

Problem Set 6 • Macroeconomic policy & European Central Bank

1. Policy in the AS-AD model. Consider Exercise 4 from Problem Set 5. (i) Identify in each case the kind of monetary policy (expansionary or contractionary) that may offset the change in the inflation rate caused by the event described in the case. (ii) Identify in each case the kind of fiscal policy (expansionary or contractionary) that may offset the change in real GDP caused by the event described in the case.

2. Policy in the AS-AD model. Let E be an economy and E' the economy given by the rest of the world.

- Analyse graphically by means of the AS-AD model the effect on the macroeconomic equilibrium of both E and E' of the return to E' of all the unemployment immigrants currently in E .
- Considering E , explain if it is possible to offset, by means of the fiscal policy, the effect on real GDP found in (i). If so, list two fiscal policy measures that could achieve this goal.
- If the fiscal policy in (ii) is expansionary, suppose it is financed by the issuance of government bonds. Explain if this issuance could have some effect on the equilibrium real GDP.

3. Policy in the AS-AD model. (i) Analyse graphically by means of the AS-AD model the effect on the macroeconomic equilibrium of the closure of all the factories owned by foreigners. (ii) Which type of economic policy could offset the effect on the equilibrium inflation rate of the closure? Analyse the effects of this policy on the AS-AD model.

4. Fiscal & monetary policy. (i) Find two differences between an expansionary monetary policy and an expansionary fiscal policy. (ii) Find two characteristics they have in common.

5. Policy effectiveness. A teacher makes the following proposal to a student that, though being near a borderline pass, has not passed Macroeconomics: "You will pass the course if you devote a couple of days in holidays to looking over your lecture notes". In connection with the factors determining the effectiveness of economic policies, does this situation illustrate the concept of lag, the concept of temporal inconsistency, or Goodhart's law?

6. Goodhart's law. Exams are indicators of knowledge: the more one knows on a subject, the higher the mark one is expected to obtain in an exam (not previously announced) on the subject. Goodhart's law predicts that, once it is publicly known that exams become the instrument to test one's knowledge, exams may turn out to be a less reliable indicator of knowledge. Explain why. [Hint: Ask yourself whether you study Macroeconomics to master the subject or to pass exams.]

7. Goodhart's law. Explain if Goodhart's law has a bearing on the following situation. The Catalan law 18/2007, on the right to housing, "dota les administracions actuants d'instruments per aconseguir que els habitatges desocupats injustificadament, en àmbits d'acreditada necessitat d'habitatges, s'incorporin al mercat immobiliari per mitjà de tècniques de foment, però també de tècniques d'intervenció administrativa". Article 41 refers to "Detecció d'utilitzacions i situacions anòmales dels habitatges" and declares permanent vacancy an anomalous situation. Point 5 in the article asserts that, to verify the existence of an anomalous situation, the competent civil service may request information concerning "abnormal water, town gas, or electricity consumption".

8. Goodhart's law. Consider slide VI-9. Explain why attendance is no longer a good measure of the students' performance when the teacher announces that attendance determines the final mark.

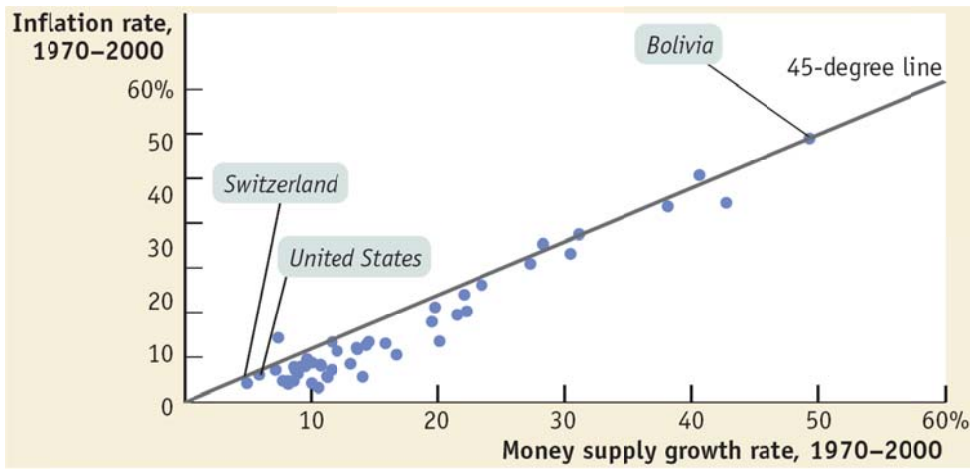
9. Simultaneous policies. Suggest a justification for simultaneously implementing: (i) an expansionary fiscal policy and a contractionary monetary policy; (ii) a contractionary fiscal policy and an expansionary monetary policy. (iii) Is there any difference between applying only an expansionary fiscal policy and applying both an expansionary fiscal policy and an expansionary monetary policy?

10. Simultaneous policies. What combination of monetary policy and fiscal policy leads, simultaneously, to a fall in the inflation rate and an increase in production?

11. Stopping deflation. (i) What kind of fiscal policy can put deflation to an end? (ii) And what kind of monetary policy?

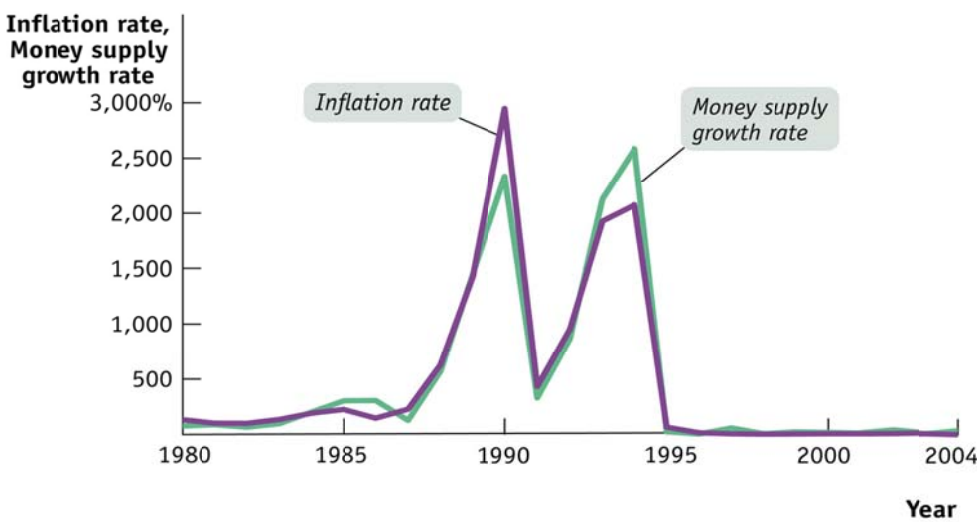
12. Simultaneous policies. Find the effect on the macroeconomic equilibrium of implementing, at the same time: (i) an expansionary fiscal policy and a contractionary fiscal policy; (ii) an expansionary fiscal policy and a contractionary monetary policy; (iii) a contractionary fiscal policy and a contractionary monetary policy; (iv) an expansionary monetary policy and a supply-side policy; and (v) a supply-side policy and a contractionary fiscal policy.

13. Monetary policy. Does the chart on the right suggest that, in the period 1970-2000, monetary policy has been more expansionary in the US than in Bolivia? Explain your answer.



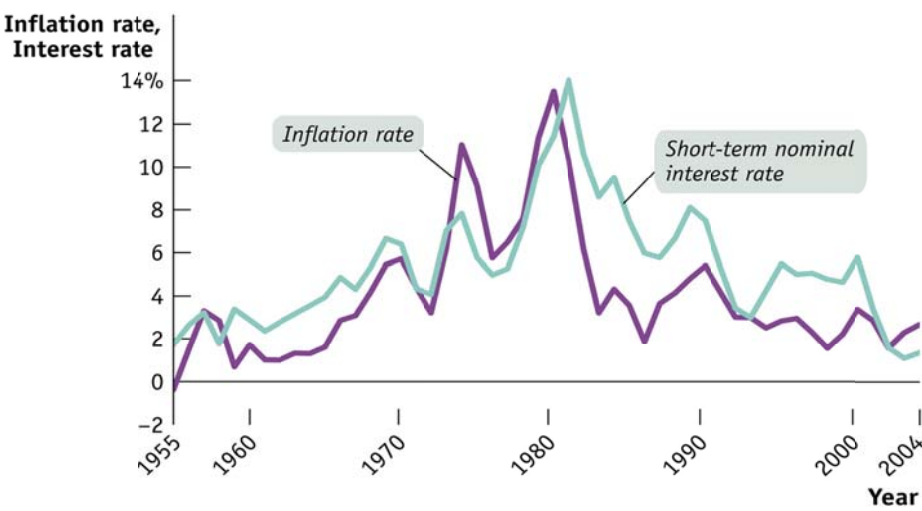
<http://www.worthpublishers.com/krugmanwellsnew/main.htm>

14. Monetarism. Is the chart on the right providing evidence for the monetarist view?



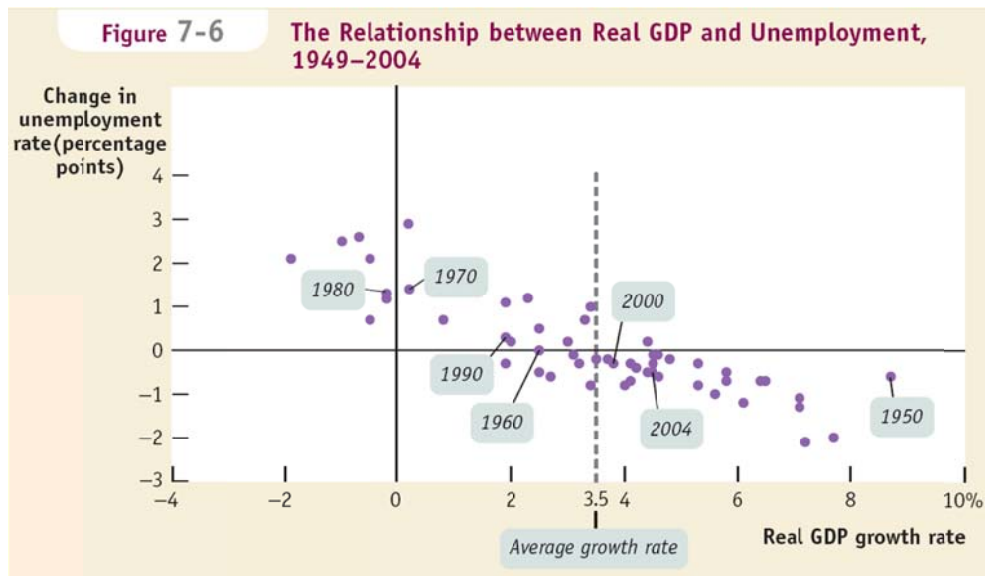
<http://www.worthpublishers.com/krugmanwellsnew/main.htm>

15. Monetary policy. Consider the chart on the right. (i) During which periods the monetary policy can be considered expansionary? Why? (ii) During which periods the monetary policy can be considered contractionary? Why?



<http://www.worthpublishers.com/krugmanwellsnew/main.htm>

16. GDP & u . (i) What relationship is the chart on the right describing? (ii) According to the chart, what happened between 1960 and 1970? (iii) And between 1980 and 1990? (iv) What kind of fiscal policy could explain what happened in each case? (v) And what kind of monetary policy? (vi) Without any further information, in which case is more plausible to justify the claim that supply-side policies have been applied?



<http://www.worthpublishers.com/krugmanwellsnew/main.htm>

17. **Goodhart’s law.** Taking for granted that students report their opinions honestly, each academic year the university invites students to fill in a questionnaire to assess the teachers’ performance. Before the 2010-11 academic year teachers were informed of the students’ assessment after the end of the academic year. Since the 2010-11 academic year the questionnaire must be filled in at the moodle website and the teacher can know the students’ opinions even before he or she marks the students. (i) Why is Goodhart’s law relevant to this situation? In particular, do students have an incentive to report truthfully their opinions under the new evaluation policy? (ii) Would you recommend going back to the traditional evaluation policy? If so, why? If not, why not?

18. **Taylor’s rule.** Using the simple version of Taylor’s rule, explain if having the inflation rate above the target inflation rate leads the central bank to (by modifying the nominal interest rate) set the real interest rate above, below, or at the same level as the economy’s long-term real interest rate.

19. **Policy externalities.** Policymakers in the US want the US economy to boom. Explain if the fact that the eurozone is already booming contributes positively or negatively to achieve that goal.

20. **Expansionary monetary policy.** Explain four ways by means of which a central bank can increase the liquidity of an economy.

21. **MROs by the ECB.** The European Central Bank (ECB) decides to provide liquidity (500 million €) to the market by means of a main refinancing operation (MRO) organized with a variable rate tender procedure. (i) Compute in the following table the allotment to each bank. (ii) Determine the marginal interest rate of the tender. (iii) Answer the same question if the ECB decides to provide 300 million €.

i	<i>bids by the banks</i>				<i>allotment by the ECB</i>			
	B1	B2	B3	B4	B1	B2	B3	B4
5.5%	30	25	10	15				
5.4%	40	30	25	20				
5.3%	50	35	30	40				
5.2%	70	50	50	60				
5.1%	100	80	90	80				
5.0%	120	100	100	100				

22. MROs by the ECB. The ECB decides to provide liquidity (500 million €) by means of an MRO organized with a fixed rate tender procedure. Find, in each table, how the ECB allots the 500 million € to the banks.

<i>bids by the banks</i>				<i>allotment by the ECB</i>			
B1	B2	B3	B4	B1	B2	B3	B4
200	100	50	400				

<i>bids by the banks</i>				<i>allotment by the ECB</i>			
B1	B2	B3	B4	B1	B2	B3	B4
100	50	50	150				

<i>bids by the banks</i>				<i>allotment by the ECB</i>			
B1	B2	B3	B4	B1	B2	B3	B4
150	80	70	200				

23. Fiscal policy. (i) What side effects are associated with an expansionary fiscal policy consisting of a rise in the government expenditure that is financed by a rise in taxes? (ii) What if the additional government expenditure is financed by issuance of government bonds?

24. Monetary policy. (ii) Analyse the effect on the interest rate of an increase in reserve requirements combined with an open market operations in which the central bank sells financial assets. (iii) Answer the same question if the central bank carried out a purchase of financial assets instead of a sale.

25. Taylor's rule. Consider the simple version of Taylor's rule in which $a = \frac{1}{2}$, $\hat{i}_r = 4$ (the long-run equilibrium real interest rate), and $\hat{\pi} = 3$ (the central bank's target inflation rate). (i) Explain the meaning of $a = \frac{1}{2}$ by means of an example. (ii) Find the nominal interest rate i set by the central in each of the case shown in the following table. (iii) Indicate the cases in which the real interest rate is above \hat{i}_r and explain why it is above. (iv) At each period, which effect does the decision by the central bank of the interest rate cause on aggregate demand, real GDP, and the unemployment rate?

<i>period</i>	π	\hat{i}_r	$\pi - \hat{\pi}$	i	i_r
1	9%				
2	7%				
3	1%				
4	-1%				
5	3%				
6	5%				
7	0%				

26. Definitions. (a) Explain the following relationships: (i) Okun's law; (ii) Phillips curve; (iii) Laffer curve; (iv) Taylor's rule. (b) Explain the following concepts: (i) Ricardian equivalence; (ii) crowding-out effect; (iii) monetary policy transmission channels; (iv) quantity equation; (v) neutrality of money. (c) Is there any difference between government debt monetization and issuance of government bonds?

27. Financing deficits. The government wonders whether to finance an unexpected public deficit by increasing taxes or by issuing T-bills. (a) Using the loan market model, show graphically the effect of each option on the interest rate. (b) For each option, explain the kind of monetary policy that the central bank should carry out to neutralize the effect on the interest rate established in (a).

28. Taylor's rule. A central bank follows the Taylor's rule $i = \pi + \hat{i}_r + (\pi - \hat{\pi})/2$, where $\hat{\pi}$ is the bank's inflation target and \hat{i}_r is the real interest rate to which the economy converges in the long run. Calculate by how much the actual real interest rate in the economy differs from \hat{i}_r if π is twice $\hat{\pi}$.

29. AS-AD model. In order to curtail its debt, the government decides to increase the income tax and, simultaneously, to cut public spending. At the same time, the government decrees a labour reform that solely amounts to a fall of all wages by 10%. (i) Using the AS-AD model, explain the foreseeable effect of all those measures on the inflation rate, real GDP, and the unemployment rate. (ii) Indicate a monetary policy measure that could revert the inflation rate to its original value.

30. Macroeconomic policy. The government knows that, whenever a domestic big bank is in trouble, it will come to the rescue and bail out the bank. Despite this, the government has announced that under no circumstance banks will be rescued. Now, a very big bank is in trouble and the government decides that it will be rescued. What limitation of economic policy is this situation illustrating? Explain your answer.

31. Policy effectiveness. University rectors (vice-chancellors) stood up the Spanish Education Minister, J. I. Wert, on the 23rd of May, 2012. It was an unprecedented case. It was claimed that this was expression of a protest against the minister's bad governance, since the decree-law on cuts on the higher education sector then recently passed had been drafted without consulting those in charge of implementing the cuts: the rectors themselves. What limitation of economic policy is this situation illustrating? Explain your answer.

Multiple choice questions

1. According to the classical dichotomy, a reduction in the money stock causes

- (a) a reduction in the real interest rate.
- (b) a reduction in real exchange rate.
- (c) a reduction in real GDP.
- (d) None of the above

2. That money is neutral in the long run means that

- (a) Okun's law is invalid in the long run.
- (b) monetary policy can always neutralize a negative supply shock.
- (c) the Ricardian equivalence proposition only creates inflation in the long run.
- (d) None of the above

3. Using the version of the quantity equation in which variables are expressed as rates of change, if the money stock remains constant and the general price level rises, then

- (a) real GDP necessarily rises.
- (b) if real GDP remains constant, the velocity of money has diminished.
- (c) if real GDP remains constant, the rate of change of the velocity of money is positive.
- (d) None of the above

4. According to the quantity equation, if $V = 2$ and $M = 400$, then

- (a) nominal GDP is not 800.
- (b) $P = 8$ if real GDP is 100.
- (c) real GDP is higher than 100.
- (d) None of the above

5. The central bank can provide liquidity by

- (a) conducting an open market operation in which the central bank sells financial assets.
- (b) raising the reserve requirements.
- (c) raising the people's liquidity ratio.
- (d) conducting an open market operation in which the central bank purchases financial assets.

6. The rest of the world has just entered a recession, so foreign output is being reduced. It is likely that, in the domestic economy, this will cause

- (a) a rise in both the inflation rate and real GDP.
- (b) a rise in the inflation rate and a fall in real GDP.
- (c) a fall in both the inflation rate and real GDP.
- (d) a fall in the inflation rate and a rise in real GDP.

7. Policymakers have decided to offset the effect on real GDP of a contraction of the AS function. If they resort to the fiscal policy to achieve this goal, the appropriate fiscal policy
- shifts the AD function to the right.
 - shifts the AD function to the left.
 - shifts the AS function to the left.
 - None of the above
8. When the central bank sells financial assets,
- the nominal interest rate tends to decline.
 - liquidity tends to rise.
 - the money multiplier goes up because the sale causes a rise in both the reserve ratio and the liquidity ratio.
 - the nominal interest rate tends to increase.
9. What sentence is not true?
- The central bank affects directly M_0 .
 - The money multiplier links M_0 with M_1 .
 - An increase in the reserve ratio lowers the money multiplier.
 - The ECB sets the value of the Euribor by means of a tender procedure.
10. What policy can neutralize the effect on the inflation rate of a reduction in population that does not affect employment?
- Supply-side policy.
 - Contractionary monetary policy.
 - Expansionary fiscal policy.
 - None of the above
11. Decisions on indirect taxes (like the VAT) fall within
- supply-side policy.
 - monetary policy.
 - fiscal policy.
 - None of the above
12. A contractionary monetary policy aims at
- reducing the real interest rate.
 - increasing the real exchange rate.
 - reducing the inflation rate.
 - None of the above
13. The interest rate channel of monetary policy differs from the exchange rate channel in that the former affects
- the government expenditure, whereas the latter affects net exports.
 - private investment, whereas the latter affects government expenditure.
 - private consumption, whereas the latter affects the credit conditions.
 - None of the above
14. Taylor's rule is an instance of
- a fiscal policy rule.
 - a monetary policy rule.
 - a supply-side policy rule.
 - None of the above
15. Which of the following is not an example of demand policy?
- An expansionary open market operation
 - Professional training programmes for unemployed workers
 - Cutting unemployment benefits
 - A rise in the tax rates
16. Using the version of the quantity equation in which variables are expressed as rates of change, if the money velocity remains constant, then
- if nominal GDP does not change, then the inflation rate is approximately equal to the rate of change of the money stock.
 - the rate of change of nominal GDP is always positive.
 - if the money stock does not vary, then the inflation rate is approximately equal to the rate of change of nominal GDP.
 - if the inflation rate is zero, then nominal GDP remains constant.
17. Combining an expansionary fiscal policy with a contractionary monetary policy
- always makes the inflation rate go up.
 - may leave the inflation rate unaltered.
 - always causes a drop in the inflation rate.
 - None of the above
18. Monetizing the government debt means
- increasing taxes now with the aim of decreasing them in the future.
 - that the central bank is implementing an expansionary fiscal policy.
 - that the central bank is carrying out a contractionary monetary policy.
 - None of the above
19. Fighting stagflation means aiming at
- increasing real GDP and lowering the inflation rate by adopting a contractionary monetary policy and an expansionary fiscal policy.
 - lowering real GDP and increasing the inflation rate by means of supply-side policies.
 - increasing real GDP and lowering the inflation rate by adopting an expansionary monetary policy and a contractionary fiscal policy
 - None of the above

20. An increase in real GDP and a reduction in the inflation rate have been observed. A possible explanation is that
- an expansionary fiscal policy has been implemented.
 - a contractionary monetary policy has been implemented.
 - supply-side policies have been applied.
 - None of the above
21. Which variable is in the quantity equation?
- The velocity of money
 - The unemployment rate
 - The target inflation rate
 - The real interest rate
22. The goal of an expansionary fiscal policy is to increase
- the money stock.
 - the unemployment rate.
 - the foreign real GDP.
 - None of the above
23. Which sentence is not false?
- The ultimate goal of monetary policy is to lose control of the nominal interest rate.
 - The inflation rate is the only intermediate target of monetary policy.
 - Establishing reserve requirements is a monetary policy instrument.
 - Open market operations do not constitute an instrument of monetary policy.
24. Which sentence is not false?
- The General Council is the main decision-making body of the European Central Bank.
 - The Eurosystem is exactly the same institution as the European Central Bank.
 - The European System of Central Banks is the monetary authority of the eurozone.
 - The Executive Board of the European Central Bank implements the monetary policy decided by the Governing Council.
25. The empirical evidence suggests that a persistently monetized budget deficit tends to
- increase the inflation rate.
 - accelerate a disinflation process.
 - cause deflation.
 - Neither (a) nor (b)
26. An example of a policy rule is given by
- Okun's law.
 - the Laffer curve or the rule of 70.
 - Taylor's rule.
 - the Phillips curve.
27. The empirical evidence suggests that the degree of independence of a central bank with respect to the government is negatively correlated with
- the unemployment rate.
 - the real GDP rate of growth.
 - the inflation rate.
 - None of the above
28. The sequence $\downarrow M0 \Rightarrow \downarrow M1 \Rightarrow \uparrow i \Rightarrow \uparrow i_r \Rightarrow \downarrow C \Rightarrow \downarrow I \Rightarrow \downarrow AD \Rightarrow \downarrow Y$ represents the interest rate channel of monetary policy.
- The step $\downarrow M1 \Rightarrow \uparrow i$ is not correct because, in the loan market, a fall in liquidity never implies a raise in the interest rate.
 - The step $\downarrow M0 \Rightarrow \downarrow M1$ is due to the money multiplier.
 - The above sketch represents the effect of an expansionary monetary policy.
 - None of the above
29. The main refinancing operations (MROs)
- are the interest rates set by the European Central Bank.
 - are also known as the marginal lending facility.
 - are a particular case of the Taylor's rule.
 - constitute a tool of monetary policy.
30. Goodhart's law states that the design of economic policies
- requires at least as many instruments as goals.
 - is always temporally inconsistent.
 - faces the problems generated by the existence of lags.
 - None of the above
31. Which combination of measures cannot give rise to a contractionary fiscal policy?
- The tax rate is lowered and the government expenditure is increased.
 - The central bank sells financial assets.
 - The tax rate is raised and transfers are increased.
 - None of the above
32. Which rate is not set by the European Central Bank?
- The interest rate on the marginal lending facility.
 - The interest rate of the main refinancing operations when they are executed in the form of a fixed rate tender.
 - The Euribor
 - None of the above

- 33.** Which sentence is not false?
- Policies that improve the productive capacity of the economy constitute examples of demand-side policies.
 - Monetary policy is an example of a supply-side policy.
 - According to the quantity equation the higher the government budget deficit, the larger the crowding out effect on private expenditure.
 - The classical dichotomy expresses a view on the relationship between real variables and nominal variables.
- 34.** The basic rule of economic policy asserts that
- there is no basic rule of economic policy.
 - policymaking based on rules is better than policymaking based on discretionary measures.
 - temporal inconsistent policies are not credible.
 - None of the above
- 35.** According to the crowding-out effect, an increase in the government expenditure tends to
- reduce private expenditure (consumption plus investment).
 - lower the nominal interest rate.
 - increase the inflation rate and cause a fall in real GDP.
 - None of the above
- 36.** According to Taylor's rule,
- the central bank should force the real interest rate to be below the long-run equilibrium real interest rate if the inflation rate is below the target inflation rate.
 - the central bank should force the real interest rate to be above the long-run equilibrium real interest rate if the inflation rate is below the target inflation rate.
 - the central bank should force the real interest rate to be below the long-run equilibrium real interest rate if the inflation rate is above the target inflation rate.
 - the proper design of economic policy demands having at least as many instruments as targets (or goals).
- 37.** The crowding-out effect has to do with
- the Laffer curve.
 - the Phillips curve.
 - neither (a), nor (b), nor (d).
 - the Ricardian equivalence proposition and the impossible trinity.
- 38.** Which sentence is not true?
- Monetizing the budget deficit does not mean that the government increases the tax rate to raise more revenue.
 - The crowding out effect takes place when the central bank buys financial assets.
 - An expansionary fiscal policy causes, at least initially, an increase in aggregate demand.
 - The empirical evidence suggests that, in general, the higher the degree of independence of a central bank with respect to the government, the smaller the inflation rate of the economy.
- 39.** The quantity equation is not directly related to
- contractionary fiscal policy measures.
 - the velocity of money.
 - real GDP.
 - None of the above
- 40.** What is likely to cause stagflation?
- A contractionary open market operation
 - An expansionary fiscal policy.
 - The closure of 30% of all the factories.
 - A tax rise combined with an increase in transfers.
- 41.** The main refinancing operations (MROs) of the European Central Bank are
- open markets operations.
 - standing facilities.
 - reserve requirements.
 - an absorbing liquidity procedure under the direct control of the General Council of the European Central Bank.
- 42.** The policy consisting of an expansionary fiscal policy combined with a supply-side policy,
- shifts Goodhart's law to the right.
 - shifts Taylor's rule to the right.
 - shifts both the AS function and the AD function to the right.
 - None of the above, or rotates the Laffer curve around its maximum point, or monetizes all the public debt, or always constitutes a temporally inconsistent policy, or contradicts the quantity equation.
- 43.** Which variable does not appear in Okun's law, the Phillips curve, or the quantity equation?
- The government budget deficit.
 - The unemployment rate.
 - The stock of money.
 - The inflation rate.

- 44.** Which one is a monetary policy instrument of central banks?
- (a) The money multiplier
 - (b) The reserve ratio
 - (c) The GDP deflator
 - (d) The inflation rate
- 45.** What policy neutralizes the effect on the inflation rate and the real GDP of a positive shock to the aggregate supply function?
- (a) An expansionary fiscal policy
 - (b) A contractionary fiscal policy
 - (c) A contractionary monetary policy
 - (d) None of the above
- 46.** Which sentence is true?
- (a) An increase in the government revenues due to a tax raise stimulates the economic activity
 - (b) A cut in public spending or a tax raise or both tend to depress aggregate demand
 - (c) An increase in public spending causes a fall in the overall economic activity
 - (d) Only (a) and (c) are true
- 47.** An expansionary fiscal policy aims at rising
- (a) the money stock.
 - (b) the unemployment rate.
 - (c) foreign real GDP.
 - (d) None of the above
- 48.** An expansionary fiscal policy on the inflationary region of the aggregate supply function
- (a) stimulates production and rises the unemployment rate.
 - (b) causes a decline in production.
 - (c) has a negligible effect on the inflation rate.
 - (d) None of the above
- 49.** An expansionary monetary policy aims at
- (a) lowering the interest rate.
 - (b) a currency appreciation.
 - (c) Reducing the inflation rate.
 - (d) None of the above