CON0002: Final Coursework – Written Component (30% of Overall Mark)

Please read these instructions carefully before you start. DO NOT include your name anywhere on the submission document!

Use the template on the next page for your submission. You must answer all of the questions listed. Each question carries roughly equal weight.

The deadline for submission is **Monday, May 9th 2022 at 12 noon (London time)**. We expect that once you have done all your revision/prep, it should take you no more than 3 hours to write the answer.

The **word limit is 1200 words** across all 6 questions (A – F).

The word limit rules are similar to those for the Individual Writing Assignment: text in graphs, tables, equations, headings or titles, sources, references and in-text citations do not count. If your submission is longer than the permitted length, it will be subject to length penalties set by UCL.

Please also make sure that you understand and abide by UCL's academic integrity policy. If you refer to material from *The Economy* or any other citation, please provide a full bibliography (reference list) as indicated at the end of the template (preferably Harvard style).

When you are drawing graphical models or writing equations, please produce these yourself by hand rather than copying and pasting from somewhere else. Include your student number with the drawing/written equation and paste this into the submission document in the appropriate place where you are discussing the diagram/equation.

Those with SORAs registered with the department will automatically get the extra time they are registered for. If you need to submit an Extenuating Circumstance instance, please read the information on the Student Support Moodle page and complete this form.

If your work is submitted late and you do not have a SORA or an EC, it will be subject to late submission penalties which will be applied by the Departmental Tutor in line with UCL regulations.

ECON0002 Summer Coursework Submission Template

Use this template to submit your coursework. You can extend the size of the answer box to fit your answer. **The word limit for your answer is 1200 words. That is, the sum of words for all your answers to six questions A-F should not exceed 1200 words**. Each question carries roughly equal marks.

A)
Ana decides every day how many hours to work and how much beef to consume. She spends all income earned from work each day on consumption of beef.

Her utility function for free time (t, 24 hours minus hours worked) and consumption (y) is: $U(t, y) = 2t^{\frac{1}{2}} + y$

The price per unit of beef consumed is 4 and her hourly wage is 1.

- Using a diagram and appropriate algebra, explain what Ana's optimal number of hours work and units of beef consumed are each day.

Ana reads a book about the impact of beef consumption on climate change and realises that there is a cost to society of her beef consumption. She takes account of this impact on society in her own decisions, incorporating a disutility of -0.03y per unit of beef consumed. She still only consumes beef and spends all income earned each day on this consumption.

- Explain, using a diagram and appropriate algebra, how recognition of the impact of her consumption choice on climate change impacts on Ana's daily free time and beef consumption choice.

- Suppose that Ana knew about the impact of beef consumption on climate change but did not take it into account when making her private decision about how much free hours and beef to consume. What could a government do to get her to reduce the impact of her consumption on the environment?

Write your answer to part A) here:

As Ana has decided that the consumption of beef is a cost to the society, she is going to reduce the consumption of beef on daily basis. As certain part of her income was going for her beef consumption on daily basis, the decision of reduction in beef consumption will also impact on the reduction of the income (Pinto-Prades et.al., 2019). As per the utility, the decline in the beef consumption is -0.03y per unit.

The present utility of Beef consumption of Ana is $U(t, y) = 2t^{\frac{1}{2}} + y$, but the changes in the consumption has changed the equation to this.

U (t,y) = 2t1/2 +y
d/dy(U(t,y)) = 2x 1/2t1/2 +1 = 0
t = 1 hour (optimum working hour)
The optimal hours of beef consumption is 1 hour.

This would impact on the free time of Ana and also the time that is gone in the consumption of beef. As there will be reduction in the beef consumption, there will also be reduction in the free time eating the beef. Ana would be also be able to save the daily income that she spends on purchasing the beef.

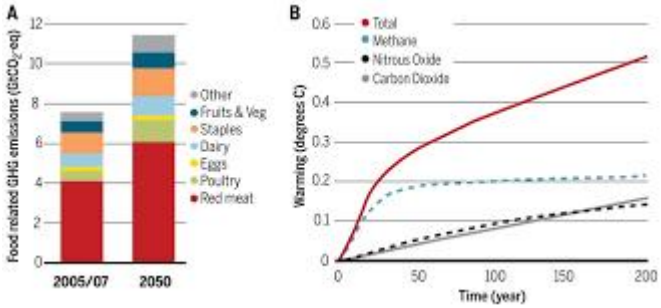

Fig: impact of Beef consumption

The govt. tends to further educate her and other people about the impact of beef consumption on the climate change.

- Ana also reads that climate change is caused by carbon emissions from air travel. Two airlines run flights between two cities, Air A and Air B. The government has said that the airlines can produce 100 units of carbon emissions between them, under a carbon permit scheme, and should decide how to split the 100 units between them. Air A and Air B have the same operating costs and the same costs of reducing the amount of carbon that they produce per flight.

Say Air A has been operating on the route for over 50 years and the government decides to give all the permits to Air A (based on its long use of the route). Air A offers a proportion R of the 100 units of permits to Air B and Air B can accept the offer or reject it and not fly on the route.

- How will the other parameters of the model as discussed in this module affect the value of R* at which Air B accepts the offer?
- Say that the government gives the permits to Air A for 5 years, and will gives them to Air B for years 6 to 10. So after 5 years, Air B can decide how they should be allocated between the airlines. How does this kind of setup affect the offers that will be made and whether those offers will be accepted?

Write your answer to part B) here:

The other parameters of the module which would affect the value of R* at which Air B accepts the offer would be that of the operating costs and the costs of reducing the amount of carbon the airplane is producing. As the value of R would be less than 50 percent, there will be drastic decline in the costs of the Air B, also it would mean that there would be less carbon emissions. This can create misbalance in the operational costs of Air B. This offer would also mean that Air B would have to reduce the number of flights that are flying in that route.

If the govt. decides to allocate the permit to both Air A for 5 years and Air B for 6-10 years, it would be easier for both the airplanes to manage the costs and also generate revenue. After the period of 5 years, Air B can take relevant decision regarding the allocation. This kind of setup will affect the future offers in a way that the operational costs of the airlines would be reduced to certain period of years and the organization requires higher capital for functioning between the routes (Michaillat and Saez, 2015). The costs would be affected and on the basis of the costs, the offers can be further accepted or declined.

C) Tackling climate change, a global problem, requires international agreements and successful implementation of those agreements. Explain, using examples from Climate Change Agreements since Kyoto 1997 and your knowledge of strategic interactions over time, why global agreements are difficult to implement in practice. Referring to the game you have used, make one recommendation on how you think the game could be changed so as to predict an increase in the chances of agreements being implemented. Make sure to include any appropriate equations or graphical analysis and independent research as relevant.

Write your answer to part C) here:

The Kyoto Protocol was adopted as the first and foremost addition to the United Nations Framework Convention on Climate Change, which is committed to the signatories for developing national programs for the reduction of the greenhouse gases emission's. The climate agreements are legally binding treaties that are useful in implementing certain actions that are beneficial for the environment. The goal of the treaties is to reduce the global warming to lower levels.

One of the key points of the agreements is that all the countries have to put actual efforts in the reduction of the carbon emissions and this can be accomplished through the policies which are framed for the prevention of the greenhouse gases (Guiot and Cramer, 2016). All the countries that are part of the agreement needs to strictly implement the changes that are required for achieving the goals. One of the short-comings of the other agreement such as Paris Agreement, tends to fail in addressing the issue of "free-rider" problem which states that the countries only want to benefit from the global efforts for limiting the emissions irrespective of the total contributions. The global agreements are difficult to implement as all the countries are not on the same page and they are unable to contribute to the final goal.

According to the game used, one of the key recommendation that can be made is that all the countries that are part of the climate agreement should be bound to have some positive input in the changes that can take place in the climatic conditions respectively.

D) Consider an economy (call it country G) that is implementing climate change legislation more rapidly than other countries (refer to them as 'row' for 'rest of the world'). Explain how this decision by country G could affect its long-run markup. Using diagrams, explain your forecast for the effect of this decision on real wages, inequality and employment in G in the new equilibrium. In the light of your findings, what advice would you give to a policy maker in G?

Write your answer to part D) here:

The economy of country G is implementing the climate change legislation faster than the other countries, which is beneficial for the changes in the climate conditions of the country G. This decision of the country can impact its long term mark up in a way that the costs of the country might increase than the other and it can also have negative impact on the GDP of the country. There are chances that the GDP of G might decrease due to the excessive costs incurred for the climate change. But, it would have a positive impact on the climatic conditions of the country (Gough, 2017).

The long-run markup of G country would be higher as it would be able to reform its resources and can also be able to minimize the global warming to certain degrees.

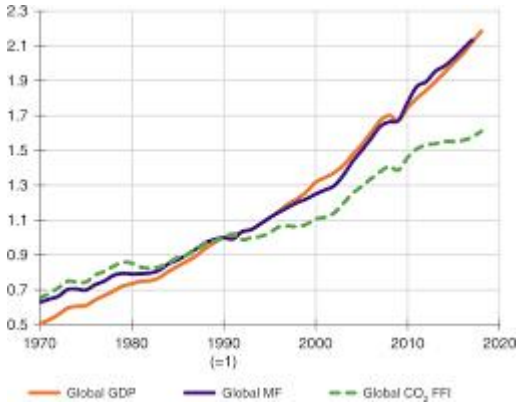

Fig: Impact of climate change legislation on Real Wages

The above image describes the impact of the Climate change legislation on the real wages, inequality and employment. It can be seen that the legislation would lead to an increase in the real wages and it will also increase the employment chances in the country as it would open new opportunities for employment. The wages would also increase as the benefits from the climate change would mean that the country would have to spend less on the climate change related activities.

The advice that can be given to the Policymaker is that the actions that would be taken for the Climate Change Legislation would lead to increase in the wages and will also give rise to the employment status as well. The impact of the legislation would lead to increase in the jobs.

E) A government announces a green budget where they will provide zero interest loans for private sector investment in green electricity production, spend on government investment in rail transport and increase value added tax on all consumer goods with a high carbon

footprint. Use the multiplier model (diagram and equations) to explain the likely effect on aggregate demand in the economy. Assume ceteris paribus. In your answer explain how you are interpreting 'cet. par.' when discussing the predictions of the multiplier model.

Write your answer to part E) here:

The multiplier effect indicates to any changes that takes place in the consumer spending that is resulting from any real GDP growth or the contraction through the use of the Fiscal Policy. There is stimulation in the aggregate demand when the govt. increases its spending. In this case, the govt. is announcing a green budget under which they are providing zero interest loans for the private sector investment and are increasing the VAT or the Value Added Tax on the consumer goods with higher carbon footprint. The multiplier impact on this situation can be explained with a diagram:

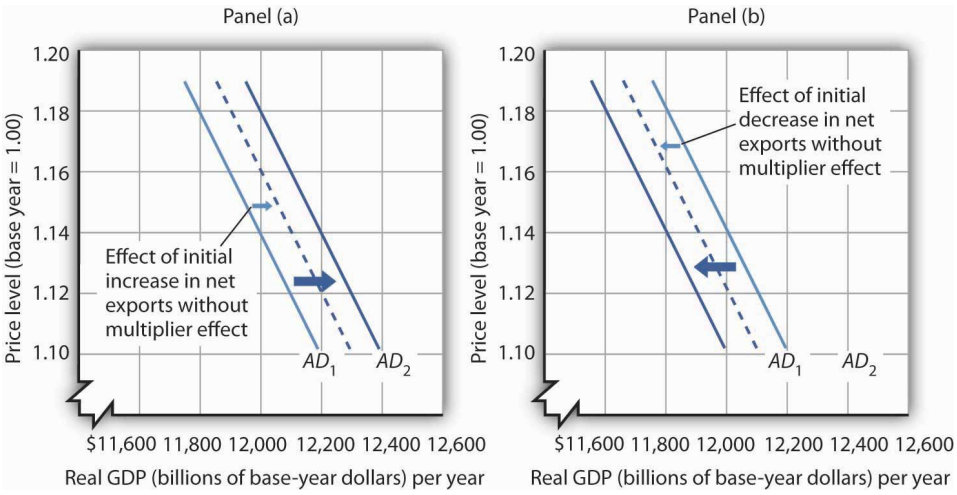

Fig: Impact of increase in aggregate demand

The above diagram reflects that there is increase in the aggregate demand, when the govt. tends to provide loans at zero interest. This indicates that while all the other conditions are same (ceteris paribus), the increase in the stimulus would further increase the demand of loans of the investors in the private sector investment(Palley, 2019)

The predictions of the model considering the aspect of ceteris paribus is that the availability of the capital would increase when the other measures remain the same. This would mean that the organizations working in the area of green electricity production tends to gather higher capital which can be beneficial for the project. This indicates that with the use of the capital, there would be higher production of green electricity in the future.

F) Now, suppose the economy in which the policies in parts (D) and (E) were implemented was initially in equilibrium (i.e. with zero net entry and constant inflation). It has an inflation-targeting central bank. How would you expect the central bank to respond to the

implementation of these policies? Use a diagram to help you explain this using the concepts of the WS/PS model, AD curve, Phillips curve, the bargaining gap, central bank preferences. (Do not explain how the economy would react to the central bank's behaviour.) Would consideration of the central bank's reaction lead you to alter the advice you offered the policy maker in (D)? Assume that you cannot interfere with the central bank.

Write your answer to part F) here:

The economies in which the policies related to the climate change are implementing were in equilibrium. But, the Central Bank in the economy is Inflation-targeting which means that the Bank has to make changes in its policies to abide by the changes that are taking place in the economy. The changes in the policies is tend to have a higher impact on the aggregate demand, but if the Central Bank is targeting the Inflation, then the demand needs to reduce (Taylor, 2019). The inflation targeting indicates that the Central Banks will either increase or decrease the interest rates for achieving their goal.

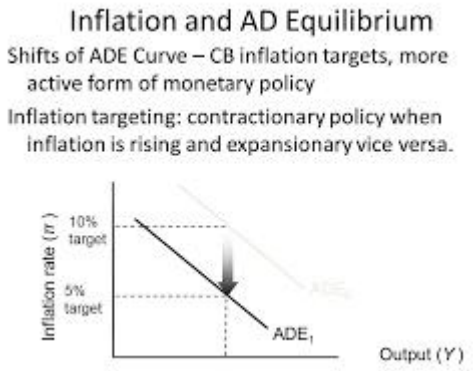

Fig: Inflation and AD Equilibrium

The graph presents that the changes in the inflation rate would impact on the aggregate demand and the Equilibrium of the economy as well. In the case when the govt. is trying to increase the demand by providing zero-interest loans, there is a possibility of increase in the inflation, which the Central Bank might not approve of considering the inflation targeting goal. The steps taken by the Central Bank for inflation targeting can lead to decline in the aggregate demand. The policy maker can make changes in the interest rates so that it can correlate with the Central Bank so that there is not much decline in the Aggregate Demand and the objective of the govt. is also achieved.

References (provide list of references used in all parts of your answer here)

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