

Contestant number	2	0	E	P		
----------------------	---	---	---	---	--	--



2020 Taiwanese Economics Olympiad

Preliminary – Round 2: Application of Economics and Finance

Question Booklet

Time Saturday, March 28, 2020, 13:00 to 16:00 (180 minutes)

Location Taipei Fuhsing Private School, Taipei, Taiwan

Instructions

- Fill in your contestant number in the boxes at the top.
- Use only a blue or black pen or pencil.
- **Choose at least one problem from each section. Solve no more than 4 problems out of 6.**
- Do all rough work in the question booklet.

Information

- This is an individual-based round.
- If you provide solutions for 5 or 6 problems, all of them will be graded, but only 4 will add to your result. If you do not specify which to grade, only the lowest 4 grades will be included in the result.
- If not stated otherwise, consider all goods, services, and assets infinitely divisible.
- Numbers of firms and people may be only integers.
- Convey your ideas clearly. Do not skip important logical transitions in your reasoning.
- Take care of handwriting. If you strike something out, it will not be graded.
- You may leave the examination venue more than 60 minutes after this round begins.

This page is intentionally left blank.

SECTION 1

Problem 1 The 2005 credit card crisis in Taiwan

The 2005 credit card crisis in Taiwan gave rise to a large number of considerably-indebted card slaves and led to failure of operations of a lot of banks. The crisis has a large impact on Taiwan's banking industry.

Suppose a borrower wishes to apply for a credit card from a bank, and the bank should have power to determine issuance of the credit card. In different scenarios, banks, borrowers, and governmental authorities have different chances of gaining or losing utilities at different levels. These scenarios are:

- (1) *If a bank refuses to issue a card to a borrower, then the bank loses 10 units of utility, and there is no difference to the borrowers and governmental authorities.*
- (2) *If a bank determines to issue a card to a borrower, and he/she is considered a good borrower by the bank, then the bank gains 10 units of utility, and the borrower and governmental authorities gain 5 units respectively.*
- (3) *If a bank determines to issue a card to a borrower, and he/she is considered a bad borrower (however without malicious intent), then the bank loses 15 units of utility, and the borrower and government authorities lose 5 units respectively.*
- (4) *If a bank determines to issue a card to a borrower, and he/she is considered a bad borrower with malicious intentions, and governmental authorities can intervene in bad debts, then the bank and the governmental authorities lose 10 units of utility respectively, and the borrower loses 5 units.*
- (5) *If a bank determines to issue a card to a borrower, and he/she is considered a bad borrower with malicious intentions, and governmental authorities can intervene in bad debts, then the bank loses 20 units of utility in total, the governmental authorities lose 5 units, and the borrower gains 5 units.*

Questions

- (a) (15 pts) If all information above is transparent to the public, and the bank, borrower, and governmental authorities all think in the maximized interest of themselves, which of the scenarios is most likely to happen? Support your answer with reasoning.
- (b) (15 pts) If you wish to prevent such a credit card crisis from happening again, what measures can you take? List 3 measures with your reasoning.



Problem 2 **Illegal parking**

Statistics from Taiwan's National Police Agency show that the number of illegal parking offenses in 2018 increased to 3,760,112. Illegal parking is prevalent everywhere. A crackdown on illegal parking may require a new legal policy.

Imagine the following policy:

Illegally-parked vehicles will be towed to a special tow lot. All towed vehicles will be forfeited, and the vehicles in the lot will be randomly distributed to all vehicle owners at the end of a day. Hence, there is a chance for an owner to receive his/her own vehicle.

Questions

- (a) (10 pts) Will the new policy change the behavior of car drivers? Support your answer with reasoning.
- (b) (20 pts) Point out any possible problems of the policy with your reasoning and propose your modified version of the policy.

SECTION 2

Problem 3 Mask purchase

Starting from February 16, 2020, the Taiwanese government introduced a new policy of mask purchase. National ID holders with ID numbers ending with an odd digit can purchase masks on Mondays, Wednesdays, and Fridays, while those whose ID numbers ending with an even digit can buy masks on Tuesdays, Thursdays, and Saturdays, and everyone can buy masks on Sundays.

Meanwhile, the South Korean government introduced a different purchase policy on March 6. Mondays are for those whose years of birth end with a one or six; Tuesdays, a two or seven; Wednesdays, a three or eight; Thursdays, a four or nine; Fridays, a zero or five to buy masks. On weekends, anyone who has not purchased masks during the week can buy masks.

Note: The total population of Taiwan is 24 million, and the production of masks adds up to 10 million pieces per day in Taiwan without exports. The total population of South Korea is 51 million, and the production of masks adds up to 11 million pieces per day in South Korea with 10% of the daily production exported overseas.

Questions

- (a) (15 pts) Discuss advantages and disadvantages of the two policies of Taiwan and South Korea. Specify a policy you support between them with your reasoning.
- (b) (15 pts) In the initial phase of the outbreak of COVID-19 (the novel coronavirus pneumonia), some countries like Taiwan, Japan, and South Korea contained the spread of the epidemic by means of mask supply control, stricter border check, and mandatory quarantine or isolation. However, the Western world did not take similar measures against the epidemic at the same time. List and explain 3 possible reasons for such a difference.



Problem 4 Supply and demand of oil

The Organization of the Petroleum Exporting Countries (OPEC), initiated by some oil-producing countries in the Middle East and Latin America, was founded in 1960 in pursuit of alliance and cooperation among oil-producing countries so as to reduce market competition and stabilize the global price and supply of oil. In today's OPEC, Saudi Arabia is one of the most influential member states in terms of population and oil reserve.

Other than OPEC member states, the USA and Russia are also large oil-producing countries. Although Russia is not a member state in OPEC, it has long followed the pricing strategy of OPEC. As the outbreak of COVID-19 (the novel coronavirus pneumonia) evolves, the demand for oil has drastically decreased. In response to such a change, OPEC determined to reduce production at a larger scale on March 5, 2020 to ensure a stable price of oil. However, Russia broke the long-standing tacit agreement with OPEC, refusing to reduce production. At the same time, Saudi Arabia unilaterally lowered oil prices for its customers and increase daily production by 25%.

Questions

- (a) (15 pts) In the market with less demand, explain why both Russia and Saudi Arabia chose to increase production and infer consequences of this event.
- (b) (15 pts) In recent years, OPEC is less likely to regulate its member states. That Saudi Arabia unilaterally increased oil production is a good example. Indicate reasons of this phenomenon and provide similar examples.



SECTION 3

Problem 5 Principals and agents

When a principal signs a contract with an agent, the principal grants the agent some power to act on behalf of him/her. However, objectives may differ between a principal and an agent, and such inconsistency may lead to a situation of a conflict of interest where the agent may emphasize personal interest rather than prioritize the maximal interest of the principal. In economics, this scenario is known as a “principal–agent problem.”

Questions

- (a) (20 pts) Illustrate a conflict of interest between a principal and an agent with a case. Also specify action the agent may take in your case.
- (b) (10 pts) List 3 solutions that can solve a principal–agent problem.



Problem 6 Perfect market

Imagine there are perfect goods and labor markets in a perfectly-structured country. The market of goods perfectly follows mechanisms of classical economics (e.g. the law of supply and demand, the free market, decision-making logics, etc. in the discipline). The market of labor also conforms to the following rules: (1) salaries are always relevant to abilities; (2) there are no limits to the entry and exit of labor; (3) unemployment does not exist; (4) every individual can make decisions based on free will.

Questions

- (a) (20 pts) Discuss why there are no perfect goods and labor markets.
- (b) (10 pts) Express your opinions on whether the government should interfere in such “imperfection.”

End of questions