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Should refusal to sell be illegal?

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We analyse a private firm's decision of whether to refuse to sell to a particular group of consumers whose interaction with other consumers generates negative externalities. The literature has rarely incorporated this motive directly into the firm's profit-maximisation problem. Discriminatory refusal-to-sell policies can increase profits and consumer utility among those affected by the negative externality. Of course it also reduces utility among consumers who are refused, raising the possibility of an indeterminate effect on social welfare. We obtain a stark and rather surprising result: The refusal-to-sell policy is socially optimal whenever it is individually optimal for a profit-maximising firm to adopt such a policy. No legislation or regulation is required from a social-welfare perspective (under the assumptions used in the specification of the social welfare function). We prove this result analytically for the case of linear demand functions. Numerical simulations show that the result also holds for constant-price-elasticity demand functions.

KEYWORDS

business owner, Coase theorem, entrepreneur, inter-consumer externality, refusal to sell

1 | INTRODUCTION

At restaurants and other retail establishments, one often observes a sign stating "We reserve the right to refuse service to anyone." This paper addresses two questions. First, when does a profit-maximising firm choose to adopt a refusal-to-sell policy? And second, from a social perspective (as evaluated by social welfare in situations where some consumers impose negative externalities on others), when should a firm's refusal-to-sell policy be regulated or prohibited? In other words, under what conditions would a firm's refusal-to-sell policy cause social welfare to decline? We show that the firm's private objective of profit maximisation is perfectly aligned with social welfare maximisation (assuming the social welfare function is correctly specified) across a rather broad range of conditions and, therefore, that refusal-to-sell policies are socially efficient.

Our assumption that the firm is a profit maximiser implies that the firm's owners have no intrinsic "taste" for discrimination. We readily acknowledge that some real-world firms may have discriminatory motives (not included in our model) other than profit maximisation. Our methodological approach of modelling the firm as having no intrinsic motive to discriminate other than that of profit maximisation should not be interpreted as ignoring the social harms caused by firms that *do* have a preference for discrimination on the basis of ethnicity, religion, gender or other protected classes (e.g., in U.S. federal anti-discrimination law). The firm's "pure" profit motive in our theoretical analysis serves to isolate this mechanism, thereby providing a new explanation for why firms that would happily serve all consumers without consideration of their types—in the absence of any negative inter-consumer externalities—nevertheless choose to discriminate by adopting a refusal-to-sell policy when a negative inter-consumer externality is present.

In the United States, the Federal Civil Rights Act of 1964 prohibits discrimination by private owners of public accommodations[1] on the basis of "race, colour, religion, or national origin." Business owners can refuse to serve customers based on customer behaviour, decorum or the health and safety of patrons and employees. Airlines, for example, have the legal right to deny boarding to sick passengers according to Centers for Disease Control guidelines.

In a recent case (Masterpiece Cakeshop Ltd. v. Colorado Civil Rights Commission), the Colorado Civil Rights Commission fined a bakery shop owner, who was a devout Christian, for refusing to produce a wedding cake adorned with a visual representation of a gay couple, which it claimed was a violation of the Colorado Anti-Discrimination Act. As Epstein (2018) points out, however, the baker offered the customer other available wedding cake designs already on display in the bakery, revealing how subtle some aspects of the law are in determining whether an instance of "refusal to sell" occurred. The fine was appealed and the U.S. Supreme Court reversed the Colorado Civil Rights Commission's decision in 2018. Ambiguity surrounding the interpretation of anti-discrimination laws and the social efficiency of private business owners' refusal-to-sell policies is the object of our social-welfare analysis.

The question of whether businesses can *legally* refuse service to customers based on a customer's type (as defined by observable characteristics or behaviours) raises surprisingly subtle economic and legal questions. Sometimes refusing service (e.g., to a customer at a formal restaurant with "improper" attire) raises little controversy. In other cases, refusing service—for example, to customers wearing clothing perceived by other customers as offensive or conveying a controversial political message—leads to litigation. In such cases, courts' decisions and interpretations of the law regarding refusal-to-sell policies are less straightforward than one might expect.[2]

In 2018, a New York City judge decided in favour of a bar that refused service to a customer wearing a "Make America Great Again" (MAGA) hat, interpreted by the bar owners as an offensive expression of political support for then-candidate President Trump (Fink, 2019). The judge found that the bar did not violate the city or state's non-discrimination law because political affiliation was not covered in any of the city, state or federal government's protected classes and the judge did not accept the plaintiff's argument that his beliefs transcended politics and therefore constituted a creed (which is one of 13 protected classes in New York City). In

Washington, DC, political affiliation *is* a protected class, implying that customers in that city cannot be refused service based on political affiliation. Outside Washington, DC, however, U.S. businesses can generally refuse service to customers based on their political beliefs without violating First Amendment protections of freedom of speech, because private businesses are not part of government. Federal anti-discrimination law requires U.S. businesses to not discriminate or refuse service based on nine federally protected classes: sex, race, age, disability, colour, creed, national origin, religion or genetic information.

This paper takes an economic approach to analysing the social-welfare consequences of granting or denying a private firm's right to refuse to sell (i.e., the right to discriminate against a particular type of consumer). Negative inter-consumer externalities imposed by one type of customer on another by their joint participation in the market have attracted relatively little attention in the economics literature compared to other kinds of externalities, even though inter-consumer externalities are relatively common and, in many cases, economically significant.[3]

Our analysis focuses on negative inter-consumer externalities that profit-maximising firms have a clear incentive to prevent, which would include customers who: smoke around others that dislike second-hand smoke; wear shorts and a t-shirt to a martini bar; bring noisy children to a restaurant; or otherwise conduct themselves in ways that could interfere with other customers' enjoyment or subjective payoffs.

Positive inter-consumer externalities can of course be important for firms to consider, too. The presence of other fans at a concert or sporting can be an important input into the entertainment technology that produces exciting events, for example. Another kind of positive externality occurs when a firm attracts a well-liked celebrity, which benefits other consumers who enjoy participating in the market more when the celebrity is present. Smart business owners expend considerable effort thinking strategically about how to attract a clientele that generates positive externalities and avoids negative ones. Facilitating positive inter-consumer externalities and avoiding negative ones generates real economic value that can be measured by consumers' increased willingness to pay for events with appropriately well-matched clienteles and increased consumer welfare by the usual metric of consumer surplus.

The conventional wisdom à la Coase (1960) is that whenever a consumption externality arises, an efficient outcome can be reached by voluntary negotiation between consumers as long as transaction costs are low.[4] In reality, however, it seems that the transaction costs are often too great for Coasian solutions to easily materialise in the real world—assigning property rights and negotiating to achieve efficient coordination among complementary sets of consumers that jointly produce high-value consumer experiences. One could hardly imagine parents with noisy children easily negotiating with other diners and finding mutually acceptable side payments to other customers at an elegant restaurant. It is simpler for the firm to adopt a refusal-to-sell policy. Simple rules that give a clear "bright line," such as "No children allowed," have numerous merits according to Epstein (1995), Gigerenzer, Todd and The ABC Research Group (1999) and Hertwig, Hoffrage, and The ABC Research Group (2013), based on both efficiency and transparency.

In this paper, we show that allowing a profit-maximising firm to adopt a discriminatory refusal-to-sell policy can increase the firm's profit as well as the payoffs among consumers who would have been negatively affected by the externality. Consumers who are refused service (i.e., discriminated against) suffer with lower payoffs as a result. The social welfare effect of allowing private firms to adopt refusal-to-sell policies therefore depends on whether the gains (for the firm and its consumers who receive protection against the negative externality) outweigh the losses (among consumers who are refused service), which can be used as a normative criterion for deciding whether this discriminatory practice should be prohibited or remain legal.

We obtain a rather surprising result from our simple economic model. Giving the firm the right to refuse customers turns out be socially optimal whenever it is privately optimal for the firm to do so. This result implies, at least from the standpoint of the social welfare criterion used in the model, that no regulation is required. The firm's profit-maximisation motive guarantees that the social-welfare criterion is satisfied. We prove this result analytically for the case of linear demand functions and show through numerical simulation that the result also holds for constant-price-elasticity demand functions.

Intuitively, if the monopolist finds it optimal to refuse a group of customers, it means that their lost consumer surplus is less than other consumers' gains. Profit tracks consumer surplus and social welfare. This link between a monopolist's profit, consumer surplus and social welfare implies that it will be socially optimal to allow the firm to use its refuse-to-sell policy whenever the firm finds it optimal to do so.

The paper is organised as follows. In Section 2, we analyse a simple model with linear demand functions. In Section 3, we report simulation results for demand functions with constant price elasticity. Concluding remarks follow in Section 4.

2 | SIMPLE MODEL

We consider a monopolist selling a product to two groups of consumers, Group A and Group B. Selling products to consumers from Group B generates negative externalities for consumers from Group A. For example, suppose Group A is non-smokers and Group B is smokers. If a restaurant serves smokers, then non-smokers may be reluctant to be served in the restaurant. Let $\theta \in (0, 1)$ be the proportion of Group B consumers in the population. We assume that consumers of each group are, apart from Group A's dislike of consuming together with Group B, homogeneous.

Let p be the uniform price faced by both groups of consumers. We assume linear individual demand functions for Group A and Group B, respectively, which are given by $q_A = D_A(p, Q_B) = a - bp - \gamma Q_B$ and $q_B = D_B(p) = a - bp$, where $Q_B = \theta q_B$, with $a, b, \gamma > 0$. Here, γ is the magnitude of the negative externality imposed by Group B on Group A. The inverse demand functions are $p = \alpha - \beta q_A - \frac{\gamma}{b} Q_B$ and $p = \alpha - \beta q_B$, respectively, where $\alpha = \frac{a}{b}$ and $\beta = \frac{1}{b}$. We also assume that the monopolist produces the good at the constant marginal cost c where $0 < c < \frac{a}{b}$.[5]

3 | ANALYSIS

We begin the analysis by considering the monopolist's profit function:

$$\begin{aligned} \pi(p) &= (p-c)Q \\ &= (p-c)[(1-\theta)q_A + \theta q_B] \\ &= (p-c)[(1-\theta)D_A(p, Q_B) + \theta D_B(p)] \\ &= \varphi(p-c)(a-bp), \end{aligned} \tag{1}$$

where $\varphi = 1 - \gamma\theta + \gamma\theta^2$. Boundary choices for p cannot be optimal. Therefore, the profit-maximising price will be interior and the monopolist will choose price to satisfy the first-order condition:

$$\pi'\left(p^*\right) = \varphi\left(a + bc - 2bp^*\right) = 0. \tag{2}$$

If $\varphi > 0$, then the second-order condition $\pi'' = -2b\varphi < 0$ is satisfied and we obtain the profit-maximising price: $p^* = \frac{a+bc}{2b}$. It is interesting to note that the equilibrium price p^* depends on neither the magnitude of the externality (γ) nor the ratio of Group B consumers (θ). Also, we have the price margin $m^* = p^* - c = \frac{a-bc}{2b} > 0$, assuming $\frac{a}{b} > c$. Substituting p^* into the demand functions yields quantities sold to each of the two groups: $q_B^* = \frac{a-bc}{2} > 0$ and $q_A^* = (1-\gamma\theta)q_B^* = (1-\gamma\theta)\frac{a-bc}{2} \geq 0$, assuming $\gamma < \frac{1}{\theta}$.

The monopolist's maximised profit is:

$$\pi^* = \begin{cases} \varphi\dfrac{(a-bc)^2}{4b} & \text{if } \gamma < \dfrac{1}{\theta} \\ \theta\dfrac{(a-bc)^2}{4b} & \text{if } \gamma \geq \dfrac{1}{\theta}. \end{cases} \tag{3}$$

Note that consumers of Group A will not buy from the monopolist if γ is large (i.e., if $\gamma \geq \frac{1}{\theta}$).

In this case, the monopolist is not refusing to sell to Group A. It would like to if it could (given the positive price margin). But Group A consumers are refusing to buy, due to the large negative externality from the *presence* of Group B customers. It is clear that if $\gamma = 0$ (i.e., no negative externalities), then the monopolist will always prefer selling to both groups of consumers. But as γ becomes larger, the expression $\varphi = 1 - \theta(1 - \theta)\gamma$ becomes smaller, implying that the monopolist's profit becomes smaller whenever it serves both markets because Group A consumers reduce the quantities they purchase. If γ reaches or surpasses $\frac{1}{\theta}$, then the monopolist's only customers (in the absence of a refusal-to-sell policy) are Group B.

The individual demand functions are derived from the following utility functions: $u_A = \frac{1}{b}\left[(a - Q_B)q_A - \frac{1}{2}q_A^2\right]$ and $u_B = \frac{1}{b}\left[aq_A - \frac{1}{2}q_A^2\right]$. Therefore, consumer surplus (CS) is given by the following formula: $CS = (1-\theta)\left(u_A - p^* q_A^*\right) + \theta\left(u_B - p^* q_B^*\right)$.

Next, we consider what happens if the monopolist adopts a refuse-to-sell policy that excludes Group B consumers (because they are the ones generating the negative externality). If the monopolist sells only to Group A, then its profit is:

$$\pi(p) = (p-c)(1-\theta)(a-bp), \tag{4}$$

so that the profit-maximising price remains the same as before, $p^* = \frac{a+bc}{2b}$. Because $Q = (1-\theta)q_A = (1-\theta)\frac{a-bc}{2}$, the firm's profit is $\pi^* = (1-\theta)\frac{(a-bc)^2}{4b}$. It is clear that the monopolist prefers selling exclusively to Group A and chooses to adopt the refusal-to-sell policy excluding Group B if and only if $1 - \theta > \theta$, that is, if $\theta < \frac{1}{2}$.

The monopolist will serve both groups if $1 - \gamma\theta + \gamma\theta^2 > \max\{1 - \theta, \theta\}$, or equivalently, if $\gamma < \frac{1}{\min\{\theta, 1-\theta\}}$. Intuitively, if θ is very small $\left(\theta < 1 - \frac{1}{\gamma}\left(<\frac{1}{2}\right)\right)$, then the monopolist will serve only Group A, refusing consumers in Group B. It will serve only Group B (giving up consumers in Group A, who choose not to purchase due to the negative externality but without being refused) if θ is very large, that is, if $\theta \geq \frac{1}{\gamma}\left(>\frac{1}{2}\right)$. And if θ is close to one half (i.e., if $1 - \frac{1}{\gamma} < \theta < \frac{1}{\gamma}$ for $\gamma \in (1, 2)$), then the monopolist will serve both markets. Proposition 1 summarises these results.

Proposition 1 Let $\theta_1 = \min\left\{1 - \frac{1}{\gamma}, \frac{1}{2}\right\}$ and $\theta_2 = \max\left\{\frac{1}{\gamma}, \frac{1}{2}\right\}$. (a) If $\theta \in (\theta_1, \theta_2)$, then the monopolist serves consumers of both groups. (b) If θ θ_1, then it refuses to sell to groupB and serves only groupA. (iii) If θ θ_2, then it refuses no one but serves only groupB.

If $\gamma > 2$, then $\frac{1}{\gamma} < \frac{1}{2}$, that is, $1 - \frac{1}{\gamma} > \frac{1}{2}$, which implies that $\theta_1 = \theta_2 = \frac{1}{2}$. Thus, the inequality, $\gamma > 2$, implies that the interval (θ_1, θ_2) is degenerate. In such cases (where negative inter-consumer externalities are sufficiently large), the monopolist will never choose to serve both groups at the same time and place.

Proposition 1 implies that the monopolist will find it in his or her interest, for example, to refuse smokers whenever the ratio of the smokers in the population is low. But if the ratio of smokers is sufficiently high, then non-smokers will choose to not visit the monopolist although they are not refused.

Tollison and Wagner (1992) argue that negative externalities from smoking will be internalised by smokers and, in competitive markets, that it will be difficult or impossible for restaurants to refuse service to smokers, in contrast to Proposition 1 which relies on the assumption of market power. Tollison and Wagner's analysis is based on the assumption of perfectly competitive supply. Numerous real-world cases, however, document that both small and large businesses (with some degree of market power) choose to exclusively serve their best (i.e., most numerous or highest-revenue) customers by excluding, for example, children from restaurants or first-class airline seats (e.g., see Dorning, 2011, on Malaysia Airlines' refusal to sell first-class tickets for children and other major carriers' children-free sections).

Refusal to sell in public policy contexts, such as refusing surgery to smokers and obese patients (e.g., Fenton, 2016), match our model's assumption of market power and link to previous work on single-payer health systems (cf. Berg & Kim, 2018), although the social objectives of incentivising smokers to quit and encouraging weight loss are obviously outside the scope of Proposition 1. Female-only gyms, restaurants and clubs with strictly enforced dress codes and numerous other real-world instances of sellers adopting a refusal-to-sell policy would seem to lend plausibility to the conditions laid out in Proposition 1.

3.1 | Welfare comparisons

In this section, we undertake welfare analysis by aggregating profits and consumer surplus in the usual way. Social welfare, denoted W, is defined as the sum of the monopolist's profit and consumer surplus: $W = \pi + CS$. If the monopolist sells to both groups, social welfare is given by:

$$W = (1-\theta)W_A + \theta W_B, \tag{5}$$

where

$$
\begin{aligned}
W_A &= \int_0^{(1-\gamma\theta)q} \left\{\alpha - c\frac{\gamma}{b}Q_B) - \beta x\right\} dx \\
&= (1-\gamma\theta)\left[(\alpha - C)q - \frac{\beta}{2}(1+\gamma\theta)q^2\right]
\end{aligned} \tag{6}
$$

$$
\begin{aligned}
W_B &= \int_0^{q} (\alpha - c - \beta x) dx \\
&= (\beta - c)q - \frac{\beta}{2}q^2
\end{aligned} \tag{7}
$$

and $q = \frac{a-bc}{2}$.

We denote social welfare when the monopolist discriminates (by refusing to sell to Group B and selling only to consumers in Group A) as W^D. Then, $W^D = \pi^D + {CS_A}^D + {CS_B}^D$, where ${CS_B}^D = 0$. Therefore, we have:

$$
\begin{aligned}
W^D &= (1-\theta)\int_0^{q} (\alpha - c - \beta x) dx \\
&= (1-\theta)q\left(\alpha - c - \frac{\beta}{2}q\right).
\end{aligned} \tag{8}
$$

To see whether it is possible that profits are greater but social welfare is smaller under the refusal-to-sell policy (i.e., $\pi^D > \pi$ but $W > W^D$), we compute:

$$
\begin{aligned}
W - W^D &= \theta(1-\gamma(1-\theta))(\alpha - c)q - \frac{\beta}{2}\theta\left(1-\gamma^2\theta(1-\theta)\right)q^2 \\
&= \theta q \Phi(\theta),
\end{aligned} \tag{9}
$$

where

$$
\begin{aligned}
\Phi(\theta) &= (1-\gamma(1-\theta))(\alpha - c) - \frac{\beta}{2}\left(1-\gamma^2\theta(1-\theta)\right)q \\
&= (1-\gamma)(\alpha - c) - \frac{\beta}{2}q + \gamma\left(\alpha - c + \frac{\beta}{2}\gamma q\right)\theta - \frac{\beta}{2}\gamma^2 q\theta^2.
\end{aligned} \tag{10}
$$

Note that $W > W^D$ if $CS_B - ({CS_A}^D - CS_A) > \pi^D - \pi$, when $\pi^D > \pi$. Also note that $\Phi(0) = (1-\gamma)(\alpha - c) - \frac{\beta}{2}q < 0$ and $\Phi\left(1 - \frac{1}{\gamma}\right) = (\gamma - 2)\frac{\beta}{2}q^2 < 0$ if $\gamma \in (1, 2)$. It is easy to demonstrate that $\Phi(\theta)$ is maximised at $\hat{\theta} = \frac{1}{2} + \frac{\alpha - c}{\beta\gamma q} > \frac{1}{2}$, as illustrated in Figure 1. Therefore, we have $\Phi(\theta) < 0$ for all $\theta \leq \theta_1 \equiv \min\left\{1 - \frac{1}{\gamma}, \frac{1}{2}\right\}$; hence, $W^D > W$ whenever $\pi^D > \pi^*$.

Proposition 2 If a profit-maximising monopolist refuses to sell to Group B, then its refusal-to-sell policy is socially optimal.

Proposition 2 implies that refusal-to-sell should be legal. When a monopolist refuses to sell to some group of consumers (B) who impose negative externalities on other consumers (A), we

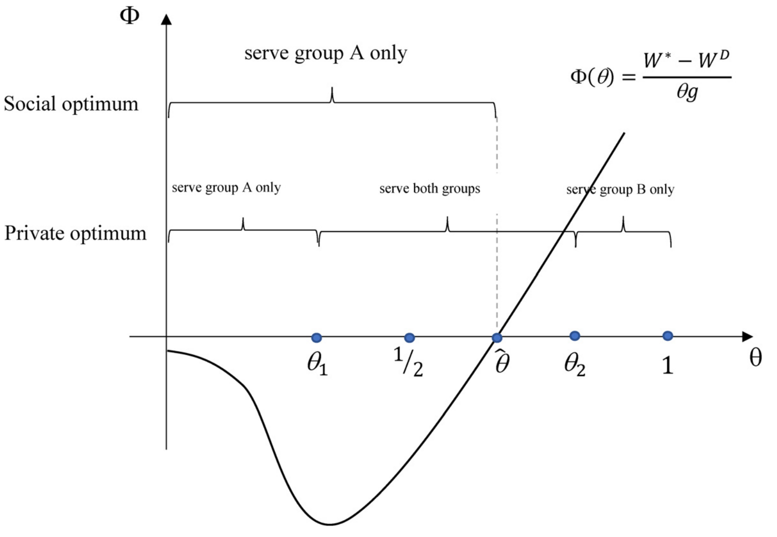

FIGURE 1 Private optimum versus social optimum [Color figure can be viewed at wileyonlinelibrary.com]

can infer (under the assumptions in the model) that Group A's lost consumer surplus from the negative externality without the refusal-to-sell policy is greater than Group B's lost consumer surplus from being refused under the refusal-to-sell policy.

The intuition is as follows. If the monopolist finds it in its interest to not serve both groups of consumers, it means that the profit from selling exclusively to Group B consumers is exceeded by the profit lost from refusing Group A consumers. Accordingly, the increase in total surplus from selling exclusively to Group B consumers is also greater than Group A consumers' lost surplus from being refused. Therefore, when the policy is prohibited, the sum of consumer surplus from both groups of consumers being served together (as well as profits) will be strictly less than when refusal-to-sell is legal. This result implies that it is socially optimal to refuse to sell to Group B whenever the seller finds it optimal to refuse.

If $\gamma > 2$, then $\theta_1 = \theta_2 = \frac{1}{2}$. In this case, even if the monopolist does not refuse to sell to Group B consumers, it cannot sell to both groups because Group A consumers choose not to purchase. Therefore, illegalisation of firms' refusal-to-sell policies cannot improve social welfare in this model.

4 | GENERAL MODEL

In this section, we consider a similar model with nonlinear consumer demand functions to see whether the results from the previous section still hold. Let the utility functions of each group of consumers be represented as $U_A(q_A, q_B) = u(q_A) - v(q_A, \theta q_B)$ and $U_B(q_B) = u(q_B)$, respectively, where $u' > 0$ and $u'' < 0$. For simplicity, we assume that $v(q_A, \theta q_B) = \delta(\theta q_B^*)q_A$, where $\delta > 0$ measures the intensity of negative externalities that Group B imposes on Group A (just as γ did in Section 2).

Given the price p, Group B consumers choose q_B^* to solve:

$$\max_{q_B} U_B(q_B) - pq_B = u(q_B) - pq_B. \tag{11}$$

The first-order condition implies that:

$$p = u'\left(q_B^*\right), \tag{12}$$

which is the inverse demand function for Group B consumers.

Similarly, Group A consumers choose q_A*to solve:

$$\max_{q_A} U_A\left(q_A, q_B^*\right) - pq_A = u(q_A) - v\left(q_A, \theta q_B^*\right) - pq_A. \tag{13}$$

The first-order condition requires:

$$p = u'(q_A) - \delta\theta q_B^*, \tag{14}$$

which is the inverse demand function for Group A consumers.

The monopolist chooses p to maximise profit:

$$\pi = (p-c)\left[(1-\theta)q_A^*(p) + \theta q_B^*(p)\right]. \tag{15}$$

The monopolist's first-order condition requires that the optimal price p^* satisfies:

$$\frac{\partial \pi}{\partial p} = Q + \left(p^* - c\right)\left[(1-\theta)\frac{\partial q_A^*}{\partial p} + \theta \frac{\partial q_B^*}{\partial p}\right] = 0 \tag{16}$$

Calculation of q_A* and q_B* to satisfy (12) and (14) is challenging due to nonlinearity of the inverse marginal utility function, $u^{'-1}(p)$. We therefore focus on the case in which $u^{'-1}(\cdot)$is linear, illustrating the validity of Proposition 2 for a specific family of nonlinear demand functions with constant price elasticity.

If the utility function takes the form $u(q) = q^{1-\frac{1}{\eta}} / \left(1 - \frac{1}{\eta}\right)$, where η represents price elasticity of demand, then a monopolist that serves both groups of consumers will sell the following quantities (based on Eqs. (12) and (14)) to consumers in each group, respectively:

$$q_A^* = [p + \delta\theta p^{-\eta}]^{-\eta}, \tag{17}$$

$$q_B^* = p^{-\eta}. \tag{18}$$

The resulting profit, π^*, from selling to both groups is obtained from (15) by substituting p^*, $q_A{}^*$ and $q_B{}^*$.

If the monopolist refuses to sell to Group B consumers, then the monopolist chooses price as follows:

$$p^D = \underset{p}{\operatorname{argmax}} \pi + (1-\theta)(p-c)q_A = \frac{\eta}{\eta-1}c, \tag{19}$$

and, accordingly, $q_A^D = \left(\frac{\eta}{\eta-1}c\right)^{-\eta}$ and $\pi^D = (1-\theta)\frac{c}{\eta-1}\left(\frac{\eta}{\eta-1}c\right)^{-\eta}$. The social welfare in each of the two cases—without discrimination (W^*) and with discrimination (W^D) under the refusal-to-sell policy—can be computed as follows:

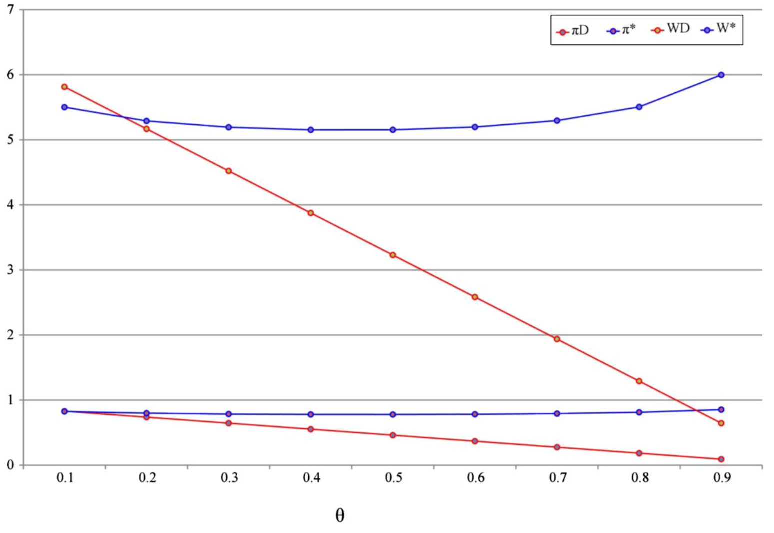

FIGURE 2 π*, πD, W* and WD (evaluated at $\delta = 1.0$) [Color figure can be viewed at wileyonlinelibrary.com]

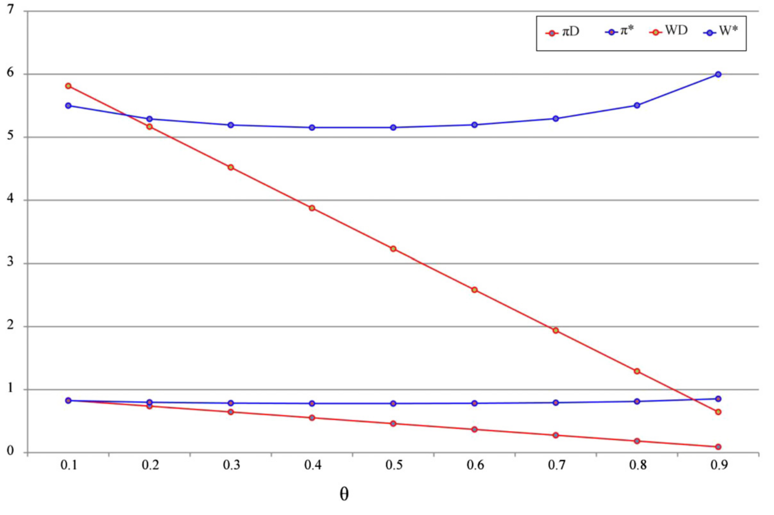

FIGURE 3 π*, πD, W* and WD (evaluated at $\delta = 1.5$) [Color figure can be viewed at wileyonlinelibrary.com]

$$W^* = (1-\theta)\left[\frac{(q_A^*)^{1-\frac{1}{\eta}}}{1-\frac{1}{\eta}} - \delta q_A^* q_B^* - c q_A^*\right] + \theta\left[\frac{(q_B^*)^{1-\frac{1}{\eta}}}{1-\frac{1}{\eta}} - c q_B^*\right], \tag{20}$$

and

$$W^D = (1-\theta)\left[\frac{(q_A^D)^{1-\frac{1}{\eta}}}{1-\frac{1}{\eta}} - \delta c q_B^D\right], \tag{21}$$

To illustrate with specific parameterisations, Figures 2 and 3 show how π^*, π^D, W^* and W^D change as θ increases from 0.1 to 0.9. Figure 2 uses $\eta = 1.2$, $c = 0.1$ and $\delta = 1.0$. Figure 3 uses the same parameter values except that the negative externality is more severe, $\delta = 1.5$, to demonstrate sensitivity to this parameter. The simulation results in Figures 2 and 3 confirm the result that the threshold below which the monopolist adopts a refusal-to-sell policy is strictly less than the socially optimal threshold, $\theta_1 < \hat{\theta}$, implying, as in Section 2, that the refusal-to-sell policy is socially optimal whenever it is privately optimal for the seller to choose it.

5 | DISCUSSION AND CONCLUSION

In this paper, we showed that a monopolist's refusal to sell to a particular group of consumers is socially optimal, because the utility gained by the group of consumers afflicted by a negative inter-consumer externality (e.g., non-smokers' gains when smokers are refused) exceeds the utility lost among consumers in the externality-generating group of consumers (e.g., smokers) when the seller implements a refusal-to-sell policy excluding the latter group. We acknowledge that the model may be too simple to generalise broadly. The social welfare function used to generate these results excludes consideration of emotional disutility among consumers in the excluded group or non-consequentialist decrements to social welfare from the practice of ethnic discrimination, for example. The results do show, however, that the private decisions of sellers who refuse to sell do not generate social losses as measured by aggregate consumer surplus.

Is there any way to implement the social optimum? Others have observed that sellers are sometimes able to avoid negative inter-consumer externalities by serving different groups in segregated markets,[6] such as a physically segregated smoking section. If both groups of consumers are served well by segregation, then the negative externalities do not occur (or are reduced substantially) and, thus, the social optimum will be (nearly) achieved. Stores that segregate customers with children into separate sections inside a retail establishment are another example. Although not entirely free from moral ambiguity, the results reported in this paper suggest that such differentiated or segregated service can be thought of as an efficient way to eliminate or reduce negative externalities rather than as a discriminatory violation of rights suffered by customers with children.

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ENDNOTES

1 In U.S. law, "public accommodations" includes hotels, restaurants, theatres, banks, and other retail shops, as well as public and non-profit facilities (e.g., schools and universities), all of which must be accessible to the handicapped and avoid discriminating against protected classes stated in the Civil Rights Act of 1964. In Title II of the Act, however, the same term ("public accommodations") is defined more narrowly as "any inn, hotel, motel, or other establishment which provides lodging to transient guests." Non-profit organisations such as churches are generally exempt from anti-discrimination laws, although state and local laws are highly non-uniform across the United States, exemplified by recent exceptions granted by state legislatures mentioned in the previous footnote.

2 There are numerous examples of legislative changes at the state or local levels that protect firms' ability to adopt refusal-to-sell policies based on sellers' religious convictions that have sparked controversy. Examples

include the State of Indiana's Religious Freedom Restoration Act and the State of Arizona's amendment SB 1062 giving any individual or legal entity an exemption from that state's anti-discrimination laws if those laws impose a substantial burden on a seller's religious practice.

[3] There is, of course, a vast literature on network externalities stemming from seminal papers such as Farrell and Saloner (1985), Katz and Shapiro (1985), and David (1985). This paper is distinct from the literature on network externalities, however, which focuses on cases in which the utility of consumers depends only on the number of other consumers using the same or compatible products. In this paper, the utility of consumers depends on the *types* of other consumers rather than solely depending on their number.

[4] Pigouvian taxes are a well-known remedy for correcting inefficiency due to externalities, although they would likely lead to new legal and economic problems for firms trying to price inter-consumer externalities in a way that would make it worth their efforts enforcing and implementing complex pricing strategies rather than simply refusing to sell.

[5] If $c > \frac{a}{b}$, then no sales would occur.

[6] Most of the literature on segregation focuses on the welfare of the segregated group of consumers and not on the profit of suppliers choosing to segregate. For example, Hughes and Madden (1991) analyse the effect of (residential) segregation on segregated people's costs of commuting and housing.

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