

## Question 1

### The market for coal in China and US

**Table 1: Total Coal Exports and Imports** (thousand tons)

		2008	2009	2010	2011	2012
<b>China</b>	Exports	63,384	25,235	27,181	27,546	15,184
	Imports	44,467	138,890	179,870	200,722	318,466
<b>United States</b>	Exports	83,478	60,404	83,179	108,229	126,720
	Imports	37,811	22,985	20,567	14,505	10,294

Source: US Energy Information Administration

**Table 2: GDP Growth Rates** (annual % change at constant prices in local currency)

	2008	2009	2010	2011	2012
<b>China</b>	9.6	9.2	10.4	9.3	7.7
<b>United States</b>	0.0	- 2.8	2.5	1.8	2.8

Source: World Bank

**Table 3: Company Data (2011)**

	Glencore	Xstrata
<b>Revenue</b> (billion dollars)	144.9	33.9
<b>Profits</b> (billion dollars)	4.07	5.78
<b>Employees</b>	55,000	38,000

Source: BBC

#### Extract 1: China overtakes Japan as world's top coal importer

China overtook Japan as the world's top coal importer for the first time in decades last year, partly driven by robust Chinese demand. China, also the world's biggest coal producer and consumer, imported 200.7 million tonnes of the fuel in 2011.

China is likely to keep its top position in 2012 as rising costs and competition from foreign coal have created pressure for imports. China's coal consumption is expected to remain robust as new coal-fired power generation comes on-stream and demand from the cement industry, the second-largest driver of thermal coal consumption, is also seen rising as the government makes a strong push to urbanise. A Reuters poll last month, however, showed the country's coal imports are expected to grow at a slower pace in 2012, as domestic appetite moderates and home production rises.

Source: Reuters, 26 January 2012

#### Extract 2: Glencore and Xstrata merger

Analysts have been poring over the mathematics of the recently announced proposed all-share merger between Glencore and Xstrata, trying to work out which side has the better of the deal. The alliance would extend Xstrata's lead as the world's biggest thermal-coal miner, giving it more than one-tenth of the market, and make it the global number-three in copper. Half of Glencore's business is in buying and selling commodities. With all Xstrata's output at its disposal, it would be better able to blend coal and ores to customers' specific requirements.

Size can cause problems with officials as well as create advantages. It is possible that the world's antitrust authorities may not like the look of a merger that unites a dominant commodity

trader and a leading miner of lead and zinc as well as coal and copper. The merger's logic may be hard to dispute but Xstrata's shareholders are unhappy. They believe that in the attempt to create a mining behemoth they are being short-changed, as Xstrata brings better assets, a stronger balance-sheet and rosier prospects for growth. A couple of large institutional investors have threatened to block a deal that they believe favours Glencore.

The proposed \$77 billion merger between miner Xstrata and commodities trading giant Glencore has been plagued with difficulties and delay. Xstrata CEO Mick Davis was originally slated to become the head of the combined company, only to see the terms of the deal changed to put Glencore chief Ivan Glasenberg on top after a six-month transition. As the tenor of the deal has changed, so have Davis' feelings about it. He worries that the company that he built would not be managed the right way in its new incarnation, and that he would not be able to build an effective bridge between the companies in only six months due to the fundamental differences in culture.

Sources: The Economist, 11 February 2012; Business Insider, 28 January 2013

### **Extract 3: US switches to clean energy alternatives**

America is shovelling coal to the side-lines. Utilities are aggressively ditching coal in favour of natural gas which has become cheaper as supplies grow. Natural gas has other advantages over coal. It produces far fewer emissions of toxic chemicals and gases that contribute to climate change, key attributes as tougher environmental rules go into effect.

A pair of clean air rules enacted by the Environmental Protection Agency (EPA) over the past year tighten the limits on power-plant emissions of sulfur dioxide and nitrogen dioxide, and place new limits on mercury, a poison found in coal. This will force between 32 and 68 of the dirtiest and oldest coal plants in the country to close over the next three years as the rules go into effect, according to a survey of power plant operators conducted late last year. Once the guidelines go into effect, no coal plants will be built unless utilities can develop a cost-effective way to capture carbon dioxide, analysts say. That technology has been slow to develop and is very expensive.

Source: The Huffington Post, 6 December 2012

### **Extract 4: Green protectionism vs. growth**

Some rich countries are imposing carbon limitations and threatening to curb imports from poor countries. This will cripple their own economies and harm the poor without doing much about emissions. Various governments want such green protectionism, including taxes on carbon-intensive imports, or on all imports from countries that do not cut emissions, especially the main targets, China and India.

The European Union wants to cut emissions by 20 percent by 2020, while proposed US legislation aims for 80 percent by 2050. But large emitters of greenhouse gases such as India and China are more worried about growth and tackling poverty.

Carbon restrictions on trade, however, will do little to reduce emissions. Taxing carbon-intensive imports from China, for example, will have a negligible impact because the vast majority of its emissions-laden exports go to other developing countries.

Carbon barriers on trade make even less sense when one considers the nature of global production today. Rich countries "import" around one-third of their carbon dioxide (CO<sub>2</sub>) emissions (the amount of CO<sub>2</sub> released in making imported goods), often from developing countries. The production of a single item often involves trading components between many different countries. Complex supply chains have brought cheaper and better goods and high-paying jobs to rich countries, and infrastructure, new jobs and higher incomes to developing countries. Over a quarter of all global trade in manufacturing is now in intermediate components, not final products. Rich countries cannot restrict imports without damaging their own production and growth.

Source: The Korea Times, 16 April 2010

## Questions

**(a) Compare the trends in imports of coal into the US and China from 2008 to 2012. [2]**

*Imports of coal into US were generally decreasing while imports of coal into China were generally rising. [1m]*

*The extent of changes in China's imports was larger than that in the US, i.e. 700% rise in the case of China as opposed to 70% fall in the case of the US. [1m]*

*(Note: As there are no similarities, students are to give 2 differences to be awarded 2 marks.)*

*Other answers accepted:*

*Imports of coal into China are consistently higher than the imports of coal into the US. [1m]*

*Note: Comparison should be made across the time period 2008-2012. Answers that compare a sharp spike in imports of coal into China from 2008-2009 are not accepted.*

**(b) Explain the relationship between GDP and imports of coal in China. [2]**

*Higher GDP → greater purchasing power → higher C → higher production of local goods and services → higher demand for imports of coal for use in production [2m]*

*OR: Higher GDP → greater purchasing power → higher energy consumption (heating, cooling, etc) → higher demand for coal imports [2m]*

*OR: Higher imports of coal → more energy/resources to fuel local production of goods and services → higher output → higher GDP [2m]*

*Note: If students use "GDP growth" instead of "GDP", max 1 mark if economic reasoning is correct.*

**(c) China is both the top producer and importer of coal in the world.**

**(i) Explain whether the case of a country exporting and importing within the same commodity group contradicts the Theory of Comparative Advantage. [4]**

*The Theory of Comparative Advantage states that a country should specialise in the production of a good if it can produce it at a lower opportunity cost than its trading partner. Difference in opportunity costs arises from the different factor endowments each country has. Hence if China has a comparative advantage in the production of coal, it should specialise in producing coal for domestic consumption and export, while importing another good that her trading partner can produce at a lower opportunity cost. [2m]*

*However, a country may choose to export and import within the same commodity group for various reasons. [2m for any acceptable reason]*

- *to increase the level of competition in the domestic market. With competition, there will be lower prices and greater variety, which will benefit consumers.*
- *to obtain different varieties of a product but of a similar quality/grade*
- *to obtain different varieties and of different quality/grade*

*Other acceptable answers:*

- *The country is experiencing increasing opportunity costs as level of production rises.*
- *The country is in the process of losing its comparative advantage as shown by falling exports and rising imports of the good. However, such structural changes take time resulting in the good being both imported and exported.*

**(ii) Using the information available, what conclusion can be drawn about the price elasticity of demand for coal in China compared to that in the US? [4]**

The demand for coal is generally price inelastic, as coal is an input for generation of energy, which is a necessity. The demand for coal in China is likely to be more price inelastic as compared to the demand for coal in the US.

According to Extract 1, China is the world's largest consumer and producer of coal. With a growing economy, the demand for energy in China is increasing at a faster rate than that in the US. As coal is the main source of energy in China, the demand for coal in China is relatively more price inelastic.

According to Extract 3, natural gas is a substitute for coal in the US. As the supply of natural gas in the US has increased, the availability of natural gas in US is greater than that in China. Hence the demand for coal in the US is relatively less price inelastic than that in China, with the availability of close substitutes.

1 mark – stating PED for coal in China compared to that in the US (only if reasoning is given)

3 marks – providing 2 reasons to support

2 marks – providing 1 reason to support

**(d) Evaluate whether the merger between Xstrata and Glencore is a sound strategy for both firms. [8]**

**Introduction:**

- Define merger: A merger is an agreement between two or more firms to combine their assets into a single firm.
- Companies merge in order to obtain higher profits, through increasing revenue (bigger market share and stronger market power) and reducing costs (benefits of EOS).
- The merger between Xstrata and Glencore is an example of a vertical merger as Xstrata is a miner of commodities while Glencore deals with commodities trade.
- Whether the merger is a sound strategy for both firms depends on the extent to which each firm gains from the deal.

**Thesis: The merger is a sound strategy for both firms**

- **The vertical merger reduces costs for Glencore:** With the merger, Glencore can obtain supplies of commodities at lower cost. Extract 2 states that the merger would allow Glencore to tap on all of Xstrata's mining output. With lower cost of production, Glencore could earn higher profits. The merger also provides Glencore with a constant source of supplies of commodities such as lead, zinc, coal and copper.
- **The vertical merger increases Glencore's revenue:** Extract 2 also states that Glencore would be better able to blend coal and ores to customers' specific requirements with the merger. The merger allows Glencore to customise its products according to customers' needs. This could make the demand for the firm's products more price inelastic as there are not many firms who are able to do customisation. Hence, Glencore could charge higher prices and earn higher revenue.
- **The vertical merger provides Xstrata with a steady source of revenue:** The merger allows Xstrata to sell its mined commodities to Glencore, providing Xstrata with a steady source of revenue. Table 3 shows that Glencore has a higher revenue than Xstrata, suggesting that it is likely to have a larger consumer base. Extract 2 also mentions that by merging, Xstrata could extend its lead as the world biggest thermal-coal miner and third largest in copper mining.
- **The combined firm can reap marketing economies of scale:** The merger would increase the output of the combined firm, allowing it to experience internal economies of scale. The firm will be able to lower its average cost of production, as its advertising and marketing costs are spread over a larger output.
- **The combined firm has potential to grow more quickly:** Large firms with a large market power are likely to expand more quickly. Extract 2 mentions that the world's antitrust

authorities may feel threatened by the merger as each firm is already very strong. Glencore is a dominant commodity trader while Xstrata is a leading miner of lead, zinc, coal and copper. With the merger, the combined firm is likely to gain larger market dominance and thus earn higher revenue and higher profits.

**Anti-thesis: The merger may not be a sound strategy**

**The merger benefits Glencore more than Xstrata**

- According to Extract 2, Xstrata has better assets, a stronger balance-sheet and rosier prospects for growth. With the merger, Glencore's assets will seem to increase as the combined entity has more assets.
- Table 2 also shows that Xstrata has higher profits of \$5.78 billion while Glencore only has a profit level of \$4.07 billion. Hence Xstrata seems to be the stronger firm in the merger and Glencore would benefit more by merging.
- Xstrata may not benefit as much if Glencore still has other suppliers of the commodities that it trades. Xstrata may also be restricted in providing supplies to other firms, hence affecting its revenue, especially if it is required to sell commodities to Glencore at lower prices.
- Extract 2 also tells us that some large institutional investor have threatened to block the merger as they believes it favours Glencore more.

**The merger could lead to diseconomies of scale**

- Changes to the deal of the merger could affect employees' morale. Extract 2 mentions that there was a change in the decision on who to become the CEO of the merged firm after 6 months. These could lead to a lack of confidence for the employees in the combined firm.
- Poor integration of the firms as a result of differences in corporate culture and management conflicts could also affect employees. Due to differences in culture of firms, which is a concern of Xstrata's CEO Mick Davis, mentioned in Extract 2, employees would have to adapt to new leadership and a new culture, which could affect their morale and productivity.
- The merger may also attract anti-trust investigations by government authorities resulting in additional regulations on the combined firm.

**Conclusion: (students need to take a stand and provide reasoning)**

While it may be true that Glencore seems to benefit more as Xstrata is the stronger firm, the combined entity is likely to result in a stronger market dominance for both firms. The merger will likely bring about more benefits to the combined entity, if the transition is well-managed and cultural differences between the firms are resolved.

Level	Descriptors	Marks
L3	<ul style="list-style-type: none"> <li>• Well developed and balanced answer with good use of economic analysis and clear reference to data</li> <li>• Answer clearly explains benefits of merger from the perspective of both firms</li> <li>• Answer addresses revenue and cost benefits (larger market share + EOS gained)</li> <li>• Reasoned conclusion made</li> </ul>	5-6
L2	<ul style="list-style-type: none"> <li>• Undeveloped answer with some economic analysis used in explanation, with limited reference to data.</li> <li>• One-sided answer, considering only the benefits OR disadvantages of merger</li> <li>• Answer consider only the benefits and disadvantages of the merger to both firms, without looking at the perspective of each firm</li> <li>• Answer only address either revenue or cost benefits</li> </ul>	3- 4
L1	<ul style="list-style-type: none"> <li>• Descriptive answer with no economic analysis and framework to support.</li> </ul>	1-2
E2	<ul style="list-style-type: none"> <li>• Well-reasoned judgement considering the impact of the merger on both firms, addressing both revenue and costs.</li> </ul>	2
E1	<ul style="list-style-type: none"> <li>• Some attempt to make judgement but is not well supported</li> </ul>	1

**(e) Discuss the view in Extract 4 that by imposing carbon limitations on the imports**

from developing countries, developed countries 'will cripple their own economies and harm the poor without doing much about emissions'. [10]

**Introduction (Briefly explain how/why the government has imposed carbon limitations on the imports from developing countries)**

- Developed countries impose carbon limitations on imports from developing countries with the objective of reducing carbon emissions resulting from the production of these imports in developing countries. The production of imported goods is a form of a negative externality due to the external cost to society, as carbon emissions contribute to the greenhouses effect and global warming.
- Carbon limitations can be imposed by curbing imports from countries that do not cut emissions, as mentioned in Extract 4. This could be in the form of higher import taxes, tariffs or quotas on these imports.
- However, these measures might not succeed in achieving the objective of reducing carbon emissions and might also harm both the developing countries and developed countries.

**Thesis: Imposing carbon limitations harms the economies of developed countries and developing countries but are not effective in reducing emissions**

**Argument: Imposing carbon limitations harms the economies of developed countries and developing countries**

- Carbon taxes on imports from developing countries are essentially trade protectionism measures, which harms both economies. By implementing tariffs, this increases the price of imports and reduces the quantity of imports.
- This might lead to increasing prices from domestic producers due to less foreign competition. Furthermore, the domestic producers might not have comparative advantage in producing the goods compared to foreign producers thus the additional tariffs and quotas might be protecting inefficient domestic producers.
- Moreover, the developing countries might also respond by imposing trade tariffs on the exports of the developed countries in a tit-for-tat move.
- Extract 4 also mentions that more than 25% of global trade in manufacturing is in intermediate components, not final products. By imposing carbon limitations, rich countries are affected too as they are part of the supply chain and may incur higher cost of inputs.
- When taxes are imposed → cost of production increases → developing countries may pass on the higher cost of production to developed countries → sell inputs to developed countries at higher prices, while not reducing the amount of carbon emissions
- Furthermore, such carbon protectionist measures would slow down economic growth for these developing countries, resulting in lower domestic investments in the economy.

**Argument: Imposing carbon limitations are not effective in reducing emissions**

- Developing countries such as China & India can continue to export to other developing countries especially countries that are experiencing high economic growth due to growing middle class and increasing domestic consumption, as mentioned in Extract 4.
  - However, developed countries still form the bulk of the trade with developing countries
- The governments in developed countries may also have difficulty in estimating how much to tax as it is difficult to value the external cost, especially because the carbon emissions are emitted in other countries. Tax rates that are too high or too low would not be effective in reducing carbon emissions to the optimum level.
- Fall in imports bought by developed countries may lead to higher production of carbon-intensive goods in developed countries to make up for the fall in imports, leading to higher carbon emissions in developed countries.



- The developing countries are not yet ready for emissions-reduction solutions as their focus is on the country's economic growth. If imposing carbon limitations results in slower economic growth for these developing countries, it is more unlikely that these developing countries will be willing to invest in the development of clean technology or alternative fuels.

**Anti-Thesis: Imposing carbon limitations is still necessary as it helps to reduce the level of carbon emissions, although its effectiveness may be limited**

- The production of imported goods is a form of negative externality that contributes to global warming and climate change. The production of goods in developing countries requires the burning of fuels for energy, resulting in carbon emissions. This is an external cost to society, as carbon emissions contributes to the greenhouse effect and global warming.
- Taxes on carbon intensive imports would raise the price of these goods and lower the quantity demanded for them
- The negative externalities from the production of these goods would be internalised and production of carbon intensive goods would be brought down to the socially optimal level
- The tax imposed could incentivise carbon-intensive producers to reduce emissions, leading to greater social welfare.
- The additional revenue collected from these carbon taxes can then be used by governments to develop clean energy or even providing subsidies to producers from developing countries to have more carbon-efficient production methods, resulting in lower carbon emissions.

**Conclusion/synthesis:**

- Carbon emissions and its impact on climate change are global issues that require a joint effort by all the large economies in the world in order to be solved
- To effectively reduce carbon emissions, developed countries can intervene to help developing countries with more carbon-efficient production methods, or by supporting natural gas/alternative energy industries in developing countries.

<b>Level</b>	<b>Descriptors</b>	<b>Marks</b>
L3	<ul style="list-style-type: none"> <li>• Well developed and balanced answer considering the impact of imposing carbon limitations on developed countries, and its effectiveness in reducing carbon emissions</li> <li>• Good use of economic analysis and reference to data</li> </ul>	7-8
L2	<ul style="list-style-type: none"> <li>• Balanced but undeveloped answer with some economic analysis used in explanation, with limited reference to data. OR One-sided answer</li> <li>• Theoretical answer listing strengths and limitations of taxes</li> </ul>	4-6
L1	<ul style="list-style-type: none"> <li>• Descriptive answer with no economic analysis and framework to support.</li> </ul>	1-3
E2	<ul style="list-style-type: none"> <li>• Well-reasoned judgement recognising that reducing carbon emissions on a global scale requires cooperation between all countries</li> </ul>	2
E1	<ul style="list-style-type: none"> <li>• Some attempt to make judgement but is not well supported</li> </ul>	1