



NYJC

TUTORIAL QUESTIONS

Resource Allocation in Competitive Markets: Application of Demand & Supply

Application of Demand & Supply

Essential Question:

How do consumers, producers and governments respond to changes in prices and income?

Key Questions:

- 1. How does the effect of imposing a tax or subsidy on a particular good or service depend on price elasticities?**
- 2. How does the effect of imposing price controls depend on price elasticities?**

Review on: Application of Demand & Supply

Below are general issues you need to know before attempting the tutorial questions. Please put a tick in the column, to indicate that you are aware of the issue and understand it clearly. Else do revise the issues before attempting the essay and case study questions.

Application of Demand & Supply	Tick
1. What is the relationship between price elasticity of demand and total revenue?	
2. How does a government influence market outcomes through the use of taxes, subsidies, price and quantity controls?	
3. What role does PED and PES play in deciding the tax burden between consumer and producer when the government imposes indirect taxes?	
4. How does differing degrees of PED, YED and XED influence producers' price and output decisions?	
5. How does a government make use of elasticity concepts in making decisions to tax as well as to undertake macroeconomic policy?	

SECTION 1 – Economics ALIVE! [Attempted quiz on SLS]

SECTION 2 – Case Studies

CSQ1: Tourism and Hospitality Industry **[Suggested Answer on Page 4-15T]**

Table 1: Tourism Industry Performance for Singapore

	2010	2011	2012	2013
Total visitors (000)	11,641.7	13,171.3	14,496.1	15,567.9
Region (000)				
Americas	524.8	563.7	616.4	641.5
Mainland China	1,171.5	1,577.5	2,034.2	2,269.9
Europe	1,373.5	1,401.5	1,537.3	1,591.2
Tourism Receipts (\$m)	18,931	22,277	23,081	23,469
Number of Tourist Hotels	96	98	101	117
Standard Average Room Rate (S\$)	217.9	247.1	261.7	257.8
Room Revenue (S\$m)	2,091.0	2,643.5	2,818.4	2,928.3

Source: <http://www.singstat.gov.sg/statistics/>

Extract 1: Singapore Tourism Board (STB) pushes for quality tourism

For the long-term sustainable growth of Singapore's tourism industry, Singapore Tourism Board is promoting high-quality tourism by embarking on a series of customised marketing campaigns catered to different consumers, while it continues to strive to establish industry competencies to help upgrade the skills of workers in the F&B and hotel industries. In the meantime, Singapore pushes to restructure its economy by raising productivity and reducing its reliance on foreign workers. Challenges to the tourism industry include higher foreign worker levies, rising rentals and wages, coupled with an appreciating Singapore dollar.

STB's target of 17m annual visitors by 2015 implies an increase of 6.6% per annum. While emerging markets like Mainland China remain the top 3 on lists of visitor arrivals to Singapore, visitors from China have dropped 27 percent in the five months through May 2013 from a year earlier, due to slower economic growth on the mainland and the impact of a new Chinese law that clamps down on cut-price shopping tours. This is further exacerbated by the continuing strengthening of the S\$ exchange rate against the Yuan and a sales tax that Chinese tourists don't encounter in neighbouring Hong Kong.

The STB aims to offer more innovative experiences to cater to the ever-changing needs of the customers. The opening of the new cruise ship terminal Marina Bay Cruise Centre Singapore (MBCCS) in October 2012 allows Singapore to tap into the increasing number of people in Asia who are taking leisure trips on luxury vessels and allows Singapore to become a cruise gateway to Asia. STB has extended its Cruise-Fly products to the MBCCS. Together with the expansion of networks and partnerships with other airlines, more passengers will be able to enjoy convenient, seamless transfers to and from Changi Airport.

The push for medical and education tourism continues as Asian economies continue to grow. With the novelty effect of the integrated resorts wearing off, and Singapore facing stronger competition from neighbouring economies, new tourist attractions such as the River Safari and the National Art Gallery are being introduced. The opening of the MBCCS will also help support regional cruises which are well received among South East Asian travellers, who dislike long haul flights or have tighter budgets. Singapore's travel and tourism landscape is likely to remain positive.

Source: adapted from Bloomberg 2014 & other various sources

Extract 2: How competitive is Hong Kong against its competitors?

This demand elasticity analysis provides insights into Hong Kong's competitiveness as an international tourist destination in comparison with its neighbouring competitors: Macau, Singapore and South Korea. The study recognizes that differences between markets should be taken into consideration in evaluating a destination's competitiveness. Overall, this study finds that Hong Kong has a competitive advantage over Macau. However, Singapore and South Korea appear to be in a better competitive position than Hong Kong.

Source: www.elsevier.com – Tourism Management

Table 2: Short-run own-price elasticities by source market

Hong Kong	-1.209
Macau	-1.598
Singapore	-0.876
South Korea	-0.518

Source: How competitive is Hong Kong against its competitors?

Table 3: Short-run cross-price elasticities by source market

Hong Kong with respect to the price of South Korea	0.560
South Korea with respect to the price of Hong Kong	0.279

Source: How competitive is Hong Kong against its competitors?

Extract 3: Mainlanders buoy Hong Kong GDP

Hong Kong's Gross Domestic Product (GDP) is likely to have grown above 3% year on year. The number was helped by solid domestic demand, which contributes over two-thirds of Hong Kong's GDP. Hong Kong has benefited from a wave of spending from mainland Chinese who go there on vacation and to shop. Data shows the number of mainland tourists grew by about 20% each year between 2008 and 2012. The share of mainland tourists relative to all visitors rose to about 72% in 2012, up from 57% in 2008.

About a third of all retail spending, a major contributor to local demand, comes from visitors. Last year, mainland Chinese made HK\$119 billion (US\$15.2 billion) of retail purchases, up from HK\$43 billion in 2008, according to data from the census department. In 2012, local residents spent HK\$287 billion.

Source: Adapted from Wall Street Journal 2013

Questions

- (a) Compare the trends in the number of visitors from the different regions to Singapore between 2010 and 2013. [2]
- (b) Using Extract 1, comment on the possible relationships between air travel and the cruise industry. [4]
- (c) (i) With reference to Table 2, explain why all the 'own price elasticities' are negative. [2]
- (a) (ii) Explain one possible reason why the demand for South Korea as a holiday destination is less price elastic than that for Macau. [2]
- (d) Using Table 3, explain the values shown in the table for the cross price elasticities for Hong Kong and South Korea. [2]
- (e) Discuss whether an analysis of demand elasticity is useful for Hong Kong Tourism Board in devising strategies to increase Hong Kong's competitiveness as an international tourist destination. [8]

CSQ2: The market for oil and electric cars
[Suggested Answer on Page 4-19T]

Table 1: Oil production and consumption (millions of barrels)

Region	Consumption		Production	
	2014	2015	2014	2015
North America	23421	23753	18833	19733
South & Central America	7171	7139	7659	7761
Europe & Eurasia	18287	18450	17206	17479
Middle East	9180	9300	28515	30065
Asia Pacific	31195	32494	8307	8369
Total	89254	91136	80520	83407

Source: BP Statistical Review of World Energy

Extract 1: Are low oil prices here to stay?

Despite a recent upturn, the price of oil has slumped almost 50% since last summer following the longest-running decline for 20 years. US oil, and to a lesser extent Libyan oil returning to the market, has pushed up supply while a slowdown in the Chinese and EU economies have led to a poor outlook for the economy, causing oil prices to fall sharply.

This is precisely when the Organization of Petroleum Exporting Countries (OPEC), the cartel of major global oil producers, would normally step in to stabilise prices by cutting production. It has done so many times in the past, so often in fact that the market expects OPEC to intervene.

This time it hasn't. In a historic move at the end of last year, OPEC said not only that it would not cut production from its 30 million barrels a day quota, but had no intention of doing so even if oil fell to US\$20 a barrel. And this was no empty threat. Despite opposition from Venezuela, OPEC leader Saudi Arabia refused to bail out its more vulnerable members. Many OPEC members need an oil price of US\$100 or more to balance their budgets, but with an estimated US\$900bn in government reserves, Saudi Arabia can afford to play the waiting game.

OPEC now supplies a little over 30% of the world's oil, down from almost 50% in the 1970s, partly due to US oil producers flooding the market. "Given this scenario, who should be expected to cut production to put a floor under prices?" OPEC argued last month. Equally, Saudi Arabia is not prepared to sacrifice more market share while its competitors, not least US oil producers, prosper. Safe in the knowledge that it can withstand very low oil prices for the best part of a decade, it would rather stand back and "let economics do the work".

Source: *BBC News*, 24 February 2015

Extract 2: Why the low oil price will not harm sales of electric cars

Crude oil makes up about 50% of the volume of modern cars. It is not only used to power vehicles, but can also be present in other areas of the vehicle such as in the enamel in paint to the synthetic rubber in the tyres. Increasingly, it is widely assumed that the tumbling oil prices will put a dent in the sales of electric cars, as internal combustion engines of conventional vehicles become increasingly cheap to run. But for buyers of electric cars, the relative cost of refuelling is in fact a minor consideration. The popularity of electric cars in the years to come will depend much more on improvements to their performance than on the oil price.

Buyers of electric cars are not looking for cheap motoring. Electric cars attract some buyers because they serve as a badge for people committed to environmental protection to demonstrate to the world that they care about the environment, no matter what the cost. Owners of electric cars are not looking for budget motoring but status as early adopters of cutting-edge technology. Low maintenance costs and the ability to recharge at home add to the appeal of electric cars.

In the long run, the cost of the vehicles themselves will be far more influential than the oil price when it comes to getting people to buy them. Already, where battery packs generally comprise an estimated 25% of total costs of electric car production, economies of scale reaped by companies like Tesla, an electric car maker, has led to a decline in the cost of producing battery packs for electric vehicles from about US\$1000 per kWh in 2007 to about US\$450 per kWh in 2014. The battery in a Nissan Leaf, the world's bestselling electric car, accounts for half the selling price. However, a breakthrough in battery chemistry or other technologies will be needed to bring costs down enough to make electric cars a realistic mass-market prospect. Yet, the challenges of overcoming a lack of infrastructure have yet to be resolved. If electric cars fail to catch on, low fuel prices will not be the reason.

Source: *The Economist*, 24 February 2015

Extract 3: Toyota follows Tesla in announcing technology sharing initiative

Japanese carmaker Toyota this week announced it will freely share all of its hydrogen fuel cell technology in order to spur development of low-emission cars around the world. Elon Musk's Tesla Motors, took a similar step in making its patents available to other carmakers late last year. Both firms are trying to avoid a total collapse of the newly-formed electric car market. The first generation low-emission vehicles will be critical, requiring a concerted effort and unconventional collaboration between automakers, government regulators, academia and energy providers.

Source: *The Guardian*, 8 January 2015

Extract 4: China's electric car boom - Should Tesla Motors worry?

During the last four months of 2014, China's electric vehicle sales skyrocketed. Analysts attributed the jump in sales to the elimination of the vehicle tax on Chinese electric vehicles. When China's auto market started to slow in 2008, together with the rest of the world, the country sought to stimulate automotive sales and encourage its citizens to buy cleaner cars by cutting taxes on energy-efficient gasoline engines. In 2008, the central government cut taxes on these small cars to 5% from 10%. That was the year China became the largest auto market in the world.

It's still far from clear what factors are driving China's recent electric vehicle boom and why Tesla was left out. Another possibility is that China's policies to promote electric vehicles have finally reached a tipping point. For instance, to deal with traffic congestion in major Chinese cities, many municipal governments, including Beijing, have limited the number of new vehicle registrations. In Beijing, electric vehicles are exempt from this quota system. The central government has also instituted a new set of policies to encourage competition among domestic manufacturers, such as providing subsidies to help smaller companies achieve large-scale production, which increases competitive pressure that was woefully lacking during the early years of China's electric vehicle program. Perhaps locally produced vehicles have finally reached a quality threshold that make them attractive to Chinese buyers.

Whatever the reason, just as China's electric vehicle market is taking off, Tesla is facing new competitive challenges at home and abroad. Traditional automakers like BMW, Volkswagen and General Motors are developing electric vehicles that are faster, cheaper, and boast better range than before. In fact, in October 2014, Volkswagen's CEO announced the company was developing more than 20 types of electric vehicles for the Chinese market. Then there is also the prospect of competition from newcomers like tech giant Apple which is hiring away Tesla's engineers with high salaries and is rumoured to be developing its own electric car. At the same time, Tesla is struggling to establish its brand in the world's key emerging market at what may be a critical inflection point. That is a huge problem.

Source: *Fortune*, 18 February 2015

Questions

- ai. Given the information contained in Table 1, identify the region that had the greatest impact on world oil prices. Justify your answer. [3]
- aii. Besides the return of US oil and Libyan oil pushing up supply, explain one other reason that has contributed to the change in world oil prices. [2]
- b. What can you conclude from the evidence in Extract 1 about the likely value of the price elasticity of demand of oil? [3]
- c. Explain how OPEC can 'stabilise prices by cutting production' of oil. [4]
- d. Discuss the factors affecting the choice of pricing strategies for China's electric car producers. [8]

SECTION 3 – Essays

SECTION 3A – Lower-Order Skills

1. Prices of agricultural products increased by 14% in recent years, compared with only 3% for manufactured goods.

(a) Using economic analysis, account for the differences in prices of agricultural and manufactured products. [10] **[Suggested Answer on Page 4-20T]**

2. The Spanish government, which is struggling to cut one of the Eurozone's largest public deficits during a recession, has raised taxes on tobacco.

Source: <http://www.eurocare.org>, 26 June 2013, accessed on 25 August 2014

(a) Explain why an increase in indirect tax on a good like tobacco tends to cause consumers to suffer more than producers. [10] **[Suggested Answer on Page 4-22T]**

SECTION 3B – Higher-Order Skills

1. Microsoft has announced a price cut to its Xbox gaming console as well as introduce the new black Elite version. These measures are meant to counter the fall in the price of its competitor (Sony Playstation 3) and reverse falling Microsoft sales as a result of previous defects in its Xbox.

(a) Explain the factors affecting the demand for the Microsoft Xbox. [10]

(b) Discuss how an understanding of price elasticity of demand, income elasticity of demand and cross-elasticity of demand might be helpful to the manufacturer of the Xbox. [15] **[Suggested Answer on Page 4-24T]**

2. "Certificate of Entitlement (COE) supply for the fiscal year starting April 2009 will be cut by 24 per cent. A smaller COE quota will mean that overall sales of cars will be affected across the board since the supply of new cars will be restricted by the smaller quota...On the other hand, SMRT has decided to reduce bus and train fares and to increase number of train trips given the severe economic crisis..."

Adapted from the Straits Times, Feb 2009

(a) Using a diagram, explain how the recession and fall in the supply of COEs will affect the market for new cars. [10]

(b) Discuss the relative significance of price elasticity of demand and cross elasticity of demand in explaining the decisions made by the public transport operator SMRT. [15] **[Suggested Answer on Page 4-29T]**

3. "Global food prices are poised to rise sharply in 2014 again. Economists cite the rising incomes in China, severe drought in the US, China's rapid urbanisation and unrests in Ukraine and Israel as key drivers of the abrupt price increase. India has been stockpiling grains for sale to consumers at heavily subsidised prices to ensure that the poor has access to cheap food.

(a) Account for the sharp rise in global food prices. [10]

(b) From the consumers, producers and government's perspectives, assess whether India's strategy of stockpiling for subsidised sale is better than a price ceiling. [15] **[Suggested Answer on Page 4-32T]**

4. *'Sales of adult fiction in hardback had fallen by over 10%, while cheaper paperback by only 6%. The price people are willing to pay is falling, while hard-cover prices are climbing. The Association of American Publishers announced that the "explosive growth" of e-books account for 13.6% of adult fiction market in America, with burgeoning e-books sales increasing by over 1000% in the last three years after the launch of the e-book reader.'*

Adapted from: The Daily Telegraph August 2011

- (a) Explain the likely reasons for the overwhelming increase in sales of e-books. [10]
(b) With the aid of relevant concepts, analyse the impact of the e-book trend on the publishing and related industries. [15] **[Suggested Answer on Page 4-36T]**

5. In 2005 the rate of Goods and Services Tax (GST) in Singapore rose from 3% to 5%. Incomes rose by approximately 4.5% in 2005.

- (a) Explain the likely effect of this change in GST on expenditure by consumers on different types of goods. [10]
(b) Discuss whether the combined effect of the rise in incomes and the rise in GST is likely to cause the quantities of different types of goods sold to rise or fall. [15]

[Suggested Answer on Page 3-39T]

SECTION 3C – Challenging Essays

1. It is often observed that even when crude oil prices have fallen, the price of petrol at the petrol kiosks refuses to slide.

Discuss why changes in the price of petrol at the petrol kiosks do not always follow changes in the price of crude oil. [25] **[Suggested Answer on Page 4-42T]**

2. Sales of electronic cigarettes – battery powered slim metal tubes - have doubled, attracting new firms into the market. Smokers of electronic cigarettes inhale the vaporised nicotine without the chemical, tar and smell inherent with conventional cigarettes. The market for conventional cigarettes has been in steady decline in recent years, and is still facing tax hikes imposed by governments around the world.

Adapted from theweek.com, 26 April 2013

Using demand elasticity concepts, discuss the likely effects of these changes on the revenue earned in the cigarette industry. [25] **[Suggested Answer on Page 4-46T]**

3. Despite the recession, many countries have imposed the mandated minimum wages for workers.

- (a) Explain how such minimum wages might affect the total earnings of workers in an industry. [10]
(b) Discuss the impact of the recession on the labour markets in these countries. [15]
[Suggested Answer on Page 4-52]

2017 Other JCs' Prelims – Demand, Supply, Elasticities (H2)		
1	ACJC	<p>The Philippine government plans to lower income tax rates, slashing it from 32% to the mid-20s. Source: CNBC, 2017</p> <p>Explain what is involved in rational decision making for both consumers and producers, and discuss how their decision making in response to the lowered income tax rates will impact different product markets. [25]</p>
2	AJC	<p>Brick and mortar retailers of various goods and services, ranging from groceries to luxury hand bags, have seen a fall in sales revenue in Singapore. One possible reason is a fall in the cost of setting up online shopping businesses.</p> <p>Discuss possible demand and supply reasons that could account for the fall in sales revenue of different brick and mortar retailers in Singapore. [25]</p>
3	CJC	<p>Brick-and-mortar travel agents are facing challenges with the proliferation of online platforms like Zuji and the global economic slowdown. While some brick-and-mortar travel agents are shutting down, others work to maintain their relevance through apps and specialised services.</p> <p>Discuss how the above events would affect the sales volume and revenue earned by brick-and-mortar travel agents and online platforms like Zuji. [25]</p>
4	DHS	<p>Sugarcane, a water-intensive crop that takes 10 to 18 months to harvest, has many uses. It can be made into sugar, a natural sweetener for food and fermented to produce sugarcane ethanol, a biofuel for the transport sector. In recent years, a number of developments have taken place in the Indian sugarcane market. In addition to rising fertiliser costs, sugarcane crop suffered from severe damage from a faltering monsoon in India. Amid India's relatively strong economic growth that encourages higher food consumption, the Indian government has raised the minimum support price of sugarcane ethanol to ensure its adequate supply.</p> <p>Discuss the impact these events are likely to have had on consumer expenditure on sugarcane and its related markets in India. [25]</p>
5	HCI	<p>"The use of drones for aerial photography and racing are growing in popularity among the wider public. According to an industry report, in the next five years, global consumer drone sales volume is expected to increase more than tenfold, while average selling price for drones will continue to decline sharply. Source: Dronelife, accessed 8 August 2017</p> <p>Discuss the different demand and supply factors and their likely importance in determining the anticipated changes in sales volume and price of consumer drones. [25]</p>

6	IJC	<p>Malaysia implemented a 6 per cent Goods and Services Tax (GST) in 2015 on all goods and services except for staple food and some medicine.</p> <p>Discuss the various impact of such a tax on consumption and production decisions in various markets. [25]</p>
7	JJC	<p>Crude oil is an important commodity that is used to generate electricity, produce gasoline and other petroleum products used for industrial production. Oil prices have fallen from a peak of over \$110 per barrel in 2014 to below \$40 per barrel in 2015.</p> <p>Using examples from various industries, discuss why prices of oil-related products fall to a different extent when there is a fall in the price of crude oil. [25]</p>
8	MJC	<p>While mass-produced chocolate from manufacturers such as Hershey's and Mars can contain as little as 10% cocoa, artisan craft chocolate from small-scale makers can contain more than 70% cocoa. The increase in price of cocoa, a key ingredient in chocolate, has forced chocolate producers to either increase its price or shrink its packaging.</p> <p>(a) Explain the factors affecting the price elasticity of demand and cross elasticity of demand for chocolate. [10]</p> <p>(b) Discuss the factors that determine the significance of rising cocoa price on the change in prices for different types of chocolate. [15]</p>
9	MI	<p>As urban populations swell, sand has become one of the most extracted materials in the world. With extensive use in construction and industrial production, existing sand deposits are being depleted. As such, some countries have closed mines and banned exports. At the same time, prices of alternative products such as wood have fallen.</p> <p>Discuss the demand and supply factors and their relative importance in determining the output of sand in the global market. [25]</p>
10	NJC	<p>Mobile devices such as smartphones are available in different models. The recovery of the global economy and the rise in labour cost are likely to affect the sales of various models of smartphones in different ways.</p> <p>(a) Explain how elasticities of demand can assist in understanding the effect of each of these changes on the sales volume of different models of smartphones. [10]</p> <p>(b) Assess the likely combined impact of both of these changes on the revenue earned from the sale of different models of smartphones. [15]</p>

11	NYJC	<p>Restaurant owners are now crying woes in Singapore as their profit margin has been hit hard due to rising rental and food costs. However, their most pressing issue is the lack of manpower and to make things worse, consumers are now tightening their belts due to the negative growth rate for the first quarter of the year. But not all hope is lost. With the rise of online food delivery services, restaurants owners are now partnering them in the hope of attracting more customers.</p> <p>(a) Explain, using examples, the concepts of price elasticity of demand and income elasticity of demand. [10] (b) Discuss how the combination of the above factors affect the market for different types of restaurant services in Singapore. [15]</p>
12	PJC	<p>Oil prices have fallen after the OPEC group of oil producing nations said global crude stocks had risen coupled with Saudi Arabia's production increasing to 10.011 million barrels per day from 9.748 million barrels per day. In addition, a weaker economic outlook means demand for oil in 2017 is likely to grow at a slower rate.</p> <p>Discuss how the above events are likely to impact the market for oil and its related markets. [25]</p>
13	RI	<p>Meal delivery fever has hit Singapore, with companies like Uber and Grab announcing their move into the food delivery market to join the likes of Deliveroo and FoodPanda. Analysts are optimistic about this industry, given Singapore's steady economic growth and the downtrend of petrol prices. Consumers will now be spoilt for choice as they no longer have to dine in at hawker centers and restaurant.</p> <p style="text-align: right;">Source: Channel News Asia 2016</p> <p>(a) Explain the possible reasons for the rapid growth of the market for delivered food. [10] (b) Assess how related markets might be affected by these developments. [15]</p>
14	RVHS	<p>Just a year ago, anticipation of higher profits prompted cattle farmers in the European Union (EU) to switch to produce dairy, a major ingredient of many dairy-based products such as cheese. At the same time, the EU abolished dairy production quotas while China, a key importer of EU products, saw slower economic growth.</p> <p style="text-align: right;">The Economist, August 2015</p> <p>Using economic analysis, discuss the impact these events are likely to have had on EU consumers and farmers. [25]</p>
15	SAJC	<p>Global sugar prices have rocketed 30% since April as supply lags further behind demand.</p> <p style="text-align: right;">Rabobank Sugar Quarterly, 2016</p> <p>Using demand-supply analysis, explain the possible factors that led to the above outcome and evaluate the relative importance of those factors. [25]</p>

16	SRJC	<p>Organic food products such as fresh fruits and vegetables are grown without synthetic pesticides, chemical fertilizers or genetically modified seeds. 2015 was a year of significant growth for the organic food industry despite the continued struggle to meet the seemingly unquenchable consumer demand. There was also an increase in the number of farmers converting to organic farming over time.</p> <p style="text-align: right;">Source: Organic Trade Association</p> <p>Discuss the demand and supply factors that determine the output of organic food products and evaluate which is the most important factor. [25]</p>
17	TJC	<p>Malaysia will begin imposing its tourism tax from Aug 1 this year, according to details published on the Royal Malaysian Customs Department's website. Rates start from RM2.50 per room each night at a non-rated accommodation to RM20 per room each night at a five-star accommodation.</p> <p style="text-align: right;">Source: Channelnewsasia.com, 2017</p> <p>(a) Explain how the imposition of the tax might affect consumers' expenditure and producers' revenue for different types of hotels in Malaysia. [10] (b) Discuss the factors the Malaysian government might have considered before deciding to impose the tourism tax. [15]</p>
18	TPJC	<p>Water is a necessity. Across the globe, countries are working to supply drinking water to its people, through taps or subsidising bottled water. However, there are increasing calls for government to tax bottled water instead, since these plastics are not biodegradable and cause pollution.</p> <p>Brand of Natural Mineral Water (500 ML) Retailer/Country Price (SGD) Volvic NTUC/Singapore \$1.50 Evian Giant/Singapore \$1.75 Suisai no mori Epermarket/China \$3.05 Volvic Tesco/UK \$0.89 Accessed on: Various websites, 10 July 2017</p> <p>Discuss the possible reasons why prices of bottled water differ across firms and countries. [25]</p>
19	VJC	<p>The global airline industry, as measured by revenue, has continued to grow rapidly.</p> <p>Discuss possible demand and supply factors and their relative importance in explaining the reported increase in revenue earned by the airline industry. [25]</p>
20	YJC	<p>In the past few years there have been weak economic activities worldwide and increased activities to produce oil.</p> <p>Discuss the impact these events are likely to have on consumers and producers in the markets for oil and alternative energy. [25]</p>

A Level Examination Questions – DEMAND, SUPPLY, ELASTICITIES (H2)		
1	2007 H2	<p>In 2005 the rate of Goods and Services Tax (GST) in Singapore rose from 3% to 5%. Incomes rose by approximately 4.5% in 2005.</p> <p>(a) Explain the likely effect of this change in GST on expenditure by Consumers on different types of goods. [10]</p> <p>(b) Discuss whether the combined effect of the rise in incomes and the rise in GST is likely to cause the quantities of different types of goods sold to rise or fall. [15]</p>
2	2008 H2	<p>Developments in modern technology, such as faster broadband internet connections, portable DVD players, iPods and MP3 players, have had major impacts on the demand for and supply of recorded music and associated products.</p> <p>Assess how the markets involved might be affected by these developments. [25]</p>
3	2009 H2	<p>There have been large changes in the price of crude oil over the past few years.</p> <p>Discuss what determines whether consumers or producers are more likely to bear the cost of these oil price changes. [25]</p>
4	2010 H2	<p>The price of sugar, an ingredient in many canned soft drinks, dropped dramatically by 32% between July 2006 and October 2008. Healthy living campaigns meant consumers became more aware of the possible health dangers of consuming too much sugar and they switched to 'diet' drinks that do not contain sugar.</p> <p>Discuss how the combination of the fall in the price of sugar and the healthy living campaigns might affect expenditure by consumers on non-diet and diet canned soft drinks. [25]</p>
5	2011 H2	<p>Singapore is facing an ageing population issue. By 2030 senior citizens are expected to comprise almost 20% of the population.</p> <p>Using economic analysis, discuss the likely effects of this demographic change on product markets in Singapore. [25]</p>
6	2012 H2	<p>Most brands of car are available in different models. A large rise in the cost of car manufacture and a rise in incomes are likely to affect the sales of various models of car in different ways.</p> <p>(a) Explain how elasticities of demand can assist in understanding the effect of each of these changes on the sales volume of different models of car. [12]</p> <p>(b) Compare the contrast the likely combined impact of both these changes on the revenue earned from the sales of different models of car. [13]</p>

7	2013 H2	<p>The Urban Redevelopment Authority (URA) announced that prices of private residential properties in Singapore rose by 1.3% in the third quarter of 2011, but the rise in the prices has been slowing for eight consecutive quarters. At the same time it reported that the total supply of new private residential properties nearing completion was at a record high.</p> <p>Source: http://www.ura.gov.sg/pr/text/2011/pr11-135.html, assessed 28 Oct 2011</p> <p>Discuss the different supply and demand factors and their likely importance in determining the reported changes in the prices of private residential properties in Singapore. [25]</p>
8	2014 H2	<p>In 2012 the UK had very poor harvests for grain and potatoes, which are major ingredients of many of the foods of UK consumers and also provide feed for much of Britain's livestock. At the same time there was a decline in the real incomes of many UK citizens, especially those on low incomes.</p> <p>Using economic analysis, discuss the impact these events are likely to have had on UK consumers and farmers. [25]</p>
9	2015 H2	<p>Recent years have seen a dramatic rise in the output of computer-based products such as smartphones, laptops & tablets.</p> <p>Discuss the demand and supply factors that determine the output of computer-based products and evaluate which is the most important factor. [25]</p>
10	2016 H2	<p>The price of a pair of jeans can be as little as S\$20 or as much as S\$500.</p> <p>(a) Explain what might cause price elasticity of demand and cross elasticity of demand to be different for different products. [10]</p> <p>(b) Assess the likely effects of a rise in price of one brand of jeans on the revenue earned by both retailers of that brand of jeans and those who sell other related goods. [15]</p>
11	2017 H2	<p>Falling interest rate, continued income growth and other factors contributed to a period of rapid residential property price inflation in Singapore from the middle of 2009. However, the government has successfully pursued policies to restrict this rise to the extent that residential property prices actually fell in 2014 and 2015.</p> <p>(a) Use supply and demand policies to explain why falling interest rate and continued income growth may have led to rapid rise in residential property prices. [10]</p> <p>(b) Discuss the policies that might be used by the Singapore government to reduce residential property prices inflation. [15]</p>

Chapter 3: Application of Demand & Supply Suggested Answers

Suggested answers to Question 1: Tourism and Hospitality Industry

- (a) (i) **Compare the trends in the number of visitors from the different regions to Singapore between 2010 and 2013.** [2]

Similarities: Total visitors have increased by 33.7% as has all the other regions. [1]

Differences:

- However, China has increased the most (93%) while Europe has increased the least (15.9%). [1] OR
- China is consistently the highest in terms of visitor arrivals to Singapore relative to America and Europe and vice versa. [1]

- (b) **Using Extract 1, comment on the possible relationships between air travel and the cruise industry.** [4]

They are complements for each other.

→ 'Extract 1: provide seamless travel' → via the promotion of the Fly-Cruise segment by STB.

For example, for a given fall in air travel prices / tickets (from partnering air carriers in CAG) → increase in demand for cruise to other destinations in Asia. [2] OR

An increase in the demand for air travel to Asia → increase in the demand for cruise travel (no need to emphasize the changes in price → focus is on complementary relationship)

However, they can also be seen as substitutes for each other.

→ For a given change in price of air travel, there is a change in demand for cruise travel. This is in the case of regional travelers on a tighter budget → an increase in the price of air fares will lead to an increase in the demand for cruise. (Extract 1: 'support regional cruises which are well received among South East Asian travellers who dislike long haul flights or have tighter budgets' [2])

- (c) (i) **With reference to Table 2, explain why all the 'own price elasticities' are negative.** [2]

Own price elasticities refer to PED. Correct definition of PED [1]

State negative relationship between price and quantity demanded, c.p due to the Law of demand. [1]

- (ii) **Explain one possible reason why the demand for South Korea as a holiday destination is less price elastic than that for Macau.** [2]

Any of the factors affecting PED: number of substitutes, % of income spent, habit & time period. Correct identification of 1 determinant of PED [1].

Eg. Number of substitutes: To a typical tourist, there are relatively more travel destination substitutes for Macau relative to that of South Korea. Thus, a given change in the price of a holiday in South Korea will give rise to a less than proportionate change in the quantity demanded of holidays there.

Eg. The proportion of income that South Korea as a travel destination takes up of total income for a typical tourist is smaller relative to relative to Macau.

Correct explanation of factor of PED with respect to demand for S Korea and Macau [1].

(d) Using Table 3, explain the values shown in the table for the cross price elasticities for Hong Kong and South Korea. [2]

Definition of XED (definition) and identifying that XED positive and less than 1 implies they are not close substitutes. [1]

Explanation of the significance between the 2 values: [1]

A 10% fall in SK's price result in 5.6% fall in demand for HK whereas a 10% fall in HK's price results only in a 2.79% fall in demand for SK. Thus, to the tourists, HK is a weaker substitute for SK than vice versa. [1]

(e) Discuss whether an analysis of demand elasticity is useful for Hong Kong Tourism Board in devising strategies to increase Hong Kong's competitiveness as an international tourist destination. [8]

Introduction:

State that the objective of Hong Kong Tourism Board is to increase Hong Kong's price and non – price competitiveness as an international tourist destination.

State that PED and XED are examples of demand elasticity that would be analysed.

Body:

Thesis 1: PED is useful for Hong Kong Tourism Board to devise *price strategies* in the short run that increase price competitiveness for Hong Kong as an international tourist destination.

E.g. From Table 2, Hong Kong's short run PED is -1.209. This implies that demand for Hong Kong as a tourist destination is price elastic since a 10% fall in price would result in a 12.09% (more than proportionate) increase in quantity demanded for Hong Kong as a tourist destination.

In view of this, Hong Kong Tourism Board would need to increase the supply of tourist attractions in Hong Kong as a tourist destination so that supply curve shifts from S_0 to S_1 . As a result, the equilibrium price of Hong Kong as a tourist destination would fall from P_0 to P_1 . This would result in a more than proportionate increase in quantity demanded for Hong Kong as a tourist destination. Thus, total expenditure would increase from Area (A+B) to Area (A+C). (Diagram)
OR

Hong Kong Tourism Board could advise hotels and attractions operators to be more price competitive than its competitors in other countries in order to attract more tourists. In other words, hotels and attractions operators should lower price to induce a more than proportionate increase in quantity demanded for hotels and attractions. Thus, total expenditure would increase and hence increase Hong Kong's competitiveness as an international tourist destination.

Thesis 2: XED is useful for Hong Kong Tourism Board to devise *non – price* strategies in the short run that increase non – price competitiveness for Hong Kong as an international tourist destination.

E.g. From Table 3, the XED of **Hong Kong with respect to the price of South Korea** is 0.56 while XED of **South Korea with respect to the price of Hong Kong** is 0.279. This implies that Hong Kong and South Korea as an international tourist destination are substitutes but South Korea is a stronger substitute than Hong Kong in the short run. Thus, Hong Kong Tourism Board could devise marketing strategies to product differentiate Hong Kong from South Korea as a unique tourist destination. This is to tailor to the needs of the tourists especially those from the Mainland China which provides the main source of its tourism revenue. This is supported from Extract 3 where 'The share of mainland tourists relative to all visitors rose to about 72% in 2012, up from 57% in 2008.' This could account why mainland Chinese made HK\$119 billion (US\$15.2 billion) of retail purchases in 2012, up from HK\$43 billion in 2008.' Through product differentiation, this could make demand for Hong Kong more price inelastic as an international tourist destination. At the same time, this also increases the demand for Hong Kong as a tourist destination. Thus, demand curve for Hong Kong as a tourist destination would shift from D_0 to D_1 . As a result, the equilibrium price of Hong Kong as a tourist destination would increase from P_0 to P_1 . This would result in an increase in equilibrium quantity for Hong Kong as a tourist destination. Thus, total expenditure would increase from Area A to Area (A+B). (Diagram)

Anti – Thesis: PED and XED are not useful for Hong Kong Tourism Board to devise *price* and *non – price* strategies that increase non – price competitiveness for Hong Kong as an international tourist destination when there are more than one factor occurring simultaneously.

E.g. Both short run PED and XED assume ceteris paribus condition where there are no other factors occurring other than prices. Thus, the reported PED and XED would not be able to capture the responsiveness of tourists choosing Hong Kong as a tourist destination in the short run when there are other factors occurring other than prices. For instance, taste and preferences of tourists especially Mainland Chinese may change in the short run. In Extract 2, it states that 'Singapore and South Korea appear to be in a better competitive position than Hong Kong.' Given that countries like Singapore has been continuously devising ways to entice tourists to visit their countries instead of Hong Kong, tourists especially Mainland Chinese may be enticed to visit Singapore instead of Hong Kong if Singapore's strategies are successful. Thus, this would reduce demand of Hong Kong as a tourist destination and thus demand curve for Hong Kong as a tourist destination would shift from D_0 to D_1 . As a result, the equilibrium price of Hong Kong as a tourist destination would decrease from P_0 to P_1 . This would result in a decrease in equilibrium quantity for Hong Kong as a tourist destination. Thus, total expenditure would decrease from Area (A+B) to Area A. (Diagram)

Conclusion – Take a stand:

E.g. Demand elasticity is useful in devising price and non-price strategies for Hong Kong Tourism Board in the short run. However, it is more useful in devising price strategies than non-price strategies in the short run as it does not reveal the specific marketing strategies that would tailor to the needs of Mainland Chinese tourists successfully which ensure non price competitiveness of Hong Kong as a tourist destination. Furthermore, there is no information provided on the long run demand elasticities. Without this information, Hong Kong Tourism Board may not be able to devise price and non – price strategies easily when attempting to increase Hong Kong's competitiveness as an international tourist destination in the long run.

Knowledge, Understanding, Application & Analysis		
L2	Descriptive points that consider how demand elasticities (i.e. PED & XED) are useful or not useful in devising strategies for Hong Kong which contain inaccuracies or theoretical answer that does not relate to case material. OR Descriptive points that consider how demand elasticities (i.e. PED & XED) are both useful or not useful in devising strategies for Hong Kong, but superficial and contain very limited explanations	4 – 6
L1	Provide sound economic analysis of how demand elasticities (i.e. PED & XED) are both useful and not useful in devising strategies for Hong Kong with careful consideration to case materials.	1 – 3
E	Balanced view demonstrating careful consideration to case materials in assessing the degree of usefulness of demand elasticities in devising strategies for Hong Kong, displaying clear economic analysis.	1 – 2

Suggested answers to CSQ2: The market for oil and electric cars

ai. Given the information contained in Table 1, identify the region that had the greatest impact on world oil prices. Justify your answer. [3]

- **Middle East** [1]
- Total consumption in the Middle East had an overall percentage increase of 1.31 percent (**DD**↑), which was outstripped by its total production which had an overall percentage increase of 5.44 percent (**SS**↑)
- It had the **greatest net increase** in oil production (i.e. increase in SS outweighs the increase in DD) compared to the rest of the regions given, causing world **oil prices to fall**.

aii. Besides the return of US oil and Libyan oil pushing up supply, explain one other reason that has contributed to the change in world oil prices. [2]

- According to Extract 1, given the current slowdown in the Chinese and EU economies have led to a **poor outlook**, consumers are not optimistic about their employment prospects for the future. Thus, **expectations of lower future income** will lead to a fall in their current **demand for final goods and services** like cars. The **derived demand for oil**, which is a factor input in the production of cars, will fall.
- Answers explaining the magnitude of the change wrt the price inelastic demand and supply should also be rewarded.

b. What can you conclude from the evidence in Extract 1 about the likely value of the price elasticity of demand of oil? [3]

- The value of price elasticity of demand of oil is likely to be less than one (i.e. demand is price inelastic)
- Given the increase in supply of oil, according to Extract 1, due to the return of US oil and Libyan oil to the market, if demand for oil is price inelastic due to it **being a necessity since it (an industrial raw material and commodity) is a key factor input in the production of many goods and services**, there will be a sharp fall in prices.

c. Explain how OPEC can 'stabilise prices by cutting production' of oil. [4]

- OPEC, the cartel of major oil producers' supplies over 30% of the world's oil (i.e. market share) would fix *production quotas* among member states. To maximize their revenue (profits)
- If OPEC were to cut the production of oil, it will reduce the total market oil supply, propping up oil prices, achieving the effect of stabilising prices.

d. Discuss the factors affecting the choice of pricing strategies for China's electric car producers. [8]

Firms within the electric car market can undertake pricing strategies to increase the level of profits earned (assuming the profit max motive). The choice of pricing strategies primarily revolves around the price elasticity of demand for electric cars in China.

Factor 1: The number of substitutes.

Factor 2: Degree of necessity

Factor 3: Changes in government policies

SECTION 3 – Essays

SECTION 3A – Lower-Order Skills

1. Prices of agricultural products increased by 14% in recent years, compared with only 3% for manufactured goods.
 - a. Using economic analysis, account for the differences in prices of agricultural and manufactured products. [10]

Suggested Answer

Approach: Justify demand for agricultural products are relatively more price inelastic and Supply are highly price inelastic. Moreover, production of agricultural products of which some are perishables & are subject to frequent fluctuation in market conditions, e.g., natural factor (vagaries of nature such as good /poor weather, natural calamities etc) as compared to manufactured products which is more durable in nature & its production is relatively within man's control e.g. existence of excess capacity, possibility of more shift work, innovation etc. Candidates are expected to put forward relevant DD & SS factors to justify the shifts.

Manufactured products belong to secondary industries. These are products, for example, typically produced in factories, turning basic raw materials into finished products. On the other hand, agricultural products are the direct produce of land. They can be agricultural food or agricultural raw material.

There is greater price stability for manufactured products due to the fact that supply of such products tends to be price elastic, if not perfectly elastic. Supply is elastic because such products can be mass produced & stored (not perishable & hence have longer shelf-life). Its production is seldom affected by weather or seasons. Production is round the clock or can be increased at short notice. Next, since such products are durables, they can be stockpiled, thus supply can be released or withheld easily in response to price changes. Given the elastic supply, any change in demand will cause a less than proportionate change in price (diagram).

The demand for manufactured products is also price elastic, as they are durables and tend to be luxury goods– consumers can choose not to buy when price rises and buy when price falls. Hence, any changes in supply, the price will not change much (diagram).

In the case of agricultural products, the price fluctuates more because of its inelastic supply and demand. The supply of agricultural products – agriculture for example, is either perfectly price inelastic or inelastic. Production is seasonal and crop takes a few months to grow (long gestation period). Once harvested, the quantity cannot be changed. Hence, the supply of rice, wheat and potatoes, which are staples, is perfectly price inelastic. Also, they cannot be stored for long as they are perishables. Any changes in demand will bring about a more than proportionate change in prices (diagram).

Likewise, the demand for agricultural products is also price inelastic. As food is necessity, we need food for basic survival. Any changes in supply will lead to a more than proportionate change in price (diagram).

In conclusion, due to the supply for agricultural products are relatively more price inelastic and demand are highly price inelastic, changes in its price is more 'significant' compared to manufactured products.

Candidates are expected to bring in demand and supply factors to justify their shifts.

Manufacturing

Demand side reasons: Income, Taste and Preference (changes in lifestyle) and population

Supply side reasons: Technology (Cost), Increase in number of producers in the world

Agriculture

Demand Side reasons: Biofuels, Speculation, Population, and Income

Supply side reasons: Natural Disasters, Changes in technology, changes in Crop Producing Areas

Knowledge, Application, Understanding and Analysis		
L3	A clear and developed economic analysis of how demand and supply factors together with elasticities concepts are used to explain and justify the price volatility of agricultural products compared to manufactured products.	8 – 10
L2	Relevant but explanation can be further elaborated as to why prices of agricultural products tend to be more price inelastic compared to manufactured products. OR Only Demand and Supply factors that are well elaborated but without discussions on elasticities	5 – 7
L1	Smattering of points of why prices of agricultural products tend to be more volatile compared to manufactured products with no/minimal reference to concept of elasticities.	1 – 4

2. The Spanish government, which is struggling to cut one of the Eurozone's largest public deficits during a recession, has raised taxes on tobacco.

Source: <http://www.eurocare.org>, 26 June 2013, accessed on 25 August 2014

(a) Explain why an increase in indirect tax on a good like tobacco tends to cause consumers to suffer more than producers. [10] (VJC, 2014)

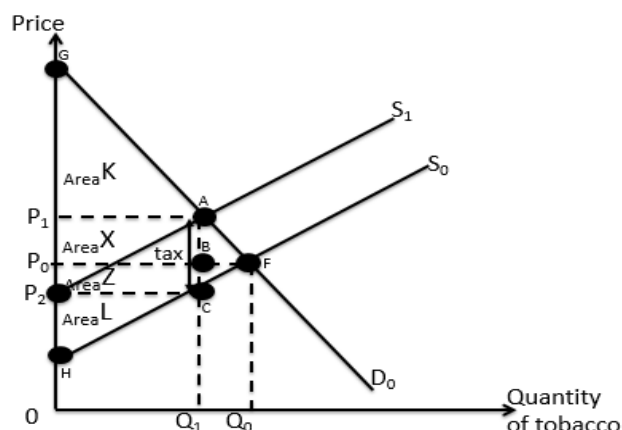
Suggested Answer

Introduction:

- Define indirect tax: Taxes that are levied on goods and services and are usually not paid directly by the consumer to the government but indirectly via the sellers of the good.
- Impact on consumer expenditure and producer revenue (Price X Quantity)
- Impact on consumer and producer surplus
 - Consumer surplus is the difference between the price buyers are willing to pay for a good and the actual price paid. It represents some kind of gain (saving) to consumers as they pay lesser than what they were willing to.
 - Producer surplus is the difference between the price sellers are willing to accept for a good and the actual price they receive. It represents some kind of gain to producers as they receive more than what they were willing to accept.
- Tax burden (tax incidence which depends on PED & PES)

Body:

- Indirect tax on tobacco → tax is perceived to add to the cost of production → supply for tobacco falls → supply curve shifts leftwards from S_0 to S_1 → shortage results in price to rise (P_0 to P_1) and quantity falls (Q_0 to Q_1)
- Demand for tobacco is price inelastic → (explain using determinants of PED) lack of close substitutes and high degree of necessity for smokers addicted (habitual consumption) to nicotine → increase in its price will lead to a less than proportionate fall in quantity demanded
- As supply falls → price rises (P_0 to P_1) and quantity falls (Q_0 to Q_1) less than proportionately → consumer expenditure increases (gain in consumer expenditure from the rise in price as shown in area X is greater than the loss in consumer expenditure as shown in area BFQ_0Q_1 → consumers suffer as consumer has to spend more than before
- As supply falls → producer's revenue falls from area OP_0FQ_0 to OP_2CQ_1 → producers suffer as they experience a decline in revenue (since tax revenue is area P_2P_1AC)
- With the indirect tax, consumer surplus is reduced from area GFP_0 to area K (GAP_1) and producer surplus is reduced from area HFP_0 to area L (HCP_2). However, the loss from consumer surplus (Area X + Area ABF) is greater than the loss from producer surplus (Area Z + Area BFC) and therefore, consumers suffer more than producers.
- Tax burden is borne more by consumers than producers → since $PED < 1$ as there are no close substitutes available to the consumers, producers are able to pass the greater tax burden to the consumers where consumer's burden (area X) is greater than producer's burden (area Z) → consumers suffer more than producers with an indirect tax on tobacco



Conclusion:

- The more price inelastic demand is, the greater the incidence of taxation on consumers.
- The more price elastic supply is, the greater the incidence of taxation on consumers.
- Consumers will bear a greater tax burden when the demand for the good is relatively more price inelastic than supply with its loss in consumer surplus being greater than the loss from producer surplus → therefore, consumers suffer more

Knowledge, Application, Understanding and Analysis		
L3	<p>Well-developed explanation of how consumers will suffer more than producers.</p> <ul style="list-style-type: none"> • Made reference to relative elasticity and tax burden with diagram. (max 9m) • Made reference to relative elasticity, tax burden, consumer & producer surplus with diagram. (10m) 	8- 10
L2	<p>Underdeveloped explanation of how consumers will suffer more than producers.</p> <ul style="list-style-type: none"> • Made reference to PED and tax burden with diagram. <p>OR</p> <ul style="list-style-type: none"> • Made reference to PED, changes in producer revenue and consumer expenditure with diagram. 	5 – 7
L1	Mere listing of points.	1– 4

Section 3B: Essays

1. **Microsoft has announced a price cut to its Xbox gaming console as well as introduce the new black Elite version. These measures are meant to counter the fall in the price of its competitor (Sony Playstation 3) and reverse falling Microsoft sales as a result of previous defects in its Xbox.**
 - (a) Explain the factors affecting the demand for the Microsoft Xbox. [10]**
 - (b) Discuss how an understanding of price elasticity of demand, income elasticity of demand and cross-elasticity of demand might be helpful to the manufacturer of the Xbox. [15]**

Suggested Answer

Part (a):

The demand for a Microsoft Xbox can be defined as the quantity of Xbox game consoles that consumers are willing and able to buy at a given price, over a particular period of time, holding all other things constant. This demand is affected by its price, as well as other non-price factors such as household incomes, the price of related goods, and the tastes and preferences of consumers.

Firstly, the price of an Xbox itself can affect the quantity demanded. The Law of Demand states that the quantity demanded of an Xbox is inversely related to its price, *ceteris paribus*. Thus the lower the price of a good/service, the greater the willingness and/or ability to buy the good/service, and hence the greater the quantity demanded. This gives rise to a downward sloping demand curve. As such, price is one determinant of demand for the Xbox.

The prices of related goods also affect the demand for the Xbox. Related goods include both substitutes and complements to the Xbox. Substitutes in this context refer to alternative goods that can be used in place of an Xbox because it satisfies the same want, such as the Sony Playstation as mentioned in the preamble. The demand for an Xbox may be affected by changes in the price of a Playstation – for instance, if the price of a Playstation goes down, consumers may switch to a Playstation, thus causing demand for an Xbox to fall. This scenario is assuming that the price of a Playstation goes lower than the price of an Xbox, and that the Playstation is a good or close enough substitute to the Xbox, such that people do not mind switching from the latter to the former. On the other hand, complementary goods refer to goods which have to be used at the same time to satisfy the same want. Examples of a complement to the Xbox would therefore be the electronic games that can be played on it, or a television set. Therefore, when the price of a television set goes down, the quantity demanded of television sets would increase (according to the Law of Demand). Since an Xbox is a complementary good, demand for the Xbox may increase as well. Thus, the prices of related goods such as substitutes and complements can affect the demand for an Xbox.

Consumer tastes and preferences can also affect the demand for an Xbox. When consumers' tastes and preferences change in favour of a particular good, the demand for that good will go up. In the case of the Xbox, it is mentioned that there were defects discovered. This may lead to a loss in consumer confidence, and as their perception of the Xbox becomes less favourable, the demand for it will fall. Likewise, in launching the new black Elite version of the Xbox, perceptions may turn favourable again if consumers perceive that it is of a better technology, or has more aesthetic appeal. As such, tastes and preferences play a role in influencing the level of demand for a product such as the Xbox.

Lastly, household income could be another factor affecting the demand for the Xbox. The level of income affects the purchasing power of households. Therefore, when income levels rise, households are more willing and able to consume goods like gaming consoles. This is based on the assumption that a gaming console such as the Xbox is a normal good, such that demand for it rises when income levels go up. This assumption is likely to hold across most consumer groups since an Xbox serves as a form of entertainment and it is not unimaginable that people would consume more of such goods as they become more affluent. Therefore, household incomes can influence the demand for an Xbox.

In conclusion, there are many factors influencing the demand for a Microsoft Xbox, such as the price of the good itself, and non-price factors like household incomes, the price of related goods and consumers' tastes and preferences. An understanding of the trends in these factors would therefore be important to Microsoft in producing and marketing the Xbox.

Knowledge, Application, Understanding and Analysis		
L3	Clear explanation of factors affecting demand for Xbox with appropriate examples drawn from the preamble.	8-10
L2	Generally clear explanation of some factors affecting the demand for Xbox. Answer may not be well organized or lack linkage to the preamble.	5-7
L1	Sketchy answers/ mere listing of the different factors of demand, <u>or</u> Generic answer on demand factors of a good with no reference to Xbox/gaming consoles	1-4

Part (b):

Elasticity concepts seek to capture the responsiveness of quantity demanded or demand to various changes in price and income. The price elasticity of demand (PED) measures the responsiveness of quantity demanded of a good/service to a change in its own price, *ceteris paribus*. The income elasticity of demand (YED) measures the responsiveness of demand for a good/service to a change in consumers' money income, *ceteris paribus*. The cross elasticity of demand (XED) measures the responsiveness of demand for a good/service to a change in the price of another good, *ceteris paribus*. An understanding of these concepts can help Microsoft in pricing and output decisions related to the Xbox. To begin with, it is assumed that Microsoft seeks to maximise the total revenue from making and selling the Xbox, where total revenue is calculated by multiplying the quantity of goods sold with the price at which it was sold.

The concept of PED would be helpful to Microsoft as an understanding of the relationship between PED and total revenue aids them in their pricing decision. Firstly, the demand for an Xbox is likely to be price elastic as it can be considered a luxury good to many people, and has several substitutes. In other words, the quantity demanded of an Xbox is very responsive to price changes ($|PED| > 1$). As such, to increase total revenue, Microsoft may lower the price of the Xbox.

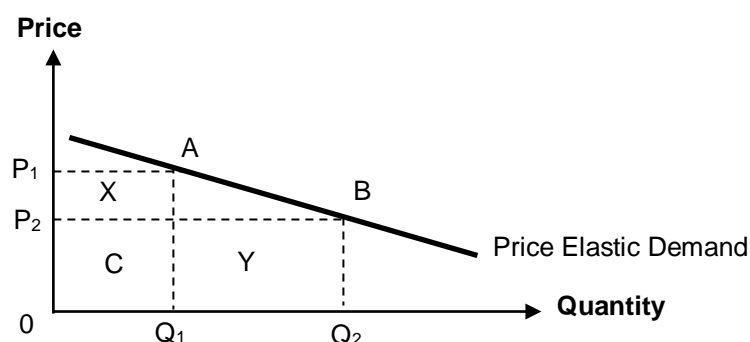


Figure 1: When demand is Price Elastic

With reference to Fig 1, suppose that the initial price and quantity traded is P_1 and Q_1 respectively. The total revenue is represented by the area OP_1AQ_1 since it is calculated by taking the product of price and quantity. When the manufacturer of the Xbox lowers the price to P_2 , quantity demanded increases more than proportionately from Q_1 to Q_2 . There will be a fall in total revenue due to a fall in the price (as represented by area X), but this is outweighed by the increase in total revenue due to the more than proportionate increase in quantity demanded (as represented by area Y), thus total revenue will increase.

Conversely, the manufacturer may decide that the demand for an Xbox could be price inelastic, particularly in markets where there is a strong gaming culture. In that case, the quantity demanded of an Xbox may not be very responsive to price changes because people have developed a habit of playing electronic games. In such cases, the manufacturer may wish to raise prices instead. Quantity demanded would fall less than proportionately, such that total revenue would still increase. As such, an understanding of the PED in a market can help Microsoft with its pricing decision.

However, the above application of the PED concept assumes that everything is held constant, but this is not always the case in real life. Therefore, an understanding of PED may only be helpful to a limited extent. Microsoft would also need to look at the pricing decisions of its competitors such as Sony to make their own decision, so that they would remain price competitive. Furthermore, the tastes and preferences of consumers may change in or against the favour of Microsoft, and this would affect the way they price their product as well. Secondly, the concept of YED may be useful to Microsoft to enable it to make output and marketing decisions. As discussed in (a), the Xbox can be considered a normal good whereby a rise in income levels would lead a rise in its demand. In particular, the Xbox may be considered a luxury or semi-luxury good for most people, thus the YED value is positive and greater than 1 as people tend to want to purchase more of such goods as they become more affluent, in a bid to improve their lifestyle. Contrast this to the YED of goods that are more of necessities (such as staple food) – the value is likely to be positive but small, as demand for these goods are not likely to increase by much when incomes rise. As people get more affluent, they are likely to indulge more in luxury goods than in necessities. Thus, the YED concept comes in handy when Microsoft is deciding on how much to produce under different economic circumstances.

For instance, Microsoft may use the YED concept when deciding how much to produce in developing and developed countries. In emerging markets such as China and Brazil, income levels have been rising rapidly in recent years, fueling the demand for the Xbox. In these developing economies, an Xbox is likely to be perceived as a luxury good as it is a form of entertainment that satisfies more than just the basic needs. As such, demand is likely to be income elastic ($YED > 1$), which means that for any given percentage rise in income, demand for the Xbox increases more than proportionately. As such, Microsoft should expand

its output in developing countries that are experiencing income growth, in order to maximise total revenue. In contrast, developed countries may have slower growth. An Xbox may also be perceived as only a semi-luxury good, or even just a normal good, thus demand for it may be income inelastic ($YED < 1$) – that is, demand will still grow, but it may be less than proportionate to income growth. As such, Microsoft may not want to stock up as much in developed countries to avoid accumulating excess stocks that may prove costly in terms of storage.

Microsoft may also find the YED concept useful when deciding how to market its products in times of economic boom. When the economy is doing well, Microsoft may choose to launch the more luxury version of the Xbox, such as the black Elite model, as demand for it is likely to be income elastic. This would thus allow Microsoft to take full advantage of rising income levels to increase total revenue.

As such, an understanding of YED can help a firm like Microsoft decide on how much to produce in different geographical locations, and even when to launch a product. However, just like how PED may be limited in its usefulness, YED is also not sufficient for Microsoft as there are other factors that influence demand, aside from income.

Lastly, the concept of XED may help Microsoft to estimate the effect on demand for their products when prices of related goods and services change, and to respond accordingly. The XED value captures the relationship between two goods. For instance, the XED value of an Xbox with respect to the price of a Playstation is likely to be positive since the demand for an Xbox is likely to increase when the price of a Playstation increases (positive relation). It is also likely to be greater than one as the Xbox is a close substitute of the Playstation, given their similar features and function. A change in the price of a Playstation would therefore trigger a more than proportionate change in demand for the Xbox, so knowing the XED would allow Microsoft to gauge how much to stock up or stock down on their product. Furthermore, if they find that the XED value is indeed large, they may adopt strategies to reduce this value, so that the demand for the Xbox becomes less sensitive to changes in the price of the Playstation. An example of a strategy would be to develop more unique features in the Xbox, such that the Playstation is no longer a close substitute. Alternatively, Microsoft could provide better support services to their consumers, such that they become more loyal to the brand and would not easily switch to other gaming consoles. Such strategies thus serve to make the XED value smaller – that is, to make the Xbox less easily substitutable.

In conclusion, the various elasticity concepts can help Microsoft in its pricing, output and marketing decisions. Nonetheless, it is important to recognise that there are limitations. To begin with, it is not easy to obtain reliable elasticity values. The elasticity concepts are based on *ceteris paribus* assumptions, but in real life, many variables are constantly changing, such that it is hard to isolate the effect of say, a change in income on demand for a good/service. Microsoft also needs to have a broader perspective that includes the costs of production and operation, the changing tastes and preferences of consumers, and technological breakthroughs in the industry, in order to better inform its business strategies.

Knowledge, Application, Understanding and Analysis		
L3	Clear discussion of how Microsoft can make use of the 3 elasticity concepts with appropriate examples.	8– 10
L2	Generally clear explanation of the usefulness with some application to the Microsoft Xbox	5 – 7
L1	Generic explanation of the usefulness of PED, YED and CED with little or no application to the given context (Microsoft Xbox)	1 – 4
Allow up to 5 additional marks for Evaluation		
E3	Clear application of the relative usefulness of the 3 elasticity concepts and other factors needed for Microsoft	4-5
E2	Clear explanation of the relative usefulness of the 3 elasticity concepts.	2-3
E1	Relative usefulness of the 3 elasticity concepts identified.	1

2. “Certificate of Entitlement (COE) supply for the fiscal year starting April 2009 will be cut by 24 per cent. A smaller COE quota will mean that overall sales of cars will be affected across the board since the supply of new cars will be restricted by the smaller quota...On the other hand, SMRT has decided to reduce bus and train fares and to increase number of train trips given the severe economic crisis...”

Adapted from the Straits Times, Feb 2009

- (a) Using a diagram, explain how the recession and fall in the supply of COEs will affect the market for new cars. [10]
 (b) Discuss the relative significance of price elasticity of demand and cross elasticity of demand in explaining the decisions made by the public transport operator SMRT. [15]

Suggested Answer

Part (a):

- Demand side effect:
 - Recession – fall in income → fall in dd for brand new cars
 - Demand for brand new cars is income elastic (seen as luxury good as compared to public transport or second-hand cars) → fall in dd by significant extent
- Supply side effect:
 - Fall in supply of COEs → ↓ss of new cars
- Combined effect of ↓dd and ↓ss → ↓Q of new cars but effect of price depends on extent of fall of dd and ss (use elasticity or relative extent of fall in dd/ss)
- Extent of ↓dd likely to be more than ↓ss due to fall in public transport fares
 - Likely ↓P of new cars (accept alternative conclusions if well justified)

Knowledge, Application, Understanding and Analysis		
L3	For an answer that uses demand-supply analysis to explain how recession causes demand to fall, and fall in COE supply causes supply to fall, and explains combined effect on Q & P. For top L3, the combined effect on Q & P must be well justified.	8-10
L2	For an answer that shows an understanding/application of how recession causes demand to fall, and fall in COE supply causes supply to fall. Attempts to explain the impact on price and quantity.	5-7
L1	For an answer that shows a descriptive knowledge of demand and supply of cars and/or an unexplained diagram.	1-4

Part (b):

- Define – PED & XED
- Relevance of PED in explaining decision taken by SMRT:
 - DD for bus/train rides provided by SMRT may be price elastic → due to the presence of other substitutes such as bus/train rides provided by private bus companies or rival company (SBS) or taxi rides.
 - As such, lower fares can result in a more than proportionate increase in Qd → higher revenue (explanation + diagram)
 - PED is relevant in explaining why SMRT has decided to lower fares.
 - Fulfills profit maximization objective
 - OR
 - DD for bus/train rides provided by SMRT may be price inelastic → seen as necessity to most Singaporeans
 - As such, lower fares can result in a less than proportionate increase in Qd → lower revenue (explanation + diagram)
 - PED does not seem relevant in explaining why SMRT has decided to lower fares.
 - Decision taken could be motivated by other objectives (welfare for the people in times of recession)
- Relevance of XED in explaining decision taken by SMRT:
 - From (a): either increase in decrease in price of new cars
 - Drop in price of new cars → fall in dd for public transport → SMRT should decrease output → therefore not relevant
 - OR
 - Increase in price of new cars → increase in dd for public transport → SMRT increase output (relevant)
 - In view of the current economic crisis, many consumers may view public transport and private transport as close substitutes. Furthermore, many consumers are likely to switch from private transport/taxi rides to bus/train rides.
 - With high positive XED value, a reduction of bus/train fares will bring about a significant fall in demand for private transport or taxi rides. This can help SMRT to attract more customers.
 - Therefore, XED helps to identify close substitutes - ↓P of substitutes (SBS) → need to respond accordingly
- Limitations of PED and XED (criticise the accuracy of estimates, ceteris paribus condition etc)
- Evaluation
 - Judgement on the relative significance of price elasticity of demand and cross elasticity of demand in explaining the decision taken by SMRT
 - Other factors need to be taken into consideration e.g. pressure by government to reduce prices given current economic crisis – welfare perspective
 - YED could be more relevant in explaining output decision

Knowledge, Application, Understanding and Analysis		
L3	For an answer that uses analysis to underpin the discussion of relative significance of price elasticity of demand and cross elasticity of demand to the public transport operator SMRT. A balanced analysis considering both sides (relevance and limitations) is required for this level.	8-10
L2	For an answer that attempts to apply price elasticity of demand and cross elasticity of demand to the public transport operator SMRT. And/or considers only relevance but not limitations (max of 6m if analysis is one-sided).	5-7
L1	For an answer that shows knowledge of price elasticity of demand and cross elasticity of demand. Does not apply to the public transport operator SMRT. Some inaccuracies.	1-4
E3	For an evaluative application of the impact of the decision made by SMRT.	4-5
E2	For an evaluative judgement on the price and output decision taken by SMRT.	2-3
E1	For an unexplained judgement or one that is not supported by analysis.	1

3. Global food prices are poised to rise sharply in 2014 again. Economists cite the rising incomes in China, severe drought in the US, China's rapid urbanisation and unrests in Ukraine and Israel as key drivers of the abrupt price increase. India has been stockpiling grains for sale to consumers at heavily subsidised prices to ensure that the poor has access to cheap food.

(a) Account for the sharp rise in global food prices. [10]

(b) From the consumers, producers and government's perspectives, assess whether India's strategy of stockpiling for subsidised sale is better than a price ceiling. [15] (CJC, 2014)

Suggested Answer

Part (a):

- Rise in income → rise in demand for food Unrests in Ukraine & Israel → rise in demand now due to uncertainty for the future OR fall in SS due to reduction in sources of food
- Severe drought in US → fall in SS
- Rapid urbanisation → fall in amount of land for agriculture → fall in SS
- DD and SS of food are both P_{inE} –PED (necessity), PES (food needs time to grow)
- Illustrate with use of diagram a very sharp rise in food prices as a result of demand and supply shocks

Knowledge, Application, Understanding and Analysis	
L3 8-10	Addresses the question. Able to give in-depth contextual explanation of rise in DD, fall in SS well. Also able to explain price elasticities of demand and supply well. Good diagrammatic illustration and explanation of how these two factors lead to a very sharp rise in food prices. Marking Guide: <ul style="list-style-type: none"> • Any 3 well-explained sources of increase in price (DD, SS, PED or PES): max 7m • 4 well-explained sources of increase in price: 8-10m
L2 5-7	Answer mostly relevant and addresses the question. For an answer which <ul style="list-style-type: none"> • contains some economic analysis of the DD SS PED PES framework though not consistently applied throughout; or with some errors • is largely theoretical with limited application to the given context
L1 1-4	For an answer which <ul style="list-style-type: none"> • is largely irrelevant with no indication that the meaning of the question has been properly grasp • Did not explain PED and PES • is largely descriptive and/or contains gross conceptual mistakes

Part (b):

Compare the impact on key benchmarks (e.g. equilibrium P & Q, TE, TR, consumer surplus, producer surplus, amount of government expenditure) for both stockpiling and price floor strategies to decide which is better.

Thesis: Stockpiling to sell at subsidised price is better Key Criteria: Consumer Surplus, Producer Surplus	
Stockpiling to sell at subsidised price	Price ceiling
<ul style="list-style-type: none"> Explain how stockpiling strategies reduces food prices within India – illustrate increase in SS due to release of stockpile and amount of subsidy in diagram Extent of change for the above depends on relative PED and PES Demand tends to be Price inelastic; SS tends to be relatively more price elastic due to stockpiling Use diagram to illustrate impact based on above benchmarks: (i) P, Q change; (ii) impact on TE consumers; (iii) impact on govt revenue; (iv) impact on producers As a result of the subsidy and price elasticities of DD and SS, <ul style="list-style-type: none"> P falls by a large extent and Q rises less than proportionately TE by consumers falls Consumer surplus increases Producers gain revenue from subsidy and thus larger TR from sale of good 	<ul style="list-style-type: none"> Assume price ceiling is meant to achieve the same lower price at P1 as subsidy in figure 11a Creates a shortage (reference to figure), since Qs is low at Qs at P1, but Qd is high at Q1 Qty exchanged will be based on Qs sold at P1 – <u>same P1 as subsidy, but lower Q at Qs.</u> Consumers who are able to purchase the lesser quantities of food will be able to gain from the lower p – (a) But there will be consumers who were previously able to purchase but do not have access now (Qs-Q0 amount) and so are worse off.– (b) Net change in consumer surplus (to before ceiling) is uncertain, depending on whether (a) outweighs (b) <u>But relative to subsidy, consumer surplus for ceiling is lower.</u> <u>Producer surplus also reduced compared to subsidy</u> <p>(optional – black market)</p> <ul style="list-style-type: none"> Furthermore, there is likely to be formation of black market, where each unit of Qs can be sold up to the consumers' willingness and ability to pay – this will result in zero consumer surplus and producer's in black market will gain maximum seller surplus This also effectively prices out the poor, aggravating the inequality
Anti-Thesis: Price Ceiling is better Key Criteria: Government Expenditure	
<ul style="list-style-type: none"> Govt expenditure rises due to subsidy amount. Producer and consumers gain, but government expenditure rises. 	<p>But SS in the price ceiling case may be more price inelastic, since there is no stockpiling by the government</p> <ul style="list-style-type: none"> Due to the inelastic nature of PES, this will result in a smaller shortage due to the ceiling at P1. Thus, the effects on consumer and

	producer surplus as explained above will be moderated.
	<ul style="list-style-type: none"> However, there may be some government expenditure incurred, since the govt may however have to police the price ceiling, thereby incurring costs. (optional – black market) Government expenditure may be spent on policing the black market instead
<ul style="list-style-type: none"> Govt did reduce prices for the poor through subsidies, but the extent of increase in quantity is not substantial (less than prop) due to the price elasticity of demand. Wastage of precious food – food is perishable, stockpiling often leads to wastage when the piles of food goes bad in the government warehouses. 	
<ul style="list-style-type: none"> Other considerations: Also depends on whether DD has further increased, due to increase in income; or expectation of food supplies and prices in future; or whether other neighbouring countries can purchase the subsidised grains from India. If there are able to, the subsidy may benefit non-Indians than the poor in India, despite the heavy expenditure on subsidies by the Indian government. Rise in demand would cause prices to rise, requiring more government subsidy and less access by the poor. 	<p>Other considerations:</p> <ul style="list-style-type: none"> Rise in demand will aggravate the shortage and prevalence of black market The poor will only benefit to the extent that they can get their hands on the limited amounts of grains at the official P1 price ceiling.
Synthesis	
<p>Government subsidy seems to yield better outcomes in terms of consumer surplus (particularly access to the poor), producer surplus. Government expenditure is substantial for subsidy, and is much lesser for price ceiling. However, this need not be the case if the monies were required to be spent on policing the price ceiling (or the black market) which may be substantially high and outweighs the costs of subsidy. This is likely to be the case given that India is a very large country (high costs of policing the ceiling or black market). Hence, on balance, subsidy may be better for India.</p> <p>(Added perspective) However, at the end of the day, the subsidy does not solve the root cause of the problem and is unsustainable in the long run given the large costs to the government. India should thus consider investing longer term policies to improve the technology and local production of agriculture produce, in order to meet the rising demand for food and improve access to the poor.</p>	

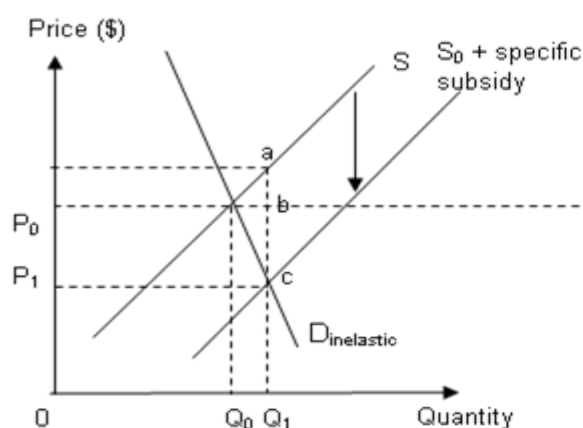


Figure 11a

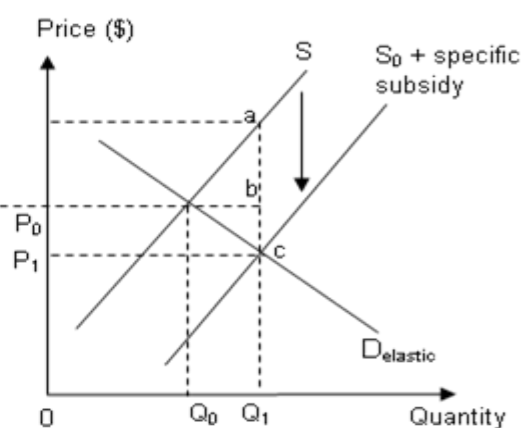


Figure 11b

[NB: Just refer to figure 11a, figure 11b is here for my own reference for the moment]

Knowledge, Understanding, Application and Analysis		
L3	Addresses the question, with thorough explanation of how price ceiling and stockpiling for subsidised sale work, and its effect on P, Q, consumers, producers (with explicit link to consumer & producer surplus) and government, with good use of diagrams to illustrate points. Coherent and well-argued essay that clearly compares the <u>relative</u> impact on consumers, producers and government.	8-10
L2	Mostly addresses the question, and explains (but with some gaps/inaccuracies) how price ceiling and stockpiling for subsidised sale work, and its effect on P, Q, consumers, producers and government, with some relevant use of diagrams to illustrate points. Shows evidence of developing content points to form judgements on the relative impacts on the various parties, though without consistent and clear explanation. Mostly coherent argument, though not consistent throughout the essay. Marking Guide: Answer that does not fully address the question, in the form of the following variations – max 6m: <ul style="list-style-type: none"> - Answer with no comparison but thorough explanation - Explores only 2 out of 3 parties' perspectives, e.g., only from consumer and producer but not government POV 	5-7
L1	Essay only obliquely answers the question, with weak or incomplete content explanations of how price ceiling and stockpiling for subsidised sale work, and its effect on P, Q, consumers, producers and government, with no/little relevant use of diagrams to illustrate points. No link to consumer, producer and government, or with link to these parties but very poorly or skimpily explained. Little/no evidence of developing content points to form judgements on the relative impacts on the various parties. Incoherent arguments. Marking Guide: <ul style="list-style-type: none"> - Answer that does not address the question, exploring only 1 out of 3 parties perspectives – max 5m 	1-4
E3	Shows well-reasoned evaluation on the effects on the various parties, and a justified (and contextualised) stand on which policy is better	4-5
E2	Shows some attempt to evaluate the effects on the various parties but with weak or no justified stand on which policy is better.	2-3
E1	For an unexplained judgement or one that is not supported by analysis.	1

4. *'Sales of adult fiction in hardback had fallen by over 10%, while cheaper paperback by only 6%. The price people are willing to pay is falling, while hard-cover prices are climbing. The Association of American Publishers announced that the "explosive growth" of e-books account for 13.6% of adult fiction market in America, with burgeoning e-books sales increasing by over 1000% in the last three years after the launch of the e-book reader.'*

Adapted from: The Daily Telegraph August 2011

- (a) Explain the likely reasons for the overwhelming increase in sales of e-books. [10]
(b) With the aid of relevant concepts, analyse the impact of the e-book trend on the publishing and related industries. [15] (NYJC, 2011)

Suggested Answer

Part (a):

Synopsis: To look into the different factors affecting the 'overwhelming' increase in sales' of e-books. The sales of e-books is represented by an increase in the equilibrium quantity of e-books. These factors should be linked to increases in demand and supply of e-books.

1. Intro

- Explain that increases in sales of e-books can be due to rising DD for e-books or rising SS of e-books.

2. Increase in sales could be due to increasing demand.

Focus should be on the increasing equilibrium quantity (**Draw and show**).

Factors responsible for this:

- **Change in taste and preference in favour of e-books:** Explain the features of an e-book: An ebook is a book in electronic format. It is downloaded to a computer, PC, Mac, laptop, PDA or any other kind of computer, and is read on the screen. It can have numbered pages, table of contents, pictures and graphics, exactly like a printed book. Advantage of an e-book: easy storage, environmentally friendly, ability to show links for easy access to more information.
- **Increase in income**
- **Increase in the price of traditional books (substitutes)**
- **Fall in price of e-book readers as well as increase in availability of e-book readers (complements)** on other devices such as handphones, etc

3. Increase in sales could be due to increasing supply

Focus should be on the increasing equilibrium quantity (**Draw and show**).

Factors responsible for this:

- Lower cost of producing e-books due to improved technology
- Increasing number of firms creating e-books due to high profits offered by ebooks

4. Increase in sales in e-books due to both rising demand and supply factors

5. **Conclusion :** E.g. DD more responsible than supply, especially change in taste and preference

Knowledge, Understanding, Application and Analysis		
L3	Clear explanation of DD and/or SS factors that contributed to the increase sales of ebook with appropriate use of examples and diagrams.	8 – 10
L2	Answers that were focused on DD and/or SS factors of ebook but lacks reference to sales of ebook.	5 – 7
L1	Answers show some knowledge of concepts required with respect to DD and SS factor influencing sales.	1 – 4

Part (b):

Synopsis: *To analyse how the rising sales in e-book due to rising demand (non price factors) or rising supply (price factor) impact (positive and negative) publishing and related industries. In analysing the impact on markets, answers should demonstrate how the rising trend in the sales in e-book can affect the market DD and/or SS of the publishing and related markets. Attributes such as changes in equilibrium price and output, revenue etc. should be analysed.*

1. Intro

- Explain that the rising e-book trend is due to falling e-book prices (\uparrow SS and/or \uparrow DD)
- Identify some goods and services in the publishing industry: relating bookshops (retailing industry), traditional books, paper manufacturing, printing machines, chemicals for printing, toner, photography etc.
- Identify other related industry (e.g. e-book reader, smart phones - I-phone & Android)

2. Impact on publishing industry : E.g traditional books (Substitutes)

- Falling e-book prices leads to increase qty DD for e-books
- E-books and traditional books are substitutes. Fall in price of e-books, leads to fall in DD for traditional books. (Draw the traditional book market and explain impact on equilibrium price and output)
- Extent of fall in DD will depend on the closeness of substitutes between e-books and traditional books. XED can tell us if they are good or poor substitutes. (Explain how!)
- E-books may be close substitutes to traditional books (explain why) hence the magnitude of the fall in demand for traditional books is large
- E-books may be poor substitutes to traditional books (explain why) hence the magnitude of the fall in demand for traditional books is small
- For both the above case explain how this would determine the impact (**equilibrium price and output, revenue etc**) on the traditional book market.
- In the LR, as profitability of substitute goods (traditional books) falls, producers of substitute goods may turn to e-books and divert their resources towards the e-book market. This results in a fall in SS of the substitute goods. (draw and explain the impact on the market. Compare short run outcome to LR outcome. Explain that overall outcome is dependent on the magnitude of shift between LR and SR)

3. Impact on other related industry : E.g paper manufacturing (derived demand to traditional books)

- As the demand for traditional books falls, the demand for paper to produce these books also falls as they are in derived demand (explain).
- The demand in the paper will fall. (Draw the paper market and explain impact on equilibrium price and output)
- Similarly in the LR as the paper to produce traditional books contracts, more firms may leave the market due to falling profits. This results in a fall in SS. Final outcome in the market depends on relative shifts between DD and SS)

4. Impact on related industry : E.g Smartphones (Complements)

- E-books and smartphones are complements. Fall in price of e-books, leads to rise in DD for smartphones. (Draw smartphones market and explain impact on price and output)
- Extent of rise in DD will depend on the closeness of complements between e-books and smartphones. XED can tell us if they are good or poor complements. (Explain how!)
- E-books may be close complements to smartphones (explain why) hence the magnitude of the rise in demand for smartphones is large
- E-books may be poor complements to smartphones (explain why) hence the magnitude of the rise in demand for smartphones is small
- For both the above case explain how this would determine the impact on the traditional book market. In the LR, as profitability of complementary goods (e.g. smartphones) rise, more firms may enter the smartphone industry. This results in a rise in SS of the complementary goods. (draw and explain the impact on the market) . Compare short run outcome to LR outcome. Explain that overall outcome is dependent on the magnitude of shift between LR and SR)

5. Impact on other related industry : E.g Software (derived demand)

- As the demand for e-book rises, softwares that are used to create these ebooks will expand as well. These goods are in derived demand. (Explain)
- The demand in the software industries will rise. (Draw the software market and explain impact on equilibrium price and output)
- Similarly in the LR as the software to create ebooks expands, more firms may enter the market due to rising profits. The rising supply may erode the profits as prices falls (Final outcome in the market depends on relative shifts between DD and SS)

6. Conclusion

As the sales of e-book expands rapidly, its impact is felt across several markets that are related to it as well as market that are related to markets that are affected. It is thus important for governments to ensure that there are stringent laws on copy-rights, patents and others that would protect writers of both print and e-books. With increasing globalization and fast improving technological advancements, transfer of information has been greatly facilitated and with much ease. These will therefore result in greater influence and impact on more industries than initially thought it to be!!

Knowledge, Understanding, Application and Analysis		
L3	Clear explanation of how the market (equilibrium price and output, profits...etc) of substitutes and complements as well as goods that are in derived demand (bookshops, printing, paper, IT industry: publishing and non-publishing) are affected by the rising sales of e-book.	8-10
L2	Clear explanation of how the market (equilibrium price and output, profits...etc) of substitutes and complements are affected by the rising sales of e-book.	5-7
L1	Superficial answers that attempts to explain how publishing and related industries are affected by rising sales in e-book.	1-4
E3	Looks into the possible impact of the outcomes in other industries	4-5
E2	Addresses the extent of changes in the market of publishing as well as non-publishing industry (e.g based on closeness of substitutes and complements). Alternatively, adopts a comparison of outcome in the market of publishing as well as non-publishing industry over different time periods.	2-3
E1	Answer attempts to provide an unexplained judgement on the outcome in the publishing as well as non-publishing industry.	1

5. In 2005 the rate of Goods and Services Tax (GST) in Singapore rose from 3% to 5%. Incomes rose by approximately 4.5% in 2005.

- (a) Explain the likely effect of this change in GST on expenditure by consumers on different types of goods. [10]
- (b) Discuss whether the combined effect of the rise in incomes and the rise in GST is likely to cause the quantities of different types of goods sold to rise or fall. [15]

Suggested Answer

Part (a):

Introduction:

Explain how Equilibrium quantity is determined in the market through interaction of demand and supply.

Body:

Shift of demand and/or supply would change equilibrium quantity of different goods in the market.

GST is an **ad valorem tax** which is calculated as a percentage of the sales price of a commodity. Supply curve shift left. Diverging supply curve. Diagram.

The increase in GST will raise the prices of goods and reduce quantity exchanged (purchased) but expenditure ($P \times Q$) by consumers might **rise** or **fall**.

The extent of the change in total expenditure by consumers on different types of goods would depend on the **price elasticity of demand** for the different types of goods.

Define PED and explain that PED values depend on several factors like number and closeness of substitutes, degree of necessity etc)

For goods having inelastic demand, ($0 < PED < 1$) (e.g. necessity goods), the effect of the increase in price (because of raised GST) would cause Qty Dded to fall by a smaller percentage and so total expenditure by consumers would actually **rise**. Explain with diagram.

For goods having elastic demand, ($1 < PED < \text{infinity}$) (e.g. luxury goods) Qty Dded would fall by a larger percentage and total expenditure by consumers would **fall**. Explain with diagram.

Conclusion:

The effect of the increase in GST would cause a change in TE by consumers, but the extent of the change in total expenditure depends on the PED of the different types of goods.

However, whether the demand for a product is price elastic or inelastic depends on the various determinants of PED. For e.g. demand for luxury goods may be price inelastic for the rich but price elastic for the poor.

Knowledge, Understanding, Application and Analysis		
L3	An answer that uses relevant analysis including PED to show the effect. Show appreciation of how PED makes a difference to extent of price rise and whether TE rise or fall.	8-10
L2	An answer that describes the effect or gives an unexplained diagram to show the effect, using relevant elasticity concept. Answer is well-explained but for one good only (max 5m) OR Inadequate explanation for 2 goods without good application of PED concept	5-7
L1	An answer that shows a descriptive knowledge that price will rise or defines elasticity but doesn't use it. If just mention that tax raise price, & PED has an impact but nothing else, this is just knowledge. Only discuss for one good, without using PED concept.	1-4

Part (b):

Introduction:

Define YED

The effect of the rise in **income** on different types of goods would depend on the YED values (for **normal** goods with positive YED the demand curve would shift to the **right** and for **inferior** goods with negative YED demand curve would shift **left**). Explain with examples and diagrams.

Body:

The increase in GST would cause the supply curve to shift left. However the extent of the change in equilibrium quantity would depend on the PED values of different goods.

The **combined** effects of the rise in income and the rise in GST would depend on the PED and YED of the different types of goods.

3/4 possibilities----- Explain with Diagrams.

- Leftward shift of both supply and demand curve for **inferior goods (with YED -ve)** would lead to a **fall** in equilibrium quantity sold.
- For **Luxury goods {YED high +ve, PED > 1}** (leftward shift of the SS curve and rightward shift of the DD curve) **there** would probably be a **rise** in quantity sold as the effect of the increase in income outweighs the tax rise. (must show DD shifts more than the SS shift)
- For **normal /necessary goods (YED low +ve, PED < 1)** the effect is indeterminate. **Leftward** shift of the SS curve and **rightward** shift of the DD curve but the **extent** of the shift of the SS and DD curves would determine the net effect on the equilibrium quantity. The equilibrium quantity may increase, decrease or remain same.

Conclusion:

The combined effect of the rise in incomes and the rise in GST is likely to cause the quantities of different types of goods sold change in different ways depending on the PED and YED values of the goods.

However, both the values are **relative**; one person's inferior good might be another person's luxury.

Other factors like tastes and preferences, price of substitutes/complements, etc may not remain the same, and if any of these change, the outcomes will be different with varying degrees depending on the amount of the impact varying factors have on the consumers of the goods and also on the elasticities of demand for the good.

Knowledge, Understanding, Application and Analysis		
L3	An answer that uses analysis of PED & YED to underpin the discussion of how quantities of different types of goods will be affected by a rise in incomes and a rise in GST	8-10
L2	An answer that shows an understanding or application of PED & YED to determine combined effect of rise in income and rise in GST on a good but explanation is undeveloped	5-7
L1	An answer that shows a descriptive knowledge of price and income elasticities of demand.	1-4
E3	Compares the different outcomes with and without the presence of the assumptions	4-5
E2	Evaluative assessment based on economic analysis Consider possibility of different outcomes if assumptions do not hold	2-3
E1	Unexplained assessment or one that is not supported by analysis Mere summative conclusion about the combined effects of rise in GST & income	1

Section 3C: Essays

1. It is often observed that even when crude oil prices have fallen, the price of petrol at the petrol kiosks refuses to slide.

Discuss why changes in the price of petrol at the petrol kiosks do not always follow changes in the price of crude oil. [25] (SAJC, 2012)

Suggested Answer

Introduction:

- Market for crude oil and market for petrol at petrol kiosks are 2 separate markets. Market for crude oil is an international market whereas petrol kiosks are essentially operating in the domestic market, though it can be influenced by global events.
- The 2 markets are governed by different DD & SS conditions though they are linked. Link between crude oil and petrol at petrol kiosks – crude oil is refined to produce petrol.

Note: Changes in price of petrol do not 'follow' changes in price of crude oil in terms of **direction** and **magnitude**.

Body:

What determines crude oil price – why crude oil prices have fallen.

Crude oil prices are determined by global demand and supply.

Examples:

Contraction of the global economy \Rightarrow weak global demand $\Rightarrow \downarrow P_{\text{crude oil}}$.

Improvement in supply conditions e.g. easing of political tension in certain oil producing regions particularly the Middle-East $\Rightarrow \uparrow SS \Rightarrow \downarrow \text{crude oil price}$.

The following analysis is based on fall in price of crude oil. ($\uparrow P_{\text{crude oil}}$ acceptable)

Side 1: Why changes in the price of petrol at the petrol kiosks follow changes in the price of crude oil.

Assume ceteris paribus condition, and that price of petrol at petrol kiosks is determined by market forces.

$\downarrow P_{\text{crude oil}} \Rightarrow \downarrow \text{unit COP as crude oil is refined to produce petrol} \Rightarrow \uparrow SS_{\text{petrol}} \Rightarrow \downarrow P_{\text{petrol}}$ at petrol kiosks. Extent of $\downarrow P$ of petrol depends on PED & extent of $\uparrow SS_{\text{petrol}}$.

Demand for petrol is price inelastic – lack of substitutes, cost of conversion to alternative fuels. Extent of $\uparrow SS_{\text{petrol}}$ is highly dependent on crude oil costs as a % of total cost and how much crude oil price has fallen.

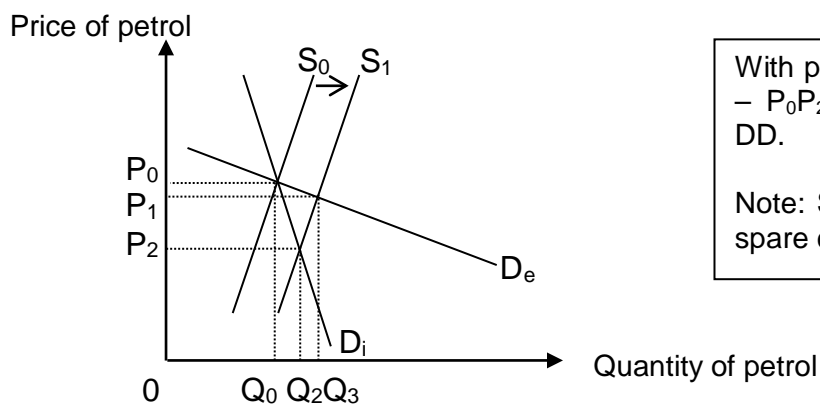


Figure 1

With price inelastic DD, larger price fall – P_0P_2 compared to P_0P_1 with elastic DD.

Note: SS_{petrol} is price inelastic – limited spare capacity, time factor.

Evaluation:

- Changes in price of petrol may follow changes in price of crude oil (direction) but not necessarily to the same extent (magnitude). Depends on PED.
- Typically, the cost of crude oil is the greatest single factor affecting petrol price over time. Hence, over the long term, changes in the price of petrol at petrol kiosks tend to follow changes in the price of crude oil (direction).

Side 2: Why changes in the price of petrol at the petrol kiosks do not always follow changes in the price of crude oil.

Judgement:

Although the price of crude oil has the most impact on petrol prices in the long term, domestic market conditions, which include the forces of demand, supply, competition and government regulation can create short term supply and demand imbalances which can significantly impact petrol prices. This explains why changes in the price of petrol at the petrol kiosks do not always follow changes in the price of crude oil, especially in the short term.

Other factors that influence price of petrol at petrol kiosks

Simultaneous changes: DD factors (students to provide at least 2 dd factors)

- \uparrow DD for petrol due to:
 - Rising affluence leads to change in taste and preference in favour of private mode of transport backed by the ability and willingness to pay. Increased DD for petrol with increased car usage $\Rightarrow \uparrow DD_{\text{petrol}}$.
 - \uparrow population especially due to migrant population $\Rightarrow \uparrow$ DD for transport \Rightarrow assume ability & willingness to pay.
 - \uparrow economic growth $\Rightarrow \uparrow$ production $\Rightarrow \uparrow$ transportation of goods $\Rightarrow \uparrow DD_{\text{petrol}}$.

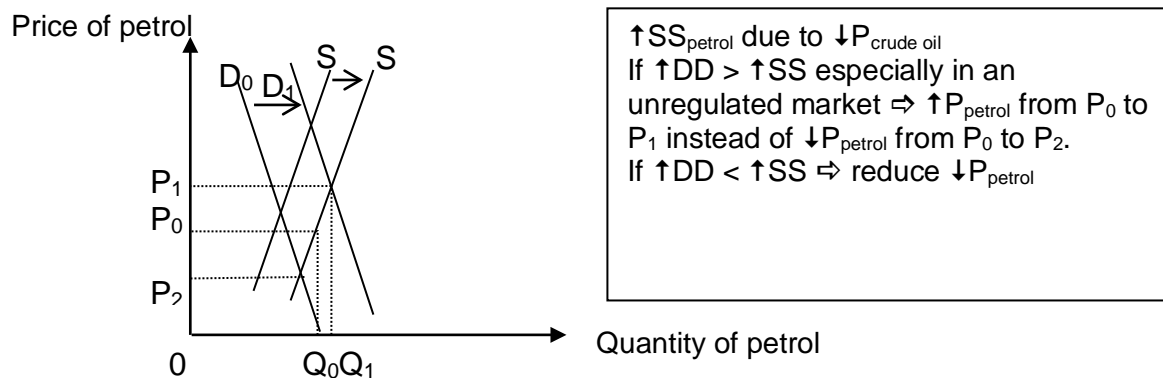


Figure 2

Simultaneous changes: SS factors (students to provide at least 2 SS factors)

- **↑ in other cost components** which offsets $\downarrow P_{\text{crude oil}}$ eg \uparrow refining costs, distribution & marketing costs, wage costs eg due to domestic inflation, may lead to $\uparrow P_{\text{petrol}}$ instead if it more than offset fall in unit COP due to $\downarrow P_{\text{crude oil}}$.
- **Supply shortages** due to pipeline problems, shortage of refineries to refine the crude oil \Rightarrow can create shortages which exert upward pressure on price. $\uparrow P_{\text{petrol}}$ despite $\downarrow P_{\text{crude oil}}$.
- Most of the world's oil is located in some of the more politically unstable parts of the world - supply disruptions can have dramatic effects on $P_{\text{crude oil}}$. Refining companies may **stockpile crude oil** rather than increase production of refined oil in expectation of future rise in crude oil price, given the volatility of crude oil prices. This would limit $\downarrow P_{\text{petrol}}$ as there would not be an increase in supply of petrol after oil-refining companies decided to increase their stockpile of crude oil.
- **Exchange rate** changes e.g. currency of an oil importing country depreciates against that of an oil exporting country \Rightarrow dampen $\downarrow P_{\text{crude oil}}$ in domestic currency.
- **Competition**, as reflected by the number of choices in the market, can also affect price changes. Location: A lone petrol kiosk can raise price due to a lack of substitutes and competition as opposed to a market where consumers may have more petrol kiosks to choose from. $\Delta P_{\text{retail petrol}}$ independent of $\Delta P_{\text{crude oil}}$. Oligopolistic petrol retailers may collude to raise P_{petro} independent of $\Delta P_{\text{crude oil}}$.
- **Profit margin** – when crude oil price spiral upwards, petrol retailers have little or no opportunity to earn profits. So when crude oil is cheaper, they see a chance to capitalise on the situation and delay lowering of prices at the petrol kiosks. (Not nec bad. If they shut down, job losses, reduced competition & even higher petrol prices.)

Illustrate with diagram/s + explanation of adjustment mechanism.

Evaluation:

Generally, supply and demand imbalances bring about shortages/surpluses and results in price changes in the short term which will eventually bring the market to equilibrium e.g. by attracting additional supply or influencing demand.

Relax assumption: Government intervention

So far, the analysis assumes an unregulated market. Government regulation may take the following forms:

- **Taxes** – during periods of $\downarrow P_{\text{crude oil}}$, govt may raise taxes on petrol to raise revenue or discourage excessive consumption due to the negative externality generated. Taxes on petrol vary from country to country.

- Subsidies – government may reduce existing subsidies in view of the cheaper crude oil.
- May decide to curtail oil drilling – create supply shortages which will then push up $P_{\text{crude oil}}$, offset the initial $\downarrow P_{\text{crude oil}}$.
- All these may negate effect on P_{petrol} due to $\downarrow P_{\text{crude oil}}$.
- Look into impact on consumers, producers as a result. Ability also to look into the possible impact of petrol prices moving together with crude oil prices.

Knowledge, Application, Understanding and Analysis		
L3	Excellent ability to explain & analyse why P_{petrol} at petrol kiosks do not always follow $P_{\text{crude oil}}$, well supported with illustrations & egs. Ability to query some of the assumptions – free market, ceteris paribus. Shows thorough knowledge of theory of DD & SS & facts.	18-20
	Good knowledge of DD & SS theory & facts & clear evidence of ability to apply to Q, supported with diagrams & egs. Reasoned arguments. Some critical comments.	15-20
L2	Accurate but undeveloped explanation with few egs. Ability to identify both DD & SS factors but do not expect clear logical presentation. Focused on either direction/magnitude of ΔP . OR side 1 or 2 but not both.	12-14
	Theory is incompletely explained & applied – focused on DD or SS factors. Lacks economic analysis. Answer is descriptive rather than analytical.	9-11
L1	Mere listing of factors without relating to question. Evidence of some knowledge incompletely applied. Meaning of question not fully grasped.	6-8
	Mostly irrelevant. Contains only a few valid points made in an irrelevant context. E.g. focus on crude oil market, not petrol retail.	1-5
E3	Implications of the evaluative discussion was looked into	4-5
E2	Evaluative discussion that refers to long term and short term, direction & magnitude of ΔP based on economic analysis.	2-3
E1	Unexplained judgement or one that is not supported by analysis.	1

2. Sales of electronic cigarettes – battery powered slim metal tubes - have doubled, attracting new firms into the market. Smokers of electronic cigarettes inhale the vaporised nicotine without the chemical, tar and smell inherent with conventional cigarettes. The market for conventional cigarettes has been in steady decline in recent years, and is still facing tax hikes imposed by governments around the world.

Adapted from theweek.com, 26 April 2013

Using demand elasticity concepts, discuss the likely effects of these changes on the revenue earned in the cigarette industry. [25] (NJC, 2013)

Suggested Answer

Introduction

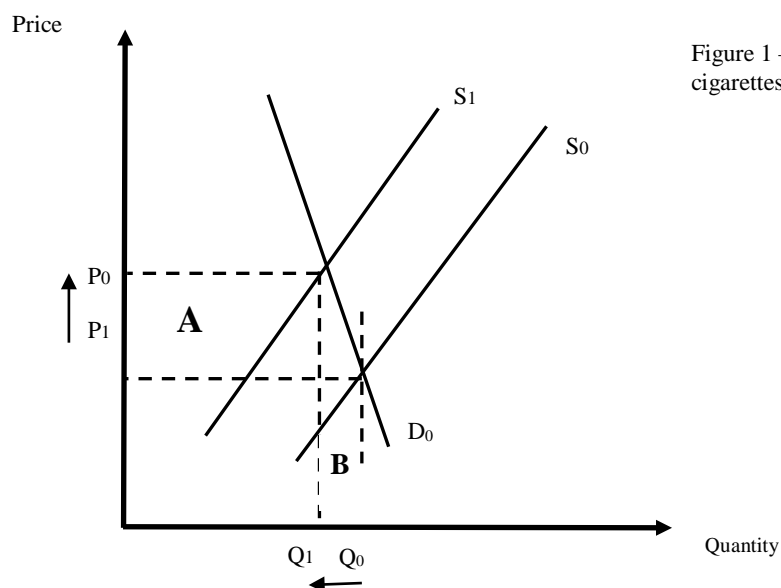
State that revenue earned is determined by equilibrium price and quantity in the market for both electronic (e-cigarettes) and conventional cigarettes.

Recognize that e-cigarettes and conventional cigarettes are substitutes in consumption and therefore revenue in one market is also affected by changes in the price of the substitute good.

Body:

Conventional cigarette market

- Explain that a continuing tax hike by governments around the world increases the cost of production for conventional cigarette firms, there resulting in a fall in supply for conventional cigarettes.
- Explain that the demand for conventional cigarettes is likely to be price inelastic, i.e. $PED < 1$, due to the lack of close substitutes and high degree of necessity for smokers addicted to nicotine. As such, an increase in its price will lead to a less than proportionate change in quantity demanded in conventional cigarettes, ceteris paribus.
- With reference to figure 1, given the relatively price inelastic demand curve of conventional cigarettes, a leftward shift of the supply curve from S_0 to S_1 results in a less than proportionate fall in quantity demanded from Q_0 to Q_1 to the increase in its price from P_0 to P_1 , ceteris paribus. Revenue earned in the conventional cigarettes market increases as the rise in revenue (area A) due to the increase in price is greater than the fall in revenue (area B) due to the fall in quantity demanded.



E-Cigarette Market

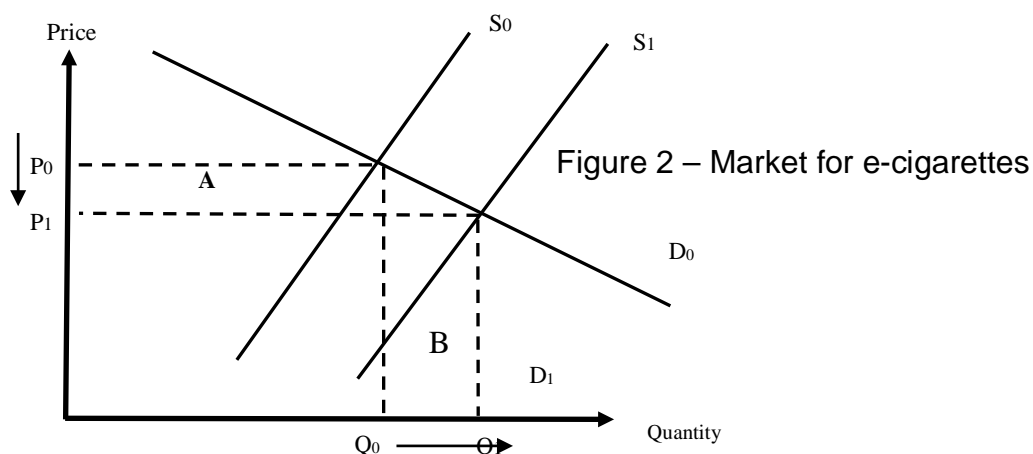
- Explain that the effect of changes in the e-cigarette market on its revenue is dependent on the values of PED and XED.

PED

Explain that the demand for e-cigarettes is likely to be price elastic, i.e. $PED > 1$.

- Smokers are likely to consider conventional cigarettes as a good substitute to electronic cigarettes. In addition e-cigarettes to social smokers, i.e. smokers who smoke only for leisure as part of a social group, is but one of many means / tools of socialising for them and therefore the degree of necessity is low in terms of consumption.
- With reference to figure 2, as more new firms are attracted to the e-cigarettes market the supply of e-cigarettes producing firms will increase. Given the relatively more price elastic demand curve D_0 , a rightward shift of the supply curve from S_0 to S_1 will see a more than proportionate rise in quantity demanded from Q_0 to Q_1 to the fall in price from P_0 to P_1 , ceteris paribus.

Revenue earned in the e-cigarettes market will increase as the fall in revenue (area A) due to the fall in price is less than proportionate to the increase in revenue (area B) due to the increase in quantity demanded, ceteris paribus.



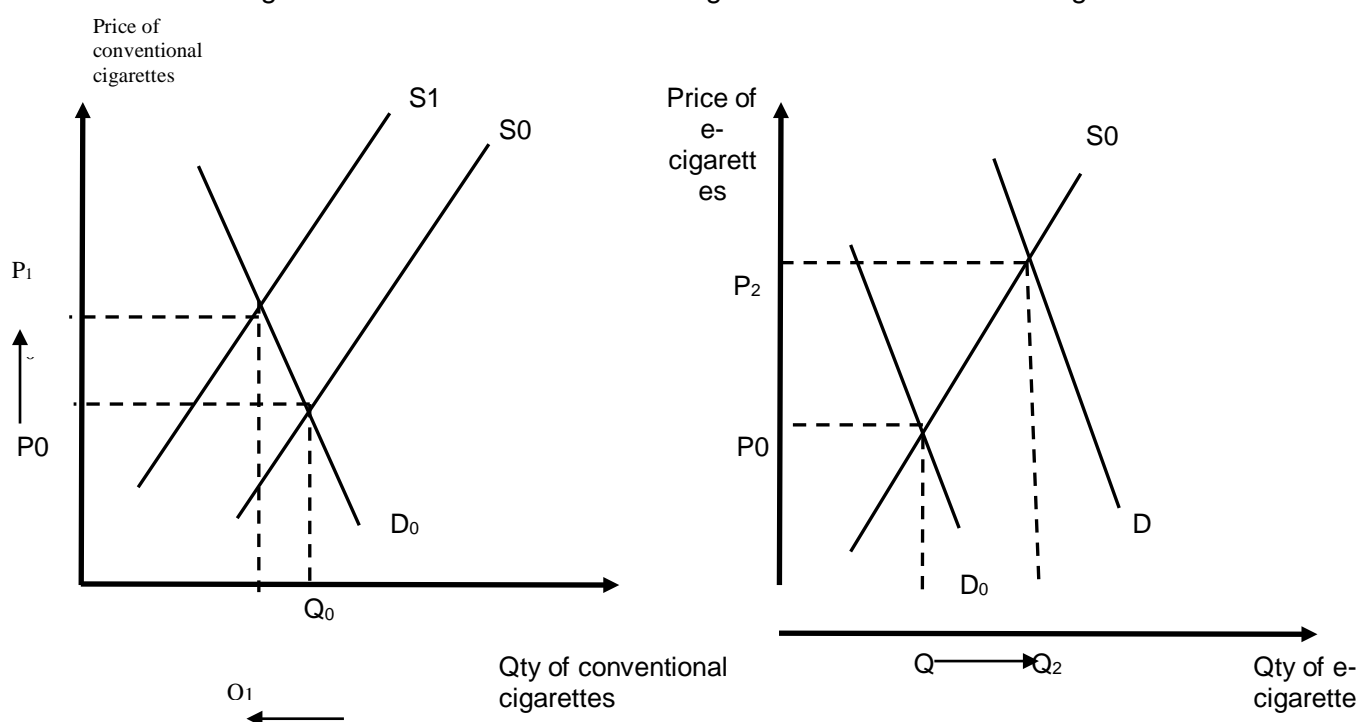
XED > 0 (substitute in consumption)

- Explain that both conventional and e- cigarettes are substitutes in consumption. This means that an increase in the price of conventional cigarettes will lead to an increase in demand for electronic cigarettes. However the extent of the increase in demand for e-cigarette is dependent on the value of XED.
- Explain that the cross elasticities of e-cigarettes with respect to conventional cigarettes is likely to be high and positive, i.e. $XED > 1$.

E-cigarettes and conventional cigarettes are strong / close substitutes for smokers addicted to nicotine, and therefore have high positive cross elasticities. A high and positive value of XED means that for a given increase in the price of conventional cigarettes this will lead to a significant increase in the demand for e-cigarettes, *ceteris paribus*.

With reference to figure 3, as the price of conventional cigarettes increases, quantity demanded will decrease. According to the Law of Demand, there is an inverse relationship between price and quantity demanded, *ceteris paribus*. And as the quantity demanded for conventional cigarettes decreases, the quantity demanded for e-cigarettes will increase at every price levels given that they are substitutes in consumption. And if $XED > 1$, this results in a significant increase in the demand for e-cigarettes as illustrated by a rightward shift of the demand curve for e-cigarettes from D_0 to D_2 .

Figure 3 : $XED > 1$ – Markets for e-cigarettes and conventional cigarettes



Evaluation:

Not all smokers addicted to nicotine consider e-cigarettes and conventional cigarettes to be strong / close substitutes in consumption. To these smokers, the experience of smoking from a metal tube (e-cigarettes) is unlike smoking the real thing (conventional cigarettes). To these smokers the overall experience of smoking a conventional cigarette is irreplaceable, from having to tap the conventional cigarette stick thereby packing in the tobacco to being able to taste the tobacco as they put that cigarette stick to their lips. As such, e-cigarettes and conventional cigarettes are weak substitutes with positive cross elasticities values ranging between zero and one, i.e. $0 < XED < 1$.

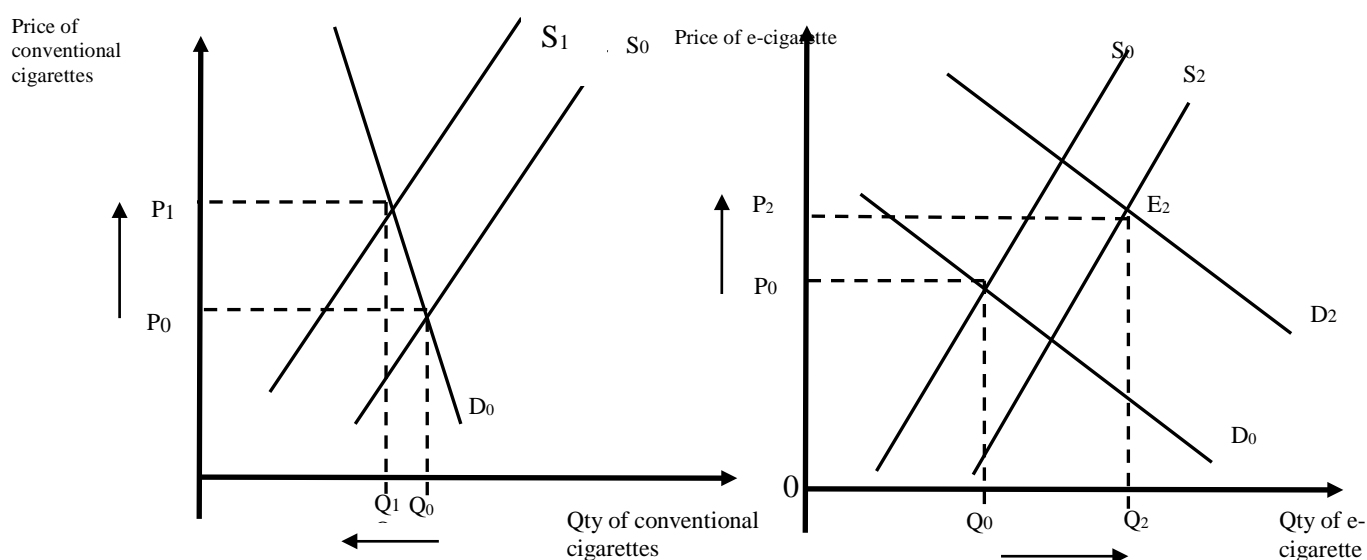
With $0 < XED < 1$, this means that the shift in demand for e-cigarettes is to a relatively smaller extent as compared to the increase in price of conventional cigarettes.

- Explain the importance of considering the values of PED and XED, and the rightward shift in supply due to the increase in the number of new firms in order to analyse the effect on revenue earned in the market for e- cigarettes.
- Explain that the overall effect on revenue earned in the e-cigarettes market is dependent on the extent of the shifts its demand and supply curves. Thus, this gives rise to a resultant equilibrium price that is uncertain although the quantity transacted of e- cigarettes will increase.

(note: candidates are not required to draw the many different permutations of the differing extent of shifts in demand and supply curves to illustrate the effect of changes on revenue earned in the e-cigarette market. A well-reasoned explanation(s) with at least one diagram to illustrate understanding is sufficient.)

- Explain that it is likely that demand for e-cigarettes is price elastic and that the cross elasticities of e-cigarettes with respect to conventional cigarettes is high and positive, i.e. $PED > 1$, $XED > 1$. The extent of the shift in demand is likely to be more than the extent of the shift in supply in the market for e-cigarettes for “sales of e-cigarettes have doubled which attracted new firms into the market”.

Figure 4 : Markets for e-cigarettes and conventional cigarettes



With reference to figure 4, as the price of conventional cigarettes increases, demand for e-cigarettes increases significantly since $XED > 1$. The extent of the shift in demand is more than the shift in supply in the market for e-cigarettes, thereby giving rise to the resulting equilibrium price of P_2 and equilibrium quantity at Q_2 . Revenue earned in the e-cigarettes market increases and is given by the area $OP_2E_2Q_2$.

Conclusion / Evaluation

- The effect of changes on revenue in the markets for conventional and e-cigarettes depends on the values of PED and XED, as well as the relative extent of the shifts in demand and supply in the e-cigarettes market. It also depends on the type of consumers and their patterns of consumption for the product.

Knowledge of elasticity values in the respective markets allows cigarette manufacturers an opportunity to implement strategies aimed at increasing the revenue earned for their respective firms in the relevant market with special considerations also on the laws and regulations of the different countries in which cigarettes are sold.

Knowledge, Application, Understanding and Analysis	
Level 3 18 – 20	<ul style="list-style-type: none"> Answer shows excellent knowledge of demand and supply forces, and how revenue expenditure earned may be affected Excellent consideration of elasticity concepts (must include BOTH PED AND XED) and its relevance in influencing revenue. Excellent analysis of other possible scenarios where the overall total revenue may increase/decrease i.e. Analysis of different extents of shifts, demand and supply changes in the market for conventional cigarettes) Excellent rigour in economic analysis and development. Excellent use of diagrams that is adequately explained. Excellent attempts at contextualisation.
15 – 17	<ul style="list-style-type: none"> Good consideration of elasticity concept (must include BOTH PED AND XED) and its relevance in influencing total revenue. Good rigour in economic analysis and development. Good use of diagrams that are adequately explained. Some attempts at contextualisation with some relevant examples.
Level 2 12 – 14	<ul style="list-style-type: none"> Answer shows good knowledge of demand and supply forces and how revenue may be affected. Good consideration of elasticity concepts and its relevance in influencing market equilibrium. Good rigour in economic analysis with some contextualisation. Relevant diagrams drawn with clear explanation. Some recognition that the extent of the shifts in demand and supply curves has an effect on price and hence overall revenue earned.
10 – 12	<ul style="list-style-type: none"> Answer shows adequate knowledge of demand and supply forces and how revenue may be affected. Consideration of elasticity concepts and its relevance in influencing revenue (i.e. at least one elasticity concept). Some rigour in economic analysis and development. Relevant diagrams drawn but not well explained or clear explanation in absence of diagrammatical analysis. Minimal or no contextualisation.

	<ul style="list-style-type: none"> • Only 1 market analysed well and incomplete analysis for the other market (E.g. the changes in demand and supply in the conventional cigarette market may be well explained but the changes in demand in the e-cigarettes market was not well analysed or vice-versa)
Level 1 6 - 9	<ul style="list-style-type: none"> • Answer shows some knowledge of demand and supply forces and how equilibrium price &/or quantity may be affected. • Errors and inconsistencies occur in the explanation, showing lack of understanding of the economic concepts. (For example, if the changes in demand and supply in both markets may not be identified correctly or not explained correctly) • Answer lacks balance in consideration of demand and supply forces. • Lack of economic analysis and development • Minimal or no contextualisation. • Max 9m if analysis considers only equilibrium price and quantity with no reference to revenue earned.
1-5	<ul style="list-style-type: none"> • Answer is mostly irrelevant. • Only few valid points which do not clearly address the question.
E3 (4-5)	For well-reasoned and explained judgment on the likely effects on revenue in both markets
E2 (2-3)	For explained judgment on the likely effects on revenue in both markets.
E1 (1)	For a mainly unexplained judgment on the likely effects on revenue in both markets.

3. Despite the recession, many countries have imposed the mandated minimum wages for workers.

(a) Explain how such minimum wages might affect the total earnings of workers in an industry. [10]

(b) Discuss the impact of the recession on the labour markets in these countries. [15] (RVHS, 2012)

Suggested Answer

Part (a)

- Define a minimum wage and explain the impact on wage rate and the quantity of labour
- Define wage earnings as the product of wage rate and the quantity of labour
- Explain the role that PED plays in determining if total wage earnings increase or decrease
- Explain at least two determinants of PED of labour:
 - (i) Proportion of labour costs as part of total costs
 - The larger the proportion of labour costs the more price elastic the demand for labour
 - (ii) Scope for automation
 - When labour can be easily substituted by machines, the PED of labour is high
 - (iii) PED for the final goods and services
 - The more price elastic the demand for the final good and service, the more price elastic the demand for labour
 - Largely due to the inability of producers to pass on wage increase on to consumers

Knowledge, Understanding, Application & Analysis		
L3	For a developed explanation on how minimum wage affects the total wage earnings of workers using PED concepts.	8-10
L2	For an undeveloped explanation on how minimum wage affects the total wage earnings with few or no reference to PED concepts.	5-7
L1	Smattering of valid points	1-4

Part (b)

- Explain that the demand for labour is a derived demand
- Explain the effect of the recession on wage rate and quantity of labour using the demand and supply framework
- Recognise and explain that the effect of the recession on the market for labour producing normal and inferior goods differs
- Normal goods
 - Explain that the wage rate does not change as it is fixed by the minimum wage, quantity of labour falls
- Inferior goods
 - Explain that for some cases, the wage rate does not change as it is fixed by the minimum wage, quantity of labour increases, give examples to illustrate point made
 - Explain that for some cases of inferior goods, wage and quantity is determined by the intersection of the demand and supply of labour
 - In this case, PES of labour affects the extent of increase in wage rate and quantity of labour
 - Explain at least one determinant of PES of labour

- Occupational mobility
 - Ease of transfer of skills between occupation, ease at which skills are acquired
- Geographical mobility
 - Ease of location to areas with job opportunities

Knowledge, Understanding, Application & Analysis		
L3	For a developed explanation on how wages and the quantity of labour are affected by a recession using YED and PES concepts and relevant diagrams.	8-10
L2	For an undeveloped explanation on how wages and the quantity of labour are affected with few or no reference to YED or PES concepts.	5-7
L1	Smattering of valid points.	1-4
E3	For an implication of the evaluative assessment made	4-5
E2	For an evaluative assessment based on economic analysis.	2-3
E1	For an unexplained assessment, or one that is not supported by economic analysis.	1