ACJC Preliminary Examinations 2017 Paper 2 Question 1

1 The Philippine government plans to lower income tax rates, slashing it from 32% to the mid-20s.

Source: CNBC, 2017

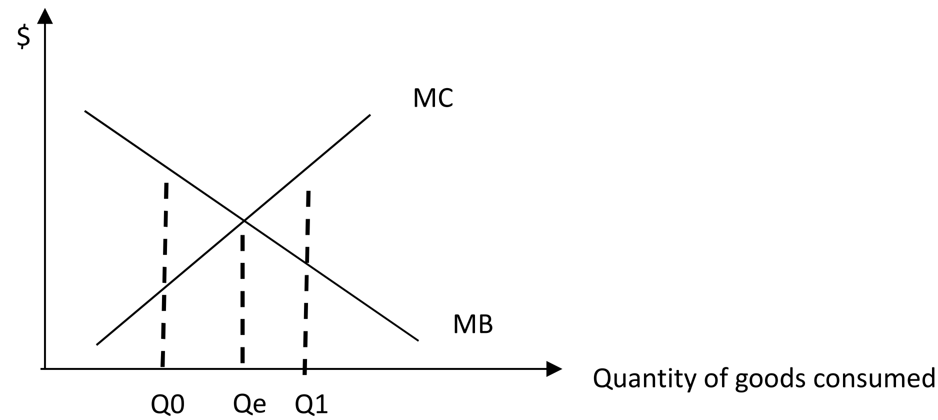
Explain what is involved in rational decision making for both consumers and producers, and discuss how their decision making in response to the lowered income tax rates will impact different product markets. [25]

Main idea: explain the process of rational decision making by consumers and producers. Consider how lower income tax rates will affect consumers' (due to less constrained budget) and producers' (due to greater benefits in producing normal goods and less benefits in producing inferior goods) rational decision-making process. Then consider how the changes in consumers' decisions will affect different producers differently, based on YED, supply and PES concepts. Discuss the combined effect on the relevant markets, by looking at the new equilibrium price and quantities.

- Explain what is meant by scarcity - "limited resources and unlimited wants". Limited resources impose constraints to one's decisions. Therefore there is a need to make choices in order to gain the most out of our limited resources.
- Explain process of rational decision making: MPB = MPC, within constraints. In economics, decision making is based on the marginal unit or additional/ incremental unit. Decision-making on allocation of resources to maximise output is based on marginal cost and marginal benefits. It is worth increasing consumption or production when one more unit consumed/ produced involves an additional benefit exceeding the additional cost because it means there is an increase in net benefit enjoyed.
- Explain consumers and producers' objectives in making rational decisions: to maximize their own utility / profits, in their decisions on what and how much to consume or produce.

Key Point 1: Rational decision making by consumers involves maximising satisfaction, by equating marginal benefit to marginal cost

- Consumers have limited resources to spend on unlimited goods and services. They are satisfaction/utility maximisers.
- They aim to maximise satisfaction by ensuring that every additional dollar spent on a good or service brings additional benefit (or utility) exceeding additional cost incurred, whereby the cost is the price of the product as well as opportunity cost.
- However, aaccording to the **Law of Diminishing Marginal Utility**, as more and more units of a good or service are consumed, beyond a certain point of consumption, the additional utility a consumer derives from successive units decreases. As more units of a good are consumed, additional units will provide less additional satisfaction than previous units. Hence, the MB curve is downward sloping.



- At output Q0 (or any output below Qe), the MB of increasing consumption is greater than the MC. There will be an increase in net benefits if the consumer increases consumption. Thus, the rational consumer will decide to consume more of such goods.
- Conversely, any consumption beyond Qe, (for instance at Q1), the MB of increasing consumption is less than the MC. There will be a decrease in net benefits if the consumer increases consumption. Thus, the rational consumer will decide to reduce his consumption of such goods.
- Consumption thus is at the optimal (equilibrium) level when the additional benefits derived from consumption equals additional cost (MC=MB), which occurs at Qe.

Key Point 2: Rational decision making by producers involves maximising profits, by equating marginal benefit (marginal revenue) to marginal cost

- Producers have limited resources to use in producing unlimited goods and services to consumers
- They aim to maximising profits by ensuring that every additional cost incurred in production is recovered through any additional revenue earned.
- However, the law of diminishing marginal returns states that additional output produced by factors of production will decrease, when variable factors are increasingly added to fixed factors.
- This means the marginal cost of production rises as a firm increases its production.
- Hence, the MC is upward sloping.
- Similar to the rational consumer who equates MB and MC, in order to decide consumption levels, producers equate their MB and MC to decide production levels. Total profit is maximum possible when MR=MC.
- Producers will increase production as long as MR exceeds MC because there is additional profit to be made from each output produced. But they will decrease production once MR is lower than MC because there are additional losses incurred from each output produced.

  Note: students can draw the MR, MC diagram and make reference to it.

Key point 3: consumers and producers must then make these decisions within their constraints.

This could include the financial constraints that both face when deciding how much to consume or produce or strategies to implement. For the consumer, his income level, wealth and access to funds would limit the number and nature of goods he can afford to consume. For producers, their past profit savings would restrict their ability to conduct R&D or marketing campaigns. Yet, they are also constrained by the amount and quality of factors of production within the country when trying to hire more factors in order to produce more.

Transition: ultimately, consumer and producers making rational decisions privately would result in equilibrium in markets. The consumption decisions are represented by a demand curve and production decisions are represented by a supply curve. Changes in certain factors, such as income levels, will lead to consumer and producers reviewing and adjusting decisions. This will result in a new equilibrium achieved in various product markets.

Impact of lowered income tax rates on consumers and producers' decision-making

A lowered income tax rate will affect rational decision-making by consumers in terms of how much and what to consume, because they have less constraints on the budget.

Note: students can choose to analyse just 1 type of market: normal goods generally, or necessity or luxury goods market (specifically). They should then choose the inferior goods market as the second market, to show a contrast in terms of direction of change in demand (and hence price and quantity)

NORMAL: necessity and luxury goods

1) **The lower income tax will allow consumers to rationally decide to consume more normal goods (rise in demand)**

   With the cut in income tax from 32% to mid-20%, consumers' disposable incomes will rise by almost 10%. This will reduce the financial / budget constraints that they face, as they now have a larger amount of incomes to spend on consumer goods. Consumers will thus become more willing and able to consume normal goods, which have a YED value >0. These are goods which experience an increase in demand when incomes rise, and a decrease in demand when incomes fall.

   It is calculated by: $\text{YED} = \dfrac{\text{\% change in quantity demanded at every price level}}{\text{\% change in income}}$

   In order words, $\text{YED} = \dfrac{\text{\% change in demand}}{\text{\% change in income}}$

   In weighing the benefits and costs of consuming a certain good, the consumers' decision is less constrained by his budget and thus will decide to consume more of that good, if its benefits outweigh the costs; or a good that he previously could not afford. This might not be feasible previously, as he was constrained by his lower income.

   (a) **Thus, consumers will decide to consume more necessities**, but its increase will be less than proportionate to their 10% increase in disposable incomes. The demand for necessities is positive income inelastic, where the increase in demand due to higher incomes is less than proportionate to the increase in income.

   In other words, the demand for necessities will increase, for instance: staple food such as rice, pork and vegetables, which are essential parts of Philippine cuisine, will be consumed. However, these necessities will experience a less than proportionate increase in demand compared to the rise in the Philippine consumers' disposable incomes, due to the lower income tax rate.

The consumers' decision to increase consumption is especially true for goods and services which are deemed luxurious, which have a positive income elastic demand, YED > 1.

(b) **Thus, with the lowered tax rate and less budget constraints, consumers will decide to consume more luxurious goods**, and its increase will be more than proportionate to their 10% increase in disposable incomes. The demand for luxuries is positive income elastic, and so the increase in income will lead to a more than proportionate increase in demand of such goods, i.e. more than 10%.

With this lowered income tax rate, Philippine consumers may decide to purchase more branded handbags like LV or Channel, and also high-end cars such as Rolls Royce and sports car model Ferrari, which have opened outlets in Philippines in recent years.

However, with the higher disposable income, consumers making rational decisions on consumption will be less restrained by their budget. They may decide to consume more high-quality products, switching away from lower quality substitutes that they used to consume.

INFERIOR GOODS

2) **The lower income tax will allow consumers to rationally decide to consume fewer inferior goods (fall in demand)**
Demand for inferior goods has negative income elasticity value, where an increase in income will result in a fall in demand for such products. These are the products which tend to have better quality substitutes exist. When consumers have lower budget constraints, they will have increased ability to consume better quality goods. Hence, rational consumers will decide to switch away from these poorer quality goods and services, hence leading to a fall in demand of inferior goods. In other words, the demand for inferior goods such as imitation handbags, margarine and no-frills in house brand food items will decrease.

Impact of lowered income tax rates on producers' decision-making

Either 1 explanation – using PES or change in supply is sufficient as part of considering how producers' decision making is impacted in response to the cut in income tax.

i) The lower income tax will cause consumers to change their consumption decisions as explained above. These changes in market demand will lead to respective price changes in the market. This changes the marginal benefit of production, which leads rational producers to review their decision-making in production. For the producers, when responding to changes in price, they are somewhat constrained by their PES factors and ability to produce. Their current PES value will affect their responsiveness to these price changes in terms of quantity supplied.

- <u>Normal goods</u>: rational producers will decide to increase production

For producers which produce normal goods, they will experience an upward pressure on price of the goods they produce. Hence, the marginal benefit of producing an additional output increases. Rational producers will thus decide to increase production, and the extent depends on their PES.

If supply is price inelastic, such as rice and other agricultural products, then a rise in price will lead to a less than proportionate increase in quantity supplied. Rational producers will decide to increase production, but to a smaller extent than the rise in price caused by the higher demand.

If supply is price elastic, for manufactured goods such as clothing or electronic devices, then a rise in price will lead to a more than proportionate increase in quantity supplied. Rational producers will decide to increase production of these manufactured goods, to a larger extent than the rise in price, in response to the cut in income tax rates and hence higher demand.

- <u>Inferior goods</u>: rational producers will decide to decrease production

For producers which produce inferior goods, they will experience a downward pressure on price of the goods they produce. Hence, the marginal benefit of producing an additional output decreases. Rational producers will thus decide to increase production, and the extent depends on their PES.

If supply is price inelastic, then a fall in price will lead to a less than proportionate increase in quantity supplied. Rational producers will decide to decrease production, but to a smaller extent than the fall in price caused by the lower demand.

If supply is price elastic, then a rise in price will lead to a more than proportionate increase in quantity supplied. Rational producers will decide to decrease production of these manufactured goods, to a larger extent than the fall in price, in response to the cut in income tax rates and hence lower demand.

<u>Alternatively</u>

ii) The lower income tax could also help <u>producers decide to change their resource allocation</u>, as they may review their decisions on what to produce and how much to produce. This happens as they anticipate consumers' new decisions on what and how much to consume, due to their higher disposable incomes.

- <u>Normal goods:</u> Higher expected profits due to predicted rise in demand after the cut in income tax → increase supply of normal goods

- <u>Inferior goods:</u> Lower expected profits due to predicted fall in demand after the cut in income tax → decrease supply of inferior goods
  In addition, Producers of inferior goods may also possibly divert resources to producing normal goods → further increase in supply of normal goods

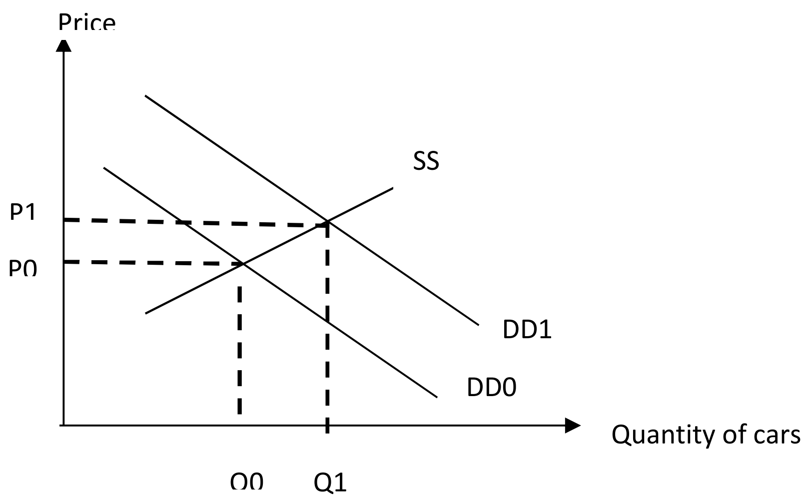
Impact of new / reviewed decisions made by consumers and producers on the market
Note: Students must combine the effects of consumers and producers (whether PES or change in supply) decision-making, analyzing the overall effect on the market price and quantity.

In markets, rational consumers will make decisions in order to maximize their satisfaction and producers to maximise profits. In perfectly competitive markets, the equilibrium quantity and price will maximize the total consumer and producer surplus. The lowering of the income tax rate in the Philippines changes the consumers' budget constraint, which in turns affects the producers' benefit from production. As a result, there would be new market equilibrium in different markets.

(A) Markets for Normal goods such as cars

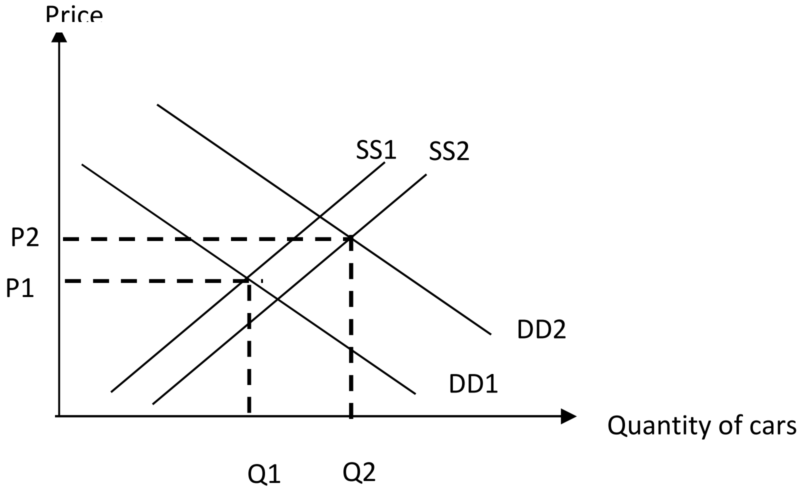
(Consumers' decision) Rise in demand + PES (producers' decision to increase Qs as response to a rise in price: PES)

Since cars are a manufactured good which can also be stored in advance, its supply is price elastic. When demand rises from DD0 to DD1, there would be a shortage of cars and hence upward pressure on price in Philippines. Car manufacturers would then decide to increase their production of cars, since the marginal benefit of production has increased. This occurs along the supply curve. As the price of cars increases, quantity demanded decreases along the new demand curve DD1. The market equilibrium then occurs when the shortage is eliminated. The equilibrium price increased from P0 to P1, and output increased from Q0 to Q1. which occurs at price P1 and quantity Q1. Since car producers are able to increase quantity supplied more than proportionate to the increase in price, the car market sees a smaller rise in equilibrium price and a smaller increase in equilibrium quantity, than if supply was price inelastic.



Alternatively

(Consumers' decision) Rise in demand + Rise in supply (Producers' decision in anticipation of higher price and profits): definite increase in Q, indeterminate change in P



Due to lower budget constraints, demand for cars will increase and is illustrated by the rightward shift of the demand curve from DD1 to DD2. As producers expect higher prices and profits, due to predicted increases in demand, supply will increase from SS1 to SS2. Assuming demand of cars increases more than supply, there is a shortage of cars at original price P1, which thus leads to an upward pressure on price. Consumers will therefore decide to reduce quantity demanded along DD2 and producers increase quantity supplied along SS2. Hence, a new equilibrium in the car market is achieved at higher price P2 and larger quantity Q2.

(B) <u>Markets for Inferior goods, such as imitation handbags (follow through with same structure as the market for normal goods above)</u>

(Consumers' decision) <u>Fall in demand + PES</u> (producers' decision to reduce production as a response to a rise in price: PES)

If PES > 1, the rise in demand will be accompanied by a smaller rise in equilibrium price and a larger increase in equilibrium quantity, than if PES > 1.

Alternatively

(Consumers' decision) <u>Fall in demand + Fall in in supply</u> (Producers' decision in anticipation of a rise in incomes and hence fall in demand, which leads to a lower expected price): definite increase in Q, indeterminate change in P

Conclusion

- Challenge assumptions involved in rational decision-making:
  1. (Perfect) information. Especially for producers in anticipating how consumers will change their behaviour.
  2. Consumers' Choice: to increase consumption rather than increasing savings or leisure or import (using some ideas of withdrawal), which will limit the extent of change in demand
  3. Rationality: consumers and producers may not make decisions at the margin all the time, or are more swayed by emotions

- With higher incomes, consumers may change their definition of "inferior", "necessity" and "luxury" goods. The increased income may cause them to view certain products that were previously "necessity" as "inferior", e.g. public transportation as they are now willing and able to afford private transportation. Furthermore, some consumers may now view certain "luxury" items as "necessity"; as a needed part of their lives. Such examples are gourmet coffee like Starbucks. This has differing effects on the extent of shifts in demand, from what was explained earlier. Hence, price and quantity will change to varying extents.

- Challenge assumptions in the market:
  1. Ceteris paribus: government does not change other tax rates (e.g. sales tax to maintain tax revenue), no other factors changed to affect demand/supply (e.g. economic slowdown that led to use of expansionary FP but amidst very poor economic outlook)
  2. Perfect competition market structure: but firms can adopt strategies such as marketing or product differentiation etc. in order to further increase demand for their goods

Level	Knowledge, Analysis, Application	Marks
High L3	• Clear and thorough explanation of rational decision-making process by both consumers and producers (use of marginalist principle and rational decision-making framework) • Good and detailed discussion of how the lowered personal income tax rates could affect both consumers and producers' decision-making • Accurate and well-integrated use of YED and PES, as well as supply concepts (considers both consumers and producers) • Answer contains impact on at least 3 different markets (price and quantity) • Arguments and impact on these markets are well-explained and illustrated with diagrams • Answer is well-substantiated by real life examples, especially applied to Philippines	18-20
Low L3	• Clear explanation of rational decision-making process by both consumers and producers (use of marginalist principle and rational decision-making framework), although one of them could be more thorough and well-analyzed • Good and detailed discussion of how the lowered personal income tax rates could affect both consumers and producers, but not applied consistently to idea of decision-making (not addressing question that clearly) • Accurate and well-integrated use of YED and PES <u>OR</u> supply concepts (considers both consumers and producers) • Answer contains impact on at least 2 different markets but done well (indicating the price adjustment process - price and quantity clearly) • Arguments and impact on these markets are explained and illustrated with diagrams, which could have been more analytical • Answer is well-substantiated by real life examples, but may not be the most appropriate ones	15-17
High L2	• Answers both parts of the question but not that well-developed for one of them • Clear explanation of rational decision-making process by both consumers and producers, but both marginalist principle or rational decision-making framework could be better elaborated • Good and detailed discussion of how the lowered personal income tax rates could affect both consumers and producers, but not applied consistently to idea of decision-making (not addressing question very clearly or accurately) • Accurate and appropriate use of YED and PES <u>OR</u> supply concepts (considers both consumers and producers), but could be better incorporated or thought through • Answer contains impact on at least 2 different markets (price and quantity) • Arguments and impact on these markets are explained and illustrated with diagrams, but not so clear or well-analyzed • Answer is substantiated by some real life examples, but not consistently	12-15
Low L2	• Answers both parts of the question but both could have been better developed • Some attempt to explain of rational decision-making process by both consumers and producers, but (a) unclear use of marginalist principle, or (b)	9-11

	unbalanced – answer focuses on either consumers or producers only, or (c) with some minor conceptual errors • Discussion of how the lowered personal income tax rates could affect consumers decision-making but could have been clearer (does not really address the question, but an ordinary demand/supply question) • Some usage of YED (mainly considers consumers only) • Answer contains impact on at least 1 market (price and quantity) • Arguments and impact on these markets are explained and illustrated with diagrams, but not so clear or well-analyzed • Answer is substantiated by few or no examples	
High L1	• Some knowledge of factors in rational decision-making • Some knowledge of how the lowered personal income tax rates could affect consumer demand and thus the different markets • Arguments and impact on markets are explained, perhaps with a diagram which is not well-used • Answer may contain conceptual errors or lack economic analysis and depth • Points made appear incidental and does not address the question on impact of consumers and producers' rational decision-making • Answer is substantiated by few or no examples	5-8
Low L1	• Almost no knowledge of factors in rational decision-making or how the lowered personal income tax rates could affect consumer demand • Mere listing of points without economic analysis and depth • Significant conceptual errors • Points made appear incidental and does not address the question	1-4

Level	Evaluation	Marks
L3	• Candidate is able to challenge assumptions made in the framework or answer • Candidate is able to apply well-explained economic concepts to the question, in order to derive at a balanced conclusion about the different impact on different markets • Candidate is able to think of novel and insightful comments, which are relevant to the question	4-5
L2	• Some attempt to make conclusive judgments about the overall impact on different markets, however not well-substantiated with economic theory or quite generic (not focused to Question)	2-3
L1	• Sweeping comments which are not explained with economic theory	1