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The Assembly of Rents

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Abstract: There are fixed costs in production. One has to assemble rents earned in production lines to cover them. There are also fixed costs in consumption. Consumers assemble surpluses to cover them. In either case, rent assemblage could either be a quantity solution, a quality solution, or a combination of both. Once a fixed cost is committed by contract, it becomes historical. Yet compared to the option of paying this fixed cost all over again, increasing those quantities or qualities, which do not further increase this fixed cost, is less costly. The Law of Demand therefore implies the quality and/or the quantity solutions. The quality solution, as provided by the Alchian-Allen Theorem, is but a special case: where an increase in quality is the only viable solution under some specific real world constraints.

Keywords: Rent assembly, consumer surplus, quality, quantity, fixed cost, entrance fee, Alchian–Allen Theorem, Steven Cheung, Economic Explanation

Economics might have advanced differently, should Professor Steven N.S. Cheung have written his *Economic Explanation* in English.

From 2001 to 2002, Cheung published three volumes of *Economic Explanation* in Chinese: *The Science of Demand*; *The Behavior of Supply*; and *The Choice of Institutions*. Some ten years later, in 2010, he started rewriting these three into four, serializing the chapters in the Hong Kong Economic Journal, which I faithfully looked forward to every Tuesday morning. By April 2014, when four combined volumes were all available, I quickly got myself a copy and went through them again in one go. I was in awe, realizing that the Professor had completely rewritten economics.

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The four volumes are: The Science of Demand¹; Income and Cost²; Price Taking and Price Searching³; and The Choice of Institutional Arrangements.⁴ Cheung substantially simplifies economics by keeping only one non-observable economic concept, the quantity demanded, and discards the rest. He argues that with the Law of Demand, the concept of cost, and the implications of competition, these three simple elements can explain the real world so much better, if one was to deduce testable implications.

Cheung illustrates this powerful approach with convincing examples. In this process, he proposes ten new hypotheses. They are, in order of appearances, (1) the Warehouse Theorem of Investment⁵; (2) the Shang He Theorem⁶; (3) the Theorem on Overheads⁷; (4) the Theorem of Direct Costs⁸; (5) the Overcrowding Effect⁹; (6) Information cost and the Theorem of Agglomeration¹⁰; (7) a Theorem on Cheating¹¹; (8) the Jade Theorem¹²; (9) a Theorem on Collectors and Counterfeiters¹³; and (10) a Theorem on Enforcement Costs.¹⁴

Theorems (2) to (5) are somewhat connected. They all try to explain economic behaviors when some forms of fixed costs are imposed. For Theorem (6), the connection is slightly indirect. Transportation cost is a fixed cost imposed onto consumers. When sellers agglomerate, the average transportation cost increases. Theorem (10) defines clearly quality and quantity, the variables when fixed costs are imposed.

By the fall of 2014, I came to realize that the connection is simply a general concept of the assembly of rents to cover fixed costs. Moreover, this general concept may render the Alchian-Allen Theorem a special case.

1 Steven N.S. Cheung, *Economic Explanation* (in Chinese), 2010 Beijing Edition. Book One, The Science of Demand, Arcadia Press.

2 *Op. cit.* 2011 Edition. Book Two, Income and Costs. The Behavior of Supply (Part I), Arcadia Press.

3 *Op. cit.* 2012 Edition. Book Three, Price Taking and Price Searching. The Behavior of Supply (Part II), Arcadia Press.

4 *Op. cit.* Book Four, The Choice of Institutional Arrangements. First Edition 2002; Second Edition 2014. Arcadia Press.

5 *Op. cit.* Book Two. P.113.

6 *Op. cit.* Book Two. P.163.

7 *Op. cit.* Book Two. P.193.

8 *Op. cit.* Book Three. P.205.

9 *Op. cit.* Book Three. P.225.

10 *Op. cit.* Book Three. P.323.

11 *Op. cit.* Book Three. P.328.

12 *Op. cit.* Book Three. P.297.

13 *Op. cit.* Book Three. P.330.

14 *Op. cit.* Book Four. P.171.

I would not be able to explain these theorems in detail, nor venture to represent Cheung's arguments accurately. Instead, I would try to explain the general concept of rent assembly using his as well as my own examples.

The Shang He Theorem

The Shang He Scroll is a five-meter long painting dating back to the Song Dynasty. The original is a national treasure that remains well kept in the Forbidden City. In 2002, it was exhibited in the Shanghai Museum. Admission to this museum was free, but people must stand in line separately just to see this painting. Viewers were reportedly said to have lined up for up to four hours in order to be able to come close to it. After viewing the painting himself, Cheung proposed that the more people standing in line, the longer they would stay to appreciate the painting before they leave. Hence, the waiting time is not only a positive, but an increasing function of the number of persons standing in line.

To illustrate, suppose there are 60 people in the queue, and the flow velocity is currently one person per minute. Each viewer would have to stand in line for 60 min in order to see the painting for one minute. Now suppose the queue increases to 120. People who have waited so long would be reluctant to stay for as short as one minute with the painting. Suppose they spend 2 min on average instead. The flow velocity becomes one person every 2 min. The last person on this 120-person queue will now have to wait for 4 h, instead of 2.

4 h standing in line would scare many away. But for those who still choose to wait, they would not leave after viewing the painting for just one minute. They are prepared to enjoy longer, or else they would not have waited at all.

Given the queue and its flow rate, waiting time is a fixed "entrance fee" to the viewers. Viewing is viable only when the consumer surplus is sufficiently high to cover this fixed entrance fee. One could even argue that consumer surplus are higher for those who would enjoy the painting longer. But this traditional argument is not testable at all, because consumer surplus is not observable.

Cheung's solution is simple. He argues that after standing in line for 4 h, the cost for waiting becomes historical. But should the viewer leave and come back next time to see the same painting for one other minute, he would have to wait 4 h in line again. Now that the viewer is already in front of the painting, it costs him much less to spend an additional minute before the painting, as compared to coming back next time. Hence, according to the Law of Demand, now that the price is relatively

lower, he will stay longer. Deriving a testable hypothesis this way requires no consumer surplus at all.

Cheung generalizes his argument to supermarket cashier queues. He proposes that in the absence of fast lanes, when queues are long, people tend to buy more. On the other hand, those who only want to pick up one or two quick items may not be ready to stand in line for 15 min ...

Direct costs and overheads

Rents are assembled to cover fixed entrance fees. This logic can be explained even better in production because, unlike consumer surplus, producer's surplus is largely observable.

Cheung proposes that there are fixed costs which producers have to pay even if they do not produce anything. Direct cost, however, increases with output. Take a printing factory for example. Land, factory building, machines are fixed costs, while papers and ink are direct costs. A producer expects to assemble rents, over and above direct costs for each product line, to cover the fixed costs.

Once committed by contracts, initial fixed costs become historical, and may not be directly relevant to future decisions. What is relevant would then be the respective rents derived from alternative product lines. With limited factory space and machines, rents derived from alternative product lines will become opportunity costs to one another. The highest rent forsaken in order to take an order of production is therefore the opportunity cost, which can simply be called overhead cost.

A printing factory owner provided the following example.¹⁵ In the eighties, when China opened up, labor-intensive toys could be produced at low costs in southern China. And yet the quality of printing was still substandard. Printing factories in Hong Kong were in huge demand.

To catch Christmas sales in the US and Europe, most toys had to be shipped before September. June, July and August were the busiest months. Suppose a small factory was asked to print the packing for either (a) Barbie, (b) Ninja Turtle, or (c) Snoopy. All orders required completions by September. Volumes were from 200 to 800 thousands. Simple designs were charged 1 to 2 Hong Kong Dollars each; while complicated designs, 2 to 3 HKD. Direct costs were 70-75% the price; leaving 25- 30% for overheads and profits.

¹⁵ Examples from Mr. Alan C.Y. Yu on 26 Oct 2014.

Suppose further the printer estimated that the respective overheads and profits were (a) HKD300,000 for printing Barbie; (b) HKD200,000 for Ninja Turtle; and (c) HKD150,000 for Snoopy. But the small factory can handle only one order before September. The printer would of course choose to print Barbie. In that case, the HKD200,000 rent for Ninja Turtles would be the highest valued option foregone, and hence the opportunity cost which Cheung call overhead cost.

Hence, Cheung proposes that these overheads are rents, which are in turn the opportunity costs when choosing what to produce.

The Overcrowding Effect

Now suppose the printer could ask workers to work overtime in order to finish Ninja Turtle as well. But of course he had to pay higher wages: at 150% normal wage rates on weekdays, 200% on Saturdays, and 300% on Sundays. He worked out that the total additional wages would be HKD100,000, leaving only HKD100,000 for overheads and profits. Yet he could earn this extra HKD100,000 without losing Barbie. Hence, he decided to work overtime and print Ninja Turtle as well.

As for Snoopy, the printer found another smaller printer who had the spare capacity to complete it by September. This subcontractor would of course share this HKD150,000 profit with him. After negotiation, they agreed to a 50/50 split, leaving him HKD75,000, who became the main contractor responsible for coordinating with the client and supervising the subcontractor.

This process is what Cheung called the Overcrowding Effect, in which producers would overcrowd his production capabilities in order to maximize the sum of rents derived from each product line. This is done firstly by prioritizing his orders, and subsequently subcontracting jobs to one another.

Similar to the Shang He example, once initial fixed costs are committed, they become historical. Squeezing in Ninja Turtles would increase direct costs but not fixed costs. Compared to the choice of renting an extra factory space and hiring additional machines, overcrowding the current capacities to print Ninja Turtles costs less and is chosen according to the Law of Demand. This logic is the same as that of the Shang He Scroll, except only one important constraint: standing in line for 4 h could allow viewing the painting but nothing else. The only choice is for how long one stays with the painting. In the factory example, the printer can choose not only what quantity to produce, but also which product to produce.

When the variables to choose, without increasing the entrance fee, were qualities only, the Alchian-Allen Theorem applies. Let us explain using a different example.

Transportation cost as an entrance fee

From the viewpoint of consumers, transportation cost is often a fixed entrance fee before consumption: a trip to the supermarket before shopping for groceries; a trip to Maine before dining in one of their lobster shacks; or a long trip to Xian before seeing the Terracotta Army...

To illustrate, let us take the agglomeration of flower sellers as an example. Suppose John lives on Flower Market Street in Hong Kong. Florists here are mostly wholesalers before dawn, who then turn into retailers for the rest of the day. For similar qualities, retail prices here are generally lower than those offered by retailers all over other parts of the city. As a flower lover, John buys on average half a dozen of flowers for HKD30 per week on his way home. Suppose John now moves to Stanley, the Southern tip of Hong Kong Island, a location 2 h away from the Flower Market. If John now wants to buy half a dozen of flowers, instead of a 4-hour round trip to the Flower Market, he may simply buy it from the retailer nearby his home. John may end up paying HKD50 for the same quality, but the extra cost is still much less as compared to the 4-hour trip.

John would now visit the Flower Market much less frequently. He may, however, still visit under one or more of the following circumstances: (a) he needs to buy more: for instance 100 roses for his wedding anniversary; (b) an elaborate flower arrangement as a birthday present; (c) a pot of high quality orchid for Chinese New Year; (d) he has a lunch appointment at a nearby restaurant, or he is on a multi-purpose shopping trip to the vicinity; or (e) any combination of the above. These reactions to the increased transportation costs can be called (a) quantity solutions; (b) and (c) quality solutions; and (d) and (e) multipurpose trips.

When transportation cost is increased, the consumer may visit less frequently; but whenever he visits, he would assemble consumer surplus to cover the higher transportation cost. These consumer surpluses could be assembled by either increasing the quantity purchased, raising the quality of the purchase, making the trip multipurpose; or any combination of the above. Economic theory cannot deduce that the quality solution must necessarily be the only solution.

Unlike the case of shipping the good apple out,¹⁶ the trip cost is not a fee per flower but a lump sum whatever quantity of flowers John would buy, or activities he can assemble into a multipurpose trip, as long as he could carry his purchases home without hiring a goods vehicle separately.

The conditions under which Alchian-Allen Theorem would apply are rather specific and can be explained in the following example.

Take a standard carton of 77 navel Sunkist oranges for example. Suppose the average cost for shipping a standard cartonful of oranges from California to Hong Kong is USD10. Holding the orange size constant, the average transportation cost per orange is roughly HKD1. This HKD1 will buy a seventy-seventh shipping space within the carton. Under these circumstances, the quantity solution is not feasible: one cannot possibly put two oranges into the same HKD1 shipping space. Multipurpose trip is also not viable either: one cannot possibly assemble, for example, one apple plus one orange into the same HKD1 shipping space. Hence, after imposing a HKD1 transportation cost, the consumer may not choose to buy any orange. Should he choose to buy, the only possibility is to buy a higher quality orange.

Hence, the Alchian-Allen Theorem is but a special case.

Cheung explains the example of textile quotas. In the seventies when quotas were imposed by the US, qualities of garments exported from Hong Kong to the US increased sharply. The price for a quota is an entrance fee for export. One cannot possibly put two garments into the same quota. The quantity solution is therefore not available, leaving only the quality solution.

Summary

In production, when a fixed cost is imposed, one has to assemble rents to cover it. This can be done by increasing either the quantity, quality, or different types of goods to be produced. Once a fixed cost is committed by contract, it becomes a historical cost. Compared to the option of expanding the factory by paying additional fixed cost, producing an extra unit, better quality, or an extra product would cost less and become preferable according to the Law of Demand. The quality solution results only when all other options are not available. This logic is similar in consumption. The differences are in physical constraints in each case, whether in production or in consumption.

¹⁶ John Umbeck; Shipping the Good Apples Out: Some Ambiguities in the Interpretation of "Fixed Charge"; *Journal of Political Economy*, Vol. 88, No. 1. (Feb., 1980), pp. 199–208.

When a fixed charge is imposed, rents are assembled to cover it. This can be done by increasing those quantities which would not further increase this fixed cost. Some of these quantities are used for transactions in the market, while others are not. Sugar inside an apple is not priced or transacted separately. An increase in the quantity of sugar inside an apple is generally called an increase in quality. In the example of shipping the good apple out, those quantities which would not further increase the unit shipping cost are sugar, juice, nutrients, texture/firmness, etc. When these attributes increase in quantity, the market says there is an increase in quality, because quantity is reserved for the reference to the proxy unit used in market transactions.

Conclusion

In the market, quantities are discrete: there are always minimum quantities for every purchase, and the quantity of transaction is often measured in the whole of a proxy unit. Inside every proxy unit, there are quantities which are not transacted separately and are called qualities instead.

Moreover, there are often sequential relations between contracts: one has to buy land before construction, to rent factory spaces and hire machines before production; to sign a rental contract before selling goods in a shop, to stand in line before viewing the Shang He Scroll, to travel before shopping, and to pay an entrance fee before taking rides in a theme park.

Ignoring transaction costs and contractual arrangements, economics has been too far from explaining the real world. Cheung's theorems seem to have uncovered the regular patterns behind these contractual interactions, and provided simple yet powerful theories to deduce testable implications. And the general concept of rent assembly may in turn allow a glimpse into such power of *Economic Explanation*.

Note: The Chinese version of this paper was presented at the Conference on Economic Explanation, Hang Zhou, China; on November 1st, 2014. While ideas are mostly Professor Cheung's, the author is responsible for any mistake and misinterpretation.