Price Discrimination in Licencing Standard Essential Patents

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Motivation: 5G technology

5G is a technology not only targeting mobile phones or tablets but also aimed at the development of the «Internet of Things»

There seems to be a widespread policy objective of ensuring adoption of IoT (and the Smart Home)

Motivation: the Internet of Things and the Smart Home

The Internet of Things is a network of connected physical devices

The Smart-Home is the part of the IoT network that includes the devices in our home.

As such both are likely to exhibit <u>network effects</u>, in that the value of an intelligent device is likely to increase with the number of other intelligent devices in the network

There is a clear complementarity from the users point of view in that "a smart-home is really smart if all devices are smart".

The objective should thus be to promote adoption in all sectors and avoid the risk of some sector not adopting the technology.

Motivation: Avanci

A patent pool, called Avanci, has been set up by some of the major telecommunications patent holders of 5G

Such a patent pool is to constitute a one-stop shop for device manufacturers wishing to incorporate the 5G technology inside their devices

This is expected to reduce search and transaction costs and thus favour adoption of the technology

In addition, to the extent that standard essential patents are complement products, they are more efficiently priced by a patent pool because it will internalize the positive effect of a lower price for one license on the price of the other lisense

Motivation: Price Discrimination

Since 5G wireless technology is not aimed only at smartphones manufacturers but also at manufacturers of fridges, washing-machines, bikes, cars and so on…

Avanci has decided to price per unit and to differentiate the price of licenses on the basis of the device sector, i.e. <u>to price discriminate by sector</u>

Sketch of a model-I

One (monopolist) patent pool faces demands for licensing of its technology by device manufacturers belonging to two different downstream sectors, A and B (e.g. in a "smart home" example, sector A could be fridges and sector B could be ovens)

Demand from each sector depends negatively on the price of the technology for that sector and <u>positively</u> on the quantity of devices sold by the other sector (e.g. because the value of having an intelligent fridge increases if you also have an intelligent oven and viceversa)

(Demand from device manufacturers derives from demand of users for the manufactured devices)

Sketch of a model - II

The patent pool maximizes profits by charging a unit royalty fee for each sector

The patent pool can set the same unit fee in both sectors (<u>no price discrimination</u>) or a different unit fee in each sector (<u>price discrimination</u>)

We compare adoption with price discrimination and with uniform prices <u>when both sectors are served under under uniform prices</u> (i.e. in the less favourable scenario for price discrimination)

What we knew already

On the one hand, we know that, absent externalities, third-degree price discrimination in selling one good <u>often increases the total quantity sold</u> (summing up over sector A and sector B)

On the other hand, still absent externalities, third-degree price discrimination <u>increases adoption in one sector but decreases adoption in the other</u> (unless one market is not served with uniform prices).

We also know that third-degree price discrimination, still absent externalities, <u>decreases the likelihood of one sector not adopting</u> (because the price is too high) compared to uniform prices

What we found

In the presence of positive externalities in adoption (derived from externalities enjoyed by consumers) price discrimination may <u>increase adoption in each of the two-sectors</u>

When this happens it is also the case that <u>manufacturers welfare in each sector increases too</u>

We give empirical conditions for this to happen. These conditions relate to the relative size of network effects and

of price elasticities

Many thanks for your attention!

Comments are welcome
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