• **Question 1. Savings identity (7%, 7 minutes).** Explain if it is possible for an economy to have, at the same time, (i) a positive government budget deficit, (ii) a trade surplus and (iii) investment larger than savings.

• **Question 2. Savings identity (8%, 7 minutes).** Suppose that the coronavirus pandemic will create, during 2020, the following effects on the Spanish economy. First, it will reduce both exports and imports, with exports falling more than imports. Second, as regards the government budget, public expenditure and transfers will rise, whereas tax receipts will decline. Explain what must happen to net private savings (that is, the difference between savings and investment).

(Optional, 3%, 4 minutes. What if exports fall less than imports?**)**

• **Question 3. Real exchange rate (7%, 6 minutes).** Assume that the nominal exchange rate goes up and, simultaneously, the real exchange rate goes down. If the foreign price level remains constant, explain whether the domestic price level increases, decreases or does not change. Accompany your explanation with a numerical example.

• **Question 4. Money multiplier model (10%, 10 minutes).** The reserve ratio is 1/6. M1 is five times cash in the hands of the public. M0 is 100. Find cash in the hands of the public, M1 and the money multiplier. If there is no solution, explain why.

• **Question 5. (3% + 5%, 6 minutes).** Real GDP is 120. The GDP deflator (in base 100) is 240. The liquidity ratio is 1/2. The inflation rate is –3%. The exchange rate is 2 €/\$. The purchasing power parity exchange rate is 2 \$/€. The real interest rate is –5%. The open market operation is expansionary. The money multiplier is 2. The nominal value of a T-bill is 1000 euros. The velocity of circulation of money is 3. The CPI is 75. The unemployment rate has increased by 2%. Aggregate demand is equal to aggregate supply. Net exports are negative. The monetary base has not changed. Transfers are equal to public expenditure,which is the same as the tax receipts.

(i)   Find the nominal interest rate, if possible. If not, indicate what information is missing.

(ii)   Explain if the euro is undervalued or overvalued with respect to its purchasing power parity value.

• **Question 6 (optional, 7 minutes).** (i) Explain the decision problem depicted on the cartoon shown on the right.

(Optional, 4 minutes. (ii) What is, in your opinion, the choice made by the Spanish government? Explain your answer.

(iii) Presuming that the government faces the trolley problem several times, explain as well if there are reasons to believe that the choice initially made was subsequently changed.**)**

https://9gag.com/gag/aL07jq5/trolley-problem-of-covid-19
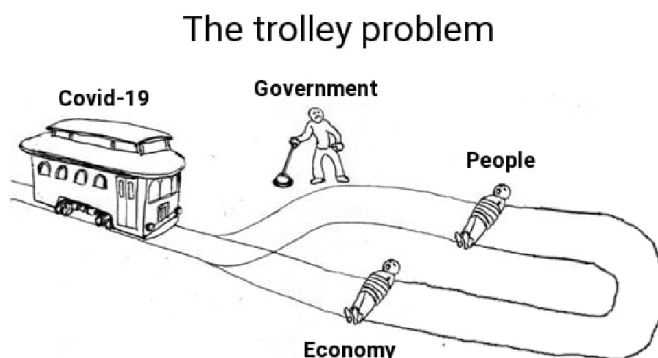
● **Question 7. Economic consequences of COVID-19 (12%, 10 minutes).**

(i)   Explain the message the cartoon below conveys. In particular, using concepts from the course, <u>explain how massive amounts of money could be used to fight the (economic consequences of the) coronavirus</u>.

(ii)   <u>What is the meaning of the scissors</u>? How is to be interpreted the person on top of the money-firing cannon saying no to the use of the scissors?
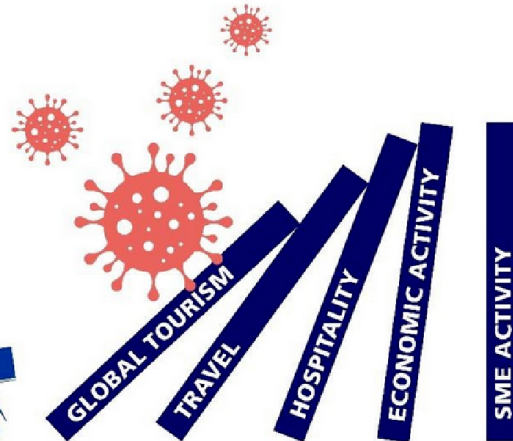

https://stweetly.com/Cartoon4sale/

● **Question 8. AS-AD model (25%, 20 minutes).** The slide below (by the Zurich Insurance Group) illustrates a domino effect caused by the COVID-19 pandemic via the contraction in global tourism. Consider a country receiving a large number of tourists.

https://europeansting.com/2020/03/27/this-is-the-human-impact-of-covid-19-and-how-business-can-help/

(i)   Use a graphical representation of the AS-AD model to ascertain the <u>effect on the inflation rate and GDP of a large reduction in the number of tourists coming to the country</u>. Explain which functions are modified and why.

(ii)   Use a graphical representation of the AS-AD model to find the <u>effect on the inflation rate and GDP of travel and hospitality companies closing down</u>. Explain which functions are modified and why. <u>Extend your analysis by considering the subsequent effect on all the SMEs</u> (= small- to medium-sized enterprises).

(iii)   What variable in the AS-AD model represents 'economic activity'? Why?

(iv)   Use a graphical representation of the AS-AD model to determine the <u>effect on the inflation rate and GDP of a large increase in the number of self-employed workers that must close their businesses</u>. What functions are modified? Why?

● **Question 9. AS-AD and currency market model (25%, 20 minutes).** An economic report by Nomura on the economic costs of lockdowns claims that "Lower oil prices and a demand shock caused by COVID-19, should push euro area inflation lower".

COVID-19 — The economic cost of lockdowns — NOMURA Connecting Markets East & West

GDP growth expectations (quarter-on-quarter saar)

China	United States	Euro Area	United Kingdom
-43%	**-42%**	**-43%**	**-44%**
Q1	Q2	Q2	Q2

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COVID-19 — Nomura's economic forecasts — NOMURA Connecting Markets East & West

Real GDP, % year-on-year

	Q4 2019	Q1 2020			Q2 2020			Q3 2020			Q4 2020		
		Base	Good	Bad	Base	Good	Bad	Base	Good	Bad	Base	Good	Bad
Global	3.4	3.1	-3.1	-3.4	-8.0	-5.9	-9.7	-3.1	-1.0	-7.6	-2.3	0.5	-7.2
United States	2.3	-0.6	-0.6	-0.6	-13.5	-10.4	-13.8	-11.0	-7.5	-15.4	-10.8	-5.2	-15.3
Japan	-0.7	-3.6	-3.6	-3.8	-7.3	-6.2	-9.0	-5.4	-3.4	-11.1	-3.0	0.1	-9.0
Asia ex Japan	5.1	-4.3	-4.2	-4.7	-3.0	-1.9	-5.4	1.9	3.2	-0.4	2.5	3.9	-0.1
Euro Area	1.0	-3.0	-3.0	-3.0	-16.0	-11.6	-17.4	-7.1	-4.1	-18.0	-5.6	-2.2	-17.5
United Kingdom	1.1	-3.3	-3.3	-3.3	-16.2	-11.9	-17.7	-6.6	-4.4	-16.5	-5.0	-2.7	-15.8

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https://www.nomuraconnects.com/focused-thinking-posts/global-covid19-economic-outlook/

(i)   Show, in a graphical representation of the AS-AD model, <u>how lower oil prices and a demand shock could reduce the inflation rate</u>. Explain which functions are modified and why.

(ii)   The report indicates that, in Japan, "The ¥108trn stimulus package will help keep the economy from falling into a vicious cycle but have a limited impact on demand", where <u>a stimulus package represents money spent by the government</u> (more public purchases and transfers). Describe that 'vicious cycle' (which variables are involved). <u>Use the AS-AD model to show how the package could 'keep the economy from falling'</u> into that cycle.

(iii) The report also claims, for Japan, that "The risk is renewed yen appreciation, caused by a full-blown global recession and further risk averse moves in markets". Show, in a graphical representation of the currency market model in which the yen is the home currency and the euro the foreign currency, <u>why the yen appreciates if all investors believe that a global recession is going to cause a more severe contraction in the eurozone than in Japan</u> (as the chart above suggests).
       [If you prefer, you may suppose instead that all investors believe that investing in Japanese financial assets is safer than investing in European financial assets.]

● **Question 10. (25%, 20 minutes).** Consider the cartoon below, by cartoonist KAL (Kevin Kallaugher), representing an 'American business cycle'. Use in each question the appropriate model to address the issue posed.

(i)   Explain the consequences for GDP of a gridlocked congress that <u>fails to eliminate harmful (to business) tax laws</u>.

(ii)   Why are corporate profits threatened in this case? Specifically, how could tax laws be harmful to businesses?

(iii)   Explain the <u>effect of the value of the dollar (with respect to the euro) if American owners of firms look for a 'safe haven'</u> (that is, they increase financial investment in the eurozone).

(iv)   The capital flight in (iii) reduces the tax revenue of the US government. What is the effect on the government budget of losing billions in tax revenue? <u>Is that effect expansionary or contractionary for aggregate demand</u>? Why?

(v)   <u>Explain what effect causes on the US interest rate a growing government debt</u>.

(vi)   **(Optional, 5%, 4 minutes).** Is there any similarity between the feedback process the cartoon depicts and the situation the COVID-19 pandemic may create in the near future (not just to the US economy but to any economy, in particular, less developed economies)?

● **Question 11. (20%, 20 minutes).** The chart below shows China's GDP growth rate.

"<u>China's economy shrank for the first time in decades in the first quarter of the year</u>, as the virus forced factories and businesses to close." https://www.bbc.com/news/business-52319936

(i)   Use a graphical representation of the AS-AD model to find the <u>effect on the eurozone inflation rate and the eurozone GDP of sharp contraction in the Chinese GDP</u>. Explain which functions are modified and why.

(ii)   Use a graphical representation of the currency market model to find the <u>effect on the value of the Chinese currency (the renminbi) against the euro of a reduction in the Chinese GDP</u>. Explain which functions are modified and why. Does the euro appreciate or depreciate?

Year-on-Year GDP has now fallen into negative territory
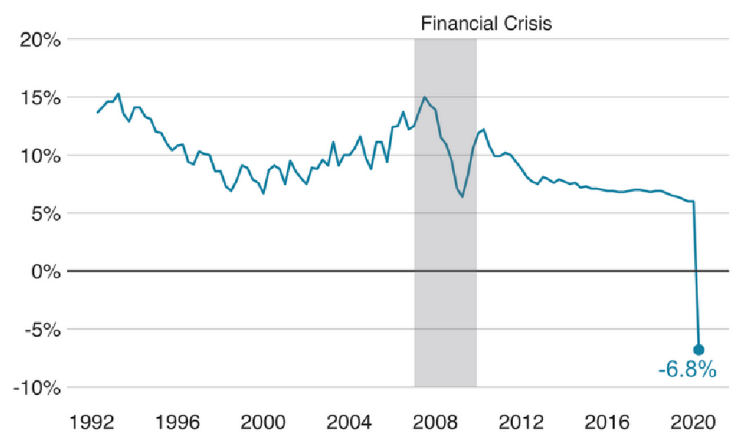
Source: China's National Bureau of Statistics

● **Question 12. (15%, 15 minutes).** Consider the cartoon below, by cartoonist KAL.

https://www.pinterest.com/pin/501799583466962171/

(i)   'Money' in the upper part of the cartoon is different from 'money' in the lower part. Why? (Hint: liquidity market model vs AS-AD model)

(ii)   Focusing on the upper part, interpret 'economic crisis' as 'rise in the interest rate'. Using the liquidity market model, <u>suggest a demand-side explanation of a crisis</u> and represent your explanation graphically. <u>Suggest also a supply-side explanation</u> and indicate how this explanation is captured by the model. Why having money is good in the liquidity market?

(iii)   Turning to the lower part, <u>use the AS-AD model to show the consequences of a stimulus plan by the government</u>. Why would the plan make people happy?

(iv)   **(Optional, 9%, 7 minutes).** Suggest similarities between the two situations shown in the cartoon and what the coronavirus crisis may cause (or may be already causing).

● **Question 12. (Optional, 9%, 6 minutes).** What does the cartoon below, by KAL, suggest to you? Do you think that the cartoon's message would remain valid if 'Economics' replaced 'Politics'? Motivate your answer.

https://stweetly.com/Cartoon4sale/
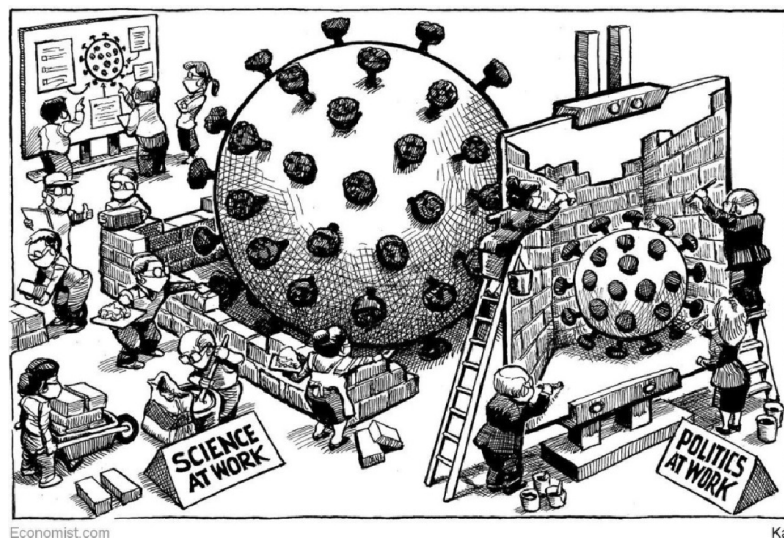
● **Question 13. (20%, 18 minutes).** "One of the more worrying consequences of the coronavirus is that it looks likely to become a catalyst for deglobalisation (…) At the centre of this will be the <u>decoupling of the Chinese economy with developed economies and the US in particular</u>. The world's three largest free economies – the European Union, the United States and Japan – are all drawing up separate plans to lure their companies out of China (…) Exports of goods and services accounted for 19.51 per cent of China's GDP last year, according to the World Bank."
https://finanz.dk/china-faces-economic-reckoning-as-covid-19-turns-world-against-globalisation/

(i)   Use a graphical representation of the AS-AD model to find the <u>effect on the eurozone inflation rate and the eurozone GDP of European companies moving factories and facilities from China back to the eurozone</u>. Explain which functions are modified and why.

(ii)   Use a graphical representation of the AS-AD model to find the <u>effect on the Chinese inflation rate and the Chinese GDP of European companies moving factories and facilities from China back to the eurozone</u>. Explain which functions are modified and why.

● **Question 14. (20%, 16 minutes).** Select two of the risks shown below (where SMEs means 'small- to medium-sized enterprises'). For each risk, pick a model (liquidity market, currency market, AS-AD) and illustrate the effects of the risk on the model, explaining the changes each risk causes in the associated model.

https://www.weforum.org/agenda/2020/05/covid-19-global-risk-landscape/

● **Question 15. (15%, 13 minutes).** Use some model (liquidity market, currency market, AS-AD) to answer the question in the cartoon on the right.

http://www.fundmymutualfund.com/2008/02/some-funny-cartoons-i-grabbed-from.html
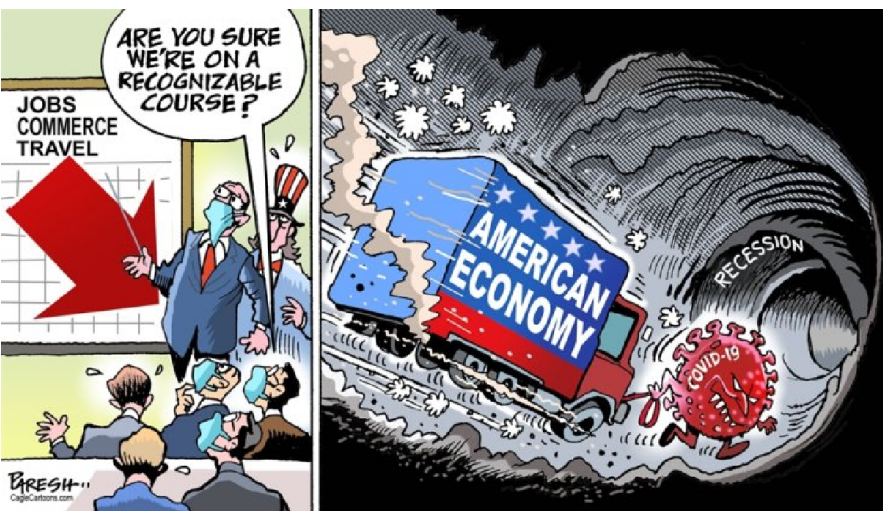
● **Question 16. (12%, 10 minutes).** Use some model (liquidity market, currency market, AS-AD) to justify the connection between the US economy and the coronavirus crisis that the cartoon on the left establishes.

https://www.koreatimes.co.kr/www/opinion/2020/03/197_286945.html

● **Question 17. (Optional, 7%, 5 minutes).** Justify or criticize the claim that, in the trolley problem on the right, the decision of the Spanish government has shifted from first doing nothing, imposing next the lockdown and now asking to wear masks (wearing masks in public places will, as a general rule, be mandatory as of 21st of May, 2020).

The trolley problem of Covid-19 and masks

https://twitter.com/PetrLudwig/status/1255821960510087169/photo/1
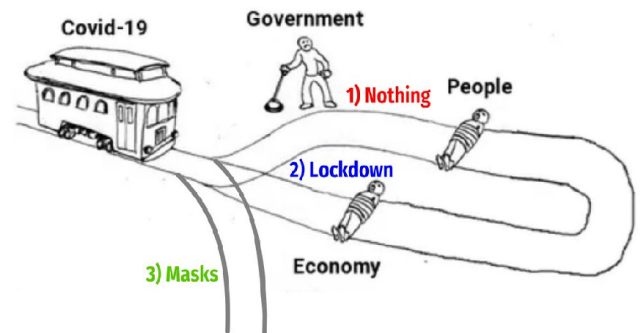
● **Question 18. (18%, 14 minutes).** The cartoons below depict two situations: one in which a recession occurs first and next a second wave of the pandemic occurs; and a second one in which the reverse happens, namely, a recession follows the pandemic. Use the AS-AD model to analyze whether the consequences of the two situations are significantly different.

https://www.koreatimes.co.kr/www/opinion/2020/03/197_286945.html

https://mackaycartoons.net/2020/03/18/wednesday-march-11-2020/

● **Question 19. Liquidity market model (20%, 15 minutes).** The chart on the right shows information on the long-run interest rates on government bonds.

"The COVID-19 epidemic is also causing interest rates to plummet, to the point that in early March yields on German and US 10-year sovereign debt registered historic lows (intraday rate: −0.89% and 0.33%, respectively). Both risk aversion and the expectation of an accommodative and decisive reaction from the central banks explain the decline in these safe-haven assets. However, throughout March, and as the need for fiscal policy to lead the fight against the COVID-19 epidemic became apparent, the expectation of greater financing needs on the part of the public sector exacerbated the declines in yields."

"… other indications of liquidity problems appeared when, in some sessions marked by significant risk aversion, the prices of what are traditionally considered 'safe-haven' assets (such as US or German sovereign debt) decreased instead of increasing: a symptom that needs to obtain liquidity were

Sovereign yields of Germany and the US and risk premiums *
Cumulative change in the period (bps)
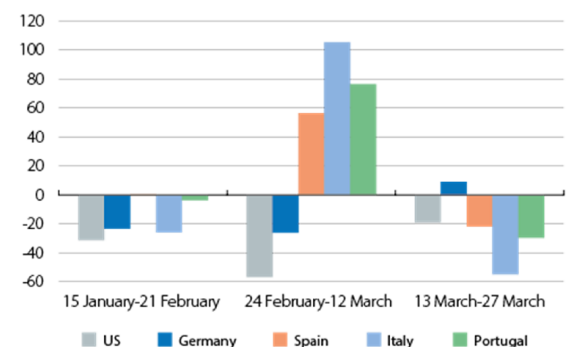
Note: * 10-year yields.
Source: CaixaBank Research, based on data from Bloomberg.

forcing some market players to sell assets which, in such a context of risk aversion, they would normally like to maintain on their balance sheet."

https://www.caixabankresearch.com/en/coronavirus-spreads-markets-and-monetary-policy-takes-urgent-action

(i)   Use the liquidity market model to explain how an 'accommodative and decisive reaction from the central banks' may cause a fall in the interest rate.

(ii)   Use the liquidity market model to explain the consequences on the interest rate of selling financial assets.

● **Question 20. Currency market model (20%, 15 minutes).**

"Dollar weak as euro rises on Franco-German proposal for recovery fund.

The U.S. dollar edged lower against the euro on Tuesday as the common currency added to Monday's gains following news of a Franco-German proposal for a fund that would offer grants to European Union regions and sectors hit hardest by the coronavirus pandemic (…) Germany and France, whose agreements usually pave the way for broader EU deals, proposed that the European Commission borrow 500 billion euros ($550 billion) on behalf of the whole EU. The Commission is expected to outline their proposal before a European summit scheduled for May 27.

The U.S. currency, which draws safe-haven flows when risk appetite falls, has assumed a softer tone as investors took heart from encouraging early-stage data for a potential coronavirus vaccine (…) Governments scaling back lockdown restrictions has also helped investors grow optimistic that economies could soon return to normal." (18 May 2020, cnbc.com)

https://www.cnbc.com/2020/05/19/forex-markets-us-dollar-coronavirus-vaccine-optimism-in-focus.html

(i)   Use the currency market model (taking the euro to be the home currency and the dollar the foreign currency) to explain why good news about the prospects of the eurozone economy may cause a depreciation of the dollar with respect to the euro.

(ii)   Use the currency market model (with the euro being the home currency and the dollar the foreign currency) to explain why a reduced role of the dollar as a 'safe-haven currency' may cause a depreciation of the dollar with respect to the euro.