Test Final Exam 2022

Test instruction

School of Business and Economics

Exam: Macroeconomics I Final Exam
Code: E_EBE1_MACEC

Examinator: B.A.Brugemann
Co-reader: E.J. Bartelsman

Date: Thu 31 Mar
Time: 18:45 - 20:45
Duration: 2 hours

Calculator allowed: yes, physical
Graphical calculator allowed: yes
Scrap paper allowed: yes, physical
Open book exam: no

Type of questions: 19 multiple choice, 2 open

Answer in: English (preferred) or Dutch

Remarks:

The exam has four sections. The following table gives an overview over the point distribution, number of multiple choice questions, number of open questions, and estimated time to complete.

Section	1	2	3	4
Points	25	25	30	20
No. MC questions	10	5	4	0
No. open questions	0	0	1	1
Estimated minutes	15	30	45	30

The order of questions in Sections 1 and 2 is randomized, in Sections 3 and 4 it is the same for all students.

During the exam
- You will be able to return to your answer once you moved onto the next question
- It is a closed-book exam
- The following can be used during the exam:
  1. A normal calculator and/or a graphical calculator
  2. Scrap paper

During the exam, you are not allowed to use any other material or sources (either in digital or physical form) or work together with other people. You are also not allowed to use a smartphone or tablet.

Credit score: 100
Grades: will be published by Tue 14 Apr
Inspection: online in Testvision

If you have **not** signed up for this exam, you will not receive a result. Through VUnet you can object to the fact that you can no longer sign up after the expiry of the registration deadline (and the fact that you will not receive a result for this exam). Submit your appeal online within one week after the exam. More information can be found at www.vu.nl/intekenen.

Section 1: Multiple Choice Questions for Basic Learning Objectives

Question order: Random
This section contains 10 multiple choice questions assessing basic learning objectives.
The section is worth 25 points. Each question is worth 2 or 3 points.

Continue to the questions by clicking "Next".

Question 1 – S1Q1 Nominal Wage Cuts – 312108.3.5

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 3
Chance score: 1.00 pt. / 33%
Status:
Last modified: 31-03-2022 16:50

Consider a situation in which an economy has cyclical unemployment. The authors of *The Economy* argue that in such a situation, employers may be reluctant to reduce the nominal wage of their employees. Which of the following best describes the reason that the authors give for this behaviour?

A Employers are concerned that nominal wage cuts would lead to conflicts with employees and hurt morale.

Feedback
Correct. This is the reason mentioned by the authors of *The Economy*. The idea is that cuts of the wage in Euros or Dollars is very noticeable for workers and may lead to conflict.

B Employers are concerned that workers will not have enough income to buy their products.

Feedback
Incorrect. This is not the reason mentioned by the authors of *The Economy*. Furthermore, this is unlikely to a a concern for most employers. For most individual employers, employees spend only little of their income on the products of their employer.

C Employers are concerned that they will be penalized by the government for this type of behaviour.

Feedback
Incorrect. This is not the reason mentioned by the authors of *The Economy*. Furthermore, employers are usually not penalized for cutting nominal wages in capitalist economies.

Question 2 − S1Q2 Demand Side & Supply Side Models − 312113.2.3

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 2
Chance score: 0.67 pt. / 33%
Status:
Last modified: 24-03-2022 21:22

Which option best describes something that is part of the focus of the demand side model in *The Economy*, and not part of the focus of the supply side model?

A How imported inputs affect the production costs of firms.

Feedback
Incorrect. Supply side models focus on how factors of production are employed to produce goods and services.

B How a decline in wealth affects consumption spending

Feedback
Correct. The multiplier model is a model of the demand side. It is concerned with what determines the different components of aggregate spending. This includes consumption spending and how it is impacted by changes in wealth.

C How long it takes for the labour market to adjust to an improvement in technology.

Feedback
Incorrect. The reallocation of factors after a change in technology is part of the focus of models of the supply slide.

Question 3 − S1Q3 Claims on Output − 312114.2.3

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 2
Chance score: 0.67 pt. / 33%
Status:
Last modified: 25-03-2022 08:18

Consider the labour market model of *The Economy*. Assume that initially the labour market is in equilibrium. Which of the following events brings about a situation in which the claims on output are inconsistent because they are too low?

A A decrease in the bargaining power of unions, with the level of employment remaining unchanged for some time.

Feedback
Correct. An decrease in the bargaining power of unions at an unchanged level of employment reduces the real wage claimed by workers. The output claimed by firm owners is unchanged, hence claims on output are now too low.

B A decrease in competition, with the level of employment remaining unchanged for some time.

Feedback
Incorrect. A decrease in competition raises the markup and thus the claim of firm owners on output. At an unchanged level of employment, the real wage claimed by workers is unchanged. Thus, the claims on output are now too high.

C An increase in the level of employment caused by an increase in aggregate demand.

Feedback
Incorrect. An increase in the level of employment caused by an increase in aggregate demand raises the real wage claimed by workers, as it is now easier from them to find another job. The real profits claimed by firm owners are unchanged, hence claims on output are now too high.

Question 4 − S1Q4 Phillips Curve US − 312119.2.4

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 2
Chance score: 0.67 pt. / 33%
Status:
Last modified: 26-03-2022 15:07

Consider the empirical association between the unemployment rate and inflation in the US since the 1960s. Which statement about this empirical association is the most accurate?

A The Phillips curve has been shifting up over time since the 1960s and reached its highest level in the time period from the 1990s until now.

Feedback
Incorrect. It is true that the Phillips curve shifted up over time from the 1960s until the 1980s, but it did not reach its highest level in the time period from the 1990s until now. Rather, it has been low and flat from the 1990s until now.

B The Phillips curve shifted up from the 1960s until the 1980s, but has been low and flat in the period from the 1990s until now.

Feedback
Correct. This is what Figure 15.6 in *The Economy* shows.

C The Phillips curve has been shifting down over time since the 1960s, ending up low and flat in the period from the 1990s until now.

Feedback
Incorrect. The Phillips curve actually shifted up in the decades after the 1960s.

Question 5 – S1Q5 Price Increase With Imported Materials – 312120.2.7

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 3
Chance score: 1.00 pt. / 33%
Status:
Last modified: 26-03-2022 15:06

Consider the price-setting curve with imported materials. Assume that unit imported materials costs account for 20% of total unit costs. Now suppose that there is an increase in unit imported materials costs, while unit labour costs are unchanged. The resulting increase in the prices of domestic output (that is, the increase in the price level P) is 5%. By how much did unit imported materials costs increase?

A 1%

Feedback
Incorrect. On conceptual mistake that leads to this answer is the following. Suppose you misinterpret the increase in the price of domestic output as the price increase in imported materials, and you try to calculate the increase in the price of domestic output. Then you would take 5% of 20%, which leads to 1%.

B 15%

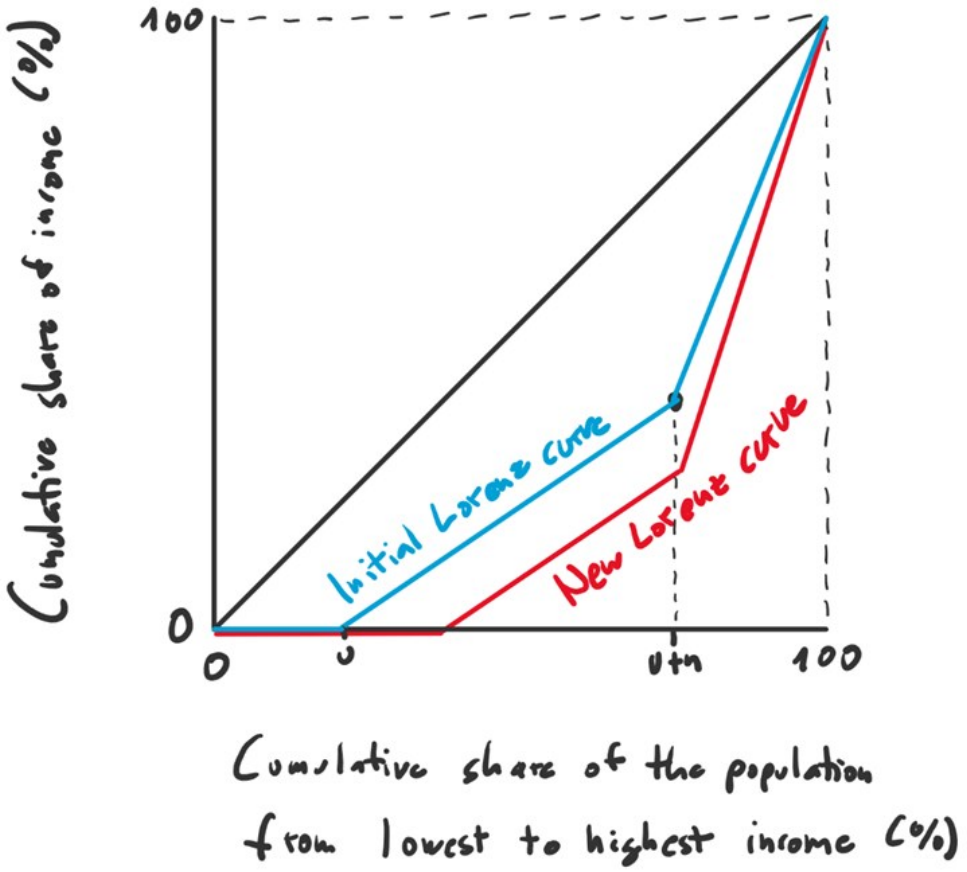
Feedback
Incorrect. One can arrive at this answer using the numbers given in the problem by subtracting 5% from 20%. However, once can check that an increase in 15% is not enough. The resulting increase in the prices of domestic output would be 20% of 15%, which is 3% rather than 5%.

C 25%

Feedback
Correct. One can verify this as follows. The percentage increase in the price of domestic output is the percentage increase in the price of imported materials multiplied by the share of imported materials in total units costs (given that unit labour costs do not change). We obtain 25% times 20%, which equals 5%.

Question 6 – S1Q6 Inequality Labour Market Model – 312121.2.8

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 3
Chance score: 1.00 pt. / 33%
Status:
Last modified: 26-03-2022 14:51



Consider the labour market model of *The Economy* and the associated Lorenz curve with three groups: the unemployed, the employed, and firm owners. Recall that the wage share is defined as the share of labour income in total income. The figure above shows the impact of some changes in the economy on the Lorenz curve. The initial Lorenz curve before the changes is blue, the new Lorenz curve after the changes is red. Which changes are consistent with the figure?

A An increase in the unemployment rate and a decline in the wage share.

Feedback
Correct. This is correct due to the following observations. The kink at the unemployment rate shifts to the right, thus unemployment increases. Furthermore, the second kink shifts down, and its level is the wage share. Thus, the wage share declines.

B A decrease in the unemployment rate and a constant wage share.

Feedback
Incorrect. This is correct due to the following observations. The kink at the unemployment rate shifts to the right, thus unemployment increases.

C An increase in the unemployment rate and a constant wage share.

Feedback
Incorrect. It is correct that the unemployment rate increases. The kink at the unemployment rate shifts to the right, thus unemployment increases. However,, the second kink shifts down, and its level is the wage share. Thus, the wage share declines.

Question 7 − S1Q7 Job Creation and Destruction Magnitudes − 312122.2.4

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 3
Chance score: 1.00 pt. / 33%
Status:
Last modified: 26-03-2022 14:44

Which of the following best describes how job creation, job destruction, and net employment growth vary across capitalist economies?

A Job creation and net employment growth are both equal to about 10% of employment per year in most countries, while job destruction is small in comparison.

Feedback
Incorrect. The magnitude of net employment growth is actually small in comparison to job creation. Job creation is indeed close to about 10% of employment per year in most countries.

B Job creation and job destruction are both equal to about 10% of employment per year in most countries, while net employment growth is small in comparison.

Feedback
Correct. This is shown in Figure 16.4 in *The Economy*.

C Job destruction and net employment growth are both equal to about 10% of employment per year in most countries, while job creation is small in comparison.

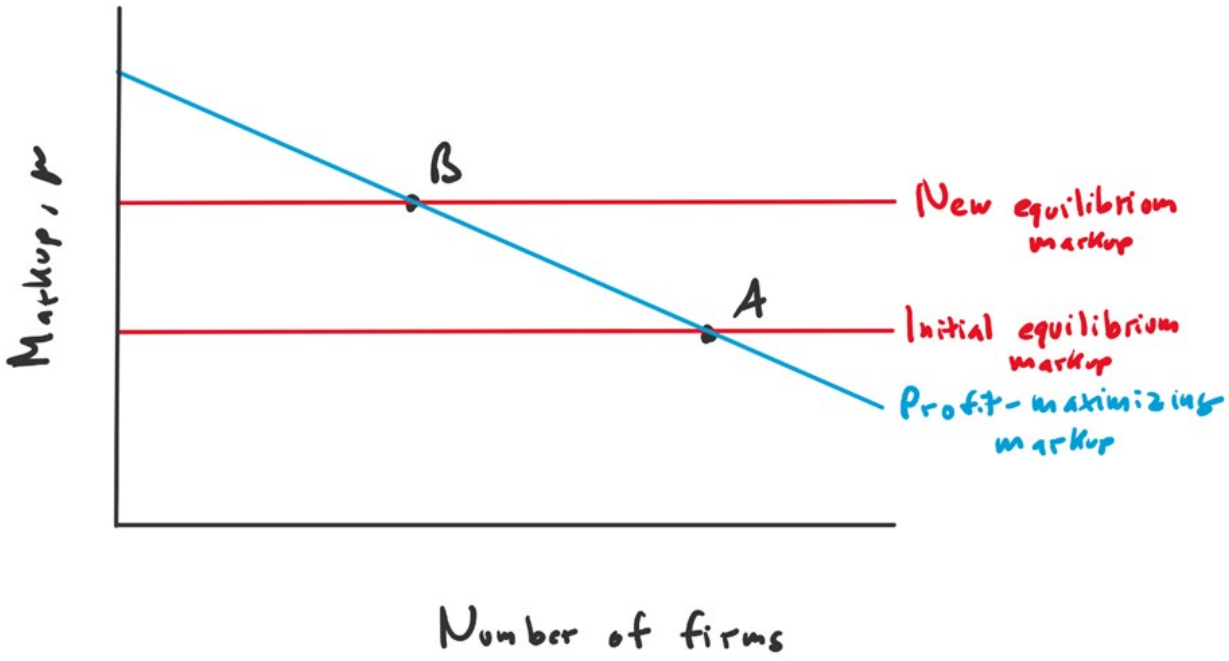
Feedback
Incorrect. The magnitude of net employment growth is actually small in comparison to job destruction. Job destruction is indeed close to about 10% of employment per year in most countries.

Question 8 − S1Q8 Firm Entry Infrastructure − 312123.3.5

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 3
Chance score: 1.00 pt. / 33%
Status:
Last modified: 25-03-2022 09:56

Consider the model of the long-run price-setting curve in *The Economy*. Consider the following change: the government improves infrastructure. Let A denote the equilibrium before this change, and B the equilibrium after this change. Which of the following diagrams provides the correct analysis of the impact of this change on the number of firms and the equilibrium markup?

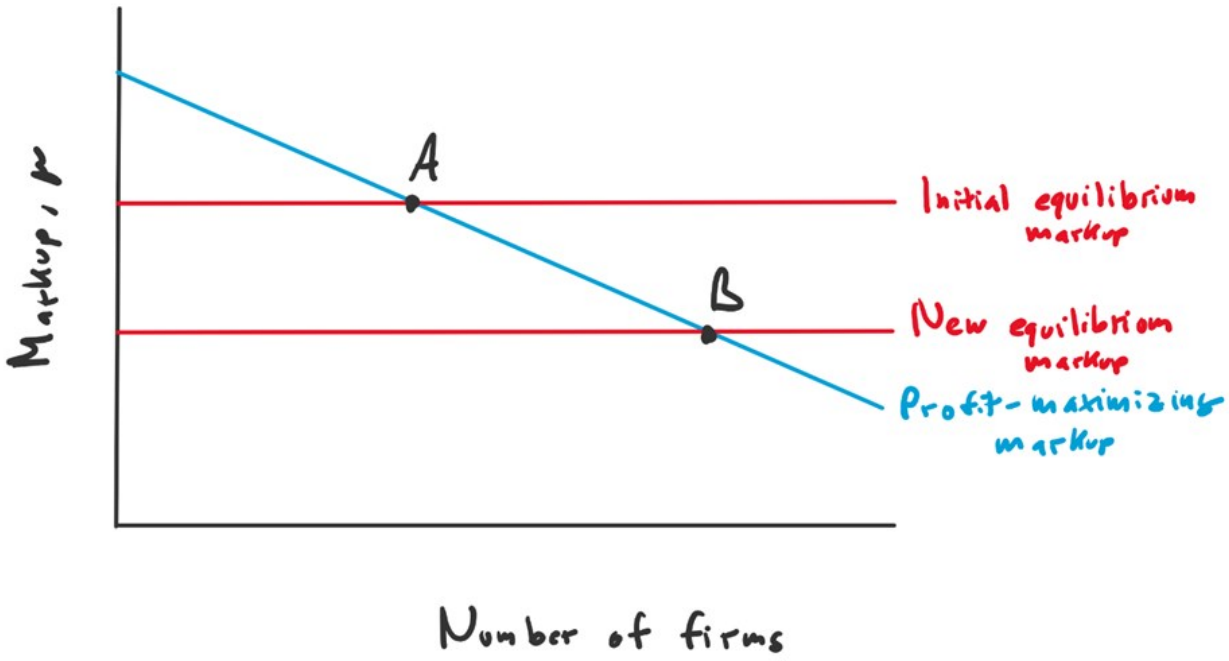
A



Feedback

Incorrect. An improvement in infrastructure reduces the equilibrium markup: since firms in the market will be more profitable due to better infrastructure, a smaller markup is sufficient for entry and exit to be balanced. A downward shift in the equilibrium markup incentivises entry and leads to an increase in the number of firms. The graph here incorrectly shows an increase in the equilibrium markup and a decline in the number of firms.

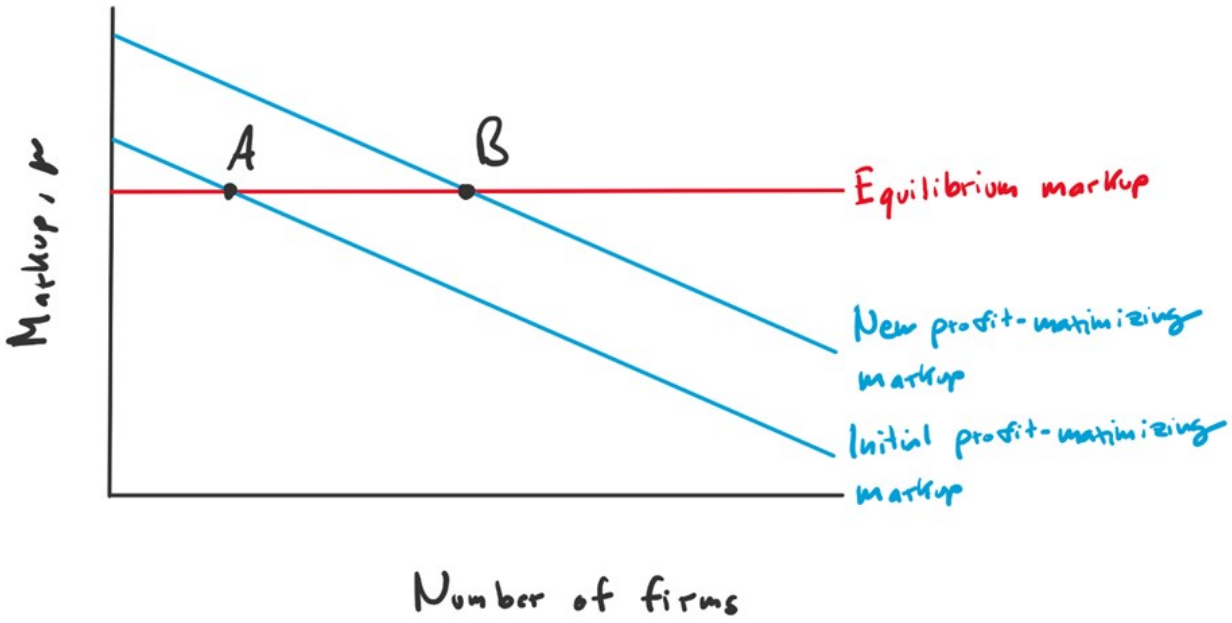
B



Feedback

Correct. An improvement in infrastructure reduces the equilibrium markup: since firms in the market will be more profitable due to better infrastructure, a smaller markup is sufficient for entry and exit to be balanced. A downward shift in the equilibrium markup incentivises entry and leads to an increase in the number of firms.

C



Feedback

Incorrect. An improvement in infrastructure does not change the profit-maximising markup at a given level of employment. Rather, it affects the equilibrium markup. It is also counterintuitive that improved infrastructure reduces the number of firms.

Question 9 – S1Q9 Wages Manual Tasks – 312124.2.6

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 2
Chance score: 0.67 pt. / 33%
Status:
Last modified: 28-03-2022 11:13

Which of the following describes a reason why workers in occupations intensive in manual tasks, such as janitors, cleaners, vehicle drivers, and food service workers, have not experienced strong wage gains over the 1980-2010 time period?

A The tasks of these occupations do not rely very much on information or data processing.

Feedback

Correct. This is what makes these tasks different from high-skill tasks. High-skill tasks are complementary to information technology. Advances and increased investment in information technology then leads to wage gains for high-skill occuputations. This complementarity is typically absent for nonroutine manual tasks.

B The tasks performed by these occupations are easily automated.

Feedback

Incorrect. The manual tasks of these occupations are in fact difficult to automate, unlike routine nonmanual tasks.

C Any decline in the price of the services provided by these occupations leads to a strong increase in demand for these services.

Feedback

Incorrect. Autor (2015) argues that the elasticity of demand with respect to the price is not very high for the services provided by these occupations. This appears to be different for the tasks of high-skill occupations.

Question 10 – S1Q10 Slowdown High–Skill Occupations – 312125.1.6

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 2
Chance score: 0.67 pt. / 33%
Status:
Last modified: 28-03-2022 11:18

According to Autor (2015), over which time period did the growth of high-skill occupations slow down?

A 1940-1979

Feedback
Incorrect. High-skill occupations grew strongly during this time period, while employment in agriculture declined a lot.

B 1980-1999

Feedback
Incorrect. This is the main time period of so-called employment polarization, during which both high-skill occupations and nonroutine manual occupations grew strongly.

C 2000-2012

Feedback
Correct. Figure 5 in Autor (2015) shows the weak growth in high-skill occupations during this time period.

Section 2: Multiple Choice Questions for Advanced Learning Objectives

Question order: Random
This section contains 5 multiple choice questions assessing more advanced learning objectives.
The section is worth 25 points. Each question is worth 4, 5 or 6 points.

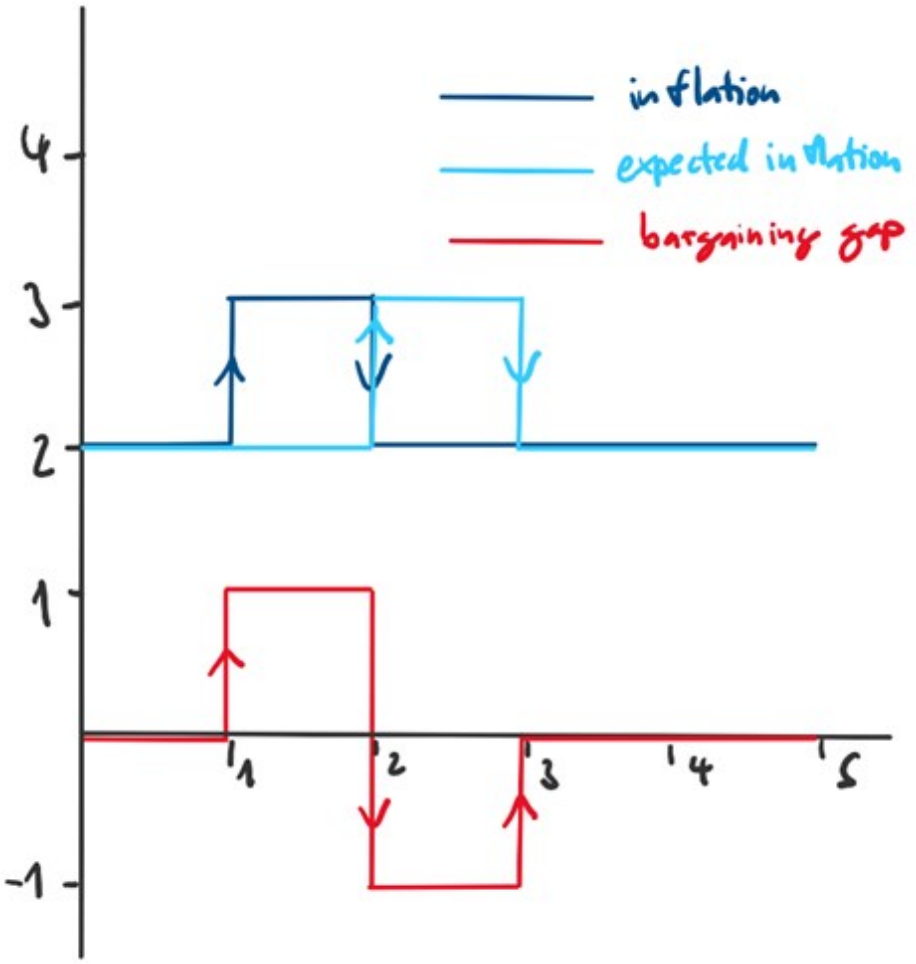
Continue to the questions by clicking "Next".

Question 11 – S2Q1 Time Path Inflation – 312126.2.5

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 6
Chance score: 2.00 pt. / 33%
Status:
Last modified: 31-03-2022 16:49

Consider the medium-run model with expected inflation and a shifting Phillips curve. The economy is in labour market equilibrium before year 1. In year 1 there is a bargaining gap of 1% and in year 2 the bargaining gap is -1%. After this, the bargaining gap returns to zero. Which diagram correctly shows the paths of inflation and expected inflation?

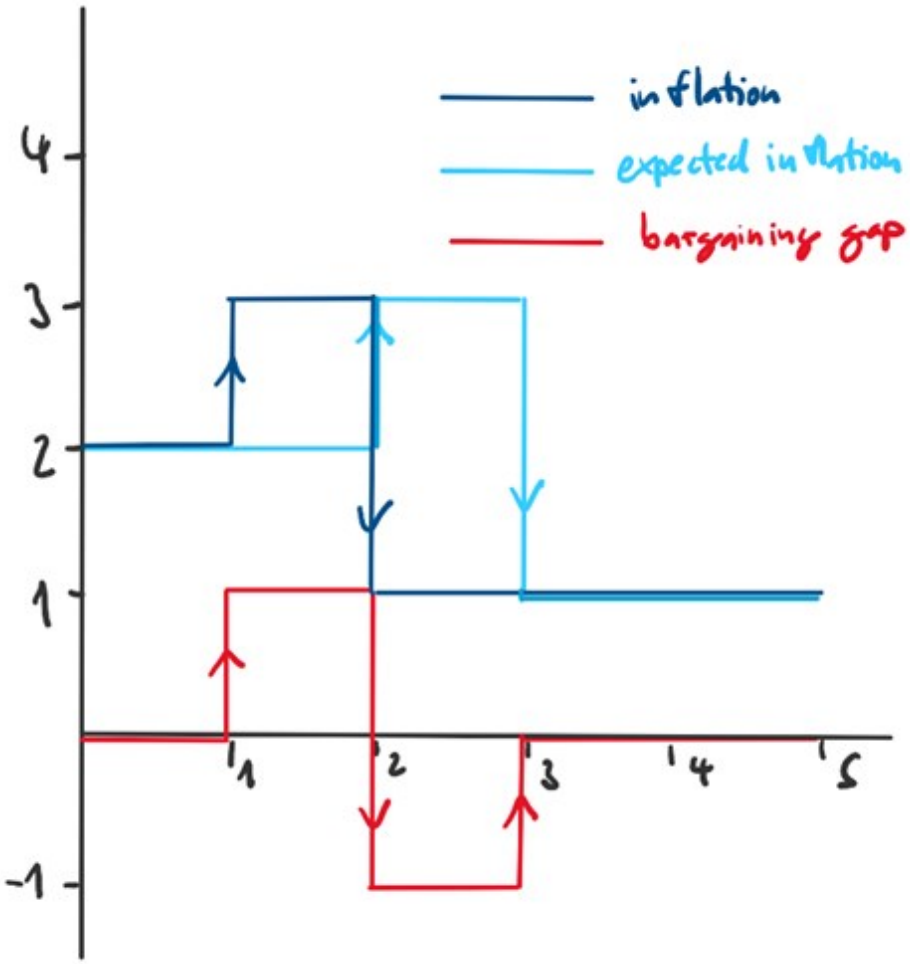
A



Feedback

Correct. In Year 1 a bargaining gap implies that inflation exceeds expected inflation by 1%, so inflation is 3%. This implies that expected inflation rises to 3% in Year 2. A bargaining gap of -1% in Year 2 implies that inflation falls short of expected inflation by 1%, so inflation is 2%. This implies that inflation returns to 2% in Year 2, and expected inflation returns to 2 % in Year 3. The bargaining gap is zero from that time onwards, so inflation and expected inflation remain at 2%.

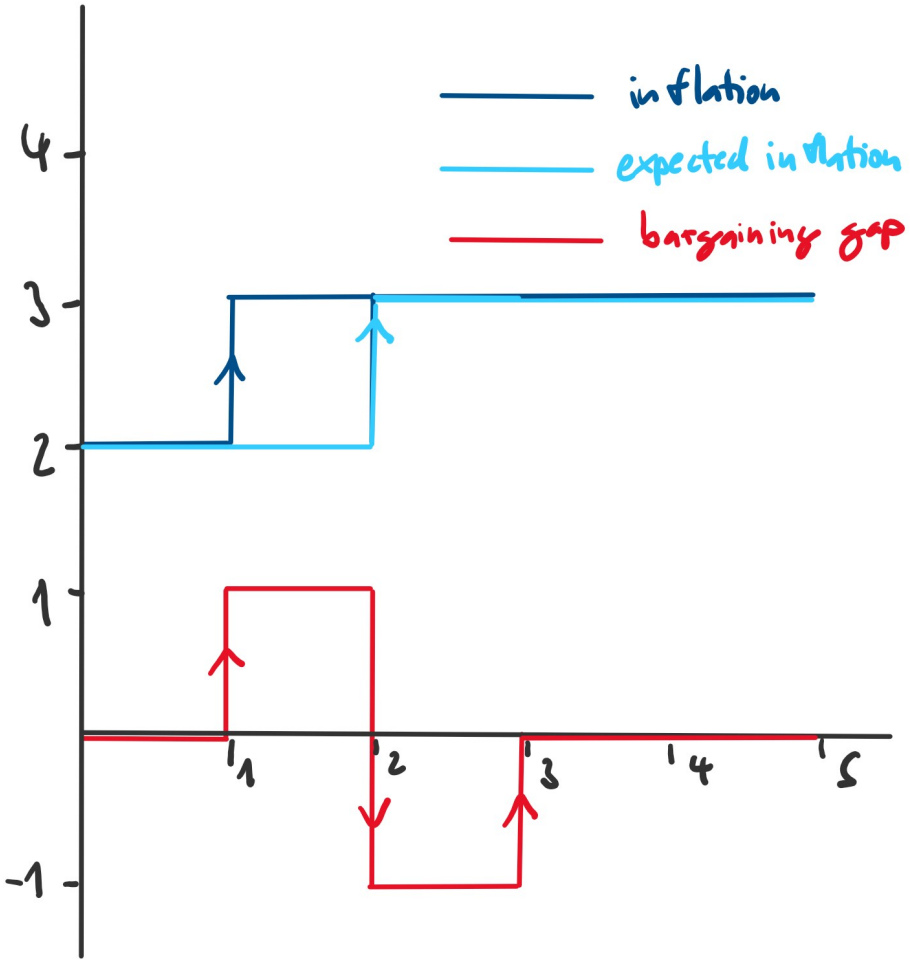
B



Feedback

Incorrect. Some aspects in this graph are correct. In Year 1 a bargaining gap implies that inflation exceeds expected inflation by 1%, so inflation is 3%. This implies that expected inflation rises to 3% in Year 2. However, what is incorrect here is the size of the drop of inflation in Year 2.
A bargaining gap of -1% in Year 2 implies that inflation falls short of expected inflation by 1%, so inflation is 2% rather than 1%. Although the drop in the bargaining gap is 2%, the inflation rate only drops by 1% from Year 1 to Year 2 because expected inflation has increased in the meantime.

C



Feedback

Incorrect. Some aspects in this graph are correct. In Year 1 a bargaining gap implies that inflation exceeds expected inflation by 1%, so inflation is 3%. This implies that expected inflation rises to 3% in Year 2. However, what is incorrect here is that inflation continues at 3% from Year 2 onwards.
A bargaining gap of -1% in Year 2 implies that inflation falls short of expected inflation by 1%, so inflation is 2% rather than 1% in Year 2.

Question 12 – S2Q2 Zero Lower Bound and Fisher Equation – 312127.1.4

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 4
Chance score: 1.33 pt. / 33%
Status:
Last modified: 25-03-2022 12:52

Suppose the lowest nominal interest rate that the ECB can set is -0.5%. Furthermore, suppose the ECB wants to be able to attain a real interest rate of -5%, so that it can fight recessions effectively. What is the lowest level of expected inflation that would enable the ECB to do this?

A 4.5%

Feedback
Correct. The Fisher equation tells us that
Real interest rate = Nominal interest rate - Expected inflation
Substituting -5% and -0.5% for the desired level of the real interest rate and the lowest nominal rate yields
-5% = =-0.5%- Expected Inflation
Thus, to reach a real interest rate of -5%, expected inflation must be at least 4.5%.

B 5.5%

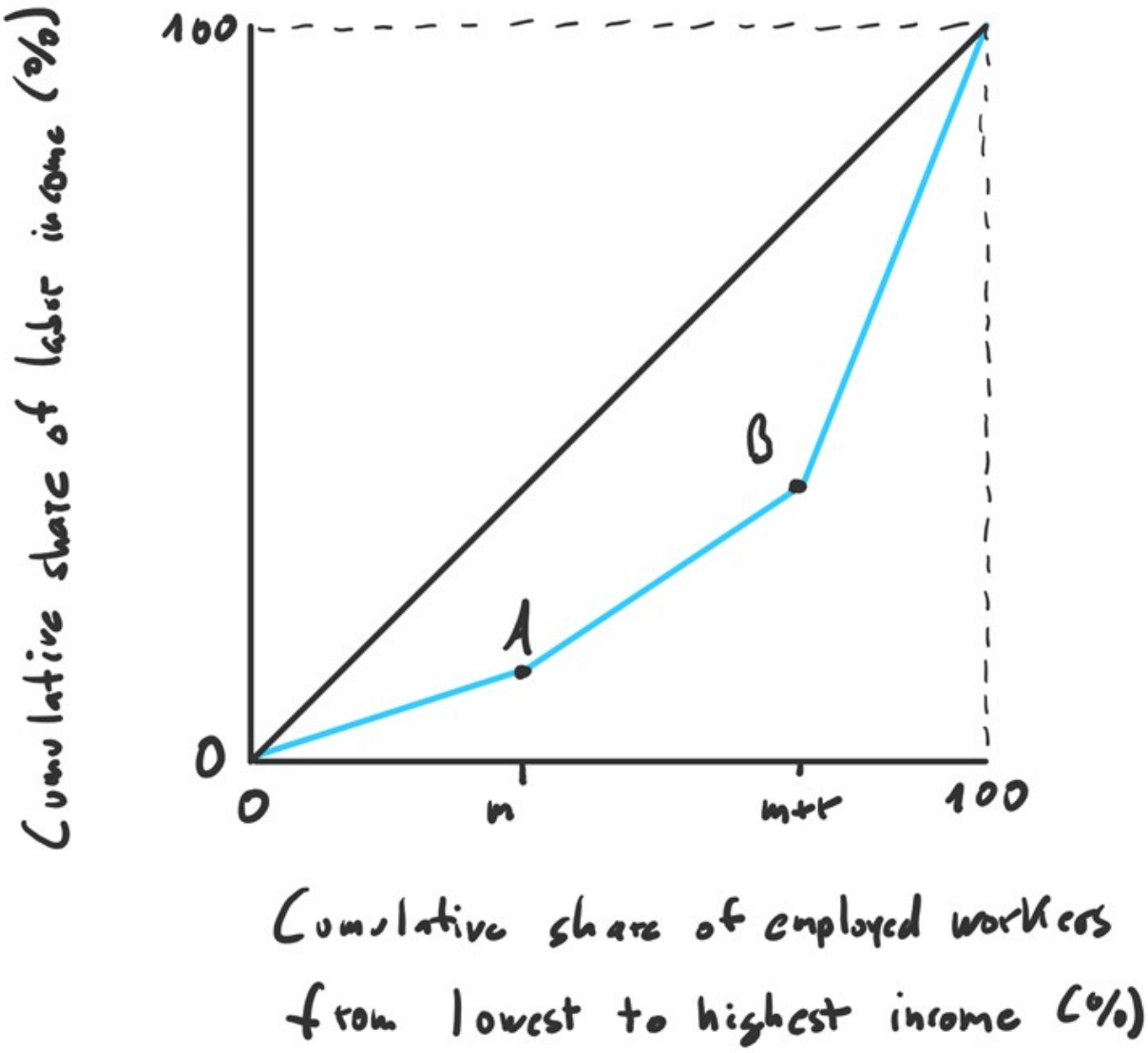
Feedback
Incorrect. The Fisher equation tells us that
Real interest rate = Nominal interest rate - Expected inflation
Substituting -5% and -0.5% for the desired level of the real interest rate and the lowest nominal rate yields
-5% = =-0.5%- Expected Inflation
Thus, to reach a real interest rate of -5%, expected inflation must be at least 4.5%.
A mistake that would lead to 5.5% would be to incorrectly bring the -0.5% to the left hand side by subtracting 0.5 from 5. An incorrect version of the Fisher equation may also produce this outcome.

C -4.5%

Feedback
Incorrect. A mistake that would lead to this answer would be to use the following incorrect version of the Fisher equation:
Real interest rate = Nominal interest rate + Expected inflation
Substituting -5% and -0.5% for the desired level of the real interest rate and the lowest nominal rate yields
-5% = =-0.5%+Expected Inflation
Solving for expected equation would then yield -4.5%. Given the incorrect formula, this would actually be the highest level of expected inflation that would allow the ECB to achieve a real interest rate of -5%, since the equation incorrectly has the real interest rate increasing in expected inflation.

Question 13 – S2Q3 Wage Polarization Gini – 312128.2.9

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 6
Chance score: 2.00 pt. / 33%
Status:
Last modified: 31-03-2022 17:03



In this question you use the Lorenz curve graph to study how wage polarization affects wage inequality between employed workers. The graph above shows the initial Lorenz curve before wage polarization occurs. The graph only considers employed workers, so unemployed workers and firm owners are not included. This also means that the income considered in the graph is labour income rather than the total income of the economy. There are three groups of employed workers. A fraction m does nonroutine manual tasks. A fraction r does routine tasks. The remainder does abstract tasks. We introduce wage polarization as follows:

- It does not change the fractions of employed workers doing different tasks.
- It only changes the relative wages of the different groups and thereby the shares of these groups in total labour income:
  - It increases the share going to workers doing nonroutine manual tasks.
  - It also increases the share going to workers doing abstract tasks.
- Workers doing routine tasks continue to have a higher wage than workers doing nonroutine manual tasks, so workers in routine tasks remain the middle group.

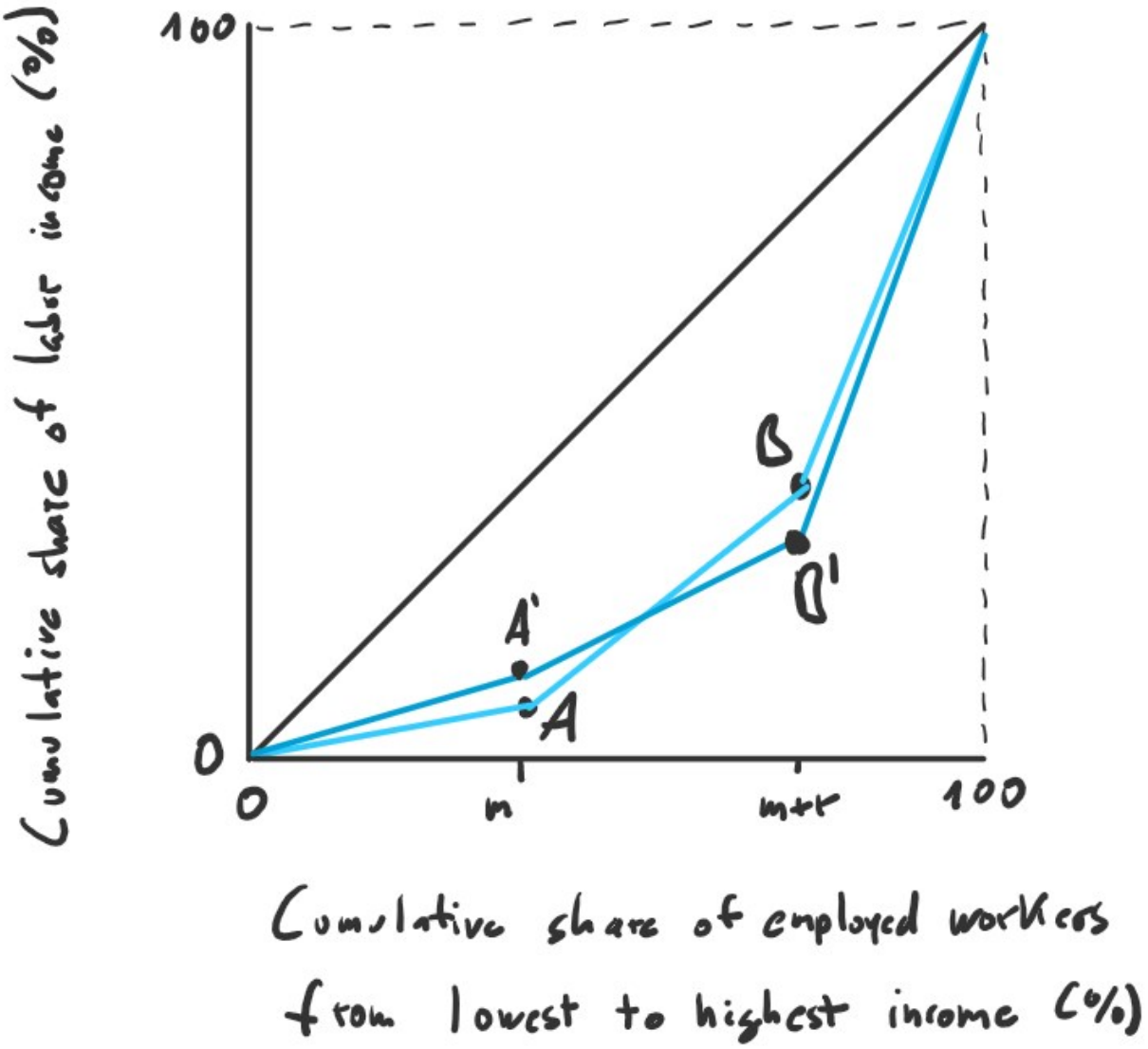
As a consequence of these assumptions, wage polarization results in vertical shifts of the points A and B in the figure. Let A' and B' denote the corresponding shifted points.
Copy the figure to a sheet of paper. Draw the new Lorenz curve, that is, the Lorenz curve after wage polarization has occurred. Use your result to answer the following question.
In which direction does employment polarization change the Gini coefficient?

A The Gini coefficient increases strictly.

B The Gini coefficient decreases strictly.

C The assumptions in the question are insufficient to determine the direction of the change in the Gini coefficient.

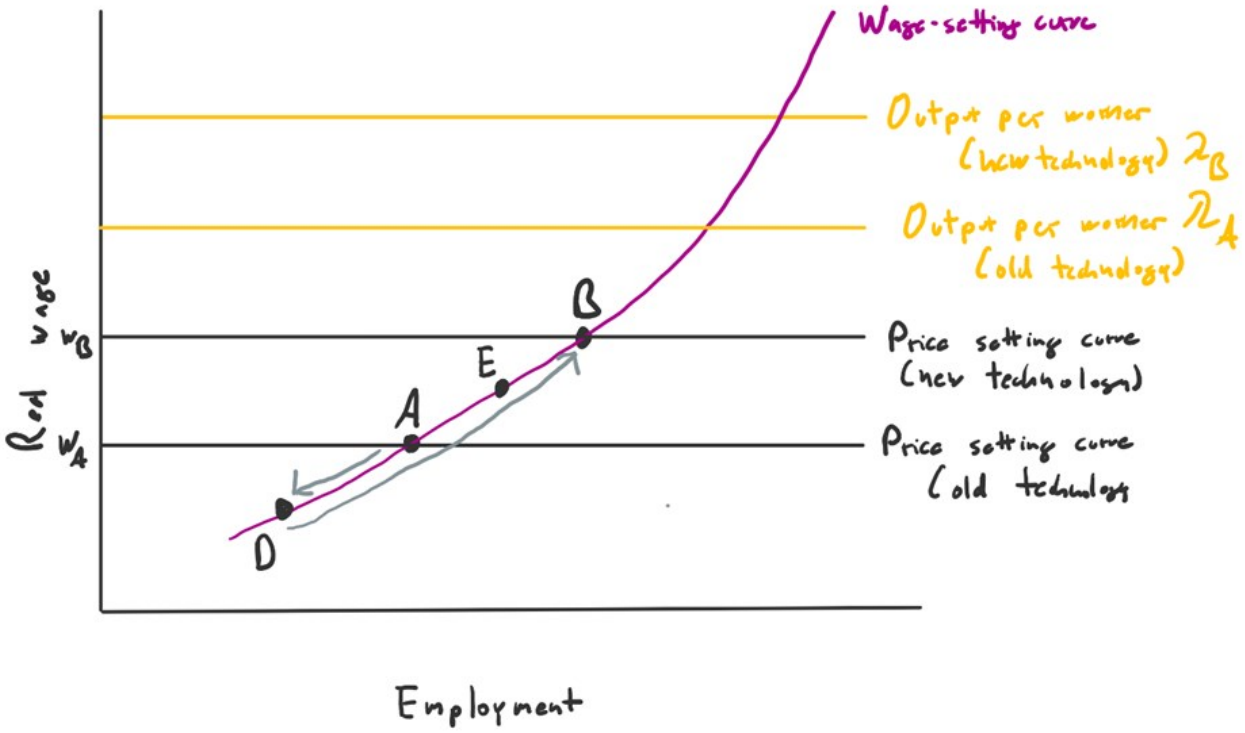
Feedback at question level
The new Lorenz curve is shown here:



The first kink shifts up as workers doing nonroutine manual tasks have a higher share of income. The second kink shifts down as workers doing abstract tasks also have a higher share of income. Thus, the new Lorenz curve crosses the old Lorenz curve. Given this, it is not clear whether the area between the perfect equality line and the Lorenz curve increases or shrinks. Thus, the direction of the change in the Gini coefficient cannot be determined.

Question 14 − S2Q4 Employment and Wage Adjustment Gap − 312129.2.4

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 4
Chance score: 1.33 pt. / 33%
Status:
Last modified: 26-03-2022 16:32



The figure above shows an adjustment path of the labour market in *The Economy* after an improvement in technology, moving from an old long-run equilibrium in point A to a new long-run equilibrium in point B. The labour market first moves to point D, after which it gradually moves along the wage-setting curve through points A and E until reaching point B.
Which of the following is true about point E?

A There is a wage adjustment gap but no employment adjustment gap.

Feedback
Incorrect. The employment adustment gap is defined relative to the new equilibrium B. As long as employment remains below the level in the new equilibrium, there is an employment adjustment gap. This is the case in point E.

B There is both an employment adjustment gap and a wage adjustment gap.

Feedback
Correct. Both the employment adustment gap and the wage adjustment gap are defined relative to the new equilibrium B. As long as employment remains below the level in the new equilibrium, there is an employment adjustment gap. Analogously, if the real wage is still below the real wage in point B, there is still a wage adjustment gap.

C There is an employment adjustment gap but no wage adjustment gap.

Feedback
Incorrect. The wage adustment gap is defined relative to the new equilibrium B. As long as the real wage remains below the level in the new equilibrium, there is a wage adjustment gap. This is the case in point E.

Question 15 − S2Q5 Price−Setting with Markup On Costs − 312130.3.10

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 5
Chance score: 1.67 pt. / 33%
Status:
Last modified: 31-03-2022 17:02

Consider the labour market model in *The Economy*. There are two common ways of specifying the markup when studying the price-setting decision of firms. One way is to specify the markup as the profit margin relative to the price. We have used μ to denote this version of the markup. The second way is to specify the markup as a percentage markup on unit costs, that is, the profit margin relative to unit costs. We have used m to denote this version of the markup. In the labour market model, this specification of the markup leads to the following equation for the price p set by a firm:

$$\frac{p - \frac{W}{\lambda}}{\frac{W}{\lambda}} = m$$

Here W is the nominal wage set by the HR department, and λ is labour productivity. This equation reflects the fact that the cost of producing one unit of output is

$$\frac{W}{\lambda}$$

The markup m is taken as given in the labour market model. Use the equation above to obtain the correct formula for the price-setting curve in the labour market model, expressed in terms of m and λ. Which formula is correct?

A $\frac{W}{P} = \frac{1}{1+m}\lambda$

Feedback

Correct. Starting with the equation in the problem and multiplying both sides by W/λ yields

$$p - \frac{W}{\lambda} = \frac{W}{\lambda}m$$

Adding W/λ to both sides yields

$$p = (1+m)\frac{W}{\lambda}$$

Dividing both sides by $1+m$ and dividing both sides by p and multiplying both sides by λ yields

$$\frac{W}{p} = \frac{1}{1+m}\lambda$$

Noting that all firms set the same price, so that $P = p$, yields the desired result.

B $\frac{W}{P} = (1-m)\lambda$

Feedback

Incorrect. This is the same formula we have for the price-setting curve when we have the markup defined as the ratio between the profit margin and the price. Thus, this formula cannot be correct, because price and unit costs are not equal to each other.

C $\frac{W}{P} = \frac{1+m}{\lambda}$

Feedback

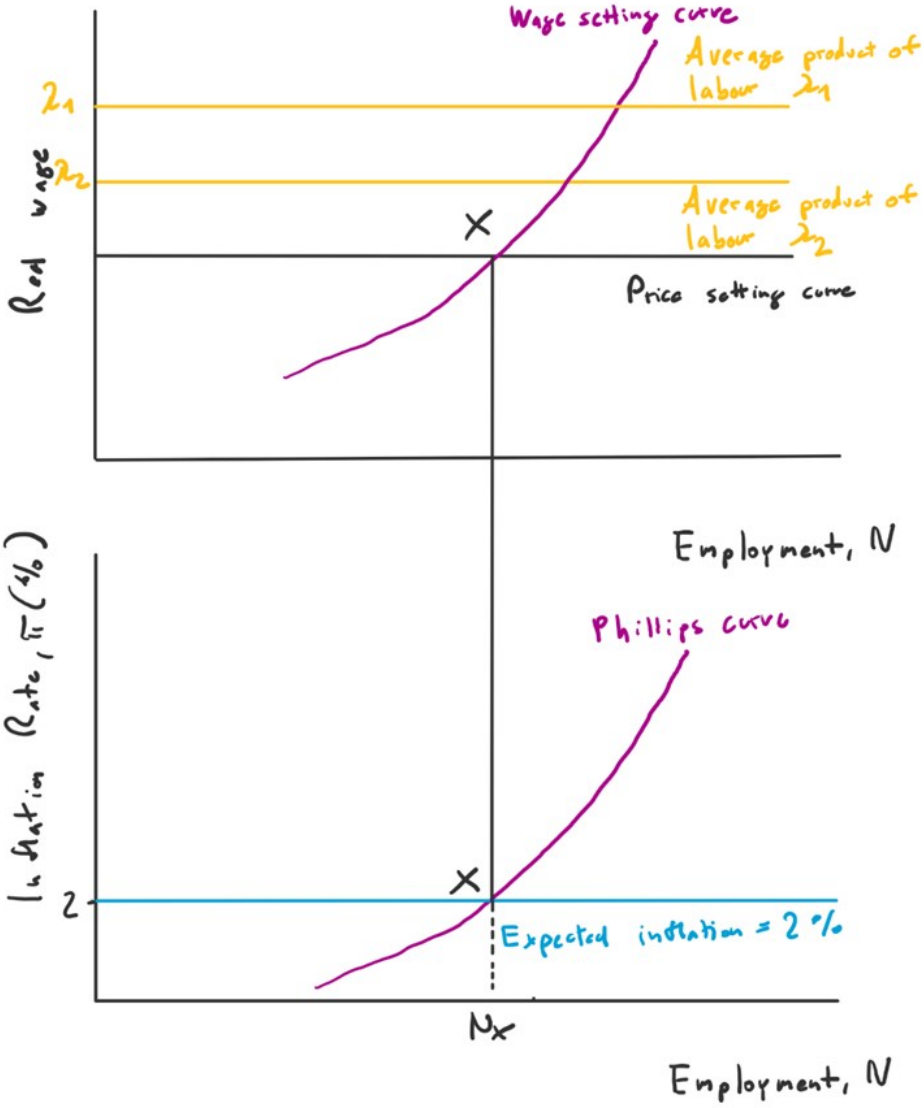
Incorrect. One can arrive at this equation by rearraning the equation given in the problem in an incorrect way. This option can be ruled out by noting that the result wage is increasing in the markup, which is counterintuitive.

Section 3, Problem 1: Shift of Demand from Services to Goods

Question order: Fixed

The Covid 19 pandemic has caused a shift in demand from services to goods. People working from home bought computing equipment, furniture, and exercise equipment. People also consumed fewer haircuts, restaurant meals, and personal training. While some of these shifts may be reversed after the pandemic, at least to some extent the changes in consumption patterns are likely to persist for some time.

In this problem you examine the impact of this shift on inflation in the medium-run model. We capture the shift in the model by a drop in the average product of labour from λ_1 to λ_2 that persists over the medium run. The idea is that the economy must shift some workers from producing services to producing goods, and for a while productivity is lower until the reallocated workers have learned to be as good at producing goods as they were at producing services.



The figure above shows the usual diagrams for the medium-run model. The initial equilibrium before the shift in demand from services to goods is in point X. Copy the figure to a sheet of paper, and add any shifts in the wage-setting curve, the price-setting curve and the Phillips curve that are induced by the shift in demand from services to goods. Use your findings to answer the following questions.

You can click "Show block intro" to see this introduction to the problem when working on the questions.

Continue to the questions by clicking "Next".

Question 16 – S3P1Q1 Shift Wage–Setting Curve – 312132.1.7

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 4
Chance score: 1.33 pt. / 33%
Status:
Last modified: 26-03-2022 17:46

Part 1/2

How does the shift in demand from services to goods shift the wage-setting curve?

A It shifts up.

B It shifts down.

C It does not shift.

Feedback at question level
The wage-setting curve does not shift. The problem captures the shift in demand from goods to services through a decline in a labour productivity. In the labour market model (and thus the medium-run model) a change in labour productivity does not shift the wage-setting curve. The wage-setting curve provides the real wage that firms need to pay to induce workers to provide effort. It shifts with variables such as the generosity of unemployment benefits.

Question 17 – S3P1Q2 Inflation – 312133.1.3

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 5
Chance score: 1.67 pt. / 33%
Status:
Last modified: 26-03-2022 17:47

Part 2/2

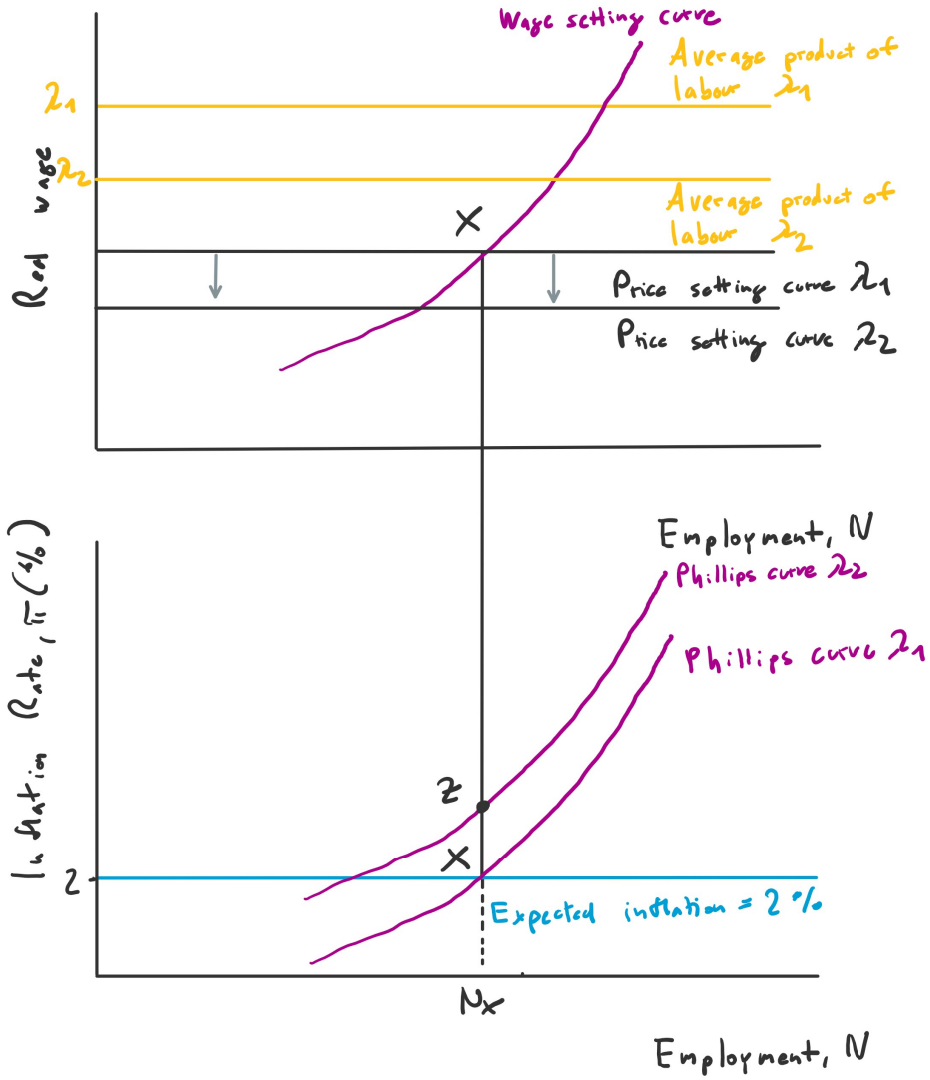
Assume that aggregate demand und thus employment remains unchanged in the year in which the shift in demand from services to goods occurs. How does the shift in demand from services to goods affect inflation in this year?

A Inflation increases strictly.

B Inflation is unchanged.

C Inflation decreases strictly.

Feedback at question level



The figure above adds the shifts in curves that are induced by the shift in the demand from services to goods. The price-setting curve depends on the markup and on labour productivity. In particular, a drop in labour productivity shifts the price-setting curve down: the pie to be distributed between workers and firm owners shrinks, and firm owners claim the same share as before, so the size of the slice going to workers decreases. The downward shift in the price-setting curve implies that the bargaining gap is higher at any given level of employment. Since inflation is given by expected inflation plus the bargaining gap, it follows that the price-setting curve shifts up.

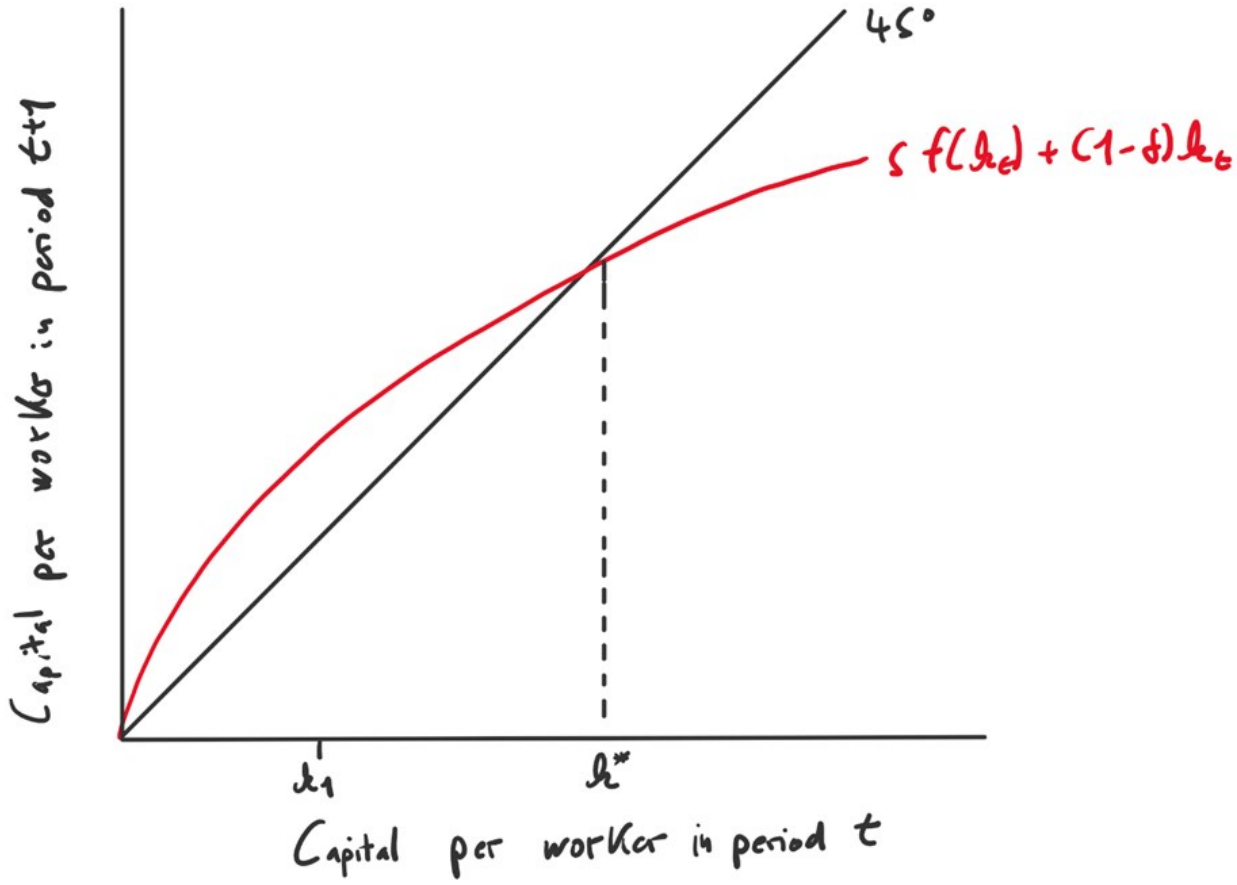
The question assumes that the level of employment remains unchanged at N_X. As illustrated in the figure by point Z, the inflation outcome in the year of the shift in demand is then higher than it would have been in the absence of the shift.

Section 3, Problem 2: Arrival of Refugees in the Solow Model

Question order: Fixed

In this problem you use the Solow model to think about the macroeconomic impact of the arrival of a large number of refugees, as is occurring at the moment in many countries as a consequence of Russia's invasion of Ukraine.

Consider the Solow model, and assume that initially (before the arrival of refugees) the economy is in steady state. Thus, capital per worker is equal to k^* in the graph below, and output per worker is constant over time. Now a large number of refugees arrives in the current time period. The arrival of refugees is a one-time event that occurs in the current period, after this the population of the country is once again constant. While in reality it will take some time to integrate refugees into the labour market, assume for the purpose of this analysis that the refugees are fully integrated immediately. Thus, they immediately have the same position in the labour market as the initial population of the country. This implies that output per worker is still given by $y = f(k)$ where k denotes capital per worker. As usual, we assume that the function f is strictly increasing. In the current period in which the refugees arrive, capital per worker k_1 is lower than in the preceding period because the existing capital stock of the country is now spread across a larger number of workers. Assume that the arrival of the refugees has no impact on other parameters of the model: the production function f, the saving rate s, and the depreciation rate δ all remain unchanged.



Copy the graph above to a piece of paper and use it to sketch the path of capital per worker after the arrival of the refugees. Use your findings together with the other assumptions of the model to answer the following questions.

You can click "Show block intro" to see this introduction to the problem when working on the questions.

Continue to the questions by clicking "Next".

Question 18 − S3P2Q1 Output per Worker Current Period − 312137.1.2

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 5
Chance score: 1.67 pt. / 33%
Status:
Last modified: 25-03-2022 16:23

Part 1/3

How does the level of ouput per worker in the current period (the period in which the refugees arrive) compare to the level of output per worker in the preceding period?

A It is strictly higher

B It is exactly the same

C It is strictly lower

Feedback at question level

As stated in the problem, capital per worker is lower in the current period than in the preceding period, when it was equal to k^*. Let k_1 denote this lower level. Output per worker in the current period is $y_1 = f(k_1)$. Since the function f is strictly increasing, it follows that output per worker is strictly lower than in the preceding period.

Question 19 – S3P2Q2 Evolution Over Time – 312139.1.4

Question type: Multiple choice
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Random
Partial scoring: No
Maximum score: 4
Chance score: 1.33 pt. / 33%
Status:
Last modified: 25-03-2022 16:34

Part 2/3

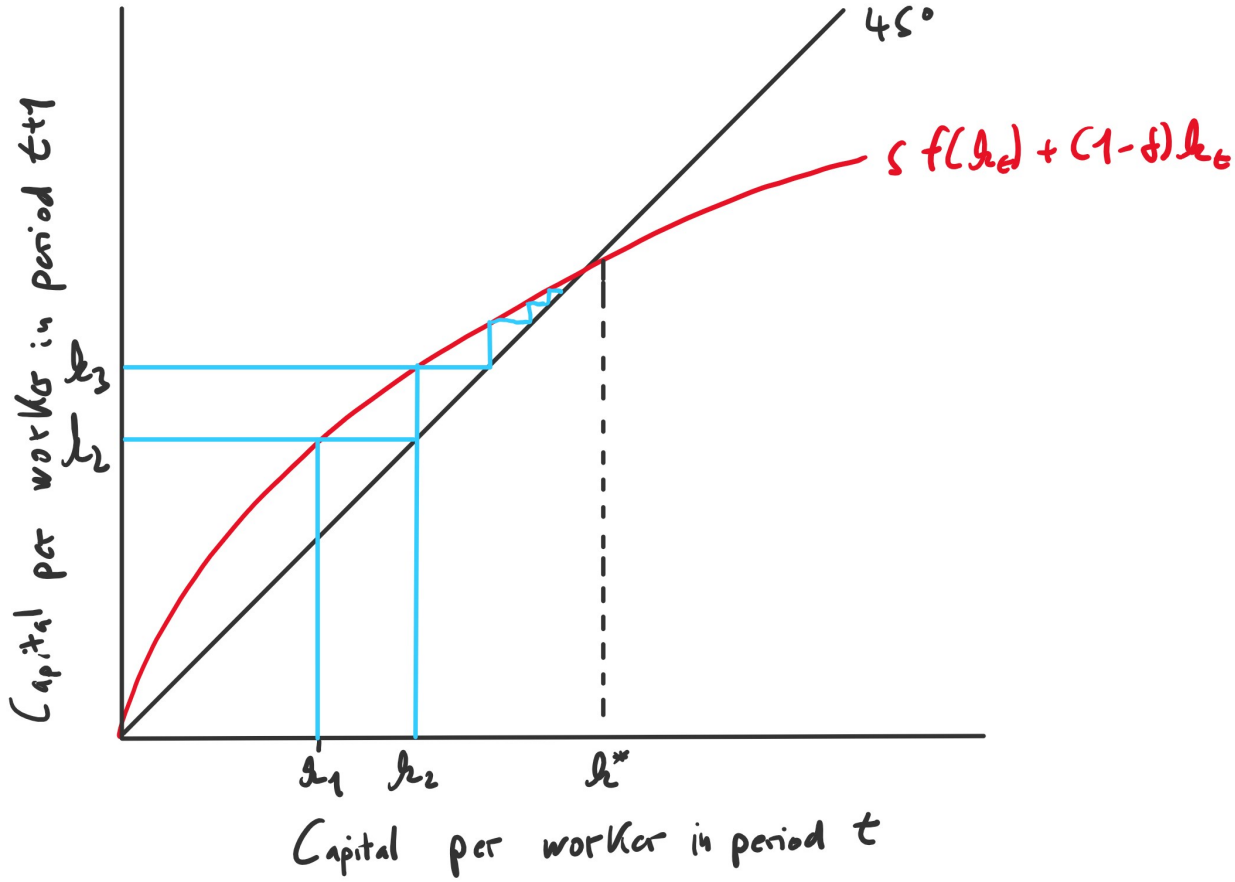
Which of the following best describes how the level of output per worker evolves after the arrival of the refugees?

A It gradually increases over time and converges to a level that is strictly higher than its level before the arrival of the refugees.

B It gradually increases over time, converging to its level before the arrival of the refugees.

C It gradually decreases over time and converges to a level that is strictly lower than its level before the arrival of the refugees.

Feedback at question level



The figure above shows the path of capital per worker after the arrival of the refugees. In the current period, capital per worker is tat the lower level k_1 . Notice that there is no shift in the red curve, that is, in the function that gives k_{t+1} as a function of k_t . This is because the saving rate, the depreciation rate, and the function f are all unchanged. Thus, the steady-state level of capital per worker is also unchanged. At k_1 we see that investment exceeds depreciation, so k_2 is strictly larger than k_1 . We see that capital per worker is increasing over time and gradually converges to the old and new steady state level. This implies that output per worker also gradually converges to its level before the arrival of refugees.

Question 20 − S3P2Q3 Explanation − 312141.1.4

Question type: Open-ended
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Fixed
Partial scoring: Yes
Maximum score: 12
Chance score: 0.00 pt. / 0%
Status:
Last modified: 26-03-2022 17:34
Word count: 500
Word count: No

Part 3/3

Carefully explain the economic mechanism(s) that are behind the impact of the arrival of refugees on output per worker, both in the period of the arrival of the refugees and in the long run. Do this in a way that uses the concepts of saving, investment, a diminishing marginal product of capital, and related concepts that are needed for the explanation, in a way that demonstrates your understanding of the concepts. Make sure that your explanation is consistent with your responses in parts 1-2 or explicitly address discrepancies. If you are unsure about aspects of the correct answer and explanation, discuss this explicitly. (ca. 100-200 words, the word range is an indication of what is expected and the upper limit is not enforced)

Grading instruction

Rubric (Number of points: 12)

12/12 points: You provide a careful, complete, succinct and fully correct explanation that uses all the indicated concepts as well as any other relevant concepts, in a way that demonstrates an excellent understanding of all these concepts. Your explanation is fully consistent with your previous responses in the same problem.
10/12 points: You provide a careful and largely complete explanation that uses all the indicated concepts, and that does not contain any substantial misconceptions. You demonstrate a good understanding of almost all indicated concepts, yet some may be used without demonstrating an understanding. Discrepancies between your explanation and your previous responses in the same problem are explicitly addressed. You discuss explicitly if you are unsure about aspects of the correct answer and explanation.
9/12 points: You provide a careful and mostly complete explanation that uses all the indicated concepts. Your explanation indicates one or more substantial misconceptions, but, overall, you have a good understanding of most concepts. For some concepts, your level of understanding may remain unclear. Discrepancies between your explanation and your previous responses in the same problem are explicitly addressed. You discuss explicitly if you are unsure about aspects of the correct answer and explanation.
8/12 points: You provide a fairly complete explanation that uses all the indicated concepts. Your explanation indicates one or more substantial misconceptions, but, overall, you have a satisfactory understanding of most concepts. For some concepts, your level of understanding may remain unclear. There may be discrepancies between your explanation and your previous responses in the same problem that are not explicitly addressed. Your explanation may indicate that you are unsure about the correct answer and explanation, without undressing this explicitly.
6/12 points: You make a meaningful attempt to provide an explanation and use some of the indicated concepts. Your explanation either does not demonstrate your level of understanding of the concepts, or does indicates major misconceptions. There may be discrepancies between your explanation and your previous responses in the same problem that are not explicitly addressed. Your explanation may indicate that you are unsure about the correct answer and explanation, without undressing this explicitly.
3/12 points: You make a meaningful attempt to provide an explanation and use some of the indicated concepts. Your explanation demonstrates a minimal level of understanding of some of the concepts. Discrepancies between your explanation and your previous responses in the same problem are not explicitly addressed. Your explanation does not address whether you are unsure about aspects of the correct answer and explanation.
0/12 points: You do not make a meaningful attempt to provide an explanation. In particular, your explanation may be an explanation a mechanism in a standard model we studied in the course, without any attempt to address the specifics of this problem.

Answer model:
The arrival of refugees reduces output per worker in the period of arrival, but in the long run output per worker gradually returns to its previous level. In the period of arrival capital per worker drops, since each worker now has less capital to work with. Since output per worker is an increasing function of capital per worker, output per worker is lower than in the preceding period. However, the lower capital per worker in the period of arrival also implies that output per unit of capital is higher: capital is more productive. This is a consequence of the diminishing marginal product of capital: each unit of capital has more labour to work with. Higher capital productivity together with an unchanged saving rate implies that saving, and thus investment, exceeds depreciation. Capital per worker starts to increase. The diminishing marginal product also implies that it cannot growth without bound, as depreciation catches up with investment. It converges to a steady state level. This level is the same as before the arrival of refugees, since the saving rate, the depreciation rate, and the production function are unchanged. Consequently, the level of output per worker is also unchanged in the long run.

Feedback at question level

Answer model:
The arrival of refugees reduces output per worker in the period of arrival, but in the long run output per worker gradually returns to its previous level. In the period of arrival capital per worker drops, since each worker now has less capital to work with. Since output per worker is an increasing function of capital per worker, output per worker is lower than in the preceding period. However, the lower capital per worker in the period of arrival also implies that output per unit of capital is higher: capital is more productive. This is a consequence of the diminishing marginal

product of capital: each unit of capital has more labour to work with. Higher capital productivity together with an unchanged saving rate implies that saving, and thus investment, exceeds depreciation. Capital per worker starts to increase. The diminishing marginal product also implies that it cannot growth without bound, as depreciation catches up with investment. It converges to a steady state level. This level is the same as before the arrival of refugees, since the saving rate, the depreciation rate, and the production function are unchanged. Consequently, the level of output per worker is also unchanged in the long run.

Section 4: Connection of News with Theoretical Frameworks

Question order: Fixed
This section contains 1 open question worth 20 points.

Continue to the question by clicking "Next".

Question 21 − S4 Invest in child care − 312140.1.5

Question type: Open-ended
Pre-test item: No
Folder: /Top/SIS/E_EBE1_MACEC/Final Exam 2022
Answer option order: Fixed
Partial scoring: Yes
Maximum score: 20
Chance score: 0.00 pt. / 0%
Status:
Last modified: 31-03-2022 17:26
Word count: 500
Word count: No

Consider the following extract from an opinion piece written by Lauren Melodia for the *Washington Post*, published on January 26, 2022.

Invest in child care
Although the unemployment rate is falling faster than expected, the pandemic continues to fundamentally disrupt our economy. Many people are choosing to remain out of the labor market altogether until public health conditions and disruptions subside, which in turn limits productive capacity and can raise prices. One policy that could address many of these issues across sectors at once has already passed the House and is waiting for Senate action: public investment in our child-care system.
Child care is the backbone of our economy and can enable all parents to get and keep a job. But as of 2018, many communities across the country are child-care deserts. The covid pandemic has further decimated this infrastructure. As of this time last year, 20,000 child-care providers were estimated to have permanently shut down.
By making supply-side child-care investments — building new child-care centers and offering loans and grants to existing or recently closed small-business child-care providers — we could both enable parents to reenter the workforce.
Many of these policies were passed by the House in the Build Back Better Act and are now on the table in the Senate. And once they are passed and implemented, we can boost the capacity, productivity and the potential of our economy and reduce future economic disruptions — all of which can be deflationary and stabilizing.
Insofar as today's inflation — or the fear of future inflation — is linked to labor market tightness or dynamics, investment in child care is critical for minimizing ongoing disruptions and expanding people's ability to work across all industries in our economy.

In your own words, explain the statements about the functioning of the macroeconomy made in the article that are most important for the article's main message. The statements may be made by the author or in sources that the author cites. Carefully explain whether and to what extent the statements are consistent with relevant theoretical frameworks that we have studied in the course. Do this in a way that demonstrates your understanding of these theoretical frameworks. (ca. 150-250 words, the word range is an indication of what is expected and the upper limit is not enforced)

Dictionary entries for some words in the article extract:

House: a legislative, deliberative, or consultative assembly, especially one constituting a division of a bicameral body
Senate: an assembly or council usually possessing high deliberative and legislative functions, such as the second chamber in the bicameral legislature of a major political unit
backbone: the foundation or most substantial or sturdiest part of something
desert: arid land with usually sparse vegetation
decimate: to reduce drastically especially in number
grant: something granted, especially: a gift (as of land or money) for a particular purpose
workforce: the number of workers potentially assignable for any purpose
act: the formal product of a legislative body
tightness: characterized by the difficulty to obtain

Grading instruction

Criterion 1 (Number of points: 20)

20/20 points: You correctly and succinctly explain in your own words the statements about the functioning of the macroeconomy made in the article that are most important for the article's main message. You provide a careful, complete, succinct and accurate explanation whether and to what extent the statements are consistent with relevant theoretical frameworks that we have studied in the course, in a way that demonstrates an excellent understanding of these frameworks.
17/20 points: You largely picked up on the statements that are most important for the article's main message, and explain them accurately in your own words. You provide a careful, largely complete, and accurate explanation whether and to what extent the statements are consistent with relevant theoretical frameworks that we have studied in the course, in a way that demonstrates a good understanding of these frameworks.
14/20 points: You mostly picked up on the statements that are most important for the article's main message, and explain them quite accurately in your own word, but some important aspect may be missing. You provide a careful, mostly complete, and accurate explanation whether and to what extent the statements are consistent with relevant theoretical frameworks that we have studied in the course, yet some relevant theoretical framework may not be considered. You demonstrate a good understanding of these frameworks, potentially with some substantial misconceptions.
11/20 points: You picked up on a substantial part of the relevant statements, but also missed important aspects. You make a meaningful attempt to explain them in your own words, but stay quite close to the wording in the article. You address connections with some relevant theoretical frameworks, yet some important aspects are not considered. You demonstrate a satisfactory understanding of the theoretical frameworks, with some substantial misconceptions.
7/20 points: You make a meaningful attempt to explain statements about the functioning of the macroeconomy, yet you missed the ones that are most important for the article's main message. You bring up some theoretical frameworks that we studied, but do not make strong connections with the content of the article. You demonstrate some understanding of the theoretical frameworks that you discuss, potentially with some major misconceptions.
3/20 points: You make a meaningful attempt to explain statements about the functioning of the macroeconomy, but for the most part what you discuss is not important or not the right kind of statement. You mention some theoretical frameworks but do not make meaningful connections with the statements in the article. You demonstrate minimal understanding of the theoretical frameworks that you discuss.
0/20 points: You do not make a meaningful attempt to explain statements about the functioning of the macroeconomy in the article, and to connect them to the theoretical frameworks that we studied.

Answer Model:

The main message of the article is that investments in child-care can reduce inflation by allowing parents to participate in the labour market. Thus, the key statements about the functioning of the macroeconomy are that an increase in the availability of child care increases the labour fource, and that an increase in the labour force reduces the upward pressure on prices. In the course we did not study how the size of the labour force depends on the availability of child care, but it seems quite intuitive that there should be a positive effect. The negative effect of an increase in the labour force on inflation is fully consistent with the medium-run model from *The Economy*. An increase in the labour force raises the unemployment rate at a given level of employment, and thus reduces the real wage that firms need to pay in order to induce workers to provide effort. In other words, it shifts down the wage-setting curve. At the initial level of aggregate demand, firms can then increase nominal wages by less. This leads to smaller increases in prices when firms set prices to maintain their markup. Overall, the pressure for prices to rise is reduced during the adjustment of the economy towards labour market equilibrium. In more technical terms, the downward shift in the wage-setting curve reduces the bargaining gap, which leads to a downward shift in the Phillips curve and thus lower inflation at a given level of aggregate demand.

Feedback at question level

Answer Model:
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