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*Journal of Macromarketing* 2006; 26; 8

DOI: 10.1177/0276146705284902

The online version of this article can be found at:  
<http://jmk.sagepub.com/cgi/content/abstract/26/1/8>

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# It's New but Is It Good?

## New Product Development and Macromarketing

Donald R. Lehmann

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*New product development is integral to marketing. There are questions, however, regarding the extent to which new products are good and for whom they are good. While benefits may be obvious for manufacturers, sellers, and users of any particular product, stakeholders beyond the transaction and direct usage of said product may receive no benefits and perhaps may be harmed by new products. Some of the complex systemic effects of new products are examined in this article, with the hope that readers will ponder some of these complexities and various trade-offs and, more important, devise measures and practices that might help to determine the extent to which products truly are or can be systemically "good."*

**Keywords:** *new products; growth; multiple stakeholders*

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**T**he development of new products and services is critical for firm survival and growth. Furthermore, substantial governmental efforts are directed toward aiding new business development (e.g., tax abatement), protecting new product development (patents, copyrights), and encouraging entrepreneurship and small business formation (e.g., the Small Business Administration). In addition, the development of new products has been a top research priority of the Marketing Science Institute and the reason for existence for the Product Management Development Association and its journal.

Despite this apparent enthusiasm for new products and the firms that generate them, however, there is the intriguing question of what the benefits of new products are from a broad societal point of view. Much has been written about predicting new product success (cf. Montoya-Weiss and Calantone 1994; Goldenberg, Lehmann, and Mazursky 2001) and to summarize the current state of knowledge (e.g., Hauser, Tellis, and Griffin 2005). Yet almost all the discussion is limited to customer acceptance and company profit. Arguments for and against new products abound. Interestingly, most of the arguments are largely two-sided, as Table 1 suggests.

The purpose of this article is to encourage expanding the discussion of the consequences of new products. At first, this seems like a simple task. For example, an economic per-

spective would focus on benefits to the firm or economic growth. Indeed, this provides an important but incomplete part of the picture, which includes multiple parties (i.e., stakeholders). For example, what is the value to customers? In terms of macromarketing, this question is surprisingly complex. One issue is at what time the consumer values a new product. Most new products increase in relative advantage/quality and compatibility over time and decrease in risk (including price). Is the value the initial value, the ultimate value, or some discounted weighted sum? Many really new products only reach maximum value decades after their introduction and in uses far different from those mutually intended (e.g., a superglue for closing wounds), which means a short-run perspective will undervalue many important new products. A crude first-generation product may not have much value itself but may be a critical step toward reaching later generations that have great value. More important, considering a product over its life cycle leads to other issues, for example, concerning maintenance and its eventual disposal. In other words, there are systemic impacts of new product introduction.

One such impact is on the product or products it displaces and the firms that manufacture and sell them. A new product could provide some benefit to the environment even if the product is harmful if it is less bad than the product it replaces (e.g., *The Economist*, August 1, 1992, 54). On the other hand, a successful new product may drive some firms out of business, hurting its employees and stockholders and having a disproportional impact on a local economy. Put succinctly, a systems view is needed (Bartels and Jenkins 1977; Wood and Vitell 1986; Wilkie and Moore 1999) that also considers broad impacts including those on international trade (Ellis and Pecotich 2002). For example, there is debate about the feasibility of hybrid and hydrogen-powered cars. Few argue that, once built, they run efficiently. It is less clear, however,

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The author thanks the reviewers and especially the editor for their helpful guidance.

*Journal of Macromarketing*, Vol. 26 No. 1, June 2006 8-16  
DOI: 10.1177/0276146705284902  
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**TABLE 1**  
**SOME PROS AND CONS OF NEW PRODUCTS**

<i>Pro</i>	<i>Con</i>
Satisfy unmet needs	Create unnecessary wants
Generate returns for society	Waste resources
Create dynamic environment	Force people "to keep up with the Joneses"
Stimulate the economy, creates jobs	Destroy jobs, businesses
Develop creativity and innovativeness; "elevate the human spirit"	Divert attention from more important businesses and social problems

whether if one includes the cost of producing the cars and the infrastructure to serve them, they are economically viable.

Considering the broad, systemic impact of marketing, that is, macromarketing, has a long tradition (e.g., Alderson 1965; Fisk 1981; Shaw 1995; Shultz 2004). For example, Meade and Nason (1991) synthesizing work on marketing systems, considered manufacturers, retailers, customers, and the environment when examining one new product, disposable diapers. This article builds on that tradition to delineate some of the potential impacts of new products. It is not intended to definitively say whether any particular new product is good or not, since the assessment varies across stakeholders. Rather, the intent is to indicate some of the possible impacts and trade-offs. For a number of reasons, we begin by discussing the customer's viewpoint and then move on to other constituencies.

Of course, a meta issue is, What is the impact of a world filled with product options? The impacts of a consumption culture may include attendant use of debt, reduced focus on learning and relations with others, drain on natural resources at both the production and disposal stages, and so on. Indeed, the pervasiveness of "stuff" is probably the biggest issue in the continued development of new products since they rarely entirely replace previous ones. Given the magnitude of this issue and the length limitations of this article, however, we focus the remainder of it on the value of a single additional new product. As we will see, this is a sufficiently complex question on its own.

## THE CUSTOMER'S VIEW

### Do People Like It?

The simplest measure of a new product's value is what customers think it is worth. This consists of three levels:

1. What they think it is and what they think they can use it for. Basically this refers to how they categorize the new product in terms of potential uses and substitutes.
2. How they think it compares to alternatives (either specific ones or a general category norm)
3. What they plan to do about it in terms of purchase and use. In particular, the maximum amount they are willing to pay for it (the reservation price) quantifies its utility.

Of course complexities arise. For example, there is likely to be a difference between liking before and after use, with the change dependent on satisfaction with both the level of use and how well it performs when used. For consumer welfare, how does one count the disappointment or delight, which comes from purchasing a product that falls short of or exceeds expectations? Logically, this would be added to the postpurchase evaluation to get the total impact, possibly in the satisfaction paradigm. Also, there are important technical measurement issues involved here (i.e., dealing with response style, social desirability bias, cardinal vs. ordinal measures, context effects, etc.).

### Does Anyone Buy It?

A simple measure of whether a new product is valuable is whether anyone buys it. Presumably, customers will only buy a new product in a category if its utility minus its price is greater than the maximum utility minus price obtainable from the existing products. Hence, a simple measure of value is the classic market test, Does it sell?

If one assumes that preferences (utility  $U$  – price  $P$ ) are distributed across consumers according to a distribution either with a central tendency (e.g., normal) or uniformly, then the more customers that buy the product, the higher its average net utility (i.e.  $U_{New} - U_{Best Old} - P_{New} + P_{Best Old}$ ). In the case where the utility of the best existing product is known and some sense of the variance of utility of both the old and new is available, one approach is to estimate the mean utility of the new product via Thurstone's (1959) Law of Comparative Judgment. One can then calculate net utility across customers—both with and without the new product—with the difference being a measure of the value of the new product. (This requires the assumption of cardinal utility and weights all customers equally. The latter assumption may be questioned if some special populations are considered more crucial or needy.)

### Is the New Product Efficient? What Does It Add?

The basic question of what a product adds comes down to how redundant (similar) it is with existing offerings. In the assortment area, Kahn and Lehmann (1991) suggested that the value something adds to an assortment depends on (1) its overall value/preference, (2) how unique it is versus existing

items, (3) some additional value for having another acceptable option, and (4) some reduced value for having an unacceptable option available. Thus, a truly redundant (me-too) new product adds value only by maintaining a large number of choice options (which, after some point, has a negative impact; cf. Iyenger and Lepper 2000).

A new product is efficient in a technical sense if no other product dominates it in terms of amount of attribute divided by price on all attributes. This measure has been used to examine the efficiency of markets (Horth-Anderson 1984). The level of inefficiency for a product is related to the distance of the brand from the efficient frontier and the level of efficiency in a market typically assessed by the inefficiency of products weighted by their share (Kamakura, Ratchford, and Agarwal 1988; Kalita 1994). Dutta, Kamakura, and Ratchford (2004) provided a useful explanation of two relevant estimation methods, data envelopment analysis (DEA), which is deterministic, and stochastic frontier estimation, which incorporates an error term.

A major practical issue is what attributes to include in the analysis. Following a strictly objective attribute approach such as Lancaster's (1966) original model tends to uncover many inefficient brands. On the other hand, just about any product has some apparently meaningless attribute on which it dominates. Since these features matter to customers (Carpenter, Nakamoto, and Glazer 1994), in one sense no product is inefficient. In general, measured inefficiency is the same thing as the brand equity that firms spend so much time and budget to develop, that is, the extra revenue that customers spend over the best "generic" alternative.

In addition to focusing on the new product itself, it is sometimes informative to focus on the market as a whole as well. One reason for doing this is that a completely inefficient dominated brand could actually improve consumer choice. This could occur, for example, via the attraction effect (Huber, Payne, and Puto 1982) by giving customers a reason to buy an efficient brand rather than the (inefficient) brand they were currently purchasing. Put differently, one can compare the efficiency of the market before and after new product entry.

### **What About Potential Customers Who Never Buy It?**

At one level, a new product appears to have no impact on nonbuyers. However, several costs and benefits may exist. For example, it may require effort to decide not to buy it, for example, a cost of thinking (Shugan 1980), or alternatively be entertaining or enjoyable to consider. A sufficiently enticing product can lead people to work harder in order to get it in the future (i.e., increase motivation) or alternatively be so far off one's price range or ability to use it that it is discouraging and/or demotivating. Indeed, the point of conspicuous consumption (Dixon 2001; Veblen 1899) is in effect to create just such

envy. There can also be a negative impact if the new product displaces an old one that the customer previously bought and prefers (as, e.g., happens frequently in clothing). Of course, use of a product valued by some may decrease the welfare of others (e.g., noise pollution, secondhand smoke). More insidiously, it may have short-term benefits for both user and other stakeholders, but long-term deleterious consequences for both the user and society. This common dilemma has been discussed extensively, for example, in the case of wood products (e.g., Harvey 1995; Shultz and Holbrook 1999; Mundt 1993).

## **IMPACT ON FIRMS**

### **Firm(s) Selling the New Product**

In terms of economic impact, the product itself may be profitable or unprofitable (a serious possibility given the failure rate of new products). Similarly, its impact on the overall product line can be positive or negative. For example, concept cars are not profitable but may increase sales of other models.

Beyond their impact on profits, new products can increase employee quality and motivation by making for a dynamic work environment and reinforcing the efforts made by employees in the case of successful new products (either commercially or in the sense of doing good, as in some orphan drugs). On the other hand, unsuccessful new products may discourage employees as well as damage relations with both suppliers and channels.

Note that new products can have very different impacts on jobs. If the product can be produced in an efficient manner, more jobs can actually be lost the more successful the product is. On the other hand, if there are no efficiency gains and total sales go up, jobs also tend to increase. Of course, this does not say where nor how skilled and well paid the jobs will be or where the jobs will be located, as the current discussions about "off shoring" indicate.

### **Channels**

As in the case of the firm making the product, there is a direct profit (or loss) associated with carrying the new product. Similarly, the impact on category or "store" profits can be positive (e.g., by increasing store traffic) or negative (e.g., due to increased stocking and inventory costs).

### **Suppliers**

Some suppliers win (those selling components for the new product), and some lose. Of course, if the new product requires fewer components, all suppliers may be worse off. On the other hand, if the product is more complex or at least made from high-cost components, suppliers in general benefit.

## Competitors

In the best-case scenario, new products increase category demand and all products do better. More typical, some firms gain and some lose. In most cases, competitors respond in terms of copying the new product, improving their own product, or cutting the price of their product, all of which are costly. There is also the argument that competition makes you stronger, that is, more efficient.

## THE ENVIRONMENT

Essentially, all new products place some requirements on the environment both in the short run (i.e., resources used in production) and in the long run via the impact of power used, heat generated, and by-products, as well as product disposal both in general terms (filling landfills) and specific ways (e.g., dealing with the materials used in old computers). Furthermore, few foresaw that plastic bags would end up affecting birds and fish, suggesting that it is hard to predict a priori all consequences. Concern over the safety of nuclear power led to increased reliance on fossil fuel, which in turn led to more strip-mining and economic power for oil-producing countries. Samli (1998) has developed a measure (the Environment Friendliness Index) that focuses on pollution, waste, recycling, and replenishment that can be applied to new products.

## THE ECONOMY

New products, and the effort required to produce and service them, generally have a positive impact on the economy. They also can lead to speculative bubbles (e.g., regarding the Internet) and the fallout their bursting brings. Some new products (e.g., transistors, credit cards) have markedly changed the nature of the economy. Still others have had major impact on international trade and the economics of other countries. In total, improved transportation and communication has changed the way people live, essentially remaking society.

Of course, the economic impact of new goods has been studied, often mainly theoretically, for decades (Hicks 1940). An excellent summary is found in Breshnahan and Gordon (1997). As an example, Hausman (1997) analyzed new ready-to-eat cereals from the perspective of imperfect competition. Using the case of the introduction of Apple-Cinnamon Cheerios, he analyzed both the implicit utility gain from having this alternative available and the negative impact of the accompanying increases in price of Cheerios and Honey-Nut Cheerios and concluded that there was a net economic gain of almost \$70 million, with the positive benefit of the additional choice option outweighing the negative impact of the accompanying price increase.

## HUMAN SPIRIT AND CONDITION

Most new products are unlikely to significantly affect society (e.g., Honey Nut Cheerios, blue M&M's). Some, however, can have a profound effect on psychological or physical well-being. In the medical field, polio vaccine, penicillin, etc. have changed life spans and quality of life. Air conditioning has had major influence on where and how people live and the Internet on how people interact and work. In addition to its by-products, at least for a time, the postsputnik space program gave a sense of shared purpose and pride and also, through related subsidies, improved technical education in the United States, which in turn helped spin off other new products and technologies. Other products have had as profound if somewhat more somber impacts (gunpowder, the atom bomb). For still others, only time will tell (cloning, gene sequencing, stem cell research). One nearly constant and positive by-product, however, is learning and increased knowledge.

More generally, new products may create a sense of turbulence and desire for stability (something enduring). Alternatively, they can generate a sense of adventure and exploration that propels a society as in Frederick Turner's (1920) "frontier thesis." In fact, they do both to different (or indeed sometimes within) people at different times in history. All this contributes to quality of life, a complex construct to measure (Peterson and Malhotra 1997; Lee et al. 2002).

At a very broad level, there is an inherent conflict between the desire for innovation and the desire for something stable and enduring. Common culture depends on common experience. In a world where products are constantly changing (and fewer valued possessions handed down from generation to generation), individuals may feel loyalty to a cohort but not to a neighborhood or a family. What this suggests is that, at least for radically new products, there may be an optimal level of newness.

## UNANTICIPATED CONSEQUENCES

Many new products have a series of consequences that are not foreseen or intended at time of purchase. Some of these involve further purchases, either additional when the product needs supplementary products to function (e.g., for PC's printers, ink, etc.) or reduced when the new product proves to be viable for use in other situations (e.g., a multipurpose tool). Others involve behavior patterns. Some products end up requiring activities that can be any combination of pleasurable-unpleasurable and good for you-bad for you (e.g., self-service). Furthermore, this combination differs by person (i.e., some people find having a push lawn mower leads to better health through exercise and satisfaction at seeing a neat lawn, and others find aches and pains and frustration at the time it takes to mow a lawn.)



Substantially new products often have long-run and unintended consequences. The Space Program (NASA) led to many technical advances (e.g., in food preparation). Other products had major short-run benefits but unforeseen long-run consequences (e.g., lead additives in gasoline and asbestos). Who knew television would be blamed for increased obesity? Improved fabrics and clothing (e.g., Gore-Tex and polar fleece) have greatly improved comfort but undoubtedly also emboldened people to go where they would not have before, sometimes with disastrous consequences. Mechanized farming increases crop yields but destroys social systems. What this means is that the consequences of new products are difficult to predict with certainty.

### MEASURING THE VALUE OF NEW PRODUCTS: THE CUSTOMER VIEW

It would, of course, be nice if a simple model existed that measured the value of new products. This section suggests some approaches for assessing important components of that value. Rather than detailed solutions, the focus is on assumptions and general modeling directions. The hope is that this will spur both analytic and empirical study.

In considering the value of a new product for users, at least three dimensions come into play.

1. Are preferences fixed or malleable?
2. Is the product good for users or harmful to them?
3. Is the new product
  - (a) an interior one, that is, one that falls in between existing ones on attributes?
  - (b) an attribute stretching one, that is, one that increases capability in some way? or
  - (c) a new attribute that can be treated as a special case of b. where the (prior) level of existing products is zero?

If we assume current preferences are fixed (or “correct”), then many new technologies provide little value. No one actively knew they wanted to make meals in 3 minutes, shop 24 hours a day from home, and so on. At best, these were passive wants. Is filling passive wants as important as addressing active ones? Moreover, if wants are at best latent, that is, producing and marketing a product creates demand for it, we could argue it adds no value (as measured at the time before introduction). On the other hand, once the want has been created and satisfied, many products become “essential.” This endowment effect development means that at some time after the product is introduced, its value may be considerably greater than its value at introduction.

There is also the fundamental issue of whether the new product is good for (as opposed to desired by) its purchaser. Exactly who gets to declare a product good or bad is, of course, both a difficult philosophical and contentious political problem. Nonetheless, most people would agree that for most people, hard drugs, products that cause disease (e.g.,

smoking), or products that seriously harm the environment have at least important negative consequences. How bad they are can be estimated at one level as the mirror image of how “good” products are evaluated, for example, in terms of sales revenue.

Many products are good for some people and bad for others (or at least considered to be so) or, even more complicated, both good and bad for the same person (e.g., a drug to control one condition that increases the risk of developing another). This raises the question of how to evaluate a mixed product. Is it the positive value to those for whom it is good, the net value taking into account (often self-inflicted) harm by those who should not use it, or the value also considering the turmoil and political ramifications of it being a contentious issue (gun control, birth control, stem cell research)? Most arguments about product goodness implicitly weigh these three components differently. While it will not solve the problem, making the weights explicit at least sharpens the trade-offs involved.

### Refinements within the Range of Existing Attributes

Many new products are, in effect, convex combinations of existing ones, that is, have intermediate levels on relevant attributes. In that case, the spatial competition literature (Vandenbosch and Weinberg 1995; Desai 2001) provides a useful framework.

For simplicity, assume products differ on a single dimension of quality and on price. Assume the extreme values on quality are 0 and 1. This leads to a Hotelling-like competition where new products choose positions on the quality line. By its nature (and especially if quality is costless), subsequent entries tend to fill in ever smaller gaps in the product space. Assuming customer utility is related inversely to distance from their ideal to the chosen (closest) product, subsequent new products provide smaller increments to their utility. At the same time, the cost of selection increases (e.g., linearly or quadratically) with the number of options (Shugan 1980). As a consequence, the benefit to customers decreases until the extra cost of deciding (including locating the preferred option) exceeds the benefit of a better targeted product. Note that firms may still find it profitable, or at least competitively necessary, to introduce new products, leading to overly broad assortments (Bronyarczyk, Hoyer, and McAlister 1998).

### New Products Outside the Range of Existing Products

These products are of the “more is better” type, that is, faster memory and more storage for computers. How much better they are depends on how much customers value the increase. Sometimes the increase enables a new category of applications (e.g., video), but at some point, decreasing marginal returns are likely to be reached. In effect, these can be dominating alternatives, better on most attributes. While methods like conjoint analysis or hedonic regression can

extrapolate small improvements, major advances are more difficult to assess.

### New Products with New Attributes

This situation is similar to the previous one. Basically, the product dominates on the new attribute. What makes it more complicated is that no estimate of the value of the dimension is available based on past behavior.

## MEASURING AGGREGATE VALUE

Measurement can be done at the individual (consumer), product market, and or financial market levels. At the individual level, the usual array of attitudinal variables are available: attitude, intention to buy, willingness to pay, and so on, as well as loyalty-type questions such as how soon would you replace it if it broke? and would you recommend it to a friend? Of course, there is variance in these reactions, including some who feel (for whatever reason) that their life is worse off because the product is available. Hence, an interesting question is how do we aggregate responses? In particular, do we only include the “votes” of those who buy it (essentially the economic view)?

At the product-market level, one obvious measure of value is the revenue generated. Following Ailawadi, Lehmann, and Neslin (2003), we can take the additional revenue generated by a product category as a measure of the value of a new product (assuming it fits an existing category). Other measures such as unit sales or price premium capture part, but not all, of the economic-based value of a new product.

At the financial level, the impact on stock price is a key measure of the value of a new product. We know new product announcements can affect stock price (cf. Chaney, Devinney, and Winer 1991). We also know that for most line extensions, the impact on both category revenue and stock price is negligible. At least from an economic perspective, that suggests the value of most new products is very small.

At the societal level, there is concern about quality of life both current and in the future. While the range of aggregations could be from local to global communities, accurately measuring the relationships between new products and societal welfare is challenging. Measures at this level of aggregation typically include, for example, health, anomie, and happiness; GDP (nationally and per capita); socioeconomic status; crime trends; poverty reduction; and so on (e.g., Hill and Stephens 1997; Sirgy 2005; World Bank 2001). Their connections to new products are not always immediately clear, although the hybrid car and alternative fuels are likely to affect one or more of these measures. An important research opportunity therefore seems to exist in creating better understanding of the relationship(s) between product(s) development and societal welfare.

## SUMMARY

This article is not an indictment of firms or their development activities. At least in a capitalist-type economy, their prime goal is to make money. However, firms increasingly are explicitly considering multiple constituencies (objectives) including the environment. What this article does suggest is that, at least informally, firms might want to consider other than short-run bottom-line considerations. Such consideration could actually benefit profitability, as owners of hazardous material sites and producers of products with adverse effects are now painfully aware. Most important, it would make explicit trade-offs that firms are often unaware they are making.

New product impacts can be far-reaching and unpredictable or essentially zero. Countless examples are available in sources such as *American Heritage of Invention and Technology*, a periodical focused on products that have had substantial impact. Interestingly, there is no widely known systematic study in marketing of the consequences of new products other than commercial success, for example, using meta-analysis. Therefore, the best “generalization” is to follow a systematic approach in considering new product consequences.

Figure 1 contrasts “lemon-scented” new products (minor tweaks within existing product categories) and really new products (i.e., those that create their own category). For modestly new products, the impact is generally mainly constrained to their customers, the firm, and its close competitors, and any channels or suppliers that are unusually affected. For really new products, by contrast, the effect can be much greater in the other categories, as Samli (1998) indicated.

Consider Apple-Cinnamon Cheerios, an incremental new product. As a small share brand in a fragmented market, it has little impact on the economy or human spirit. It has some, but not a substantial, impact on suppliers of apples and cinnamon. It affects channels in that they must dedicate one or more extra SKUs, but these are likely to come at the expense of other General Mills brands. Still, the major impacts are on customers (i.e., do they appreciate the extra choice, and what are the side effects of eating a sweetened cereal vs. whatever they would have had in its place?) and the firm (i.e., are category profits greater?).

Now contrast that to a hydrogen-powered car. Customers would have more choice and a different option in terms of noise, refueling, and so on available. The companies involved would have major commitments of R&D resources and production facilities and a large risk to manage. Suppliers would be needed and channels changed or even created. Long-run environmental issues are a concern as would be the impact on the economy and international trade as well. What this means is that, generally, really new products are where the macro-marketing “action” is.

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<u>Impact on</u>	<u>Lemon Scented</u>	<u>Really New</u>
Individuals		
Users		
Nonusers		
Employees		
Firms		
Selling Firms		
Channels		
Suppliers		
Competitors		
The Environment		
Resources Used in Production		
By-Products of Use		
Disposal		
The Economy		
Overall		
Specific Segments		
Human Spirit and Condition		

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**FIGURE 1 A TEMPLATE FOR CONSIDERING THE IMPACT OF A NEW PRODUCT**

There is also a “what might have been” issue about new products. Rather than being really innovative, most are minor modifications of existing products (i.e., line extensions). This has been attributed to an overly narrow focus on current wants of current customers (Christensen 1997). In medicine, there has been continuing controversy about the tendency of pharmaceutical manufacturers to concentrate on producing mass-market drugs rather than working on smaller market drugs that treat serious illnesses. Unfortunately, it is not clear exactly how to trade off products that produce a large benefit

to many against those that produce a large benefit to a few (i.e., is it subjective utility times number affected, estimated total person-years of life extended either unweighted or weighted by quality of life or marginal wage, or some other measure?)

At this point, the reader may be more unclear about how to value new products. To some extent, this is good. What starts out as a simple question (and is at least a tractable one if one takes an economic perspective at the firm level) is often a complex one involving imprecise measurement and multiple



stakeholders. It is hoped that this brief article will both surface some of the trade-offs involved and spur research (vs. just rhetoric) aimed at measuring value, broadly defined.

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