

CONSUMER MISPERCEPTIONS AND MARKET REACTIONS: THE CASE OF COMPETITIVE BUNDLING

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Abstract

This Essay studies bundling of two (or more) products as a strategic response to consumer misperception. In contrast to the bundling and tying studied in the antitrust literature—strategies used by a seller with market power in market A trying to leverage its market power into market B—bundling in response to consumer misperception may occur in intensely competitive markets. The analysis suggests that such competitive bundling might be welfare reducing. Regulation designed to discourage bundling—unbundling policies—may thus be desirable.

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1. Introduction

Consumer misperception—of the costs and benefits associated with a product or service—is prevalent. It can be the product of imperfect information or imperfect rationality (or both). It can be independent of any action taken by sellers. It can be instigated by sellers. And it can be mitigated by sellers.²

This Essay takes consumer misperception as given and studies one common strategy employed by sellers facing such misperception: the bundling strategy. Bundling in this Essay is used in a somewhat broader sense than is conventional in the antitrust and industrial organization literatures.³ I define bundling of products A and B to include any case where a consumer purchasing product A from seller X has a sufficiently strong incentive to purchase product B from the same seller (the meaning of “sufficiently strong incentive” will be made clear below). In a second significant departure from the antitrust and industrial organization literatures I focus on bundling by sellers operating in competitive markets.

Consider first consumer misperception about product use. To fix ideas assume that a consumer underestimates the amount of printing she will do with her home printer and thus also underestimates the number of ink cartridges she will purchase over the life of the printer. For instance, the consumer may estimate that she will need 50 ink cartridges, when in fact she will need 100 cartridges. The argument is that under these assumptions a seller offering printers only

² A seller offering a superior product has every incentive to ensure that consumers appreciate the superiority of her product. Specifically, this seller has every incentive to correct any misperception consumers might have about the shortcoming of a competing product. But correcting consumers’ misperceptions is costly. A seller might thus choose to ride the tide of consumer misperception and offer an inferior product, rather than convince consumers that a superior product justifies a higher price. The concern that sellers will often lack the incentive to educate consumers is reinforced by the public good nature of such educational efforts. If a seller succeeds in correcting consumers’ misperceptions, competitors will be quick to adapt their products to the changed demand. And the seller, who brought about this desirable change in demand, will not be able to recoup her investment in educating consumers. See, e.g., Ian Ayres and Barry Nalebuff, “In Praise of Honest Pricing,” 45 MIT Sloan Mgmt Rev 24, 28 (2003); Howard Beales, Richard Craswell, and Steven Salop, “The Efficient Regulation of Consumer Information,” 24 J. L. & Econ. 491, 503-04, 506 (1981). In a recent contribution David Laibson and Xavier Gabaix argue that under some conditions sellers will shroud unattractive product attributes even when advertising costs are zero. See Xavier Gabaix and David Laibson, “Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets” (MIT Econ WP, 2005). In some cases signaling, e.g., through warranties can alleviate consumer misperception. See Michael Spence, “Consumer Misperceptions, Product Failure and Producer Liability,” 44 Rev. Econ. Stud. 561 (1977).

³ See, e.g., Jean Tirole, *The Theory of Industrial Organization* (1988).

will find it hard to compete with a seller who bundles printers and ink, i.e., forces—through technological compatibility constraints and/or intellectual property protection—consumers who bought its printers to also purchase its ink cartridges.

The competitive advantage of the bundling seller can be explained as follows. In a competitive market a seller offering printers only will have to price its printers at the marginal cost of a printer, say \$1000. Consumers who buy printers from this seller will know that they will have to buy their ink from another seller at the marginal cost of ink, say \$10. Accordingly, the total cost of printing perceived by a consumer purchasing a printer from the printer-only seller is \$1500 ($= \$1000 + 50 * \10). Now consider a bundling seller. This seller may offer the same (or equivalent) printer at a below-cost price of \$500 and cover its losses by charging \$15 per ink cartridge. The total cost of printing perceived by a consumer purchasing a printer from the bundling seller is \$1250 ($= \$500 + 50 * \15). Given consumer underestimation of ink usage, sellers in a competitive market must bundle printers and ink.

Overestimation of use can similarly induce a bundling response by sellers. Consider the health club market. Sellers can charge a per-visit fee. Sellers can also offer a 1-year subscription, which can be viewed as an intertemporal bundle (access to the club in period 1 is bundled with access in period 2). For consumers who overestimate the number of visits they will make to the health club the bundle/subscription will be the preferred option. Accordingly, in a competitive market health clubs who fail to offer subscriptions will be at a disadvantage.

The welfare implications of bundling depend on the type of misperception that triggers the bundling response. Absent bundling underestimation of use implies underestimation of value and thus leads to too little trade. In the printers and ink example this means that too few printers will be purchased. Bundling, with its accompanying backloaded pricing, generates an underestimation of cost that offsets the underestimation of value. Bundling restores efficiency. Overestimation of use, on the other hand, implies overestimation of value and thus leads to excessive trade. Bundling exacerbates this inefficiency. Absent bundling with per-product

marginal cost pricing the overestimation of value is partially offset by the overestimation of cost. Bundling, with its accompanying frontloaded pricing, eliminates this beneficial offsetting effect.

The bundling strategy has distributional effects as well. When bundling responds to underestimation of use, high use consumers end up cross-subsidizing low use consumers. When bundling responds to overestimation of use, low use consumers end up cross-subsidizing high use consumers. The welfare implications of these distributional effects depends on the identity of the high use and low use groups.

Misperception of future use is not the only type of misperception that can trigger a bundling response. Price misperception can similarly force bundling between the product whose price is misperceived and another product whose price is accurately perceived. Mental accounting, and specifically the framing and coding of multiple gains and losses, can induce bundling. Richard Thaler, in a seminal contribution, identified the potential role of bundling as a strategic response to consumers' mental accounting.⁴ I recount and slightly extend Thaler's analysis.

The main goal of this Essay is to argue that competitive bundling in response to persistent consumer misperception is both predicted in theory and observed in practice. I therefore begin, in Section 2, by developing a theory of bundling in response to misperception of future use. This theory is developed through an extended analysis of the printers and ink example. Section 3 examines the role of bundling as a response to other types of misperception, specifically price misperception and mental accounting. I then proceed in Section 4 to briefly consider three real-world examples of misperception-based bundling. I begin with intertemporal bundling in subscription markets. I proceed to discuss the credit card market where transacting and borrowing services are bundled in one little plastic card. And I end with the cell phone market where phones / handsets are bundled with calling plans.

While mainly descriptive, the analysis in this Essay has normative and prescriptive implications. Bundling is shown to have both efficiency and distributional consequences. The

⁴ See Richard H. Thaler, *Mental Accounting and Consumer Choice*, 4 Marketing Science 199 (1985).

feasibility of bundling can either increase or reduce welfare, depending largely on the type of misperception that triggers the bundling response. The analysis carries two main policy implications. First, the existence of product bundles and the pricing of these bundles can be used as indicators of persistent consumer misperception in the examined market.⁵ Second, when bundling reduces welfare regulation that discourages bundling may provide a valuable tool for policymakers. Section 5 considers several unbundling policies.

This Essay studies bundling in competitive markets. It shows that consumer misperception can lead to welfare-reducing bundling even in competitive markets. The analysis thus departs from the legal and economic literatures on bundling and tying that have focused on tying by firms that have monopoly power.⁶ An important exception is a recent article by David Evans and Michael Salinger that studies bundling in competitive markets.⁷ Evans and Salinger, however, highlight the potential cost-based *efficiency* of bundling. This Essay highlights the potential *efficiency* and *inefficiency* of bundling, when the bundling strategy is adopted in response to consumer misperception.

It is important to emphasize at the outset that the proposed account of bundling, and of the pricing of the bundle and its components, as a response to consumer misperception is not offered as an exhaustive or even a dominant account. There are other important explanations for the bundling strategy that have nothing to do with consumer misperception. In particular, as noted above, many bundles can be justified on cost-saving grounds. Moreover, many observed bundles can be explained by a combination of the misperception-based and cost-based accounts. For example, the misperception-based account argues that underestimation of printer use leads to bundling of ink with another product. The cost-based account explains why ink is bundled with printers and not with, say, coffee tables.

⁵ Similar pricing patterns, however, may also be the product of other economic forces. Therefore, observing such pricing patterns should not be considered decisive evidence of misperception.

⁶ See, e.g., Michael D. Whinston, "Tying, Foreclosure, and Exclusion," 80 *Amer. Econ. Rev.* 837 (1990); Dennis W. Carlton and Michael Waldman, "The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries," 33 *Rand J. Econ.* 194 (2002); Barry Nalebuff, "Bundling as a Barrier to Entry," 119 *Quar. J. Econ.* 159 (2004).

⁷ David S. Evans and Michael Salinger, *Why Do Firms Bundle and Tie? Evidence from Competitive Markets and Implications for Tying Law*, forthcoming in *Yale J. on Reg.* (2005).

Market responses to consumers' imperfect rationality are the subject of increasing attention in the behavioral economics literature.⁸ An important recent contribution by Stefano DellaVigna and Ulrike Malmendier develops a model of optimal two-part tariff pricing with consumer misperception.⁹ My analysis of how bundled components should optimally be priced builds on the DellaVigna and Malmendier model. Della Vigna and Malmendier also discuss many of the markets that feature in this Essay. DellaVigna and Malmendier, however, take the existence of the bundle as given.¹⁰ The main contribution of this Essay is to endogenize bundling—to present bundling as an important strategic response to consumer misperception. I also discuss welfare and policy implications that are not identified in previous work.

2. Bundling in Response to Misperception of Future Use

A. Printers and Ink

When consumers misperceive the costs or benefits of one product, competition may force sellers to bundle this product with another product. I allow for separate pricing of the two products, but show that the competitive response to consumer misperception will often entail a single price. It is important to note that an effective bundle can exist even when two (or more) distinct products are separately priced. This bundle can be sustained through technology, i.e., compatibility constraints, law, i.e., contractual obligation, or simply economic or psychological switching/transaction costs.

⁸ See, e.g., Gabaix and Laibson, *supra* note ???; Stefano DellaVigna and Ulrike Malmendier, “Paying Not to Go to the Gym,” forthcoming in *Amer. Econ. Rev.*; Sharon M. Oster and Fiona M. Scott Morton, “Behavioral Decision-Making: An Application to the Setting of Magazine Subscription Prices” (2004) (unpublished manuscript, on file with author).

⁹ See Stefano DellaVigna and Ulrike Malmendier, “Contract Design and Self-Control: Theory and Evidence,” 119 *Quar. J. Econ.* 353 (2004).

¹⁰ An important exception is DellaVigna and Malmendier's analysis of endogenous switching costs. *Id.* at 385. Previous analyses of subscription contracts may also be interpreted as studying endogenous intertemporal bundling. See *id.*; DellaVigna and Malmendier, *supra* note ???; Oster and Morton, *supra* note ???. Intertemporal bundling is discussed in Section 4.A. below.

Consider a competitive market for printers. Assume, however, that once a consumer buys a brand X printer she can buy ink cartridges only from X (as a matter of technological compatibility). How will sellers price their product? Or, more accurately, how will they price their two bundled products: printers and cartridges?¹¹

Take a specific example. Let the cost of a printer be 1000 and the cost of an ink cartridge be 10. Assume that the seller knows that an average consumer will buy 100 cartridges over the life of the printer. (Inelastic demand is assumed for expositional simplicity.) The total per-consumer cost is thus 2000. If consumers are homogeneous in their printing practices,¹² and fully aware of their expected use of the printer, then a continuum of printer-ink price pairs is possible. To see this, let p_p and p_i denote the price of a printer and of an ink cartridge, respectively. The consumer thus expects to pay a total price of $P = p_p + 100 \cdot p_i$. Competition guarantees that the total price P equals the total cost to the seller, namely, $P = p_p + 100 \cdot p_i = 2000$. This competitive pricing condition is satisfied by per-product marginal cost pricing: $p_p = 1000$ and $p_i = 10$. But it is also satisfied, for example, by $p_p = 0$ and $p_i = 20$ and by $p_p = 2000$ and $p_i = 0$.

Consumer heterogeneity breaks the indifference between the infinity of possible price combinations. Consider two types of consumers: high use consumers who will buy 110 cartridges on average and low use consumers who will buy 90 cartridges on average. Assume an equal number of high- and low-use consumers. The $p_p = 0$, $p_i = 20$ price pair is unattractive to high use consumers. These consumers expect to pay 2200 under

¹¹ The analysis below directly applies to any market where a durable product is bundled with replacement parts or service.

¹² The homogeneous consumer case can be viewed as homogeneity within a class of consumers that has been segmented by sellers.

this pricing scheme, and will thus be quick to choose a seller offering a more balanced price combination. Specifically, high use consumers will prefer per-product marginal cost pricing, under which they expect to pay 2100. Conversely, the $p_p = 2000$ and $p_i = 0$ price pair is unattractive to low use consumers. These consumers expect to pay 2000 under this pricing scheme, and will thus prefer per-product marginal cost pricing, under which they expect to pay 1900. Heterogeneity will thus lead sellers to price their printers at marginal cost and their ink cartridges at marginal cost.¹³

B. Take I: Underestimation of Use

Now assume that consumers are myopic and systematically underestimate the amount of printing they will do and thus the number of ink cartridges that they will buy.¹⁴ How does consumer misperception affect the above result that competition will lead to per-product marginal cost pricing?

For expositional clarity, I return to the unrealistic benchmark market where consumers are homogeneous with respect to their printing practices. Absent consumer misperception any price combination satisfying $p_p + 100 \cdot p_i = 2000$ can persist in a competitive market. What if consumers mistakenly believe that they will need 50 ink cartridges, rather than 100 cartridges—the true number of cartridges that they will use? Compare the perceived attractiveness of the three price pairs considered above. With the

$p_p = 2000$, $p_i = 0$ pricing scheme the consumer will perceive a total price of 2000. With

¹³ Other equilibria where high-use consumers are offered one contract / pricing scheme and low-use consumers are offered another contract / pricing scheme are theoretically possible (if sellers can make low-price ink compatible only with high-price printers). In a competitive market, however, sellers have no incentive to deviate from per-product marginal cost pricing.

¹⁴ Hall finds that “people buy inkjet printers without information about [the cost of replacement ink].” Robert E. Hall, “The Inkjet Aftermarket: An Economic Analysis,” pp. 22-3 (1997) (unpublished manuscript, on file with author). This absence of information opens the door to misperception.

the $p_p = 1000$, $p_i = 10$ pricing scheme the consumer will perceive a total price of 1500.

And with the $p_p = 0$, $p_i = 20$ pricing scheme the consumer will perceive a total price of 1000. Since sellers get the same total price under the three pricing schemes, they will choose the $p_p = 0$, $p_i = 20$ scheme.¹⁵

This result is robust to the introduction of consumer heterogeneity. As before, assume that there are two types of consumers: high use consumers who will buy 110 cartridges on average and low use consumers who will buy 90 cartridges on average. Introducing consumer misperception, assume that the high use consumers think they will buy 60, rather than 110, ink cartridges, and that the low use consumers think they will buy 40, rather than 90, ink cartridges.

Compare the perceived attractiveness of the three price pairs considered above. With the $p_p = 2000$, $p_i = 0$ pricing scheme both high use and low use consumers will perceive a total price of 2000. With the $p_p = 1000$, $p_i = 10$ pricing scheme high use consumers will perceive a total price of 1600 and low use consumers will perceive a total price of 1400. And with the $p_p = 0$, $p_i = 20$ pricing scheme high use consumers will perceive a total price of 1200 and low use consumers will perceive a total price of 800. Since sellers get the same total price under the three pricing schemes, they will choose the $p_p = 0$, $p_i = 20$ scheme.¹⁶

¹⁵ In theory sellers might even set a negative printer price, p_p , and raise the ink price, p_i , above 20. In practice, however, negative prices pose to big a temptation for strategic behavior.

¹⁶ The analysis in the text considers only heterogeneity with respect to printer use. Another important dimension of heterogeneity, whose implications are not explored here, is heterogeneity with respect to the level of the bias/misperception (including, e.g., the case where some consumers underestimate use and some overestimate use). For an analysis of this type of heterogeneity in related contexts – see DellaVigna and Malmendier, *supra* note ???; DellaVigna and Malmendier, *supra* note ???. See also John Haltiwanger and Michael Waldman, “Rational Expectations and the Limits of Rationality: An Analysis of Heterogeneity,” 75

The preceding analysis focused on the pricing of printers and ink, taking the existence of the printer-ink bundle as given. But the formation of bundles in itself is an endogenous deliberate strategy. A main theme of this Essay is that the bundling strategy is an effective, often inevitable, response to consumer misperception. The optimal pricing analysis demonstrated the dominance of the $p_p = 0$, $p_i = 20$ scheme. This pricing scheme cannot survive without effective bundling of printers and ink. Absent such bundling, a consumer who received a free printer under the $p_p = 0$, $p_i = 20$ scheme will buy ink at the marginal cost of $p_i = 10$ from an independent ink seller. Foreseeing this dynamic no one will adopt the free printer – expensive ink tactic.

Making the $p_p = 0$, $p_i = 20$ scheme viable, however, is an attractive prospect. As shown above, if viable, this scheme dominates all other pricing schemes. Specifically, it dominates the pricing scheme that inevitably emerges absent bundling, the $p_p = 1000$, $p_i = 10$, marginal-cost-pricing scheme. Sellers thus have a powerful incentive to bundle printers and ink. Indeed sellers employ technological compatibility constraints coupled with intellectual property protection to secure effective bundling of printers and ink.¹⁷

What are the welfare implications of the bundling of printers and ink cartridges and specifically of the $p_p = 0$, $p_i = 20$ pricing scheme that such bundling entails? It may seem, at first blush, that there are no welfare implications. After all, under all three pricing schemes— $p_p = 2000$, $p_i = 0$; $p_p = 1000$, $p_i = 10$; and $p_p = 0$, $p_i = 20$ —the

Amer. Econ. Rev. 326 (1985).

¹⁷ Hall reports that printer manufacturers control over 90% of the ink market. See Hall, *supra* note 14, at 23. Also consistent with the above analysis Hall suggests that ink cartridges are “hugely profitable.” *Id.* at 4.

average consumer ends up paying the exact same amount: 2000. But the three pricing schemes are not welfare-neutral.

First, while the *average* consumer will end up paying the same amount under the different schemes, some consumers will benefit and some consumers will lose. Table 1 lists the total (and per-use/cartridge) payments of high-use and low-use consumers under each of the three pricing schemes.

Table 1: The differential effect of pricing distortions on the two consumer types

	High use consumers pay	Low use consumers pay
$p_p = 2000, p_i = 0$	Total: 2000 (Per use/cartridge: 18.2) Perceived total: 2000	Total: 2000 (Per use/cartridge: 22.2) Perceived total: 2000
$p_p = 1000, p_i = 10$	Total: 2100 (Per use/cartridge: 19.1) Perceived total: 1600	Total: 1900 (Per use/cartridge: 21.1) Perceived total: 1400
$p_p = 0, p_i = 20$	Total: 2200 (Per use/cartridge: 20) Perceived total: 1200	Total: 1800 (Per use/cartridge: 20) Perceived total: 800

Table 1 shows that low-use consumers benefit from a move to the $p_p = 0, p_i = 20$ pricing scheme, while high-use consumers lose from such a move. This distributional effect can be seen as either good or bad, depending on the identity of the high-use and low-use consumers, but it is not welfare neutral.¹⁸

A second welfare implication derives from the distortion in the number of printers that consumers buy. Underestimation of use naturally leads to the purchase of too few printers, at least absent bundling. To see this let v denote the per-cartridge value of printing to the average consumer. The total value of printing to the average consumer is

¹⁸ In fact, even if the two buyer types are identical in every aspect other than their printing practices, still the distributional effect of the different pricing schemes will not be welfare neutral. With decreasing marginal utility of money, a loss to one individual is not perfectly balanced by a commensurate gain to another individual.

thus $100v$. Since the total cost of printing is 2000 (recall that the cost of a printer is 1000 and the cost of an ink cartridge is 10), it is efficient for a consumer to purchase a printer whenever $100v > 2000$ or $v > 20$. With underestimation of use the perceived total value of printing is $50v (< 100v)$. Under the $p_p = 1000$, $p_i = 10$, marginal-cost-pricing scheme the average consumer perceives a total price of printing of 1500, and will thus purchase a printer whenever $50v > 1500$ or $v > 30$. In particular, efficient purchases will not occur whenever $20 < v < 30$.

Bundling cures this problem. With bundling coupled with the $p_p = 0$, $p_i = 20$ pricing scheme the average consumer perceives a total price of printing of 1000, and will thus purchase a printer whenever $50v > 1000$ or $v > 20$. Efficiency is restored. The underestimation of value is perfectly offset by the underestimation of total price.

C. Take II: Overestimation of Use

What would be the market response to the opposite kind of misperception—to overestimation, rather than underestimation, of use? While overestimation is less likely in the printer-ink context, I continue with this example for ease of exposition.

Again, I return to the unrealistic benchmark market where consumers are homogeneous with respect to their printing practices. Assume that consumers mistakenly believe that they will need 150 ink cartridges, rather than 100 cartridges—the true number of cartridges that they will use. Compare the perceived attractiveness of the three price pairs considered above. With the $p_p = 2000$, $p_i = 0$ pricing scheme the consumer will perceive a total price of 2000. With the $p_p = 1000$, $p_i = 10$ pricing scheme the consumer

will perceive a total price of 2500. And with the $p_p = 0$, $p_i = 20$ pricing scheme the consumer will perceive a total price of 3000. Since sellers get the same total price under the three pricing schemes, they will choose the $p_p = 2000$, $p_i = 0$ scheme.¹⁹

The optimal pricing scheme with overestimation of use— $p_p = 2000$, $p_i = 0$ —is diametrically opposite to the optimal pricing scheme with underestimation of use— $p_p = 0$, $p_i = 20$. The bundling of printers and ink, however, is equally necessary to support this very different pricing scheme. Absent such bundling, the consumer would purchase a printer at the marginal cost of $p_p = 1000$ from an independent printer seller and then pick-up free ink from the seller offering the $p_p = 2000$, $p_i = 0$ scheme. Anticipating this dynamic, no one will adopt the expensive printer – free ink tactic. As with underestimation of use, here too sellers have a strong incentive to make the $p_p = 2000$, $p_i = 0$ scheme viable, by bundling printers and ink. Arguably, effective bundling with $p_p = 2000$, $p_i = 0$ pricing can be more easily achieved, as compared to effective bundling with $p_p = 0$, $p_i = 20$ pricing (as was needed with consumer underestimation of use). All sellers need to do is to price discriminate, in the sale of ink, between consumers who purchased their printer from the same seller and consumers who purchased their printer from a different seller. (Of course, ink arbitrage must also be prevented: A person who purchased a printer from an expensive printer – cheap ink seller must not be allowed to buy a million ink cartridges at the low price and then resell most of these cartridges to consumers who purchased their printer from another seller.)

¹⁹ As in the preceding subsection, this result is robust to the introduction of consumer heterogeneity.

What are the welfare implications of the bundling of printers and ink cartridges, this time with the $p_p = 2000$, $p_i = 0$ pricing scheme? As before, while the *average* consumer will end up paying the same amount under the different schemes, some consumers will benefit and some consumers will lose. The distributional implications, however, are the reverse of those resulting from the $p_p = 0$, $p_i = 20$ scheme adopted in response to underestimation of use. High-use consumers benefit from a move to the $p_p = 2000$, $p_i = 0$ pricing scheme, while low-use consumers lose from such a move.

Now to efficiency: while bundling increased efficiency when adopted in response to underestimation of use, the opposite is true when bundling responds to overestimation of use. To see this, let v denote the per-cartridge value of printing to the average consumer. The total value of printing to the average consumer is thus $100v$. Since the total cost of printing is 2000 (recall that the cost of a printer is 1000 and the cost of an ink cartridge is 10), it is efficient for a consumer to purchase a printer whenever $100v > 2000$ or $v > 20$.

With overestimation of use the perceived total value of printing is $150v (> 100v)$. Overestimation of use naturally leads to the purchase of too many printers even under marginal cost pricing. Under the $p_p = 1000$, $p_i = 10$, marginal-cost-pricing scheme the average consumer perceives a total price of printing of 2500, and will thus purchase a printer whenever $150v > 2500$ or $v > 16.6$. In particular, inefficient purchases will occur whenever $16.6 < v < 20$. While overestimation produces inefficiency even absent bundling, bundling exacerbates this inefficiency. With bundling coupled with the $p_p = 2000$, $p_i = 0$ pricing scheme, the consumer will purchase a printer whenever

$150v > 2000$ or $v > 13.3$. Namely, the range of inefficient purchases increases from $16.6 < v < 20$ without bundling to $13.3 < v < 20$ with bundling.

With bundling sellers frontload the entire cost of printing onto the price of the printer, preventing overestimation of total price by the consumer. Overestimation of use thus affects only the perceived value of printing. Without bundling marginal-cost pricing leads to overestimation of the total price in addition to the overestimation of value. And two overestimations are better than one. The overestimation of the total price partially offsets the overestimation of value, thus reducing the inefficiency.²⁰

3. More Bundling: Beyond Misperception of Future Use

Bundling is a common strategic response to consumer misperception. This idea has been demonstrated above focusing on consumer misperception about future use. For simplicity future use and (mis)perception about future use have been analyzed as primitives of the model. In a more realistic setting future use is the product of an endogenous decision based on the future costs and benefits associated with the product. And misperception about future use can be traced back to misperception of these costs and benefits. Underestimation of use can be the product of underestimation of benefits and/or overestimation of costs. Conversely, overestimation of use can be the product of overestimation of benefits and/or underestimation of costs.

²⁰ In this model, the overestimation of total price will completely offset the overestimation of value only under the $p_p = 0$, $p_i = 20$ scheme, which cannot be sustained in equilibrium. Under this pricing scheme the consumer will purchase a printer whenever $150v > 3000$ or $v > 20$. Under no feasible price scheme will the overestimation of total price more than offset the overestimation of value leading to too few printers being purchased.

This deconstruction of misperception about future use suggests that misperceived costs and benefits might trigger a bundling response even when future use is not an issue. Two examples are considered below.

A. Price Misperception

Pure price misperception is arguably rare. Price is usually the most salient feature of a product—the one thing consumers can be expected to perceive with reasonable accuracy. Still, consumers misperceive prices, especially when these prices are not immediately due. Returning to the printers and ink example, Robert Hall found that “people buy inkjet printers without information about [the cost of replacement ink].”²¹ Credit purchases provide another example. Many consumers systematically underestimate the total price they will end up paying simply because they do not understand how fast interest accrues.

Consider two products (or two components) A and B that can be separately manufactured and sold at unit costs of c_A and c_B , respectively. The value to consumers of product A is $v_A > c_A$, and the value to consumers of product B is $v_B > c_B$. Consumers are assumed to be homogeneous. Absent bundling in a competitive market product A would be sold at a price of $p_A = c_A$, and product B would be sold at a price of $p_B = c_B$. Under reasonable assumptions this would be the market outcome regardless of consumer perception or misperception.

Now allow for bundling. Without loss of generality assume that consumers misperceive the price of product B to be $\hat{p}_B = \delta \cdot p_B$. I begin with underestimation of p_B , or $\delta < 1$. Absent bundling, the equilibrium will exhibit (per-product) marginal cost pricing, i.e., $(p_A, p_B) = (c_A, c_B)$. This equilibrium cannot be sustained when bundling is feasible. Sellers

²¹ See Hall, *supra* note 14, at 22-3. This lack of information about price is independent of any misperception about use.

offering such (per-product) marginal cost pricing would lose business to a competitor that sells the two products as a bundle A-B and sets $p_A < c_A$ and $p_B > c_B$. In fact, at equilibrium $(p_A, p_B) = (0, c_A + c_B)$.

To see why note that the perceived cost of the bundle is $\hat{P} = p_A + \hat{p}_B = p_A + \delta \cdot p_B$. Competition will force equilibrium prices (p_A, p_B) that minimize \hat{P} subject to the constraint $p_A + p_B \geq c_A + c_B$ (I assume non-negative prices, $p_A, p_B \geq 0$). The $(p_A, p_B) = (0, c_A + c_B)$ result follows. The intuition underlying this result is straightforward. Every dollar subtracted from the price of product A is perceived by consumers as a \$1 benefit; every dollar added to the price of product B is perceived by consumers as a δ ($< \$1$) cost. Sellers will thus transfer as much of the price as possible from product A to product B.

It bears emphasis that a seller who fails to adopt the bundling strategy will be driven out of the market. A seller who offers product A alone will have to charge $p_A \geq c_A$. Similarly, a seller who offers product B alone will have to charge $p_B \geq c_B$. The bundled product would always appear more attractive to consumers.

Now assume that consumers overestimate the price of product B, or $\delta > 1$. Again, when bundling is feasible (per-product) marginal-cost pricing cannot be sustained in equilibrium. As before the perceived cost of the bundle is $\hat{P} = p_A + \hat{p}_B = p_A + \delta \cdot p_B$. And again competition will force equilibrium prices (p_A, p_B) that minimize \hat{P} subject to the constraint $p_A + p_B \geq c_A + c_B$. But now, with $\delta > 1$, this minimization implies $(p_A, p_B) = (c_A + c_B, 0)$. A parallel intuition explains this result. Every dollar subtracted from the price of product B is perceived by consumers as a δ ($> \$1$) benefit; every dollar added to the price of product A is perceived by consumers as a \$1 cost. Sellers will thus transfer as much of the price as possible

from product B to product A.

The efficiency implications are straightforward. Bundling exacerbates the overconsumption problem created by underestimation of price. Overestimation of price leads to underconsumption absent bundling. This inefficiency is completely alleviated when bundling is feasible.

B. Mental Accounting

In an influential 1985 article,²² Richard Thaler, applying the Prospect Theory value function suggested by Amos Tversky and Daniel Kahneman,²³ showed that mental accounting “can influence marketing decisions either in the design of products or in the choice of how products are described.”²⁴ In particular, Thaler argued that given the concavity of the Tversky and Kahneman loss function, “sellers have a distinct advantage in selling something if its cost can be added to another larger purchase.”²⁵ Thaler listed add-on options in automobile or house purchases, riders to home or car insurance policies, and credit card insurance as examples.²⁶

Thaler’s bundling focuses on the loss frame—on the cost/price of the two items. The loss function is concave, implying that aggregation or bundling is advantageous. But the value function is convex, implying that disaggregation or unbundling is advantageous. Thaler thus implicitly assumes that gains are valued separately and are unaffected by the bundling of the two items or, alternatively, that sellers can simultaneously aggregate losses and disaggregate gains.²⁷

²² See Thaler, *supra* note ???.

²³ See Amos Tversky and Daniel Kahneman, “Prospect Theory: An Analysis of Decision under Risk,” 47 *Econometrica* 263 (1979).

²⁴ See Thaler, *supra* note ???, at 208.

²⁵ See Thaler, *supra* note ???, at 209.

²⁶ *Id.*

²⁷ This implicit assumption is not entirely consistent with Thaler’s claim that for routine transactions consumers think of the net gain from the purchase and do not code costs/prices as independent losses. *Id.* at 205.

Thaler's insights can be extended to provide a broader foundation for bundling. Consider again the two products (or two components) A and B, with their respective costs c_A and c_B , and valuations $v_A > c_A$ and $v_B > c_B$. If the two products are priced at cost and sold separately, a consumer who buys the two products enjoys a net value of $V(v_A - c_A) + V(v_B - c_B)$, where $V(\cdot)$ is the Tversky and Kahneman value function. Selling the two products as a bundle adds pricing flexibility that increases the perceived value of the two products. Absent bundling sellers are forced to set $(p_A, p_B) = (c_A, c_B)$. With bundling sellers can choose any pair of prices that satisfies $p_A + p_B = c_A + c_B$. And they will choose prices that maximize $V(v_A - p_A) + V(v_B - p_B)$ subject to the $p_A + p_B = c_A + c_B$ constraint. Specifically, given the convexity of the value function, optimal pricing satisfies $v_A - p_A = v_B - p_B$. In general, optimal pricing will not coincide with marginal cost pricing, i.e., $(p_A^*, p_B^*) \neq (c_A, c_B)$, and consumers will prefer the optimally priced bundle to the two products offered separately at (per-product) marginal cost: $V(v_A - p_A^*) + V(v_B - p_B^*) > V(v_A - c_A) + V(v_B - c_B)$.²⁸

Thaler's seminal contribution, including the minor extension suggested above, can be viewed as an example of a bundling response to a decision-making process that is commonly applied by consumers instead of the neoclassical ideal of expected utility

²⁸ This advantage of bundling at least partially depends on sellers' ability to maintain separate frames for the two products. If bundling leads consumers to perceive a combined value $V((v_A - p_A) + (v_B - p_B))$ rather than a sum of values $V(v_A - p_A) + V(v_B - p_B)$, bundling may prove counterproductive. To see this note that the convexity of the value function implies $V(v_A - p_A) + V(v_B - p_B) > V((v_A - p_A) + (v_B - p_B))$, and specifically $V(v_A - c_A) + V(v_B - c_B) > V((v_A - c_A) + (v_B - c_B))$. The pricing flexibility generated by the bundling is moot if consumers perceive a single, combined value.

maximization subject to a budget constraint. In somewhat more loose terms, Thaler was the first to identify bundling as a response to consumer misperception.²⁹

4. Three Examples

A. Subscription Services

One special type of bundling that directly responds to consumer misperception about future use is the intertemporal bundling achieved through multi-period subscriptions. In intertemporal bundling the only difference between the bundled components is the timing. For example, a year-long subscription—to a magazine, a wireless or landline phone service, an ISP, or a health club—provides the same service every month throughout the year. Why are multi-period subscriptions so common? Why not sell only single-period products or services? Consumer misperception provides an answer.³⁰

Consider a health-club offering access to its facilities on a per-visit basis. In a competitive market this health club will have to set its admission fee equal to marginal cost, say \$10 per-visit. Assume that the average consumer overestimates her future use of the health club: instead of 10 visits per year the consumer anticipates that she will make 20 visits per year.³¹ Under per-period marginal cost pricing the consumer expects a total cost of \$200. Now assume that a competitor offers—instead of or in addition to the per-visit fee—a year-long subscription for a price of \$100. (I assume that health clubs know the number of visits made by an average consumer.) The consumer will clearly prefer the multi-period subscription over per-period admission.

²⁹ I use the “loose terms” qualifier, since Thaler’s mental accounting theory combines (mis)perception (framing) and non-standard preferences (Tversky and Kahneman’s value function).

³⁰ For important theoretical and empirical analyses of subscription markets and contracts from a behavioral perspective – see DellaVigna and Malmendier, *supra* note ??? (theoretical analysis supported by evidence from numerous markets); DellaVigna and Malmendier, *supra* note ??? (health club membership contracts); Oster and Morton, *supra* note ??? (magazine subscriptions).

³¹ An assumption supported by casual observation as well as by more rigorous empirical analysis. See DellaVigna and Malmendier, *supra* note ???.

Many subscription services charge a one-time subscription fee as described in the preceding health club example. Other subscription services charge a per-period fee, but follow a fee schedule very different from per-period marginal cost pricing. In particular, many subscription services charge different per-period prices for different periods within a multi-period subscription. Particularly common is the practice of offering a low-price, or even a zero price, for an introductory period.³² One explanation for this practice is that sellers are exploiting consumer misperception—this time underestimation of future use. When signing-on to a year-long subscription service with a ‘two-month free’ introductory offer, some consumers think that they will end the subscription after the first two months. Not all of these consumers actually end their subscription after two months. Put differently, sellers may be responding to consumers’ underestimation of the length of the period during which they would need/want a subscription with the specific seller. If consumers underestimate the effective subscription period, then sellers in a competitive market will backload their price as much as possible.

This too is an example of intertemporal bundling. The cement holding the bundle together is the cost of switching from one seller to another or simply the cost of terminating the subscription. It is consumers’ underestimation of these switching costs that explain the viability of a below marginal cost introductory fee. Since switching costs keep the bundle together, it is not surprising that sellers do not make a special effort to reduce these costs. Perhaps the notorious 10 minute “please hold for next available representative” wait that must be endured to cancel a subscription is not merely the result of a seller’s attempt to economize on the size of its customer service department. More direct measures designed to increase switching costs are lock-in clauses and termination fees. If consumers underestimate the cost of switching or, equivalently, underestimate the

³² Examples include introductory offers by newspapers and magazines, credit card teaser rates, etc’.

de facto length of their subscription, sellers who fail to take advantage of switching cost-induced bundling and offer only per-period marginal cost pricing will not survive in a competitive market.³³

B. Credit Cards³⁴

The credit card is a complex, multi-attribute product. In fact, the credit card is a bundle of different products and services. The credit card bundles together transacting and borrowing services. The argument advanced in this Essay suggests that this bundling is a strategic response to consumer misperception.³⁵

Evidence suggests that consumers systematically underestimate the costs associated with the credit card's borrowing component. Consumers underestimate use, i.e., they underestimate their future financing needs. They also underestimate the likelihood that they will need to consume various borrowing-related services: They underestimate the likelihood of late repayment. They underestimate the likelihood of requiring a special (and more expensive) loan beyond their specified credit limit.³⁶ Beyond underestimation of use, consumers also underestimate the price of borrowing and borrowing-related services. They underestimate the speed with which interest accrues.

³³ For a formal analysis of the underestimation of switching costs and its implications – see DellaVigna and Malmendier, *supra* note ???.

³⁴ This subsection is based on Oren Bar-Gill, “Seduction by Plastic,” 98 NW. U. L. Rev. 1373 (2004). Economist Lawrence Ausubel was the first to suggest that credit card pricing respond to consumer misperception. See Lawrence M. Ausubel, *The Failure of Competition in the Credit Card Market*, 81 AM. ECON. REV. 50 (1991). See also Lawrence M. Ausubel, *Credit Card Defaults, Credit Card Profits, and Bankruptcy*, 71 AM. BANKR. L.J. 249 (1997); David B. Gross & Nicholas S. Souleles, *Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data*, 117 Q. J. ECON. 149, 151 (2002); David I. Laibson et al., *A Debt Puzzle*, in KNOWLEDGE, INFORMATION, AND EXPECTATIONS IN MODERN MACROECONOMICS: IN HONOR OF EDMUND S. PHELPS 230 (Philippe Aghion et al. eds., 2003); Haiyan Shui and Lawrence Ausubel, “Consumer Time Inconsistency: Evidence from an Experiment in the Credit Card Market” (2004) (unpublished manuscript, on file with author).

³⁵ I do not wish to preclude other explanations, e.g., cost-based explanations, for the bundling of transacting and borrowing services in the credit card.

³⁶ Consumers also underestimate their use of different transacting-related services, e.g., currency exchange pursuant to foreign purchases.

They do not fully understand the implications of minimum payments and low (or even negative) amortization rates. And they are not aware of various computational techniques employed by issuers to increase the magnitude of interest (and related) payments.³⁷

What are the implications of consumer's underestimation of the cost of borrowing? In particular, what are the implications for the transacting service? Can the transacting service be offered independently? Imagine a card issuer who offers only transacting services—a debit card. In a competitive market this issuer would have to set a price equal to the marginal cost of the transacting service offered. Now consider a credit card issuer that bundles transacting and financing services. Given consumer underestimation of the cost of borrowing the credit card issuer would respond by setting a high price for the financing service and a low price for the transacting service. In fact, credit card issuers often offer a negative price for the transacting service: the transacting consumer receives bonus points and frequent flyer-miles for every dollar spent. With underestimation of borrowing costs the bundle offered by the credit card issuer will be more attractive to consumers than transacting and borrowing services sold separately (and at per-service marginal cost).

Consistent with this analysis debit cards, despite their increasing popularity, are finding it difficult to compete with the credit card bundle. Absent the back-end financing and fees revenues that credit card issuers enjoy, debit card issuers cannot match the

³⁷ For a description of these techniques – see Mark Furletti, “Credit Card Pricing Developments and Their Disclosure,” Payment Card Center Discussion Paper, Federal Reserve Bank of Philadelphia (2003).

attractive short-term perks that credit card issuers routinely offer.³⁸ Accordingly, debit cards are quickly replacing checks, but are not as successful in supplanting credit cards.³⁹

C. Cell Phones

As in the credit card market, common practices in the cell phone market suggest that providers of wireless communication services are responding to consumer misperception.⁴⁰ Consider the steep jump in per minute charges when the consumer exceeds the plan limit. A recent study found that most contracts specify an increase of over 100% in the per-minute price, with some contracts specifying increases of 200% and beyond.⁴¹ Clearly, these huge increases do not reflect a corresponding change in the provider's per-minute cost.

Arguably, the high prices set for minutes beyond the plan limit respond to consumers' underestimation of their future use of the cellular phone. Providers respond to consumer misperception by bundling airtime (i.e., talking minutes), handsets and other services such as voice mail. The high long-term prices subsidize the free phones, free voice mail, and lower short-term prices.⁴² A seller that offers handsets as a stand-alone item would have to price these handsets at their marginal cost. Such a seller would find it difficult to compete with cellular service providers who "give away" free handsets as part

³⁸ See Ronald J. Mann, *Credit Card Policy in a Globalized World*, LAW AND ECONOMICS WORKING PAPER NO. 018 (2004), available at <http://ssrn.com/abstract=509063> (last visited May 10, 2004) (describing the disadvantages of debit cards, specifically no float, no benefits, and fewer legal protections); Sujit Chakravorti & Alpa Shah, *A Study of the Interrelated Bilateral Transactions in Credit Card Networks*, FED. RES. BANK OF CHI. EMERGING PAYMENTS OCCASIONAL PAPER SERIES (EPS-2001-2), July 2001, at 23 (showing that debit cards do not offer the benefit programs, extended warranties, and free credit (until the end of the billing cycle) that credit cards offer).

³⁹ See Mann, *supra* note 38. This is not to say that debit cards are not replacing credit cards at all. They are. See Brown and Plache paper in this symposium. The success of the debit card is at least partially explained by its successful bundling with other banking services—the cost of which are underestimated by consumers.

⁴⁰ See DellaVigna & Malmendier, *supra* note ???; Bar-Gill, *supra* note ???; BARRY NALEBUFF & IAN AYRES, *WHY NOT?* 178-79 (2003).

⁴¹ See DellaVigna & Malmendier, *supra* note ???.

⁴² See Ayres and Nalebuff, *supra* note ??? (noting that competition in the cellular-phone market focuses on the short-term, free phone dimension).

of their ‘handset plus service’ bundle.

Wireless service contracts are also an important example of multi-period subscriptions. As discussed in subsection A, providers employ various tactics designed to sustain this intertemporal bundling through increased switching costs. This bundling argument explains the common lock-in clause, which ties the consumer to the specific provider for as long as three years.⁴³ The lock-in clause targets consumers’ underestimation of the cost of lock-in. Specifically, consumers may underestimate the many contingencies that would induce them to end the contract earlier—the appearance of a more attractive offer from another provider, a change in their need for wireless services, or an unanticipated financial hardship that renders the monthly cellular phone bill too painful to bear.

As with high prices for minutes beyond the plan limit, it seems difficult to justify the lock-in clause on cost grounds. In some industries, fixed costs may justify a lock-in clause. It is unlikely, however, that per-consumer fixed costs alone can explain the lengthy lock-in clauses observed in the cell phone industry. Moreover, even if fixed costs are substantial, lock-in is not the obvious response. Why not simply charge an upfront fee? Lock-in clauses are common because consumers underestimate the cost of lock-in. In the cell phone market lock-in clauses do double duty. First, they sustain the intertemporal bundle. Second, they support the bundling of cellular service plans with handsets and other services. The revenues generated by these lock-in clauses, together with the revenues generated by high prices for minutes beyond the plan limit, pay for the free phones and other short-term perks offered by cell-phone service providers.

The cell phone market exemplifies the dynamic interaction between consumer

⁴³ Providers offer different short-term perks to tempt consumers into choosing service plans with longer term commitments. See DellaVigna and Malmendier, *supra* note ???; Bar-Gill, *supra* note ???.

perceptions and seller/provider reactions. Recent innovations such as roll-over minutes and flexible, no lock-in contracts suggest that at least some consumers have more accurate perceptions about the long-term costs of the wireless service. The evolution of consumer perception is driven by independent learning by consumers and by providers' advertisement campaigns. Understanding consumer perception may help predict market outcomes. Conversely, market outcomes can serve as indicators of consumer (mis) perception.

5. Policy Implications

The preceding analysis suggests that sellers often respond to consumer misperception by bundling the misperceived product (or component) with another, accurately perceived product (or component). The analysis further suggests that such bundling can be either welfare reducing or welfare enhancing. When bundling exacerbates the adverse effects of consumer misperception regulation designed to discourage bundling may be desirable.⁴⁴

In non-competitive markets the antitrust prohibition on tying serves as a direct unbundling policy.⁴⁵ One possibility is to extend this prohibition against bundling to competitive markets. In at least one context, where a base-good seller operating in a competitive market (for the base good) attempts to bundle the base good with aftermarket parts or service, such an extension has perhaps already occurred.⁴⁶ Given the severity of this remedy, however, it should probably be used, if at all, only in extreme cases where the bundling practice is obviously harmful and where alternative policies are ineffective.

⁴⁴ I focus explicitly on unbundling policies. Other policies may be equally effective. For example, regulators can directly target the misperception that gives rise to the bundling response.

⁴⁵ *** CITE Sherman/Clayton Act provisions.

⁴⁶ See *Eastman Kodak Co. v. Image Technical Services, Inc.*, 112 S. Ct. 2072 (1992); Carl Shapiro, "Aftermarkets and Consumer Welfare: Making Sense of Kodak," LXIII *Antitrust Law Journal* 483 (1995).

A less blunt unbundling policy is to promote competition on each component of the bundled product. If a consumer who bought a printer from seller A can buy ink cartridges from seller B, seller A would not be able to set low (below marginal cost) printer prices and high (above marginal cost) ink prices. This example suggests standardization as a potential solution to the bundling problem.

Focusing on intertemporal bundling, the use of bundling tactics can be discouraged by reducing switching costs. The legal guarantee of cell-phone number portability is an example of a policy aimed at increasing competition by reducing switching costs.⁴⁷ Limiting sellers' ability to use early termination penalties in subscription contracts is another example of a competition fostering, unbundling policy.⁴⁸

Disclosure regulation may also serve as an unbundling policy. If sellers bundle printers and ink in response to consumer misperception about future use, regulation requiring sellers to provide 'total cost of ownership' information may effectively prevent bundling.⁴⁹ If a seller must advertise, in addition to the printer's stand alone price, an inclusive price that adds the average cost of ink over the life of the printer, consumers will be less inclined to buy cheap printers that are bundled with expensive ink. If a mortgage lender or a credit card issuer is required to calculate for the consumer and explicitly state the total (or expected) interest and fee payments over the life of the loan, then consumers will be more likely to balance this total cost information against the short term perks offered by the lender or issuer on a bundled product.⁵⁰

⁴⁷ See Title 47 CFR, Part 52, §§ 52.20- 52.33.

⁴⁸ Compare: Philippe Aghion and Patrick Bolton, Contracts as a Barrier to Entry, 77 *American Economic Review* 388 (1987).

⁴⁹ Compare: the EPAs "Energy Star" program. On the benefits of 'total cost of ownership' information – see Ayres and Nalebuff, *supra* note ???. Ideally such disclosure regulation can achieve the same results as direct price regulation—a much more obtrusive policy.

⁵⁰ See Bar-Gill, *supra* note ???. Bar-Gill also discusses the limits of disclosure. *Id.*

6. Conclusion

Bundles are everywhere. Durables are bundled with parts and service. Diagnostic services are bundled with treatment services.⁵¹ Products are bundled with selling services (e.g., showrooms and knowledgeable salespersons).⁵² Michael Spence, in a seminal contribution, argued that almost every product “should be thought of as a bundle of characteristics.”⁵³ In the modern world economy these bundled characteristics should be broadly defined to include contractual provisions and potentially independent products.

The motivations for bundling are numerous: from leveraging of monopoly power, to product differentiation to simple cost-saving. This Essay explored another motivation for bundling. It presented bundling as a strategic response to consumer misperception. The welfare and policy implications of bundling depend on the motivation for the observed bundling. Monopoly leveraging is bad. Cost saving is good. Bundling in response to consumer misperception can be either good or bad.

This Essay provided some tools for the policymaker to identify misperception-based bundling, and to ascertain when such bundling is welfare reducing. It then considered various regulatory responses—unbundling policies. The difficulty in identifying the motivation (or motivations) for an observed bundle, coupled with the difficulty in evaluating the welfare implications of bundling even when its underlying motivation is revealed suggests regulatory caution. For this reason the most attractive unbundling policies are those that facilitate the smooth operation of markets—through reduced switching costs and the provision of information—rather than the more heavy

⁵¹ See Beales et al., 1981, p. 515.

⁵² On resale price maintenance and the recovery of selling costs – see, e.g., Lester G. Telser, “Why Should Manufacturers Want Fair Trade?” 3 J.L. & Econ. 86 (1960).

⁵³ Spence, *supra* note , at 561.

handed policies that directly prohibit bundling or attempt to fix the price of the bundle or its components.⁵⁴

⁵⁴ Compare: Colin Camerer et al., *Regulation for Conservatives: Behavioral Economics and the Case for “Asymmetric Paternalism”*, 151 U. PA. L. REV. 1211 (2003); Cass R. Sunstein & Richard H. Thaler, *Libertarian Paternalism is not an Oxymoron*, 70 U. CHI. L. REV. 1159 (2003).