

Invisible Trade – A Teaching Case*

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Abstract

We document a game designed by a group of economics undergraduate students for themselves and others to teach the differences and transition between onshore and offshore trade. The motivation is a conundrum that has been happening in Hong Kong: the gradual decline of Hong Kong's port activities over the past decades without a corresponding decline of the labour employed in the trade sector. Hong Kong firms now intermediate trade mainly in the form of offshore trade that are rather "invisible."

Keywords: Trade intermediation; offshore trade; teaching

JEL Classification: A21, F19, F60

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1 Introduction

Some take the number of cargoes a region's ports handle as a measure of the importance of the region as a trading hub. Using the number of cargoes as a measure has at least two shortcomings. First, a bulky low-value cargo (eg. furniture) involves much less trade value than a small, precious high-value cargo (eg. high-end cameras lens). In math,

$$\text{Trade Value} = \sum_i \text{Price}_i \times \text{Quantity}_i, \quad (1)$$

which is different from

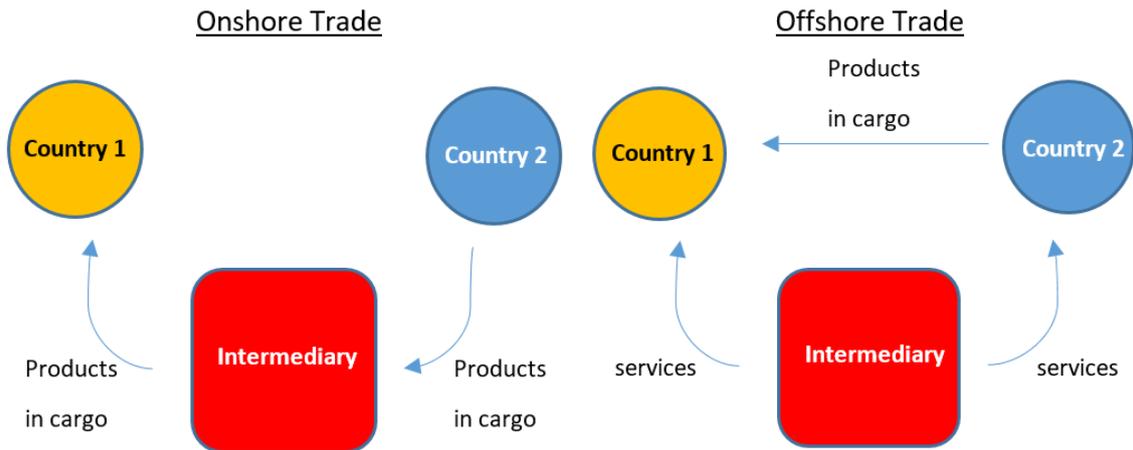
$$\text{No. of cargoes} = \frac{\sum_i \text{Quantity}_i \times \text{Volume}_i}{\text{Cargo capacity}}, \quad (2)$$

where i indices product.

Second, if an intermediary can break out from the constraint of intermediating trade only if the products physically go through its local ports, it is a technological advancement that does not reduce trade activities yet reduces port activity.

While the first point is easy to understand, the second is a little mind-stretching. It is this twist that makes the topic interesting. We explain the twist with some background.

Figure 1: Onshore and Offshore trade



In Figure 1, Onshore Trade refers to a situation that the intermediated products are physically transported through an intermediary from one country to another country. In Offshore Trade, an intermediary only provides services (some-

times including shipping) without any products physically going through the custom of its country. Thus, if offshore trade is a dominant form of trade intermediation of a trading hub, a trading hub's importance cannot be reflected by the number of cargoes transporting through its port.¹

We teach this twist aiming at two educational outcomes.

First, the economics students who design and implement the games would put themselves in the shoes of an educator. They digest the materials, understand the economic concepts, break down the concepts into building blocks, design and implement the games in test runs.

Second, the audiences who play the games would learn about the economics of trade through interactive games. In doing so, they hopefully will think more about exactly what a trade figure means.

The economics education literature has recommended this teaching approach. [Carlson and Schodt \(1995\)](#) argue that the case method helps students discover the knowledge or solutions by themselves through discussing and applying the relevant theories. It also has an advantage of allowing the teachers to receive students' feedback immediately within a specific case. [Marks and Rukstad \(1996\)](#) advocate teaching macroeconomics with case method as a teacher can convey more information of the theories and principles than conventional teaching. Game and case method have been used previously to teach trade economics. [Winchester \(2006\)](#) sets up a game for tariff, [Hong \(2019\)](#) also uses the game approach to teach the law of comparative advantage and terms of trade. [Bergstrom \(2009\)](#) designs a game experiment on operating a restaurant.

2 Conceptual background

The availability of a choice between onshore and offshore trade implies that when intermediating a trade, the middleman does not necessarily have to transfer the products to and from itself. Offshore trade, however, does not mean skipping the required procedures of quality controls and other services.

An example helps here. Suppose a toys trading firm in Hong Kong is intermediating trade between France and Malaysia. A Malaysian factory produces

¹[Sigler and Zhao \(2016\)](#) document the transition of Hong Kong's mode of trade intermediation from the traditional mode to offshore trade beginning in the early 1990s. Their definition of offshore trade is: "the practice of purchasing, or arranging the purchase of, goods that never physically enter or leave the territory."

the toys according to the specifications that the Hong Kong trading firm requires, who is the one familiar with European Union's toy safety requirements and has a long-term trading relationship with a French merchandiser. This Hong Kong toys trading firm can be constrained by technology: It has to ship the toys from Malaysia to Hong Kong before it ships the toys to France. As a result of the firm's trade intermediation, Hong Kong has a cargo in and out of the ports.

Breaking out from this constraint means the Hong Kong toys trading firm sometimes finds it more profitable not to ship the products to Hong Kong before shipping it to France. Suppose a nearby port in Malaysia is gradually developed with reliable shipping companies there, and remote quality control can be reliably done in Malaysia. The Hong Kong toys trading firm can choose whether to ship the products to France directly from Malaysia or via Hong Kong.

What is then the value-added of this Hong Kong toys trading firm as a middleman? This is exactly the question we would want our students and their audiences to ask. It relates to a lot of fundamental concepts in economics regarding trade and middlemen. If we can cut out the middlemen, don't we have more profit? A literature has developed to address the persistent presence of middlemen.

[Biglaiser \(1993\)](#) explains the rise of middlemen improves efficiency under adverse selection. Being able to distinguish the good quality from the bad through large investment in knowledge, they can sell the high-quality goods to build up their reputation for long-term survival. [Biglaiser and Friedman \(1994\)](#) show a model in which middlemen lower the price of the good compared to that without the middlemen. [Rubinstein and Wolinsky \(1987\)](#) show middlemen could help reduce transaction costs for both buyers and sellers. [Winkler \(1989\)](#) shows that middlemen arise because of market imperfections, such as trade restrictions.

Every year, for example, firms in the toy business join or exhibit at toy fairs around the world (for example, Toy Fair in New York, USA and in Nuremberg, Germany are one of the largest). These fairs are platforms for firms to connect to their potential clients and sources and build their network easily. Local governments sometimes also help promote their local trading firms and their products to other countries. These chances help them show their uniqueness, establish their supply-chains, and sometimes help facilitate licensing of trademarks and intellectual properties.

Going back to our example, the Hong Kong trading firm probably knows better how to communicate with the French merchandiser. It probably also has been

in the industry for years constantly interacting with leading toy designers, therefore are more capable of suggesting specifications and materials compared with toy trading companies in Malaysia. It probably can leverage on its understanding of the constantly changing European Union's toy safety regulations and other related tariff and non-tariff barriers. Another possibility is that the French merchandiser feels that the trading firm can reliably source from not only factories in Malaysia, but also from several other factories outside Malaysia at the same time. Communicating with a middleman can sometimes be easier than communicating with individual factories directly. Trade credits can be more easily arranged and arbitration in case of business disputes can be handled more predictably.

A middleman may provide several types of services to facilitate offshore trade. After receiving an order, the trading firm transfers the demand to producers (factories) with a careful consideration of the regulations in both the sourcing and the supplying countries. Once the producers have finished the production in accordance with the specifications, the trading firm conducts quality control and other checking. Typically, the firm either requires the producers to generate self-inspection reports or send its own quality control team to the factory for checking. Some middlemen also hire third-party independent claims adjusters to investigate the products. After the verification, the products will be transported via two ways: shipping companies the trading firm working with or the shipping crew of the clients. Middlemen would constantly think about their roles and value-added. Newer services can be added to strengthen their competitiveness and modern technology makes their offshore location less relevant compared to their core knowledge.

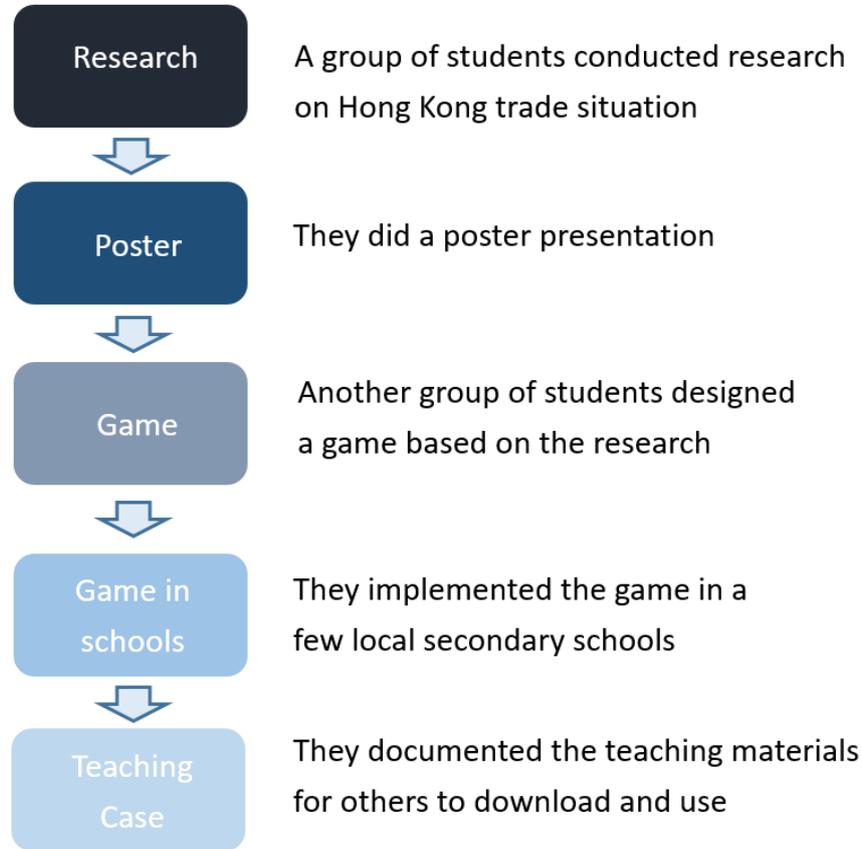
3 Processes and outputs

Figure 2 shows the flow chart of our teaching project. Two groups of students were involved. The first group of students conducted a background research on the Hong Kong onshore and offshore trade situation and did a poster presentation. Based on their research, another group of students designed a game and implemented it for students from two local secondary schools.

We document their work and output as a teaching case in this paper. The game materials and the research can be downloaded online freely for others to

teach.²

Figure 2: Flow chart of this project



3.1 The trends of Hong Kong trade

In recent years, some claim that Hong Kong is becoming less competitive in trade than before. Figure 3 shows that the number of container throughput in the Hong Kong ports has been decreasing by almost 20%, from the highest point of around 24.5 million TEUs in 2008 to less than 20 million TEUs in 2018.

If there were no offshore trade, we would have expected a corresponding drop in the labor employed in the trade sector. Figure 4 shows that indeed almost 35,000 workers have dropped out of the two trade industries, "Import/export, wholesale and retail trade" and "Transportation, storage, postal and courier services." However, the drop was merely 5% of the roughly 740,000 workers in 2007.

²Their work could be downloaded from the link below: <https://erc.cuhk.edu.hk/apec%20study%20centre/human%20capital%20development/invisible-trade/>

Figure 3: Total port container throughput (Data source: Hong Kong Census and Statistics Department)

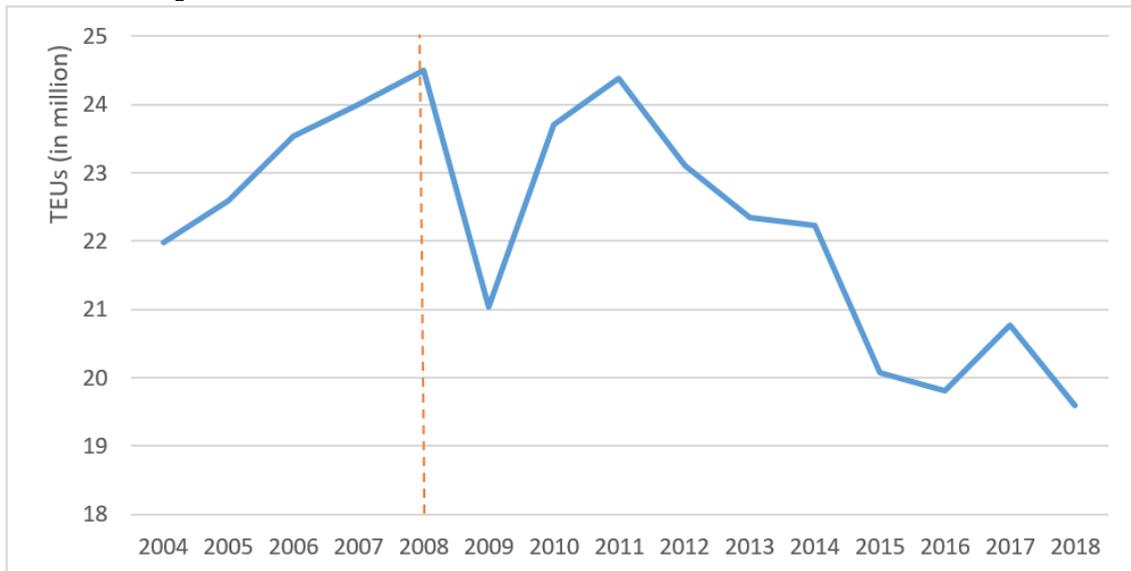
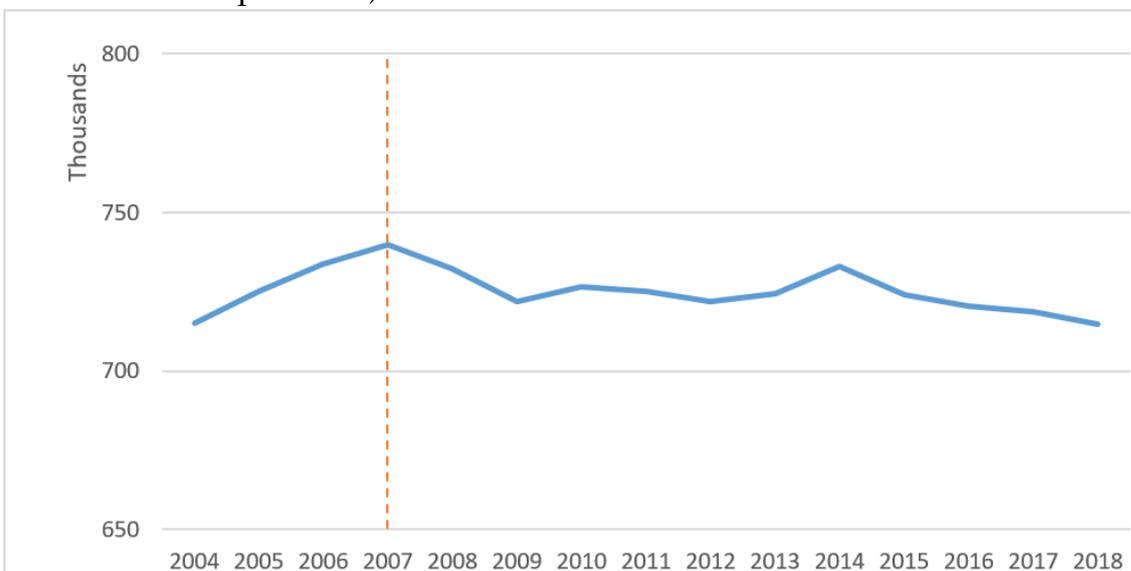


Figure 4: Labour force in “Import/export, wholesale and retail trade” and “Transportation, storage, postal and courier services” (Data source: Hong Kong Census and Statistics Department)



Trade statistics show something rather at odd. Figure 5 shows that both exports and imports of goods have increased by almost 50% in the last decade. If the value of traded goods were to stay constant, we should not have seen an increase in exports and imports. Students now should learn that the value of traded goods must have risen. Therefore, while port activities declined, the absolute value of

trade increased.

The offshore trade in goods (orange solid line in Figure 5) rise quite rapidly from 2004 to 2018 and surpassed imports and total exports in 2007. We can see that Hong Kong’s mode of trade intermediation is now dominated by offshore trade but not the traditional forms of trade.³

Figure 5: Trade statistics (Data source: Hong Kong Census and Statistics Department)

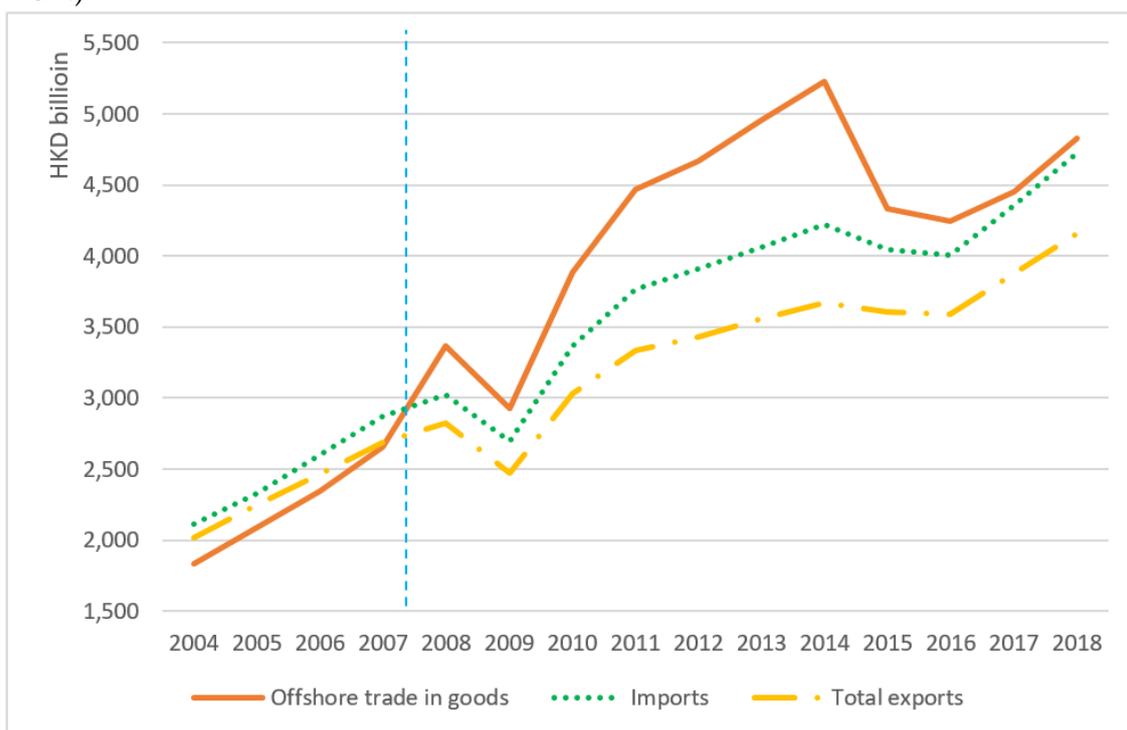
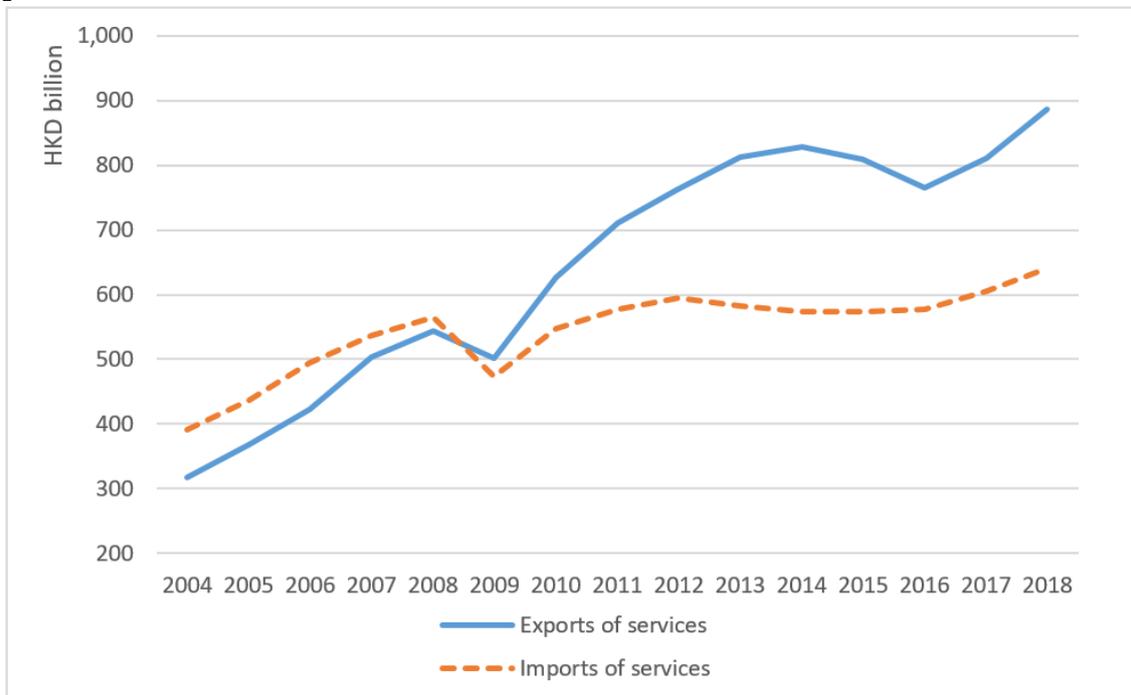


Figure 6 shows that exports of services nearly tripled from \$3,176 billion in 2004 to \$8,869 billion in 2018, while imports of services rise by more than \$200 billion from around \$400 billion in 2004. Notice that these figures are much smaller than that of the offshore trade. Offshore trade, therefore, is not included in the services trade figures. The fact that their trends are parallel suggest that trading firms are increasingly engaged in the offering trade services around the world with or without the services being recorded as trade statistics.

These statistics refute the claim that Hong Kong becomes less competitive as a trading hub. Hong Kong’s imports and exports statistics of both goods and services, on the contrary, become stronger. Hong Kong trade industry has been expe-

³Sung (2006) documents the transition of Hong Kong’s role as a middleman of China in more details and offers the theoretical background. He (2014) describes the differences among the different datasets that show variations of the magnitude but not the nature of the transition.

Figure 6: Trades of services (Data source: Hong Kong Census and Statistics Department)



riencing a structural shift from onshore towards offshore trade, given a growing share of offshore trade and services exporting. Two potential explanations behind the statistics are that each cargo contains more high-valued goods and that trades rely more on air and land transport than sea transport.

3.2 The Game

3.2.1 Set-up

The game simplifies the current situation of Hong Kong trade and incorporate the key economic ideas and concepts. We aim to deliver the economic idea that quantity (container throughput) is only a part of the total trade value and to introduce the rise of offshore trade.

Our target audiences will act as trading firms in Hong Kong, aiming to maximize their profit by completing trade contracts (i.e., completing some word puzzles games) within a limited period of time. In Game 1, they have to choose the contracts; a trade contract indicates the price and quantity of a trade product. In Game 2, they have to choose contracts and the transportation methods, either onshore or offshore, given certain conditions.

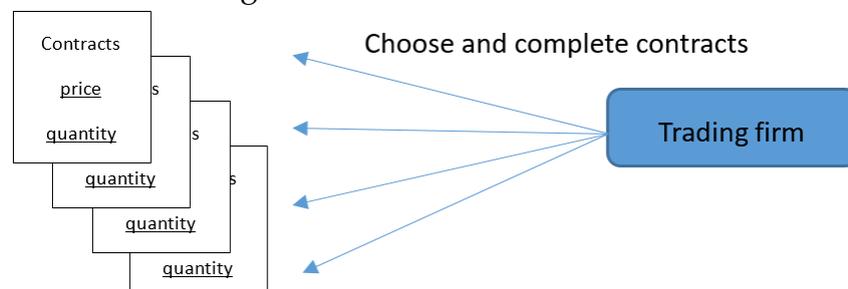
- Target audiences: high-school students or non-economics undergraduate majors
- Time needed: 45 mins
- Games: two rounds of games (15 mins each), followed by explanation slides (10 mins)
- No. of students: groups of 4 to 5. Can go up to 10 groups.
- The materials: a PPT file for presentation; an instruction for host; 2 set of game cards; a list of cards with detailed information; a set of missions

3.2.2 Procedures

Introduction. The instructors will ask the students a few questions about trade. The intention of raising the questions is to guide students to think about the concepts of trade based on their own knowledge. Students will then be divided into teams of 4 or 5 people before the game starts.

Game 1. As in Figure 7, students have to pick contracts from a list of contracts that are different in terms of the product, the price and the quantity to maximise their profits (to simplify, their cost is merely their time). To complete a contract, each team has to accomplish a corresponding mission. The mission is to solve some word puzzles. The difficulty of it depends on the values of contracts – a mission will more complicated if the value of the contract is higher (which would take them more time to accomplish).

Figure 7: Illustration of Game 1



Game 2. Before the game starts, the students will be provided with some information of the two trading methods: onshore and offshore. The instructors will introduce Hong Kong as the middleman in international trade for decades. Students will have a brief understanding of the idea of traditional Onshore Trade and Offshore Trade.

The setting is similar to game 1 (see Figure 8). However, after chosen a contract, the team has to pick a shipping method too. The shipping method is now the only factor affecting the level of difficulty of the missions, and thus the profits they earn eventually: the missions are more difficult for the method with higher shipping costs.

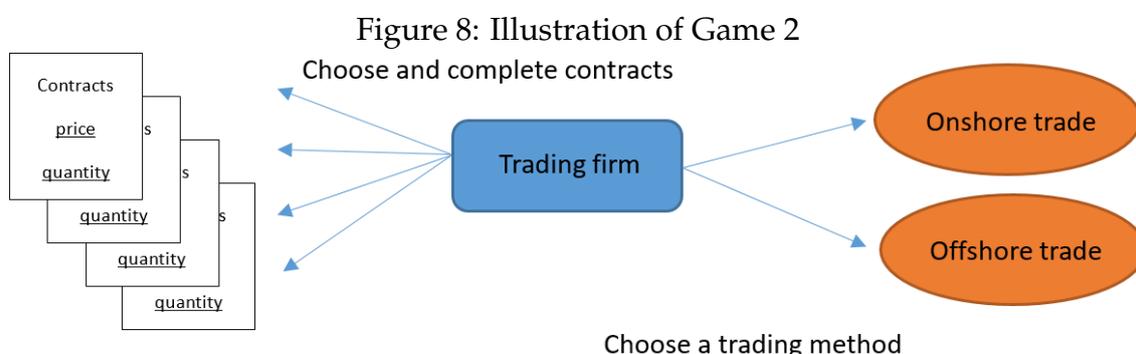


Illustration of the games. After the games end, purpose and knowledge behind the games will be explained in detail to the students, via instructors' guide with respect to the games. Certain patterns in Hong Kong trade statistics will also be described and explained. Our target audience will learn about the changes in trade situation of Hong Kong in recent years.

3.2.3 Core concepts/learning outcomes

The concepts in these games are mainly related to trade economics, along with several skills and knowledge.

1. Core concepts involved
 - mode of transportation in trade
 - onshore trade
 - offshore trade

- role of a middleman in trade
- differences between price/volume and value
- maximization of profits under different conditions and restrictions

2. Skills

- be able to interpret trade statistics and diagrams
- be able to interpret employment statistics and diagrams
- be able to reflect on the limitations of current trade statistics

3. Other related concepts and knowledge

- a middleman's value-added
- Hong Kong trade situation and recent development

3.2.4 More details of the games and the illustration

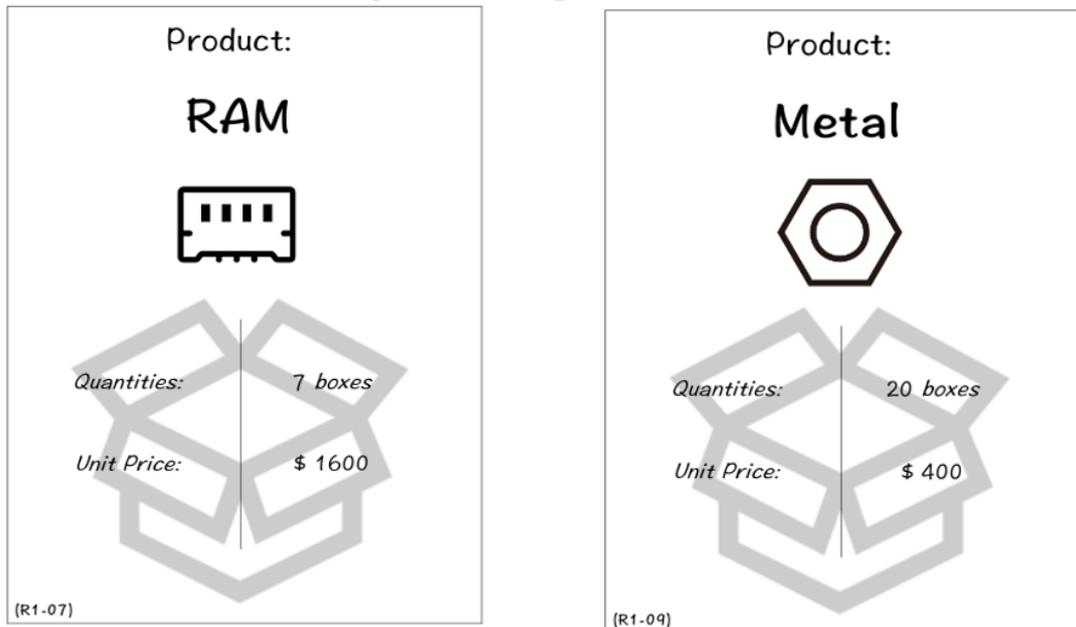
Game 1. Students will experience a trade-off: they choose either to complete more low-valued contracts (each takes them less time) or to complete fewer high-valued contracts (each takes them more time), given the limited resources and time. Learning the idea that the value of trade (both price and quantity), instead of only the price/volume, they can reflect more about the trade situation of a jurisdiction and the associated trade statistics.

Take the following two contracts in figure 9 as examples. 7 boxes of RAM cards are more valuable than 20 boxes of metal given the difference in unit price, even though the corresponding mission of choosing RAM cards is more difficult than the other one. Students could easily understand a higher level of quantity or price does not guarantee more profit. The instructors will further illustrate this point with Hong Kong situation that despite a reduction in the number of containers, the value of exports and imports does not necessarily have to drop.

Game 2. In game 2, students acting as trading parties have a chance to understand the differences between the traditional and offshore trade. They will then realize certain firms who switch from onshore to offshore trade due to lower costs, resulting in more, not lower, profit.

Figure 10 shows some examples. If students choose to trade RAM cards directly shipping from country A to B without passing through their city, the cost

Figure 9: Examples of Game 1



Value:	\$11200
Mission to complete:	Find 10 words in a word puzzle

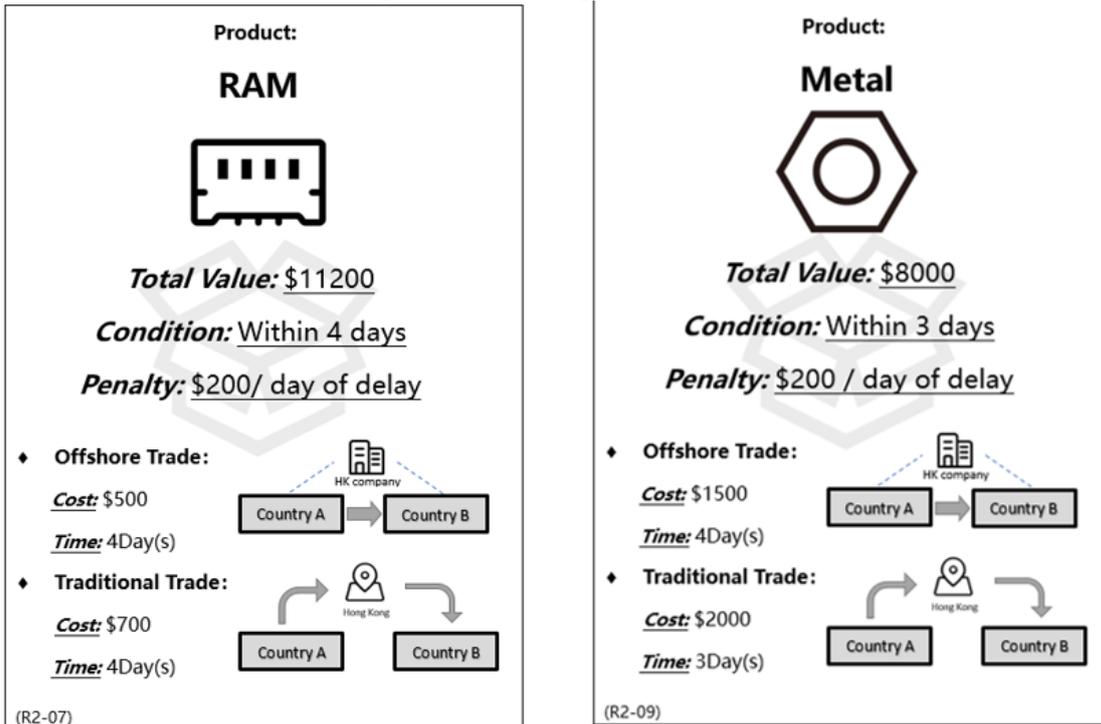
Value:	\$8000
Mission to complete:	Find 5 words in a word puzzle

is lower than traditional shipping method. For shipping metal, even though through offshore trade requires 4 days of delivery thus causing a \$200 penalty, still the profit of it is higher than onshore trade. Both examples show that offshore trade is more profitable than onshore trade.

Illustration. The instructors will record the teams’ trade in a computer. They will then use the data to illustrate their results with diagrams and guide the students in reading news articles and statistics.

As an example, figure 11 compares total trade values and onshore trade values between games for a team. We designed the cards such that choosing offshore trade is sometimes more profitable in Game 2. For instance, students chose to transfer the products shown in the graph in Game 1. Their total trade value is more than \$55,000. While in Game 1, it is implicitly assumed using traditional trading method (onshore), Game 2 allows students to freely choose the trading methods. Suppose the students choose the same products; the total trade value in Game 2 will be the same as in Game 1 (Figure 11a).

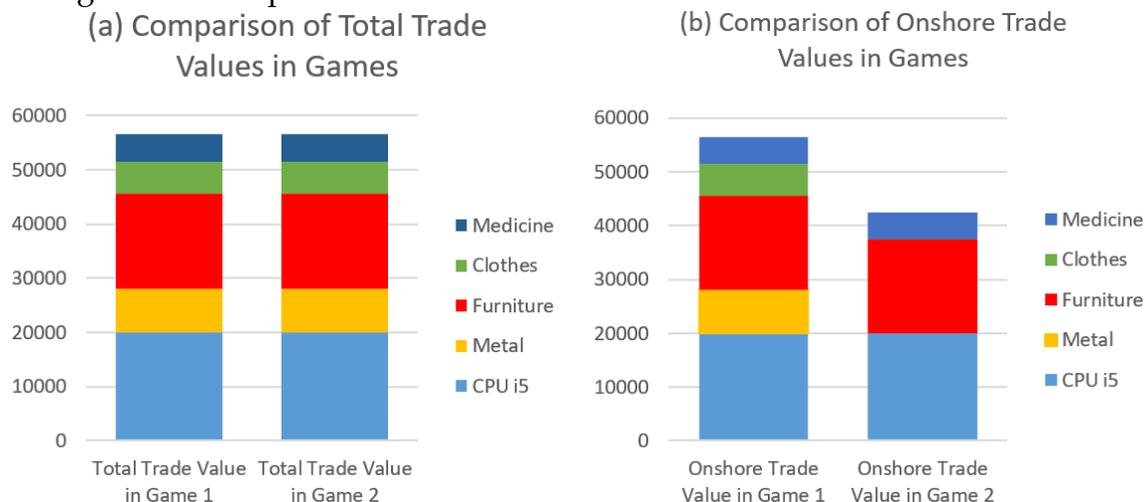
Figure 10: Examples of Game 2



Profit of offshore trade:	\$10700
Mission to complete:	Find 5 words in a word puzzle
Profit of onshore trade:	\$10500
Mission to complete:	Find 10 words in a word puzzle

Profit of offshore trade (with 1 day of delay):	\$7300
Mission to complete:	Find 5 words in a word puzzle
Profit of onshore trade:	\$6000
Mission to complete:	Find 10 words in a word puzzle

Figure 11: Comparison of Total and Onshore Trade Values between Games



When it comes to the trade values in terms of trading method, however, the onshore trade value in Game 2 is likely to be less than in Game 1 (Figure 11b). Once the option of trading methods is available, students can choose the one with the lowest cost. Thus, not all products will be shipped through the ports of the middlemen.

Instructors will explain that other than the number of cargoes, onshore trade values are often used by the news to describe trade situations. Students will then easily realize with the existence of offshore trade, even though the reported onshore trade values are smaller than before, the actual trade values of goods can be the same or even higher, as what they have achieved in their own games.

3.3 Outputs

We have transformed this project into a teaching case for others to teach secondary school or non-economics-major students. A zipped file with instructions and materials can be downloaded through the website listed in footnote 2. Others around the world can make use of the file to teach the concepts listed above.

4 Educating students through design and test runs

A group of students were involved in the design of the game. They were all economics major at the Chinese University of Hong Kong. A lot of fine-tuning has been done. Initially, one group designed a poster about the concept and showed

it to audiences who attend a conference held by the Trade and Industry Department. Then another group of students took over the materials and started to design games aimed at illustrating the concepts. They built the game materials and presentation slides themselves and design the narratives in both Cantonese and English. They conducted several rounds of test runs with economic undergraduates as well as high-school students. Eventually, they packaged the whole project and uploaded them on a website for others to download. Their next step is to market the games through a variety of channels, such as introducing it to their own teachers from their own high schools, as well as staff of the Hong Kong Department of Education. They have started emailing to several local high schools they have no connection with to notify them that they can make use of the website and the materials. We will also write educational articles such as this one in English and Chinese to publicize their outputs. The Hong Kong Trade and Industry Department, one of our funding sources, may probably help publicize the students' works through their own networks too. They can also talk to the Hong Kong Census and Statistics that collect and publish the offshore dataset, so that there can be synergy.

5 Learning outcomes

Table 1 sums up the learning outcomes of the project in which students could learn through educating others. Our students participated in researching Hong Kong trade situation learnt more about the current shift of trade Hong Kong has been experiencing, and developed their skills through the whole process. Another group of students learnt to transform a research into a game for secondary school students and can now deliver complex economic ideas and concepts in plain language.

Table 1: Learning outcomes from the activities

	Learning objectives							
	Hong Kong trade situation	Trade concepts	Research skills	Presentation skills	Statistics interpretation	Creativity	Storytelling	Teamwork
Background research	✓	✓	✓		✓			✓
Poster	✓	✓		✓	✓	✓	✓	✓
Game design	✓	✓	✓			✓	✓	✓
Game implementation	✓	✓		✓	✓		✓	✓

References

- Bergstrom, Theodore C. 2009. "Teaching economic principles interactively: A cannibal's dinner party." *Journal of Economic Education* 40 (4):366–384.
- Biglaiser, Gary. 1993. "Middlemen as experts." *RAND journal of Economics* 24 (2):212–223.
- Biglaiser, Gary and James W Friedman. 1994. "Middlemen as guarantors of quality." *International journal of industrial organization* 12 (4):509–531.
- Carlson, John A and David W Schodt. 1995. "Beyond the lecture: Case teaching and the learning of economic theory." *Journal of Economic Education* 26 (1):17–28.
- He, Xinhua. 2014. "Hong Kong's Intermediation Role in China's Trade Development." In *Globalization, Development and Security in Asia Volume 2: Trade, Investment and Economic Integration*, edited by Zhiqun Zhu and Sarah Y. Tong, chap. 9. World Scientific, 189–200.
- Hong, Bei. 2019. "A two-round in-class trading game on the principle of comparative advantage and the theory of reciprocal demand." *International Review of Economics Education* 30:100150.
- Marks, Stephen G and Michael G Rukstad. 1996. "Teaching macroeconomics by the case method." *Journal of Economic Education* 27 (2):139–147.
- Rubinstein, Ariel and Asher Wolinsky. 1987. "Middlemen." *Quarterly Journal of Economics* 102 (3):581–593.
- Sigler, Thomas J. and Simon XB. Zhao. 2016. "Hong Kong as an offshore trading hub." In *The Local Impact of Globalization in South and Southeast Asia*, edited by Bart Lambregts, Niels Beerepoot, and Robert C. Kloosterman, chap. 7. Routledge, 94–109.
- Sung, Yun-Wing. 2006. "The evolving role of Hong Kong as China's middleman."
- Winchester, Niven. 2006. "A classroom tariff-setting game." *Journal of Economic Education* 37 (4):431–441.
- Winkler, G. Michael. 1989. "Intermediation under trade restrictions." *Quarterly Journal of Economics* 104 (2):299–324.