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The Effect of "Foreign" and Local Visitors on Granting Park Concessions

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Abstract

If parks have particular characteristics, park managers should grant firms exclusive right to provide products or services within the park. The particular characteristics include that park development is only attractive to foreign visitors, that foreign visitors are only valuable for the currency they spend, and that development and congestion reduce the park's value to domestic visitors.

Permitting monopoly to provide development means maximizing net revenue from sale of services to foreigners. Monopoly concessions also mean less development is produced than with competing concessions. Less development and fewer foreign visitors mean increased value to domestic visitors.

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Dedication

I thank the Department of Economics and the Centre for Resource Management at the University of Canterbury, New Zealand for their generous support. If this paper is interesting and free of error, colleagues at the University of Canterbury and David James deserve credit. If not, I ignored their advice and am wholly responsible.

1. Introduction

National parks stand as the supreme acknowledgement of the importance of a country's natural heritage. Decisions about national parks are never a product of complete consensus, of course. Even individuals who support creation of a park often disagree about policies administrators should adopt to maximize a park's value to society.

Providing one source of disagreement is the decision about the extent to which a park's natural features should be sacrificed to development. In part parks are established to preserve natural features, but those natural features must be altered to allow access and to enhance the experience of park visitors. The competing objectives of preservation and development are recognized even in the legal acts establishing parks. The National Parks Act, which created the U.S. National Park Service, tacitly acknowledges the twin requirements of preservation and development:

> The service thus established shall promote and regulate the use of ... national parks ... to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same ...[1]

Nor is the United States unique in its recognition of the conflict between use and preservation. New Zealand's National Parks Act is an example where these goals are even more clearly stated:

> They shall be preserved as far as possible in their natural state ... (but) development and operation of recreational and public amenities and related services appropriate for the public use and enjoyment of the park may be authorized.[2]

Further complicating but related to the decision about the extent of development is the necessity to choose the method of providing development in the park. In particular, park authorities must decide whether to use public resources or allow private firms to provide products and services to park visitors.

For some parks, the difficulty in determining the quantity and appropriate method of providing development is compounded because developed facilities are attractive mainly to visitors from other countries. For these parks, development enhances the value of the park to foreign visitors but reduces the value of the park to those domestic visitors who prefer unaltered natural features. This situation also occurs in state parks with facilities used by non-residents, facilities built at the expense of natural areas preferred by local residents.

Examples of parks whose developed facilities are attractive particularly to foreign visitors include some

(particularly western) Canadian parks, parks in several African countries, and parks in New Zealand. In New Zealand for example, seventy to eighty percent of park hotel and park airport users are foreigners.[3]

New Zealand is used here and elsewhere as an example because its park characteristics so closely match those of the model and because its park system is so extensive and important. Six percent of New Zealand's land area is preserved in national parks compared to less than one percent in the United States.[4]

The purpose of this paper is to predict the effect on park development of the type of private concession granted, particularly whether a firm is granted an exclusive concession or whether competing firms are allowed to offer the product or service. That is, the paper compares park development resulting from monopoly concessions to development resulting from competitive concessions and evaluates the two policies in parks where development is valuable mainly to foreign visitors.

The next section of this paper defines development as alterations to the park which attract foreign visitors. The adverse effect of development and congestion on domestic visitors is considered in the third section. Sections four and five develop the main model and its implications, concluding that monopoly concessions maximize profit from sale of developed services to foreigners and that monopoly development means less development is produced than with

competing concessions. Reduced development and fewer foreign visitors resulting from monopoly concessions imply increased value to domestic visitors.

Subsequent sections address potential complications. The effect of price discrimination on profit and output is considered. The dubious value of price controls on monopoly concessions is presented. Advantages and disadvantages of integrating several products under one concession are discussed.

2. Development

Park development is defined in this paper as changes in the natural area that appeal to foreign visitors. To yield interesting results, development in a park must also have negative value to domestic visitors. That some alterations in a park are desired by domestic visitors is indisputable. Of concern here, however, are alterations in excess of those desired by domestic visitors.

Development has two dimensions. The first is the pure quantity or capacity dimension. The number of restaurant tables is a measure of capacity. An increase in capacity means an increase in the number of foreign visitors. Notice the assumption that the actual number of foreign visitors and the capacity for foreign visitors is the same. The model assumes all "potential" capacity is occupied. An equivalent assumption is to treat unoccupied facilities as

additional development intensity, valuable to foreigners. Naturally, additional capacity is costly to produce.

The second dimension of development is its quality or intensity. An increase in this dimension of development does not increase the capacity of the park, but does make the park more attractive to foreign visitors. Improvements in hotel rooms in a park is an example of an increase in intensity of development. The number of rooms, and thus capacity of the park, has not changed, but the value of a room to a foreign visitor has increased. Other examples include facilities like swimming pools and tennis courts provided for hotel guests. These facilities are often the most controversial changes in a park since they most dramatically violate the popular idea that only forms of recreation "appropriate" to the natural park setting should be permitted (Sax 1980).

Development capacity (X) is the characteristic explicitly priced by producers. The second characteristic, development intensity (Z), is some other desired aspect of development.[5] Producers combine the two characteristics when selling the product. The marginal value or price of X is a decreasing function of capacity X and an increasing function of intensity Z:

(1) Price = $P(X,Z)$ $P_X<0$, $P_Z>0$, $P_{ZZ}<0$

(Subscripts indicate partial derivatives.)

Firms maximize revenue less production cost from sale of development. Production cost is assumed a function of the two characteristics:

(2) Total Cost = $C(X,Z)$ $C_X, C_Z > 0$

Any decision about development by private firms or by park managers must count this cost against the benefit of development. Direct cost, however, is only one of the sacrifices required to provide park development.

3. Domestic Visitors, Development, and Congestion

An individual living in the country visits a park if the value (reservation price) of the visit exceeds its cost, primarily travel cost. Domestic market demand for the park is the appropriate sum of individual reservation prices. Without other restrictions, the number of domestic visitors increases until value to the last visitor is equal to travel cost.

Let the net value of the park to domestic visitor i be given by the following:

(3) Net value = $V^i(Z,G)-T$ $V_Z, V_g < 0$

Where: V = the reservation price of domestic visitor i and reservation prices are arranged in order of decreasing reservation price,

G = the number of foreign visitors (X) plus the number of domestic visitors (N), G=N+X, and

T = travel cost, assumed identical for all domestic visitors.[6]

Domestic visitors continue to enter the park until the cost of travel is just equal to the reservation price for the last (Nth) visitor.

(4) $V^N(Z,G) = T$

Total value of the park to domestic visitors is the sum of reservation prices less travel cost to those who visit the park.

(5) $$\text{Total value} = \sum_{i=1}^{N}[V^i(Z,G)]-NT$$

An important element of recreation within parks is congestion. Largely because entry is not restricted, people tend to continue arriving at parks to the point where congestion becomes a consideration. Even with restricted entry or admission fees, congestion may be a factor. Thus, the value function of each potential park visitor includes congestion as an independent variable. An increase in congestion--an increase in the number of other visitors--reduces the park's value to each individual ($V_g<0$).[7] In the simple case, it does not matter whether the other visitors are foreigners since anyone's presence causes undesired congestion (G=N+X).

A more complicated assumption allows an individual to have a different attitude toward congestion caused by

foreign visitors than congestion caused by domestic visitors [G=N+Q(X)]. In this case, one additional foreign visitor may reduce the number of domestic visitors by more than one (Q_x>1) or, more likely, less than one (Q_x<1). If foreign tourists concentrate in developed areas of the park, they may have limited effect on domestic visitors.

Foreign visitors may also be adversely affected by congestion. However, the paper does not explicitly treat congestion's influence on foreign demand, avoiding the (unlikely) question of whether entry by domestic visitors should be restricted in order to increase revenue from foreign visitors. In most countries, restricting entry by domestic visitors is politically impossible. In many cases it is easy to believe that foreign visitors are willing to accept more congestion than domestic visitors. If so, ignoring congestion effects on foreigners does little violence to reality.

The equilibrium condition in equation (5) defines the number of visitors N as an implicit function of T, G, and Z [N^*=N(T,G,Z)]. Derivatives of the equilibrium condition yield the comparative statics sought here. What is the effect on domestic visitors of an increase in the number foreign visitors? Take the derivative of the equilibrium condition (4) with respect to X where G=X+N.

$$(6) \quad N_x V_g + V_g = 0$$

$$(7) \quad N_x = -1$$

An additional foreign visitor means one domestic visitor chooses not to visit. Referring to equation (5), the reduced number of domestic visitors coupled with the lower value to the remaining domestic visitors means an increase in the number of foreign visitors reduces the net value of the park to domestic visitors.

Increases in development intensity also make the net value of the park to domestic visitors fall. Take the derivative of equation (4) with respect to X.

(8) $V_z+V_gN_z = 0$

(9) $N_z = -V_z/V_g < 0$

Additional development reduces the number of domestic visitors. Again referring to equation (5), fewer domestic visitors and lower value to the remaining visitors means increases in development reduce the value of the park to domestic visitors.

In summary, park development affects domestic visitors in two ways. Because it attracts foreign visitors, development reduces the park's value to domestic visitors, since additional foreign visitors mean additional congestion, fewer domestic visitors, and lower value to domestic visitors. The park's value to domestic visitors is also influenced by the intensity of development since development alters attractive natural features.

4. Comparing Monopoly and Competition

Faced with the legal mandate to control development, park authorities can choose to provide development using government resources or can grant permission for private firms to provide facilities within parks. This latter and more common case is is considered here.

Park managers place a variety of restrictions on concessions and use a variety of techniques to grant concessions within parks. At the most fundamental level, however, park managers decide whether to grant exclusive right to provide a product or service or to grant some non-exclusive right. That is, park managers choose to create a monopoly or to permit competing firms to provide development. Because of their aversion to unrestricted development, managers usually limit the number of competing concessions, if competing concession are permitted at all. These limited concessions are defined as competing concessions in this paper.

If the number of concessions granted to provide a given service is greater than one but less than would occur with no restriction on entry, firms respond in one of several ways. One possibility is that firms tacitly or openly collude and so act like a monopoly. Firms may also act in a manner consistent with some model of cooperative

oligopoly. The first result, being identical to monopoly, is considered in the monopoly section of the paper.

The second possibility implies some result between competition and monopoly so long as cooperation is imperfect and given the temptation to cheat on any cooperative agreement. If choices by firms in a cooperative oligopoly yield greater development and lower profit than monopoly, the policy advantages of monopoly remain and the discussion of competitive concessions below apply as well to cooperative oligopoly.

The third possibility, of interest to this section, is that firms compete. The general result of this competition is consistent whether the model is of competitive firms where entry is restricted or is unrestricted, for models of non-cooperative oligopoly, Cournot-Nash equilibria being an example, or for models of monopolistic competition where each firm produces a slightly different product.

Firms compete by increasing development capacity and intensity.[8] The pressure on competing firms increase development is a result of the fact that a competing firm's decisions have an external effect on other firms. When it increases capacity, a competing firm does not fully recognize that such a decision reduce prices received by other firms. The firm also does not fully recognize that increases in its intensity reduce demand for development produced by other firms.[9]

Assume a competing firm maximizes profit, faces a downward sloping demand curve, and ignores its effect on other firms:[10]

(10) maximize $S = XP(X,Z) - C(X,Z)$ w.r.t. X,Z

First order conditions for maximization are the following:

(11) $S_x = XP_x + P - C_x = 0$

(12) $S_z = XP_z - C_z = 0$

By contrast, a monopoly recognizes the effect of its capacity and intensity decisions, since all consumers are customers of the monopoly. The monopoly only cares about increases in capacity that increase profit given the lower price. The monopoly only cares about increases in intensity of development as they increase total willingness to pay for development by foreigners. Because it recognizes that effects external to competing firms are internal to the monopoly, the monopoly produces less development than competing firms.

For simplicity, let the monopoly control a number of park facilities, each equivalent to a firm under competition. As under competition, the facilities need not produce identical X and Z. Using a multi-facility monopoly makes comparing monopoly and competition relatively easy without restricting behavior of the monopoly since a multi-facility monopoly may choose a different number of

facilities than under competition by setting output of some facilities to zero.

A monopoly producer of park development maximizes profit with respect to X and Z for each of n facilities given a downward-sloping demand for outputs of the individual facilities. Demand curves for the facilities have the same relationship between one another as for firms under competition.

$$(13)\quad \text{Maximize}\quad M = \sum_{j=1}^{n} X^j P^j(X^j, Z^j, X^k, Z^k) - C^j(X^j, Z^j)$$

$$\text{for all } j \neq k \quad \text{with respect to } X^j,\ Z^j$$

$$j = 1 \ldots n, \quad k = 1 \ldots n$$

The first order conditions for each facility are the following (omitting superscript j):

$$(14)\quad M_X = XP_X + P - C_X + X^k P_X^k = 0 \quad \text{all } k \neq j$$

$$(15)\quad M_Z = XP_Z - C_Z + X^k P_X^k = 0 \quad \text{all } k \neq j$$

The respective first order conditions for competition and monopoly show the marginal cost of X is lower for the competing firm. Rewriting conditions (11) and (14) yields the following:

$$(18)\quad XP_X + P = C_X$$

$$(19)\quad XP_X + P + X^k P_X^k = C_X \quad \text{all } k \neq j$$

For (18) and (19) the right-hand terms are marginal cost of capacity. Starting at the monopoly output, marginal cost is the same under monopoly and competition. The left-hand terms are marginal revenue. The monopoly (19) has as a component of marginal revenue a negative term reflecting the effect an increase in this facility's capacity has on the revenue of other facilities. Thus, starting from the monopoly optimum, the competing firm has larger marginal revenue for X but the same marginal cost as the monopoly. Competing firms admit more foreigners than monopoly. This is the usual result.

Equations (20) and (21) manipulate the first order conditions for choice of Z under competition and monopoly and omit j superscripts.

$$(20) \quad XP_z = C_z$$

$$(21) \quad XP_z + X^k P_z^k = C_z \quad \text{all } k \neq j$$

As before, in (20) and (21) the right-hand terms are marginal cost, this time of development intensity. Starting at the monopoly output, marginal cost is the same under monopoly and competition. The left-hand terms are marginal revenue. The monopoly includes a negative term showing the effect an increase in this facility's intensity has on revenue of other facilities. Once again, the competing firm has larger marginal revenue for Z but the same marginal cost

as the monopoly. Competing firms produce more intensely developed facilities than a monopoly chooses.[11]

If a competing firm chooses X holding Z constant or Z holding X constant, the model's predictions are unambiguous. A global maximum for the competing firm likely occurs in the direction of higher Z and X, although nothing in the model guarantees this result. A sufficient condition to increase both is that a tangent plane exists for competing firms at the monopoly maximum.

Given that the monopoly has chosen global maximum, increasing both X and Z reduces profit. If the competing firm increases X and Z by some amount, the cost increase is identical to the monopoly, but the competing firm earns more revenue. Once again, the competing firm does not face the opportunity cost of lost earnings to other facilities. An increase in both X and Z increases a competing firm's profit.

The global maximum for the competing firm may be located at some other combination, however.[12] The firm would never reduce both X and Z, using symmetric reasoning why it gains by increasing both X and Z. What about the other two possibilities?

Consider the possibility that competing firms choose more capacity (X) but lower intensity (Z) than a monopoly. For simplicity, assume production cost is the same at the monopoly maximum and the competing maximum. The competing firm choice must increase revenue where a similar choice

would reduce monopoly revenue. This occurs when loss of revenue by other monopoly facilities (negative external effect) is larger than the positive own effect on revenue. Other facility demand curves must shift more because of a change in own price than because of a change in own intensity. X is less important or more substitutable to consumers between facilities than Z.

Likewise, for a competing firm's revenue to increase, demand must be elastic enough so that the increase in revenue due to the increase in X offsets the demand shift due to lower Z. Once again, consumers respond more to a change in price per unit of capacity than for a change in intensity. Although no compelling reason argues for functions of this form in the case of park development, opponents of unrestricted concessions often argue competing concessions produce an excessive quantity of cheap and low quality facilities (Ise 1961).

The other possible response by competing firms seems more plausible in the case of foreign visitor demand functions, but intuitively less plausible. Symmetric reasoning from the previous situation suggests a decrease in X and and increase in Z under competition is more likely if foreigners are more sensitive to changes in intensity (quality) than to changes in price. This is a reasonable assertion if foreigners spend a substantial sum just to get to the park or if they tend to be wealthy. However, this

result jars economic intuition since it envisions competing firms rushing to raise price and reduce quantity.

The simple result that competing firms increase both capacity and intensity remains the most compelling. The possibility of another result cannot be rejected, but predicting such a result requires additional information about actual functional forms.

5. Monopoly is Superior

A park manager's objective is to allow that capacity and intensity of development which maximizes the park's net social value. For the usual applications of welfare economics, net social value is defined as the sum of consumer and producer surplus, the area under the appropriate demand curve less opportunity cost of production. By this definition, monopoly is considered inferior to perfect competition since the monopoly produces an output at which some consumer and producer surplus is lost.

The manager of the sort of park considered in this model seeks to maximize the park's social value to the nation's citizens. As such, a manager is interested in foreign visitors only insofar as they spend valuable foreign currency within the country and to the extent that their presence makes domestic visitors worse off. Development, which attracts foreign visitors, is valuable only as it

earns foreign currency and costly as it discourages domestic visitors and consumes the country's valuable resources.

Apparently contradicting traditional theory, this paper concludes monopoly concessions are superior to competing concessions. Not surprisingly, the contradiction is only apparent. Given its assumptions, this paper's conclusion is consistent with traditional theory. Monopoly concessions are superior to competing concessions because monopoly concessions result in more profit from foreign tourists and greater value to domestic visitors.

Foreign visitors to a park are only valuable as they spend foreign currency in excess of cost. A monopoly selling developed facilities to foreigners maximizes foreign currency revenue less operating cost. Competing concessions earn less economic profit than a monopoly, perhaps zero economic profit. Since foreigners are only valuable for their currency, the usual normative judgments against monopoly do not apply. The deadweight loss of consumer surplus due to monopoly pricing is not important since foreign consumer surplus is not important. The usually unimportant (or undesirable) transfer of consumer surplus to monopoly not only is important, but is a desirable transfer from foreigners to a domestic firm.

The profit in foreign currency earned by a monopoly is the first of two reasons monopoly concessions are superior to competing concessions. A monopoly concession is also preferred by domestic visitors. Since they gain value from

a park's natural features, any reduction in development makes domestic visitors better off. As previously shown, a monopoly concession produces a lower capacity and intensity than competing concessions. In addition, the number of domestic visitors is greater than under monopoly.

The conclusion that monopoly is a superior producer of park development is a result of the assumptions of the model. The conclusions may change if these assumptions are altered. Subsequent sections of this paper consider the effect of adding some complexity to the assumptions.

6. Price Discrimination

The simple theory of monopoly assumes only one price is charged. The theory's conclusions change when the monopoly is permitted to price discriminate, defined as charging different prices to different consumers, prices based on willingness to pay.

A monopoly which price discriminates earns more profit than the simple monopoly, profit from two sources. For one, consumers who purchased the product from the simple monopoly now pay a higher price, at the extreme, a price equal to maximum willingness to pay. Second, the price discriminating monopoly sells its product to consumers who did not purchase from the simple monopoly. A price discriminating monopoly sells its product as long as the price it can charge a consumer or group of consumers is higher than cost of production. A perfectly price

discriminating monopoly produces the same output as under perfect competition, and earns as additional profit the entire consumer surplus present under perfect competition.

To a park manager, the additional profit earned by a discriminating monopoly makes it more attractive than the simple monopoly. Additional profit is earned from foreign tourists whose currency is valuable. To the extent that a price discriminating monopoly increases output, the superiority of monopoly over competition in supplying development is not assured, however. Since a price discriminating monopoly increases development, domestic visitors are worse off.

Either of the monopoly situations is superior to competition since each either implies more profit from foreigners and, at worst, no more development than under competition. However, it is possible to determine which of the monopoly situations is preferred only by measuring demand curves and assigning relative weights to foreign currency and domestic consumer value.

7. Price Controls

One popular policy chosen by park authorities who grant monopoly concessions is to impose a price ceiling.[13] This common price control is also a clearly incorrect choice. In the usual case, a price ceiling is used to force a monopoly to increase output and to reduce profit earned by the monopoly. Obviously, these two effects are exactly the

opposite of the desired result for the manager of the sort of park considered in this model. The price control reduces the valuable currency earned from foreign tourists and increases park development.

The conclusion that a price ceiling increases development is unambiguous so long as development has only one dimension. Since price controls are typically defined only on quantity (capacity), a monopoly tends to evade the restriction by manipulating the uncontrolled dimension. To the extent that development intensity is substitutable for capacity, the price control's effectiveness is reduced.[14]

Such a possibility leaves this paper's conclusions materially unaffected, however. Either the price control is effective and so undesirable, or the price control is ineffective and so useless. Both cases argue against imposing the restriction.

How would a monopoly producer of park development evade a price ceiling? Figure One illustrates the monopoly response.

An uncontrolled monopoly chooses X and Z (for facility i) to maximize profit (R*, X*, Z*). Other choices of X and Z imply lower profit and represented by iso-profit contours $R_1 > R_2$. For a given controlled price, the monopoly can choose a variety of combinations of X and Z, represented by the price locus PP. A lower price control moves PP to the right, and a higher (less restrictive) price control moves PP to the left. The monopoly picks the combination of X and

Z along PP tangent to the highest profit contour (X_2, Z_2). Given well-behaved functions, the constrained monopoly chooses more X and less Z than without a price control.

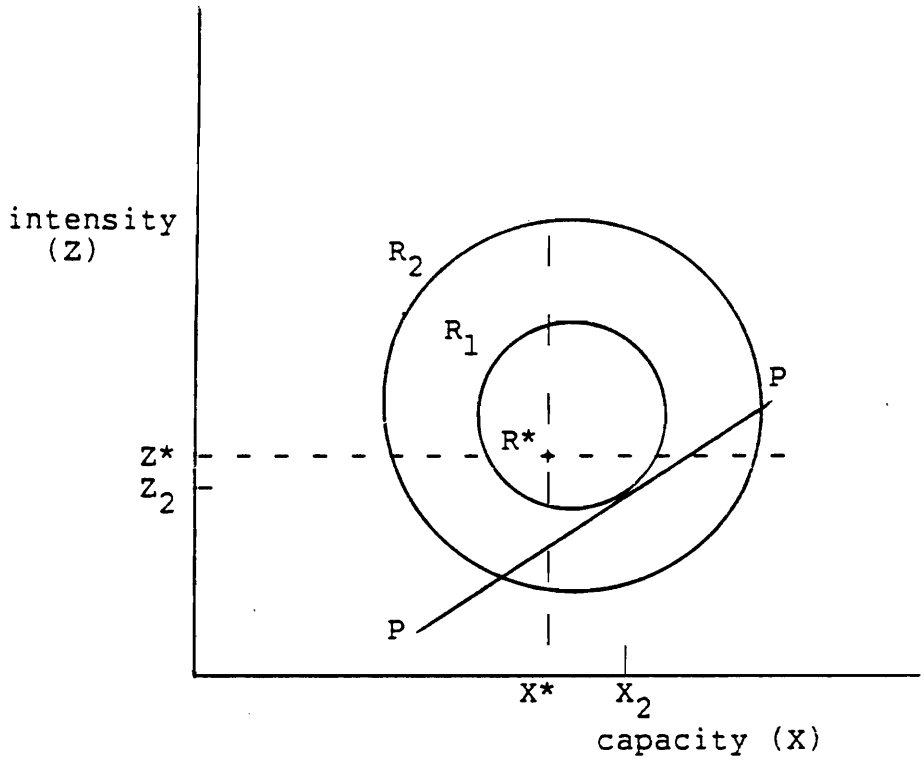

Figure One

Monopoly Response to Price Ceiling, Ordinary Case

The monopoly might also reduce both X and Z or increase both. The latter is the more likely of these two non-standard cases. It is reasonable to assert that as Z increases, tourists become less responsive to changes in price and so more responsive to changes in X. This is similar to asserting that high quality items have less elastic demand curves than low quality items. Such an assumption means the iso-price loci become steeper as Z increases. As Figure Two shows, the steep and increasing slope of PP makes it more likely that the monopoly responds to the price ceiling by increasing both X and Z (X_3, Z_3).

In addition, the iso-profit contour map is likely not strictly circular. To the extent that contours are ellipsoidal with major axes tilted toward the origin, monopoly is more likely to increase both X and Z. Refer again to Figure Two. Strong complementarity in cost of X and Z could create such a shape [$\partial(-C_x/C_z)/\partial X$) small enough].

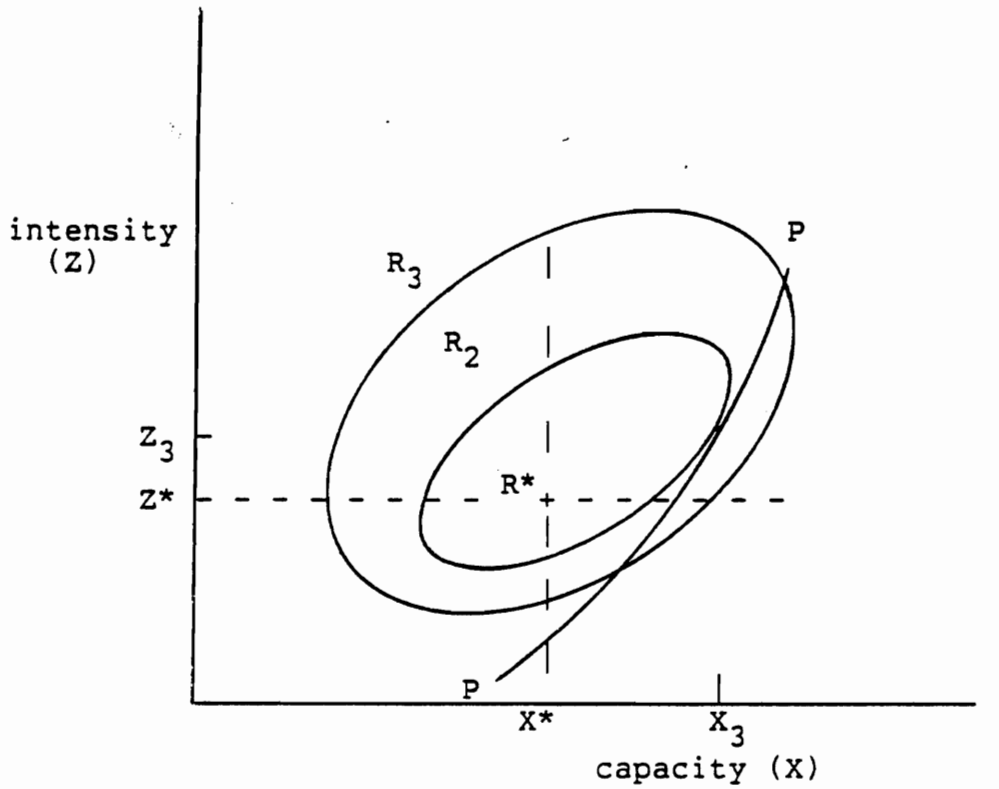

Figure Two

Monopoly Response to Price Ceiling, X and Z Increase

As worst, price controls on a monopoly concession increase (undesired) development and reduce foreign currency earnings. At best, the monopoly (or for that matter competing firm) response is unpredictable without considerable detailed information about monopoly cost, production, and revenue and without data comparing domestic visitor attitude toward development capacity and intensity. Price controls are a poor policy choice.

8. Non-Competing Services

The park manager is faced with more than adopting a policy toward competing concessions. Some concessions provide services which do not compete but are complementary, a park restaurant and housing being an example. The park manager may choose to allow separate firms to provide such services or permit a kind of conglomerate merger by allowing one firm to offer several of these services.

Two related effects of this integration are relevant in the case of park development aimed at foreign tourists. First, such integration overcomes some of the public goods aspects of advertising. Second, integration can assure consumers uniform quality given limited information. The various managerial and pecuniary economies of conglomerate merger are not considered here in favor of addressing aspects unique to this particular type of national park.

Advertising provides potential foreign visitors valuable information about characteristics of the advertised product. Much of what makes park facilities appealing is the attractive features of the park itself. If one firm advertises the attractions of a park in conjunction with facility advertising, other firms in the park benefit. Visitors attracted to the park because of the advertising use some unadvertised facilities. Because of this public goods characteristic of advertising, each firm ignores the benefit to other firms of its advertising and exploits the advertising of other firms. A single integrated firm overcomes the public goods problem since advertising only benefits that firm. The integrated firm produces that quantity of advertising which maximizes the value of all advertising less cost.

Similar reasoning suggests an integrated firm can assure uniform quality from the various components of a developed area. The cost to a foreign visitor of learning about the quality of each service in an area may be substantial. The knowledge that all services in a park are provided by one organization assures the visitor uniform quality from a variety of services.

Of course, sufficient advertising may be provided without vertical integration. Local tourist associations, local government agencies, or national tourist agencies provide group advertising funded through various contribution schemes or taxes. In this case, integration

affords no advantage. Valuable quality information may be provided without integration also. Tour books, quality ratings, and trade associations can provide information about quality. Here firms producing development can jointly produce information or independent organizations can gain by selling information.

9. Conclusion

If parks have particular characteristics, park managers should grant firms exclusive right to provide products or services within the park. Thus, contrary to the usual case, the manager is wise to allow monopoly provision of park development. The particular characteristics include that park development is only attractive to foreign visitors, that foreign visitors are only valuable for the currency they spend, and that development and congestion reduce the park's value to domestic visitors.

A park manager seeks to maximize the sum of foreign currency earnings less production cost of development and consumer surplus of domestic visitors less travel cost. Permitting monopoly to provide development means maximizing net revenue from sale of services to foreigners. Monopoly concessions also mean less development is produced than under competing concessions. Less development and fewer foreign visitors mean increased value to domestic visitors.

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Footnotes

[1]U.S., National Parks Act, 25 August, 1916, 16 U.S.C. 1.

[2]New Zealand, National Parks Act 1980, Part 1, sec. 4(2)(a); sec. 4(2)(e); sec. 15(2). Enactment No. 66, 1980.

[3]Data for several years provided by New Zealand Tourist Hotel Corporation.

[4]Ise (1961), pp. 661-2.

[5]At least one author (Leffler 1982) defines quality as the proportion Z/X. This is a useful framework when quality is readily definable as units of one characteristics per unit of output. However, more often in issues of park development, quality or intensity are characteristics shared in common by users. Luxurious common areas, extensive landscaped grounds, and highly developed recreation areas are examples of shared development. In this case the important issue is not quality per unit of output (Z/X), but total intensity of development (Z). Adopting Leffler's view of quality does not alter results of this model, however.

[6]Travel cost need not be assumed identical. If each traveller has different cost, the V function can be defined as rank-ordered reservation prices net of travel cost for

domestic visitors. Travel cost is then included in the V function. Results are not affected.

[7]That it reduces the value of a visit is one of several ways to view the effect of congestion on an individual. For some examples see Newbery (1975), Price (1980), and Cicchetti and Smith (1976). For a discussion of congestion's effects with more than one park see Cesario (1980). For visitor survey research see Fisher and Krutilla (1972) and Groves and Kahales (1976).

[8]If intensity is not readily measurable by consumers firms might misrepresent themselves and compete by reducing intensity to reduce cost. Some authors consider this possibility in markets where sellers can choose product quality. See for example Akerlof (1970) and Darby and Karni (1973).

[9]External effects on cost functions may also be present. For simplicity they are omitted here.

[10]That the relatively small number of firms typically granted concessions in a park follow this Cournot assumption is only one possible approach. Results are unaffected by adopting any one of a number of common alternatives. That a small number of firms commonly behave in a competitive manner is confirmed by Kwoka (1979) for manufacturing firms.

[11]Other authors reach similar results when predicting differences in product quality under competition and monopoly. Spence (1975) models choice of product quality in a general framework. Fournier (1985) examines competition

in product quality in the television industry where entry is restricted. Parks (1974) examines differences in product durability under monopoly and competition.

[12]Defining quality as Z/X, and making strict assumptions about consumer preferences, Leffler (1982) shows how differences between monopoly and competitive quality cannot be predicted without information on functional forms.

[13]A second type of price control is a price floor on a discriminating monopoly. If a price floor is imposed, the monopoly reduces capacity. As before, however, if development intensity is imperfectly enforced, the monopoly will tend to evade the price control by increasing intensity of development. A third price control is a price floor imposed on competing firms. This has an even greater potential for evasion since competing firms have considerable incentive to evade controls.

[14]The effect of price controls on the airline industry is discussed by Douglas and Miller (1974).