Network Effects: Do They Warm or Chill A Budding Product?

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Goldenberg, Libai and Muller (2009) argue that network effects may slow the takeoff and growth in sales of a new product as adopters wait for sufficient others (threshold) to adopt. They call this the chilling effects of network externalities. They carry out a cellular automata experiment to examine how changes in certain parameter values affect profits due to this effect. They also adapt the Bass model to compute the chilling effect in five markets.

Goldenberg, Libai and Muller (2009) have produced a fine piece of research on the role of network effects in new product growth. Their adaptation of the Bass model is clever and their results appealing. However, their works seems to echo a persistent theme in the economics literature, that network effects have negative effects that can lead to inefficient and perverse markets (e.g., Church and Gandal 1993; Farrell and Saloner 1986; Katz and Shapiro 1986, 1992). With due respect to their rigorous analysis, our research seems to suggest just the opposite – that network effects enhance the efficiency of markets (Tellis, Yin and Niraj 2009). To show this effect, I will point to two issues, omitted variables and an enhanced perspective of network effects.

Omitted Variables.

Our past research suggests that, besides network effects, price and quality play a critical role in new product growth, in addition to many other cultural and economic factors (Golder and Tellis 1997; Tellis, Stremersch, Yin 2003). Prices come down steadily and steeply while quality goes up (Golder and Tellis 2004). Based on extensive case and empirical research, I have come to the conclusion that price (and quality) might be the most important factor in the takeoff and growth of new product sales (see Golder and Tellis 1997 for evidence). For example, when mobile phones first emerged about 30 years ago, they sold for over $3500 ($7500 today), had limited talk time, poor reception, weighed a ton, and were relatively monstrous. No wonder they had limited sales and a forecast by McKenzie of a worldwide market of 900,000 units! Today mobile phones offer a world of benefits at a fraction of that price. No wonder they are hot times in the remote villages of China and India. Goldenberg, Libai and Muller do not consider price and quality either in their simulation or their empirical analysis. As such, they may positively bias the estimated chilling effects of network effects (Tellis 1988). I suspect their estimate of 86% for cellular phones is upwardly biased.

Enhanced Perspective of Network Effects

The two common perspectives of network effects are direct and indirect. A direct network effect is the increase in utility of a product as the number of users increases (e.g., fax machines). An indirect network effect is the increase in utility of a product as the number of associated accessories to that product (e.g., operating system with software programs that run on it) (Stremersch et al 2007). In a recent article in the *Journal of Marketing Research,* we have pointed to an enhanced perspective of the first of these effects. The increase in utility occurs as users of the product in one's immediate network increases

(Tellis, Yin, and Niraj 2009). For example, in a small network of co-authors who use WordPerfect, a switch by some informed authors to Word may prompt all the rest to do so. When the quality of a new product is superior to alternatives in the market, a small fraction of informed adopters can lead to quick adoption of this new product due to such network effects. The early adopters in the network enhance the utility of the new product to others, signal its quality, and provide counsel to the non-adopters. In such cases, network effects enhance rather than hinder the adoption of the superior new product. Indeed, we show that in a sample of 19 markets, the presence of such network effects causes new entrants with superior quality to surpass the market share of entrenched market leaders in just a few years after the entry (Tellis, Yin and Niraj 2009). In this respect, network effects may be said to warm and not chill a budding market.

This new perspective of network effects is of growing importance in the modern era characterized by Web 2.0. News and information on prices and quality travel rapidly through small inter-connected networks causing widespread adoption of views, products, and services. The rapid growth of eBay, MySpace, and YouTube may be attributed to this effect. So may the fall of CBS anchor Dan Rather over his story that George Bush got special treatment during the Vietnam War. Recently, the success of unknown outsider Barack Obama over well known insider Hillary Clinton in the Iowa primary may be attributed to the clever launch of his campaign through networks of followers (Deighton 2008).

Conclusion

Network effects is a rich and complex phenomenon that marketing researchers are just beginning to incorporate in their models. Goldenberg, Libai and Muller (2009) have done the field a great service by showing how this phenomenon may be responsible for key characteristics of the takeoff and diffusion of new products. I caution that this role can be properly appreciated only if one also considers price and quality, which are two other key drivers of new product takeoff and growth.

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Figure 1: Price Declines of New Products