PJC 2017 H1 Prelim Exam Paper 1

Question 1: The impact of climate change

(a) Using Table 1, compare the overall change in food prices between 2006 and 2010 with that between 2011 and 2015. **[3]**

Suggested answer:
Food prices from 2006 to 2010 has been increasing while food prices from 2011 to 2015 has been falling.
Food prices rose at a faster rate (47%) from 2006 to 2010 while food prices from 2011 to 2015 fell at a slower rate (28.6%).
There was a fall in food prices from 2008 to 2009 while the fall in food price trend from 2011 to 2015 has been consistent.

(b) With reference to Extract 2, define opportunity cost and give an example. **[3]**

Suggested answer**:**
Opportunity cost is the next best alternative foregone.

Firms have to choose between investing in clean energy sector and investing in capital good to increase output. If firms choose to invest in clean energy sector, they would forgo the profit that they would earn from increasing their output.
Or
Governments have to choose between spending in clean energy to reduce negative externalities and promote steady sustainable growth, and to spending to promote actual economic growth. If they choose spend to ensure sustainable growth, they would forgo current growth.

Note: Due to question requirement 'reference to extract 2', answers from extract 1 or not related to climate change/growth will not be accepted.

(c) With reference to Extract 3, explain whether supply or demand factors are likely to be more important in explaining changes in the price of food. **[6]**

Suggested answer**:**
With reference to Extract 3, changes in food prices can be affected by reasons such as rising population, weather changes, price elasticity of demand and supply and R&D.

Demand factor
As world population rises, there will be more mouths to feed and this will lead to a rise in demand for food as food is necessary for survival. The rise in demand for food will lead to a shortage at the original price, and with an upward pressure on price, price of food will increase. As food crops require time for gestation and as a perishable good (mentioned in Extract 3 Para 1), the rise in demand against a price inelastic supply curve will cause food prices to rise significantly.

Supply factor
Poor weather conditions have made food crop cultivation unfavourable. This implies that food production will be disrupted, leading to a fall in supply for food in the market for food. With demand for food being price inelastic as it is a necessity to all and supply falling drastically, the price of food will increase significantly.

Overall judgement/conclusion

In the short run, supply side factors seem to be more influential in terms of affecting food prices as producers and countries may not be able to pre-empt and tackle such changes effectively. With stocks being low, the inelastic supply of food makes changes in food prices even more volatile.

However, in the long run, when food supply becomes more stable and increases as R&D efforts pay off (Extract 3, last para), demand factors possibly due to a rise in income and population may play a bigger role in affecting food prices. This is because the nature of food will not change and it is almost impossible to curb demand for food when population and income both rise over time.

(d) With reference to Extract 3, explain why countries like the UK and the US are able to cope better compared to Africa and the Middle East in view of the significant rise in food prices. **[4]**

Suggested answer**:**
In UK and US, consumers consume a considerably greater amount of processed food compared to Africa and the Middle East. Hence when food prices rise, the cost of production for processed food will rise as fresh food is used as a factor input to produce processed food. This would result in a fall in the supply of processed food and a rise in the price of processed food. In comparison, this increase in the price of fresh food will be felt to a greater extent by consumers in Africa and the Middle East as they consume mainly fresh food and relatively less processed food, implying that consumers in UK and US will be able to cope better when food prices rise significantly.

In addition, due to differences in the absolute level of income, the proportion of income spent on food by UK and US consumers is relatively lower compared to consumers in Africa and the Middle East. This is supported by evidence from Extract 3 where it was mentioned that the poorest households in Africa and the Middle East are spending about 50% of their income on food, implying that when fresh food prices rise and with a lower absolute level of income compared to UK and US consumers, they will be more affected.

(e) With reference to Extract 3, explain whether the use of export controls by governments to prevent rising food prices is justified. **[6]**

Suggested answer**:**
The reason for imposing export controls cited in Extract 3 was to cope with rising food prices which affected poorer households greatly and worsens equity.

The use of export controls by governments of food producing countries is justified.

By imposing export controls, this will increase the supply of food for the domestic economy (from S_D to S'_D). At the original price, quantity supplied will outweigh quantity demanded, resulting in a downward pressure on price, leading to a fall in the price of food. The fall in the price of food will alleviate the pressures felt by poorer households. This is necessary as food is a necessity to all households and government has an obligation to ensure food prices are affordable to all.

However, the use of export controls is protectionistic in nature and may result in retaliatory actions taken by the country's trade partners. Such actions will reduce the export revenue of the country that implemented the export controls and bring about a contractionary impact on the economy. The impact will be even more significant if the country depends on trade greatly as a key driver of economic growth. In addition, protectionism goes against the comparative advantage theory, perpetuating inefficiency and limits the gains from trade.

Conclusion/Judgement

Export controls are at most a short term measure to deal with ising food prices. In order to stabilize food prices and reduce food price volatility, there must be efforts put in to raise supply through use of advanced farming techniques and technology.

(f) Discuss the view that the problem of negative externalities caused by carbon emission from firms can best be solved by using a policy of tradable permits. **[8]**

Suggested answer**:**

Intro

Negative externalities are generated from carbon emission from firms. This result in market failure, where the free market fails to achieve economic efficiency without government intervention. Hence, **governments would consider whether market failure due to the carbon emission can best be solved by using a policy of tradable permits (Claim).** However, its feasibility and effectiveness may cause it not to be the best policy to correct market failure.

The policy of tradable permits is the best to correct market failure.

The carbon emission from firms will result in external cost borne by third parties who are not directly involved in the production or consumption of goods, which is not considered by firms. For example, high carbon emission resulting in severe climate change that damaged food crops. When the governments introduce the policy of tradable permits, it would force the firms to find the lowest possible cost method to reduce emission.

Governments will distribute tradeable permit to different firms up to a certain quota. These permits would allow firms to produce a certain level of output (Qs) and pollution. If firms need to produce more, they will either buy more permits or adopt a more efficient production method, whichever is cheaper, If firms find producing in a more efficient method that could reduce carbon emission (e.g.: investing in clean technology to meet new emission quota), it would reduce the external marginal cost (negative externalities). As seen in Fig 1, This will reduce the divergence between the private marginal cost (PMC) and social marginal cost (SMC) from SMC to SMC2. This would increase social optimal output of production from Qs to Qs2 (where SMC2 = SMB), which reduce deadweight loss from area AGF to area HJF.

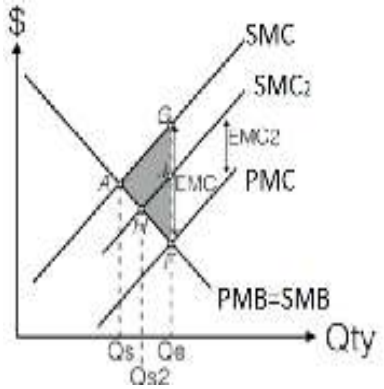

Figure 1

If firms want to produce beyond the emission quota, they would need to pay for the permits to do so. This will force them to internalise external cost, causing them to incur higher private marginal cost (from PMC to PMC2) as seen in Fig 2. This would cause the firm's output level to fall to Q2 (where PMC2 = PMB). Hence, the deadweight loss to society has reduced from area ADE to area ABC, reducing market failure.

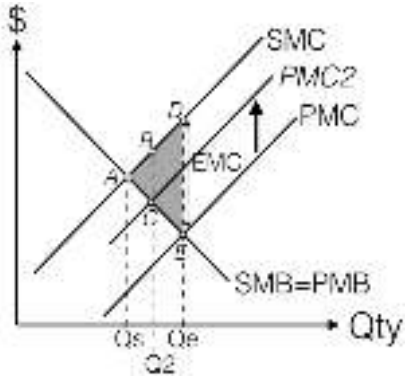

Figure 2

This policy is beneficial to create a profit incentive that encourages firms to cut emission and develop methods of production over time. For those who do not cut emission would then have to pay the true cost of production by internalising the external cost of production.

However, governments might not find it feasible to implement it as they would face large administrative costs to monitor and measure emission level of individual firms when they produce goods and services. Failure to monitor them closely would make the policy ineffective as firms would have little or no incentive to cut emission. There will also be unintended consequences as firms may shift production overseas to avoid incurring higher cost of production through investing in cleaner technology and paying for permits. This could lead to higher unemployment in these industries, and even a fall in exports.

Hence, to reduce cost of production as firms try to meet emission quota, governments should also give subsidies to firms which use low emission technology. This would allow them to reduce the external marginal cost of production without firms from incurring higher cost of production. This would be better than tradable permits as the firms would have more incentives to use cleaner methods of production to reduce carbon emission while maintaining its profit.

This policy however, might be unsustainable for governments which have budget deficit as they might incur higher opportunity cost when diverting its funds from other projects (education, healthcare, national defence) to reduce carbon emission.

As there is no effective policies that does not require government to monitor carbon emission, governments will need to set aside funds to ensure constant monitoring. However, it does create the incentive for firms to invest in research and development if is cheaper than buying tradable permits. However, it is not the best policy to solve market failure in the long run, especially if the price of permit is less than spending on clean technology. Thus, it had to be complemented with other policies to prevent firms who are facing higher cost of production due to the new initiative from moving away from the country. Hence, if government the subsidies given to firms which promote cleaner production, it would be a long term solution to reduce the effect of climate change. This would increase incentive for firms to invest technology to reduce carbon emission instead of moving away due to the introduction of tradable permits.