w_1 | I > 0) = \mu_1 + Q_1. \quad (5)$$

Explain carefully each step of the derivation of this result along the line proposed in the following questions:

a) Borjas assumes that earnings in the origin country 0 are given by

$$\ln w_0 = \mu_0 + \epsilon_0, \quad (6)$$

If individuals migrate to country 1, they get the earnings in the destination country which are given by

$$\ln w_1 = \mu_1 + \epsilon_1, \quad (7)$$

Give an intuitive explanation of both equations and explain the two terms μ and ϵ .

[7 points]

- b) Assume that the migration cost is given by $C = \pi w_0$. Derive the earnings differential, I , and discuss the decision to migrate based upon the earnings differential.
[5 points]

- c) Define $\nu = \epsilon_1 - \epsilon_0$ and $z = -\frac{(\mu_1 - \mu_0 - \pi)}{\sigma_\nu}$ for simplicity and note that ν is a normal random variable since ϵ_0 and ϵ_1 are normal random variables. The probability of migrating from country 0 to country 1 can be expressed as

$$P = Pr[I > 0] \quad (8)$$

$$= Pr\left[\frac{\nu}{\sigma_\nu} > z\right] \quad (9)$$

$$= 1 - \Phi(z). \quad (10)$$

Give an intuitive interpretation of this expression and show how to come from the first line (equation 8) to the second line (equation 9).

[8 points]

d) It is possible to use these expressions to derive the expected earnings

$$\begin{aligned} E(\ln w_0 | I > 0) &= \mu_0 + E\left(\epsilon_0 \mid \frac{\nu}{\sigma_\nu} > z\right) \\ &= \mu_0 + \frac{\sigma_0 \sigma_1}{\sigma_\nu} \left(\rho - \frac{\sigma_0}{\sigma_1}\right) \left(\frac{\phi(z)}{1 - \Phi(z)}\right) \\ &= \mu_0 + Q_0 \end{aligned}$$

Similarly, the expected value of the earnings in the destination country, conditional on migration is equal to

$$\begin{aligned} E(\ln w_1 | I > 0) &= \mu_1 + E\left(\epsilon_1 \mid \frac{\nu}{\sigma_\nu} > z\right) \\ &= \mu_1 + \frac{\sigma_0 \sigma_1}{\sigma_\nu} \left(\frac{\sigma_1}{\sigma_0} - \rho\right) \left(\frac{\phi(z)}{1 - \Phi(z)}\right) \\ &= \mu_1 + Q_1. \end{aligned}$$

Interpret the selection bias terms Q_0 and Q_1 .

[10 points]

e) Suppose that

1) $\frac{\sigma_1}{\sigma_0} < 1$

2) $\rho > \min\left(\frac{\sigma_0}{\sigma_1}, \frac{\sigma_1}{\sigma_0}\right)$.

Which migration pattern would be expected for this parameter constellation? Give a detailed answer!

[10 points]

Additional sheets of paper

