Switching Costs

Carl Shapiro
Hal R. Varian*
University of California, Berkeley

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Let us examine an analytic model of competitive market equilibrium in the presence of switching costs. The model is general, but to be specific we'll discuss it in the context of Internet Service Provision (ISP).

Let c be the be the cost per month of providing a customer with Internet access is c. Assume a perfectly competitive market, with many identical firms, so that in the absence of any switching costs the price of Internet service would simply be $p = c$.

But now suppose that there is a cost s to customers of switching ISPs. We think of this switching cost as being the monetary equivalent of the inconvenience imposed on the user due to changing providers.

In order to compensate the users for this inconvenience, ISPs can offer a discount of size d for the first month to attract new customers. How does this option affect the pricing strategy of the firm and the equilibrium in the market?

Let us analyze the consumer choice problem. At the start of a month, a consumer contemplates switching to a new ISP. If he does so, he pays the discounted price, $p - d$, but he also has to endure the switching costs s. If he stays with his old provider, he avoids the switching costs and continues to pay the price p.

*Notes to accompany *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, 1998. Adopted from Hal R. Varian, *Intermediate Microeconomics*, 5th edition, W. W. Norton & Co., 1999

After the first month, we assume that both providers continue to charge the same price p.

The consumer will change if the present value of switching exceeds the present value of staying with the original ISP. Letting r be the (monthly) interest rate, we can write the switching condition as

$$(p-d)+\frac{p}{r}+s<p+\frac{p}{r}.$$

Competition between providers ensures that the consumer is indifferent between these two choices, which implies:

$$(p-d)+s=p.$$

It follows that $d=s$, which means the discount offered just covers the switching cost of the consumer.

On the producer side, we suppose that competition forces the present value of profits to zero. The cash flow associated with a single customer involves initial discount, plus the present value of the profits in future months. Setting this to zero we have:

$$(p-c)-s+\frac{p-c}{r}=0.$$

Rearranging this equation gives us two equivalent ways to describe the

$$p-c+\frac{p-c}{r}=s, \tag{1}$$

or

$$p=c+\frac{r}{1+r}s. \tag{2}$$

Equation 1 says that *the present value to the ISP of a new customer is just equal to that customer's switching cost.* This is why the ISP is willing to offer a discount of up to s to attract the customer.

Equation 2 says that the price of service is a markup on marginal cost, where the amount of the markup is proportional to the switching costs. Adding switching costs to the model raises the *monthly* price of service above cost, but, competition for this profit flow, forces the *initial* price down. Effectively, the producer is investing in the discount $d=s$ in order to acquire a flow of markups in the future.

In reality many ISPs have other sources of revenue than just the monthly income from their customers. America Online, for example, derives a substantial part of its operating revenue from advertising. It makes sense for them to offer large up-front discounts, in order to capture advertising revenue, even if they have to provide Internet connections at rates at or below cost.

We can easily add this effect to the model. If a is the advertising revenue generated by the consumer each month, the zero-profit condition requires

$$p + a - d - c + \frac{p + a - c}{r} = 0,$$

Since $d = s$, we can write

$$p = c - a + \frac{r}{1 + r} s.$$

This equation shows that what is relevant is the *net* cost of servicing the customer, $c - a$, which involves both the service cost and the advertising revenues.