Problem Set 7: Question 2

Samuel Barker, Daniel Noriega, Rafeh Qureshi, Timothy Schwieg

Model Setup

We model the environment as imperfect competition between networks (like TWC) and distributors (like AT&T). Each firm faces a downward sloping demand curve for their differentiated product. We do not imply that there is any sense of "market power" that each firm has, only that they have the ability to mark up their prices, which allows for them to bear fixed costs.

Distributors are imperfect substitutes for each other and they may not all share the same price. Each firm will face their own firm-specific demand, and will have some mark-up in price above where marginal cost intersects their marginal revenue curves. Firms could earn profits in these markets. However, no firm has monopoly power in these markets, so the demand that they each face is not the total market demand. It is just the amount of people that will buy their good at a particular price, given the prices of all their competitors.

Part a

Q: Given that networks have zero marginal cost of adding viewers, are they making a mistake to charge distributors on a per-subscriber basis? Should distributors be compensating networks in some other way?

It is important that we make a proper distinction in the goods that are transacted in each market. Networks produce channels as their good, and sell access to this good to the distributors. Networks face fixed and marginal costs for production of these channels. Distributors buy access to channels, and then sell network packages to consumers. For simplicity's sake, we will consider that each distributor has only one package that contains all the channels that it pays for access to.

Assume that all the consumers are homogeneous, and have some willingness to pay for access to the networks content. Since there are many networks, demand for the distributor's content will still be downward sloping. The value of a distributor carrying the network's content is the customers' willingness to pay multiplied by the number of customers that are purchasing the good. Call this willingness to pay v, and the number of customers q.

The value that a distributor receives for carrying a network is qv, which is therefore the distibrutors‘ willingness to pay for that content.

The first alternative for the pricing structure of the market would be that all distributors faces a single price for access to the channels. Each firm that wanted a network's content would pay C dollars. Firms with $qv > C$ would buy this access, and receive a consumer surplus of $qv - C$. Some firms would earn significant surplus, while others would not acquire the network while still being willing to pay for on a per-customer basis.

However, networks could also observe the v for consumers and would be able to perfectly price discriminate, absorbing consumer surplus into producer surplus. By charging $t = v$ per customer, each distributor is indifferent between carrying the network and not; assume that they all do.

If a per-customer charge is implemented, all distributors buy the network, and the consumer surplus is captured by the network. This must be optimal from the network's perspective.

Part b

Q: The merger would increase the retail price paid by the households that subscribe to AT&T's competitors

Uncertain. Before the merger, TW networks was a perfect price discriminator. After the merger, they can do no worse than before, and since competitors were indifferent before they can do no better. The cost that each distributor pays to acquire TW networks content will remain fixed at $t = v$.

Competitors with q buyers were willing to pay qv to have Time Warner Networks‘ content, and when faced with a price of $qt = qv$ are indifferent between having TW networks or not. The merged company cannot charge a higher price, as the competitor would leave the market, and the revenue earned would then be zero.

The merged company would not choose to reduce the price either, as they still have perfect information about the valuations of consumers, and therefore the willingness to pay of the distributors. With this information, perfect price discrimination is the optimal choice for the profit maximizing firm.

Therefore the cost of obtaining TW networks has not changed for any of AT&T's competitors. The only source of changes in the price could come from changes in the firm-specific demand of the competitors. This firm-specific demand is dependent on the price of competitors, particularly of AT&T. From part (d) we infer that the price of AT&T could decrease. If the price of AT&T decreased, then we would see the firm-specific demand for its competitors decrease. This means the price will decrease, and the quantity sold will decrease as well.

If AT&T elects not to sell Time Warner content to its competitors, then the marginal cost of the competitors will decrease, as they no longer pay t per customer, but their individual

demand decreases, as they no longer carry Time Warner content and could have fewer customers. Their price could increase or decrease, and all that is known is that the firm is indifferent, so its producer surplus remains unchanged. Since demand could change as well, however, this does not allow us to make predictions about the price.

Part c

Q: If AT&T acquired TW, then the marginal cost t would be zero

True. The good that AT&T provides is network access to consumers. AT&T faces no extra costs of providing TW access to a new consumer once it has merged.

If AT&T acquires Time Warner, they still face the costs of producing the channels. One can imagine this as the Time-Warner portion of the merged company producing the channel, and then selling this to the AT&T portion at cost. The cost of AT&T carrying TW networks now is simply the cost of TW networks producing content.

It is not reasonable to consider the TW-portion selling it to AT&T at a price t' per consumer that AT&T sells to, as TW content will also be sold to other networks. This is therefore a fixed cost that AT&T bears, distributes and sells to other distributors as well.

This changes the pricing schema that AT&T faces, as instead of being charged per consumer, they are charged per channel that they produce. Their marginal cost of producing more channels is non-zero, and presumably quite high. But the good that AT&T is producing is access to networks for its consumers. On this front, the only costs of adding a new consumer are the marginal costs c. AT&T paid on the extensive margin to obtain access to TW networks at the cost of producing it, and therefore does not face a marginal cost of adding extra customers. Note that this zero marginal cost only occurs on the dimension of adding extra customers. Since that is the good that AT&T is selling, this is the dimension we consider.

Since the good that networks produce is channels, the costs that AT&T faces are the costs of producing that channel. These are presumably quite high but have become fixed costs for the firm. Once they have chosen on the external margin to participate in providing TW networks, they bear this cost.

Part d

Q: The merger would lower the retail price paid by households that had been subscribing to AT&T. Compare the magnitude of the gain or loss to the gain or loss that you calculated in part (b)

Uncertain. The marginal cost of providing AT&T to consumers has decreased. However a case remains where AT&T has the option not to distribute TW network content, and charge a "premium" that could increase the price as a result.

If the Time-Warner content is sold to other distributors, the firm-specific demand that AT&T faces has not changed at all. This means that the marginal revenue that AT&T earns per customer has not changed either.

AT&T will choose to produce where marginal cost equals marginal revenue, and this must occur at a greater quantity and lower price than they were selling at before the merger. In this case the retail price paid by households has decreased, and consumers are better off.

Consumers gain here, and the competitors of AT&T in part (b) now have a reduced market share because of the lower price of AT&T. This means that their demand curve has moved inwards, and their price and quantity sold have decreased. Consumers in both markets are better off, so the merger has a net beneficial effect for consumers. It cannot be that the quantity of consumers decreases, as the decreased demand leading to lower consumers in the competitors is caused by a lower price in the AT&T market. These customers are just switching to the cheaper alternative.

The other option remains for AT&T not to sell Time-Warner content to its competitors. Then AT&T has monopoly power over Time-Warner content, and increases its market power. This means that the demand curve shifts outwards, and it is possible that the prices paid by consumers increase. AT&T is less substitutable to the other distributors as it is the only distributor that carries Time-Warner networks, and this could translate into market power.

In this world, the marginal costs for its competitors have decreased, since they are no longer paying for Time-Warner Cable, but their demand has decreased as well. Nothing can be said about whether the price has increased or decreased however, so we cannot compare the magnitude of gains and losses in both markets.

The question of whether or not AT&T decides to sell access to the TW networks is whether or not the benefit of exclusively having Time Warner content would be higher than selling the content to the competitors. The revenue earned by selling to competitors is given by $\sum q_i v$ where q_i is the quantity of people buying from the competitors. If the increase in revenue from the increased market power is less than this, then they will sell to their competitors, and otherwise will maintain exclusivity. The revenue of selling TW's content to competitors is most likely to be relatively small (compared to exclusivity proceedings) when AT&T already has a large market share, and more likely to be large when AT&T has a small market share, but the exact numbers depend on the substitutability of Time Warner networks.

Part e

Q: To the extent that the merger results in a shift of consumers toward AT&T, that is inefficient

Uncertain. If AT&T could increase the price it charges to customers at the same time that it increases its customer-base (we assume that the market size has not changed), this would imply that the merger is inefficient as the dead-weight would inevitably increase.

If we were in the world where AT&T reduces its price and continues to sell to its competitors, then the effect of the shift would depend on how the mark-up is changing. In particular, it would depend on the relation between the elasticity of demand, the change of the marginal revenue curve, and the actual change of the marginal cost curve. It could be the case that AT&T increased the mark-up. AT&T has reduced its cost, but if the mark-up increased, the dead-weight loss would increase, which would imply that the allocation is more inefficient.

In the case where AT&T Monopolizes Time Warner networks content, it has increased its monopoly power, and decreased its marginal costs. This means that the dead weight loss will increase, and this outcome is more inefficient as well.

Inefficiency in the market is likely to increase in both outcomes, in the sense that the dead weight loss in the distributor market has increased.

Nonetheless, consumers could face overall lower costs thereby increasing consumer surplus, at the same time that producer surplus increases. Efficiency could be understood as production at lowest cost, and even in the case that AT&T mark-ups increased, if the final price that consumers face is lower than the initial price, both consumer and producer surpluses may increase at the same time.

Part f

Q: Now put aside the ATT-TW merger and think about mergers generally. The merging parties always argue that federal authorities should permit the merger because it will reduce costs (e.g., avoiding duplication) per unit quality and those costs savings are passed onto consumers. True, False, or Uncertain: The mergers should be blocked anyway because any pair of two potential merging partners could realize the cost savings through contracting rather than through merger.

False. Although contracts may seem like a feasible alternative in principle, a merger would capture future possibilities that would be very hard (and possibly very costly) to specify in a contract. Therefore, even if specifying a contract that perfectly substitutes a merger were possible, it would be a more expensive alternative, and therefore, it would not be possible to achieve the same cost savings that a merger would pose.

Consider the number of scenarios that could potentially occur in the future, which for practical purposes can be thought of as infinite (very large in any case). A contract stipulating enough conditions to accurately mimic a merger would have to specify terms that capture an essentially infinite set of scenarios. One could only imagine how costly drafting and enforcing such a contract would be; costs that could decrease potential savings which could be realized through a merger.

Part g

Q: Would your answer to (f) be different if the data showed a positive causal effect of many (although not all) mergers on industry output?

No, it would not. If such an effect was apparent, although it could be a case of market power (which the question seem to suggest), it could also be the case that in fact cost savings are achieved, increasing efficiency and allowing consumers to increase consumption. The evidence that there is a causal relation between mergers and an increase in industry output could also support the idea that mergers may be the most efficient option for different parties to interact in production relations, as opposed to contractual alternatives.