

Tie-in Sales and Banks

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A bank is a multiproduct firm. While its products can be grouped into two broad categories, credit and deposit services, each of these categories comprises many distinct products. In addition to these “traditional banking services,”¹ some banks, either directly or through affiliated companies, offer a wider array of financial services. A continuing trend toward deregulation is likely to further expand the set of activities and markets open to banking organizations.

Some of the services offered by banks are sold to distinct sets of buyers. On the other hand, there are broad classes of bank clientele who regularly obtain multiple services. A business firm’s relationship with a bank, for instance, may include deposit and cash management services as well as regular extensions of credit. The typical household is also a user of multiple bank services.

It is not uncommon for a multiproduct firm to undertake joint marketing efforts. The costs incurred to generate sales for the various products sold cannot always be neatly allocated across products. Such joint actions might occur in all aspects of marketing. A seller might, for instance, seek to develop a single brand identity for a variety of products so that expenditures on promotion of the brand might enhance the sales of all the products. Joint efforts might also show up in the pricing of products. For instance, a seller might give discounts on one product that are contingent on the buyer’s purchase of some other product from the same seller. Or a seller might choose to sell two products only as a bundle, not separately. It is this sort of tying, or bundling of products, that has attracted a fair amount of attention in discussions of the law and economics of antitrust.

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¹ In the context of the body of legislation and regulations discussed in this article, the phrase “traditional banking services” refers specifically to loans, discounts, deposits, and trust services.

If tying is to raise concerns from an antitrust point of view, it must be that the firm engaged in the practice has some amount of market power. This article examines tying as a use of market power, with the goal of understanding and evaluating restrictions that banks face with regard to such pricing behavior. After reviewing those restrictions and comparing them to the broader antitrust treatment of tying, the article focuses on a particular motivation for tied sales; this pricing strategy can facilitate price discrimination among diverse buyers. This focus suggests that the welfare implications of tying can be ambiguous and that public policy and antitrust law should approach the practice on a case-by-case basis.

1. THE LEGAL TREATMENT OF TYING

In antitrust legislation and case history, the tied sale of multiple products has been attacked as an attempt by a seller with a monopoly position in one market to extend its power into a second market.² Specifically, section 3 of the Clayton Antitrust Act makes it unlawful for a seller to make a sale on the condition that the buyer refrain from dealing with the seller's competitors. This section has been interpreted as a prohibition on tying contracts. For instance, in 1936 the Supreme Court found that IBM violated the Clayton Act by requiring that lessees of its punch-card tabulating machines purchase only punch cards supplied by IBM.

The legal treatment of allegedly anticompetitive practices typically takes one of two forms. A particular practice might be treated as per se illegal. In such a case, violation of the law is established simply by a demonstration that the practice in question took place. It is also possible for the legality of a practice to depend on the particular circumstances in the case at hand. In such instances, a "rule of reason" is said to apply. The Court's language in the 1936 IBM decision strongly suggested that the Clayton Act intended for tying to be treated as per se illegal.

The uncertainty in the treatment of tying, as in many antitrust issues, revolves around the interpretation of statutes stating that a given practice is illegal if its use may "tend to lessen competition or create a monopoly." Such phrases, found in most antitrust legislation and in the relevant banking legislation, leave it to the courts to determine if a given practice can only be anticompetitive or if there may be other, legitimate, reasons for sellers to engage in the practice. In the general antitrust case history on tying arrangements, there has been a movement over time from a treatment of the practice as per se illegal (or nearly so) toward a rule-of-reason approach.

While the Clayton Act's prohibition of tying has not been applied to banks, the Bank Holding Company Act's (BHCA) 1970 amendments extended a

² A description of the legislative and case history are found in Seplaki (1982).

similar prohibition to banking organizations.³ This restriction, contained in section 106 of the amended BHCA, was introduced in an environment in which banks were being given the power to expand into new activities; Congress therefore may well have been reacting to a fear that banks would use restrictive contracts to monopolize new markets.⁴

The prohibition of tying arrangements in the BHCA is quite stringent. While there are some broad classes of exemptions, little room is left for considering the specific conditions arising in a case that does not fall into one of those broad classes.⁵ For instance, there is, in general, no consideration given to the competitive conditions prevailing in the markets for the products involved. In other words, the BHCA rules seem to treat tying as a practice that is per se illegal, so that the legal rules governing tying by banks are at least as rigid as the more general rules contained in the Clayton Act.⁶

The Federal Reserve Board has recently expanded the set of exemptions. In 1995, the Board allowed bank and nonbank subsidiaries of bank holding companies to offer discounts to customers maintaining minimum combined balances across the affiliates' products. More recently, the Board has allowed banks to require some credit card customers to maintain deposit balances at affiliated thrifts.⁷ There remain, however, broad classes of activities to which a strict prohibition of tying still applies. This is particularly true of the tying of a bank's product to a nonbanking product of the bank's affiliate.

The treatment of tying as an anticompetitive practice is based on the idea that a seller with monopoly power in one market can leverage that power into an advantaged position in a second market (one in which it faces competition). In this scenario, the good for which the seller is a monopolist is referred to as the tying good, while the other good, for which there are competing sellers, is the tied good. The seller, then, might make a discount on the tying good available only to those buyers who also purchase the tied good from him.⁸ His position as a monopoly seller of the tying good enables him to charge a premium for the tied good. In this manner, the seller gives up some of his monopoly profits in exchange for being able to earn greater-than-competitive profits in the second market.

³ While the 1970 amendments referred to tying by banks, the same restrictions have been applied to BHCs and their nonbank subsidiaries and to non-BHC affiliated depository institutions as well.

⁴ Shull (1993) makes this point with reference to the legislative history.

⁵ Section 106 allows tie-ins when both products are "traditional banking products" offered by a bank (as opposed to nonbank affiliates within a holding company).

⁶ This comparison is made by Shull (1993).

⁷ *American Banker*, April 15, 1996.

⁸ It is worth noting that the selling of two goods only as a bundle can be seen as an extreme case of tying, in which the tying good is only available to those who buy the tied good and the prices of the two goods are not quoted separately.

An extreme form of the leverage argument holds that, through a strategic use of tying arrangements, a seller can deter potential entrants from even trying to compete in the market for the tied good. In this view, tying is not just a use of monopoly position in one market but is, further, a way of creating a monopoly position in another market. This extreme form of leverage is referred to as foreclosure.

If leverage or foreclosure were the only possible motivations for tying provisions, then per se illegality of the practice would be justified. A great deal of commentary on tying, however, has identified a number of other possible motivations. For instance, a seller may profitably make use of tying the sale of two products that are complements in production or consumption. Two goods are complements in production if the marginal cost of producing one good is less if the other good is produced by the same firm. There is complementarity in consumption between two goods if a buyer's willingness to pay for one good is enhanced by the consumption of the other.⁹

When there are complementarities between two products, the monopolist seller of one product has a natural advantage over competitors of the other product. It is not clear that the seller needs to use a tying arrangement to benefit from that advantage. Complementarities will allow the seller to be a more aggressive competitor in the nonmonopoly market, even if the two products are priced independently. Hence, complementarities alone may not be enough to justify tying arrangements. On the other hand, if the seller enjoys cost complementarities from providing two goods to a particular buyer, then bundled sales of the two products may be the best way for the firm to realize the potential cost savings.

Another justification for tying is that it allows the seller to price discriminate among the buyers of the monopolized product. By offering different prices for customers who buy different combinations of goods, a seller can separate buyers according to their demand characteristics in a way that might not be possible with independent pricing of all goods. This discrimination allows the seller to increase profits by extracting greater revenue from those buyers who are most willing and able to pay. When tying is used to facilitate price discrimination, its overall effect is typically to reduce the economic efficiency cost of monopoly power. This conclusion derives from the fact that tying two products tends to increase the quantity sold of the monopolized (or more monopolized) product. Consequently, the justification for an absolute rule against such practices is weakened, even in the absence of obvious cost or demand complementarities.

⁹ White (1995) provides a discussion of tying by banks when their products are linked by demand-side complementarities.

The next section presents a discussion of tying as price discrimination by a multiproduct monopolist. The following sections then discuss the effect of introducing competition for one of the products and the implications of interpreting the monopolized product as a banking product. The banking product chosen for this discussion is small business lending. This may be one area of operation in which some banks continue to exercise market power sufficient to raise questions about the possible competitive effects of tying. It is also an area in which some have expressed concern about the effects of continuing consolidation in the banking industry. For instance, Berger, Kashyap, and Scalise (1995) have suggested that one effect of consolidation will be a decline in the availability of credit to small business borrowers. One implication of such a decline might be that certain lenders would enjoy increased market power over their small business borrowers. If so, questions concerning how banks use what market power they might possess would become increasingly important.

A last reason to focus on small business lending is that what little private litigation there has been under the BHCA's restrictions on tying has almost exclusively involved small business lending.¹⁰ In most of this litigation, the courts have found no violation of anti-tying statutes, often because both the tying and tied products were "traditional banking products." Such a case fits into the broad exemption allowed by the rules. One might question, however, whether there is any meaningful economic difference between traditional banking products and others. Possibly one is more likely to find demand and cost complementarities among banking products. For products more remotely related, perhaps some other motivation is more likely. The above discussion focuses on two possibilities: the extension of market power or price discrimination. These two motivations have very different implications for the effects of tying on overall economic welfare.

2. TYING BY A MULTIPRODUCT MONOPOLIST

Questions concerning the possible anticompetitive effects of tying or bundling clearly require an analytical framework that includes a theory of interfirm competition. To the extent that tying is primarily a tool for price discrimination, however, a model of competition is not necessary for understanding the basic mechanics of the practice. To this end, this section presents a model of a seller that is a monopolist in two markets. This model follows the analysis first developed in Adams and Yellen (1976).

The monopolist in this model faces an array of potential customers who are differentiated in terms of the value that they place on the two products. Specifically, if the goods are labeled a and b , a typical buyer places a value of v_a and v_b on the consumption of the goods. Each buyer consumes at most

¹⁰ See Shull (1993).

one unit of each good. Hence, if an individual buys both goods, that individual enjoys net utility of $v_a + v_b - e$, where e is the total expenditure made purchasing the two goods. If the goods are priced independently, then $e = p_a + p_b$, while if they are sold as a bundle, e is the price of the bundle.

Each potential buyer is represented by a pair of valuations (v_a, v_b) . Hence, the population as a whole is characterized by a cumulative distribution function $F(v_a, v_b)$, giving the fraction of potential buyers who have valuations for both products that are less than the specified values (v_a, v_b) . Treating one good in isolation, the *marginal* distribution of buyers' valuations of good a is denoted by $F_a(v_a)$. This function gives the fraction of the population whose valuation of product a is less than the specified value. The marginal distribution, $F_b(v_b)$ has a similar definition.

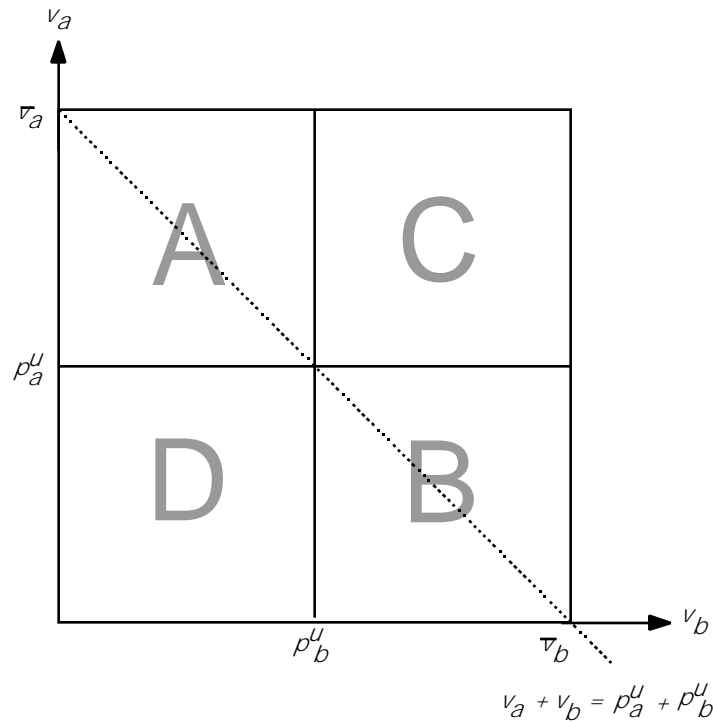
One possible simple assumption about these distributions is that v_a and v_b are uniformly and independently distributed on the interval from 0 to 1. Uniformity means that the fraction of buyers who place a value on product a of at least v is equal to $1 - v$, for all v between 0 and 1 (and similarly for product b). Independence means that this distribution of v_a is the same for any given level of v_b .

The distribution of buyers' valuations plays a central role in determining the relative values to the seller of alternative pricing strategies. In fact, as Adams and Yellen demonstrated, general results are difficult to obtain. Some broad insights about the use of bundled pricing can be obtained without making specific assumptions about the distribution of valuations, while the simple assumption of independent, uniform distributions may also be useful in thinking about the basic problem facing the seller.

Suppose first that the seller prices the two products separately. For each good, the seller faces a downward sloping demand curve given by the marginal distribution of buyer valuations. At a price of p_a , the firm will sell product a to all buyers with $v_a \geq p_a$. There are $N(1 - F_a(p_a))$ such buyers, where N is the total number of potential buyers. Hence, as price rises, sales fall. In the case of the uniform distribution, the relationship between sales, x_a , and price is simply $x_a = (1 - p_a)N$.

Facing these demand curves, the seller sets a profit-maximizing price for each product. Assume that the marginal cost of producing a unit of each product is zero, so that the profit-maximizing price for each product is simply that which maximizes revenue.¹¹ These *unbundled prices*, denoted by $p_i^u (i = a, b)$, effectively divide the population of buyers into four groups, as depicted in Figure 1. Each buyer's identification is a (v_a, v_b) pair, with the maximum value of $v_a(v_b)$ given by $\bar{v}_a(\bar{v}_b)$. The box labeled A in Figure 1 contains all buyers

¹¹ An equivalent assumption is that the lowest possible buyer's valuation for each product is at least as great as its marginal cost of production.

Figure 1 Independent Pricing and Pure Bundling

Independent pricing by a two-product monopolist divides the market into those that buy a only (A), b only (B), both goods (C), and neither good (D). Pure bundling divides the market along the (dashed) diagonal. Those above the diagonal buy the bundle, and those below do not.

for whom $v_a \geq p_a^u$ and $v_b \leq p_b^u$. All of these buyers purchase only product a . Similarly, box B contains the valuations of all buyers who purchase only product b . Box C gives the buyers who purchase both products, while box D gives those who purchase nothing.

If instead of selling the products separately the seller decides to offer them only as a bundle, the population of buyers divides into two groups: those who buy the bundle and those who do not. The boundary between these two groups is made up of all buyers for whom $v_a + v_b = e$. Such an equation would be represented by a line with a slope of minus 1, as shown by the dashed line in Figure 1. This is the line for which $e = p_a^u + p_b^u$. With this price for the bundle, all buyers with valuation pairs to the northeast of the dashed line buy the bundle, while those to the southwest do not.

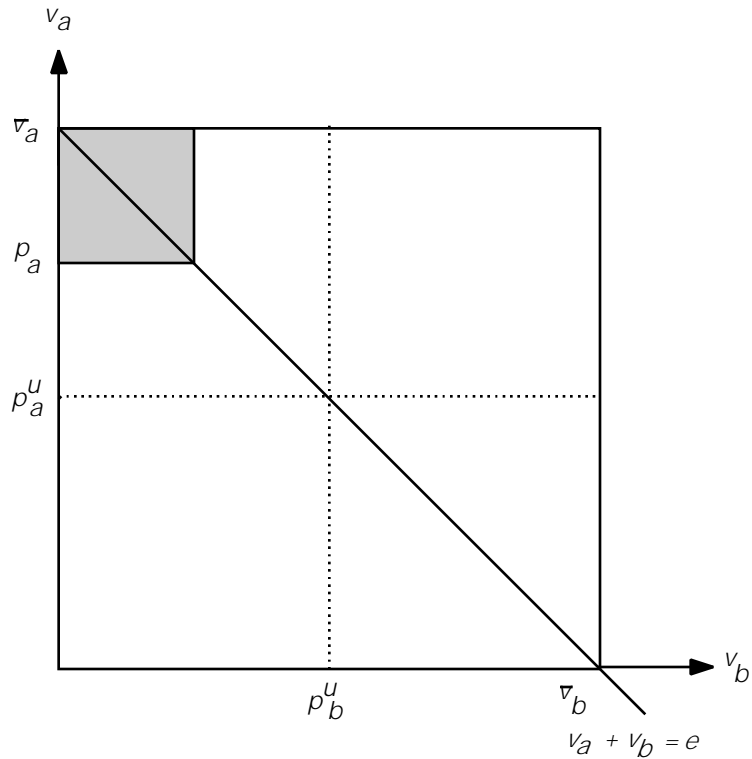
Figure 1 is drawn for the special case of independent, uniform distributions. In this case, each of the four areas (A,B,C,D) represents the same number of buyers. This special case also has the property that the dashed line cuts areas A and B in half. Under these particular conditions, the revenue generated by selling the goods independently at prices p_a^u and p_b^u is identical to that generated by selling only bundles at the price $e = p_a^u + p_b^u$. To see this, note that in switching from separate to bundled pricing revenue collected from area C is unaffected. In area A, half the buyers switch from buying only a at price p_a^u to buying nothing, and the other half switches from buying only a to buying both for the bundled price. Given the symmetry in this special case, the lost sales of good b are exactly offset by the increased sales of good a . The effect on area B parallels that on area A.

The equivalence of the revenues under the two pricing practices in Figure 1 demonstrates that bundled pricing is at least as profitable as independent pricing, since p_a^u and p_b^u are the revenue maximizing independent prices. This comparison, however, does not establish that $e = p_a^u + p_b^u$ is the optimal bundled price; bundling may be strictly preferred. In fact, if one considers a more general class of pricing practices, then the seller can certainly do better than independent pricing. In particular, the seller can set both the price for the bundle of goods (e) and the prices for the goods sold separately (p_a and p_b). Note that this mixed pricing policy is distinct from independent pricing only if $e < p_a + p_b$. Otherwise, buying the bundle is never preferred to buying the goods separately. To see that profits can be increased by a mixed pricing policy, suppose the seller leaves the price of the bundle at $e'' = p_a^u + p_b^u$ and sets a price for good a alone just below \bar{v}_a . The effects of this mix of prices are shown in Figure 2. Sales of the bundle are the same as in the bundled pricing case of Figure 1, except for the shaded box at the top left-hand corner. This box gives the valuations of buyers who purchase only good a at price p_a . All other buyers above the diagonal purchase the bundle.

Given the symmetry of the case depicted in Figures 1 and 2, the buyers of a alone can be divided into two groups of equal size. Those above the diagonal would buy the bundle if a were not separately available, while those below the diagonal would otherwise buy nothing. On sales to the former, the seller loses revenue of e'' and gains revenue of p_a (per buyer). On the latter, the seller gains p_a . Since there are the same number of buyers in each group, the net change in revenues is proportional to $2p_a - e''$. This change is positive under the assumptions of this case. Setting a high separate price for product b can generate a similar gain.

The mixed pricing strategy described above is very close to observed tying practices, as they are usually described. The seller makes product a available at the relatively low price of p_a^u , but only if the buyer also purchases b for p_b^u . Otherwise the buyer must pay the higher price for a . This is a profitable strategy, because it allows the seller to extract different revenues from buyers,

Figure 2 A Tied Discount for Good a



Buyers in the shaded box in the upper left-hand corner buy only product a at price p_a . All other buyers above the diagonal buy the bundle at price $e = p_a^u + p_b^u$.

based on their valuations. In other words, it allows the seller to more finely sort buyers according to their willingness to pay.

While the analysis of the special case depicted in Figures 1 and 2 demonstrates the nature of the gains that a monopolist can generate by selling two products jointly, it is hard to draw general conclusions from the specialized assumptions regarding costs and the distributions of buyers' valuations. Indeed, Adams and Yellen provide examples in which pure bundling is more profitable than independent pricing and other examples in which the reverse is true.

The literature that has followed Adams and Yellen, as surveyed by Varian (1989), has produced some more general conclusions. For instance, a mixed strategy, like the one described in Figure 2, will be more profitable than independent pricing if the valuation distributions of the two products are independent.

Note also that mixed bundling is always preferred to pure bundling, as the latter is a special case of the former.

The two figures show by example how the profit-maximizing independent prices for two goods might be improved upon by some form of joint pricing. The figures do not show the profit-maximizing bundled pricing configuration (pure or mixed). The typical optimal pricing structure will include prices for the goods purchased separately that are no lower than the independent monopoly prices and a price for the bundle that is no greater than the sum of the independent monopoly prices. Such a pricing structure rewards those buyers with relatively high valuations for both products and imposes a high price on those with a high valuation of one product and a low valuation of the other. Hence, bundling benefits the seller and some consumers while hurting other consumers. The sum of all buyers' consumer surplus and the seller's profit is typically increased by (mixed) bundling relative to independent pricing.¹² Hence, bundling reduces the dead-weight loss from market power.

3. TYING AND COMPETITION

The above discussion shows that a seller with monopoly power in the markets for two goods can benefit from a pricing strategy that gives preference to buyers who purchase both products. This gain to the seller is independent of any effect of the pricing practice on competition, actual or potential. The concerns that have led to legal restrictions on tied pricing arise from the possibility of such competitive effects. Can the monopolist seller of one product foreclose the market for another product to competitors by tying the sale of the two products together? The answer to this question appears to depend on the nature of the competition in the second market.

As a first approach to the problem of tying in the presence of competition, suppose that one of the markets, that for product b , is perfectly competitive. That is, suppose that there is a perfectly elastic supply of product b at the price $p_b = c_b$, where c_b is the (constant) marginal cost of producing the good. The monopolist seller of product a can choose to participate as well in the competitive market. If the monopolist sells both goods and prices them independently, then the population of buyers is divided as in Figure 3. Buyers with $v_a \geq p_a^u$ purchase good a , while those with $v_b \geq c_b$ purchase good b . Some fraction of the latter sales goes to the monopolist, but he earns no profits on this competitively priced good. Assuming, as before, that the marginal cost of producing product a is zero, the monopolist's profits are equal to the revenues from selling a .

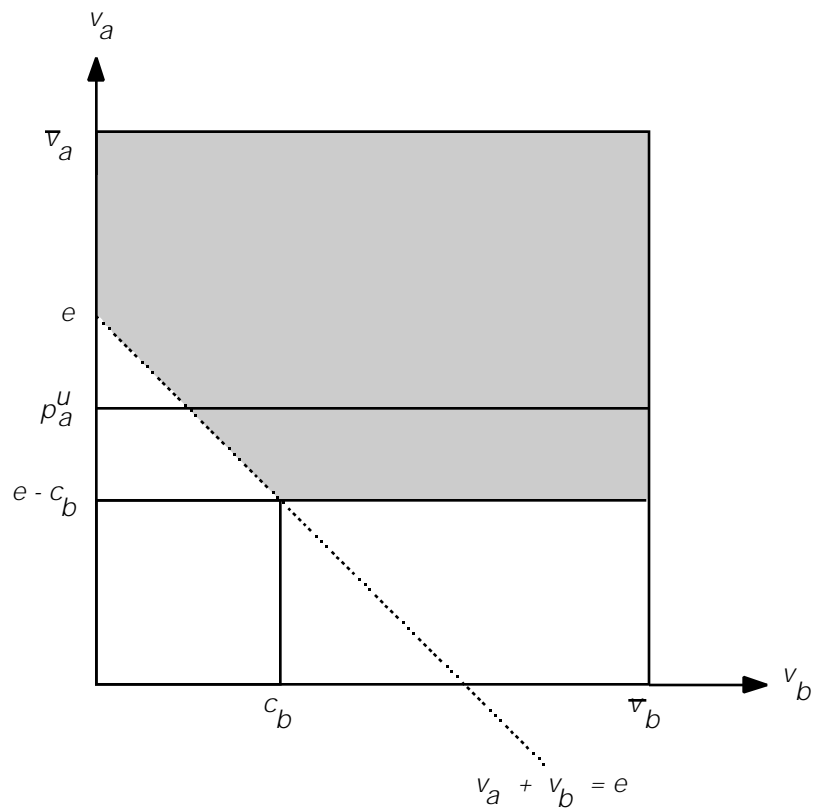
¹² The consumer surplus enjoyed by a buyer who purchases only good $a(b)$ is

$$v_a - p_a(v_b - p_b),$$

while one who buys the bundle receives surplus of $v_a + v_b - e$.

If the monopolist offers the two goods only as a bundle for a price of e , he can guarantee his market for b by forcing anyone seeking good a to also obtain b . Can he profit by doing so? Buyers will prefer the bundle to buying nothing if $v_a + v_b \geq e$. They will prefer the bundle to buying only b at its competitive price if $v_a + v_b - e \geq v_b - c_b$, or $v_a \geq e - c_b$. The sales resulting from a particular value of e are given by the area above the shaded area in Figure 3. For each unit of the bundle sold at price e , the monopolist earns net revenues of $e - c_b$. The total net revenues from these sales, then, can be no greater than the net revenue from selling a alone at a price $e - c_b$. The latter earns

Figure 3 Tying by a Product a Monopolist when Market b is Perfectly Competitive



All buyers in the shaded area buy the bundle at price e . Buyers below the shaded area and to the right of c_b buy product b at the competitive price c_b .

the same net revenue per sale, but on a larger volume of sales. Since the price p_a^u maximizes revenues (and profits) from selling a alone, the monopolist cannot increase profits by tying the sale of two goods when there is a competitive market for the tied good b .

A perfectly competitive market leaves no buyers unserved for whom the value of the product exceeds its cost. Hence, the seller of the monopolized good has no room to price discriminate among buyers according to the mix of willingness to pay for the two goods. If, instead, the market for product b is characterized by imperfect competition, the monopolist seller of product a may find tying to be a profitable pricing strategy. Here, the monopolist's optimal strategy depends on the price set by the competitors in market b . Suppose this price is $p_b > c_b$. The monopolist's problem is essentially the same as that depicted in Figures 1 and 2. Given the price p_b , the seller can act as a monopolist toward the set of buyers with $v_b < p_b$ and $v_a < \bar{v}_a$. Hence, it is certainly possible that, given a competitor's price, the seller's optimal response is to tie the sale of the two products.

Of course, the actual pricing structure chosen by the monopolist is the result of the strategic interaction between that firm and its competitors in the market for product b . If product b is homogeneous across sellers, then the resulting equilibrium price may be no different from the perfectly competitive price. For tying to be valuable to the monopolist, competition in the market for the tied good must be such that, in equilibrium, competitors' prices exceed marginal cost.

Whinston (1990) examines a model in which the market for the tied good is a duopoly, with the two sellers' products being imperfect substitutes. In that setting, tying can be profitable for the reasons outlined above; the tying seller acts as a multiproduct monopolist on the market for the tying product and the residual market for the tied product, given the competitor's actions. Whinston shows further that, in the presence of fixed costs, tying can reduce the competitor's prospective profits and thereby induce the competitor to withdraw from the market.

Whinston's market preemption result comes close to the concerns that seem to have motivated the antitrust treatment of tying; monopolists might be able to extend their monopoly power into new markets by reducing the profit opportunities of their rivals. Even here, however, the consequences of tying for overall economic welfare are ambiguous. Market preemption is a side-effect of the seller's desire to price discriminate among heterogeneous buyers.¹³ This

¹³ Whinston identifies conditions under which preemption of a rival's market opportunities does operate independently from the price discrimination effects of tying. This case requires that the monopolist be able to precommit (before the rival incurs fixed costs of entering the market) to offering the goods only as a bundle. Absent the price discrimination benefits, the seller would break that commitment if given a chance.

price discrimination, as above, has a tendency to be welfare-enhancing since it typically increases total sales of the products. Working against the price discrimination effect may be the effect of reducing the output of rivals in the market for the tied good. Certainly tying produces gains for some buyers and sellers and losses for others, but the overall effect cannot be determined in general.

Note that the two products in the model can be given the interpretation of the same good at different points in time. Under this interpretation, “tying” may appear as the use of a long-term contract by a seller with initial market power to deter entry by future potential competitors. As with the general case of tying with imperfect competition, this arrangement has both a competitive effect and a price discrimination effect; offering long-term arrangements together with unbundled “spot” prices at each point in time allows the seller to discriminate among buyers with differing patterns of preferences for the good over time.

4. TYING BY A BANK WITH LENDING AS THE TYING GOOD

Banks engage in many types of joint pricing or bundling of products. Depositors who maintain a minimum balance might receive free checking or other services at reduced or no fee. A borrower might be asked to keep compensating balances on deposit at the bank. Many such practices might be driven primarily by cost complementarities between the products. For instance, the probability of incurring the costs of dealing with a check drawn on an account with insufficient funds is lower the greater the balance is in an account. It is also possible that such practices achieve a certain amount of price discrimination. Recall, however, that price discrimination is a way in which sellers increase their gains from monopoly power. This use of market power is quite different from that envisioned by the market foreclosure view, under which power in one market is used to create power in a second market. In both of these views, however, tying is an activity undertaken by a seller with market power.

The adoption of tying restrictions in the 1970 BHCA amendments was a response to a concern that the granting of expanded powers to banks would enable them to gain an unfair advantage in the new markets they entered. This advantage would come from the ability of banks to tie new products to products in their traditional markets, in which they were shielded from competition by an array of legal restrictions. Since that time, however, financial innovation and deregulation have eroded the advantaged position and power over prices enjoyed by banks in many of the markets in which they participate.¹⁴

¹⁴ The changes experienced by banking are surveyed in Berger, Kashyap, and Scalise (1995).

One area in which banks may continue to hold market power is in small business lending. Changes in the financial system over the last few decades have opened new options and sources of funds to larger firms. Small firms, however, have remained relatively bank-dependent. Small business lending, then, might be a product for which the price discrimination effects of tying are potentially significant.

To treat one of the products in the model presented above as the extension of credit, some slight modification is necessary. Specifically, suppose that there is a set of potential borrowers, each of whom seeks a loan of a fixed size, say \$1. With a probability of ϕ , a borrower successfully produces revenues to repay the loan. Otherwise, the borrower produces nothing and defaults on the loan. For simplicity, suppose that all borrowers have the same probability of success, ϕ , but that they differ in the revenue they will generate if successful. This revenue, y , is distributed between 0 and \bar{y} .

A monopolist lender in this market would set a loan price, R (payment due outside of default), to maximize profits given its cost of funds, r . This lender faces a downward sloping demand curve for credit, since for any price, R , all borrowers with $y \geq R$ will seek loans.

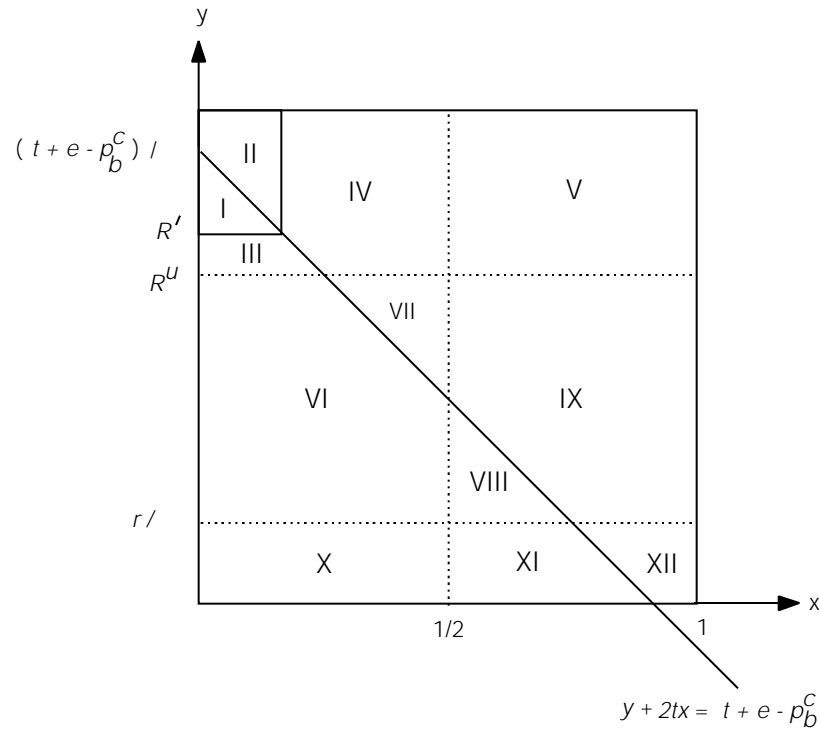
To analyze the effect of tying between credit and a second product, assume that the lender is one of two providers of product b and that this product is differentiated across sellers. Product differentiation allows a precise specification of the product b demand that the lender faces, given the other firm's price. Specifically, one can imagine that the two sellers are located at the endpoints of a line interval. The lender is located at point 1 and the rival at point 0. This spatial differentiation can have literal geographic interpretation; the sellers' stores are at two different locations. Alternatively, the differentiation can be in terms of some characteristic of the product. In either case, assume that a consumer's preferences between the two varieties of product b is given by the consumer's location on the same line interval (between zero and one).

A buyer located at point x incurs a cost of $t(1-x)$ when obtaining product b from the lender and a cost of tx in obtaining the product from the other seller. Hence, the net value to a buyer purchasing from the lender at a price of p_b is $v^* - t(1-x) - p_b \equiv w_b(x, p_b)$. If, instead, the same buyer buys from the competitor at a price of p_b^c , the net value is $(v^* - tx - p_b^c) \equiv w_b^c(x, p_b^c)$.

In Figure 4, credit takes the place of product a from the earlier figures. Accordingly, the vertical axis measures y , the revenue generated by a successful borrower. The horizontal axis gives a borrower/consumer's location with regard to product b ; buyers further (horizontally) from the origin have a greater relative preference for the lender's variety of product b .

The monopolist lender's optimal unbundled price of credit is denoted R^u , while the competitive price is r/ϕ . Both the lender and a competitor sell product b . The competitor's price is set at p_b^c , in response to which the lender sets an

Figure 4 Tying the Extension of Credit to the Sale of a Differentiated Product



With independent pricing, $p_b^u = p_b^c$, and each consumer buys product b from the closest seller. Therefore, all buyers with $x > 1/2$ buy from the lender, while those with $x < 1/2$ buy from the competitor. Loans are made to all with $y > R^u$. With a tied discount for credit, buyers in IV, V, VII, IX, and XII obtain the bundle at price e . All others buy b from the competitor, with those in I and II obtaining unbundled loans at price R' .

unbundled price of p_b^u .¹⁵ Given these prices, all buyers with $w_b(x, p_b^u) \geq w_b^c(x, p_b^c)$ buy b from the lender, while all others buy from the competitor.¹⁶ Given prices p_b^u and p_b^c , all buyers with $x \geq 1/2 + (p_b^u - p_b^c)/2t$ purchase from

¹⁵ As mentioned earlier, fixing the competitor's price abstracts from the form of strategic interaction in market b . Although the actual price levels depend crucially on this interaction, many of the qualitative characteristics of tied pricing are independent of the equilibrium level of prices.

¹⁶ This section includes the additional assumption that v^* is big enough (and/or t is small enough) that all buyers purchase product b from someone.

the lender, and those with x below this level purchase from the competitor. In the credit market, all buyers with $y \geq R^u$ take out loans.

The division of the market with unbundled pricing, as shown in Figure 4, reflects the (unique) symmetric price equilibrium in the market for product b ($p_b^u = p_b^c$). Accordingly, all buyers with $x \leq (\geq) 1/2$ buy from the lender (competitor). With unbundled pricing, loans go to all buyers in the areas with the following labels in Figure 4: I, II, III, IV, V. Buyers in areas I, II, III, IV, VI, VII and X purchase b from the competitor, while those in V, VIII, IX, XI, and XII purchase from the lender.

The lender can tie the extension of credit to sales of product b by setting two loan prices, R' and $R^T < R'$, and making the lower price available only to borrowers who purchase b at the price p_b^T . In comparing the option of buying the tied products to other options, it is often useful to focus on the expected total payment, $e = \phi R^T + p_b^T$. The bundle has net value to a particular buyer of $\phi y + v^* - t(1-x) - e$. Buyers have two other options, beside buying the bundle at price e . A buyer can purchase b from the competitor and either not obtain credit, or borrow at the unbundled price of R' .¹⁷ With no credit, such a buyer earns net value of $w_b^c(x, p_b^c)$, and with credit, the buyer's net value is $w_b^c(x, p_b^c) + \phi y - \phi R'$.

Buying the bundle at price e is the most preferred option for all buyers with $x \geq 1/2 + (e - p_b^c - \phi y)/2t$ and $x \geq 1/2 + (e - p_b^c - \phi R')/2t$. These buyers are all those in areas IV, V, VII, IX, and XII in Figure 4. All others buy b from the competitor, while those in areas I and II also receive unbundled credit.

Figure 4 assumes that the competitor's price for product b does not depend on whether the lender is tying or pricing independently. While the figure is drawn to capture equilibrium when the lender prices independently, the competitor's pricing behavior is likely to be different when the lender offers a bundle instead. Rather than showing an equilibrium in this case, the figure shows how the lender's adoption of a tied pricing strategy affects buyers' decisions for a particular price of the competitor's product. The equilibrium, however, would share the important qualitative characteristics of Figure 4.

While the actual prices chosen depend on demand and cost conditions as well as on strategic considerations, the figure is drawn to capture some general tendencies. Foremost among these is that sales of the tying good (credit in the present case) tend to be higher than under independent pricing. Added extensions of credit are represented by the areas VII, IX, and XII. On the other hand, loans that would be made under independent pricing but are not made under tied pricing are represented by area III.¹⁸

¹⁷ Again, the maintained assumption is that preference parameters are such that all buyers purchase product b .

¹⁸ Note that equating areas to sales assumes a more-or-less uniform distribution of buyer characteristic pairs (y, x) .

As is typically the case, tying tends to increase the overall welfare (surplus) of borrowers with high credit quality who also place a high value on the tied product. Customers who place a high value on one product and a low value on the other see their well-being decline from tying. This is true, in particular, of those who obtain credit at the high, unbundled price (areas I and II). As discussed above, the effect of tying on overall economic welfare is difficult to determine, since these effects depend on the strategic interaction among the sellers of the tied good.

In Figure 4, an important aspect of the effect of tying is the distribution between the two rivals of sales of product b . With unbundled pricing, this market is divided evenly, with the marginal buyer (who is just indifferent between the two sellers) located at $x = 1/2$. This division of buyers minimizes the total “transportation” costs in the market, where buyer x ’s transportation cost is $t(1 - x)$ if buying from the lender and tx if buying from the competitor. With the market divided at $1/2$, each buyer goes to the “closest” seller. Tying introduces a distortion into this market. In Figure 4, buyers in areas IV and VII obtain b from the lender, even though they are “closer” to the other seller. Similarly, buyers in areas VIII and XI incur extra transportation costs in buying b from the competitor. Hence, while tying may result in an increase in total extensions of credit, reducing the social cost of monopoly power in the credit market, this positive effect may be offset by the increased transportation costs in the market for the tied good.

Tying has some interesting implications for the allocation of credit. Note first that there are some creditworthy borrowers who do not receive loans. These borrowers appear in areas III, VI, and VIII. Many of these borrowers, however, also would not receive loans under independent pricing. This limitation on the extension of credit is merely the result of the assumed market power in the loan market. Indeed, there are also borrowers (areas VII, IX, and XII) who are excluded under independent pricing but not under tying. This set may even include borrowers who are not creditworthy when loan terms are considered in isolation from the rest of the customer relationship (area XII). Borrowers for whom $y < r/\phi$ would not receive loans if credit were independently and competitively priced; these are borrowers from whom maximum expected return is less than the cost of funds. Nevertheless, these borrowers’ willingness to pay for product b is high enough to make it profitable for the lender to maintain a multiproduct relationship with them.

An outsider, viewing the credit decisions made by the bank in isolation from the rest of the bank’s customer relationships, might conclude that the bank was making unsound loans. Even worse, the bank appears to be making some unprofitable loans while profitable opportunities are left on the table. Such a view, however, would be misleading, because it does not evaluate the bank’s activities as a whole. In a multiproduct business, the isolated evaluation of parts of the product line can give a distorted view of the whole.

How might the analysis of tying by a bank change if one recognizes banks' unique status as issuers of liabilities insured by the government? In terms of Figure 4, one might simply interpret deposit insurance as a subsidization of the lender's cost of funds, r . While it is true that tying results in a riskier loan portfolio, those risks should not necessarily be of concern to the deposit insurer. From the point of view of the safety and soundness of the entire bank, the increased risks in the loan portfolio may be offset by increased profits in the sale of the tied good.

5. CONCLUSION

The U.S. banking industry is in the midst of a period of dramatic change. Interstate banking is likely to give further impetus to the ongoing trend toward consolidation. Some have expressed the concern that this trend will work to the disadvantage of the most bank-dependent class of borrowers, small businesses. If this fear is justified, it must in part be so because consolidation will increase the market power enjoyed by at least some banks with regard to their small business borrowers. One step that might prevent such a decline in credit might be to ease the restrictions that banks face on the joint marketing of "bank" and "nonbank" products. When such joint marketing takes the form of tied pricing, its effect is often to expand sales of the products over which sellers enjoy market power.

When tying is used as a means of practicing price discrimination, it serves as a method by which businesses seek to maximize the benefits from whatever natural (comparative) advantage they may have over competitors. The statement holds true when tying is used to take advantage of cost or demand complementarities between products. On the other hand, the antitrust concern with tying is that it could be used by a seller with a natural advantage in one market to create an unnatural advantage in another market. It is only in this last case that tying increases the social cost of monopoly power. A broad restriction on banks' ability to jointly market multiple products will certainly prevent uses of tying that have anticompetitive effects as well as many that do not. An alternative approach is to grant banks broad discretion in their entry into new markets, with anticompetitive practices to be guarded against by litigation on a case-by-case basis. This approach would make the treatment of tying by banks consistent with the modern antitrust perspective on such practices.

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