CHAPTER 3

Baumol Hypothesis

"Ah, but I was so much older then,
I'm younger than that now."
Bob Dylan

In the history of economics applied to the business world, many scholars and practitioners were sceptical about the focus on managerial behaviour. During the latter half of the 20th century, managerial theories of the firm began to emerge in the literature as economic theories on how the behaviour of modern management affected the working of the economic system, rather than the other way around. The debate on strategy determining structure is implicit in the Chicago hypothesis of modern antitrust, and the Chandler dilemma is a key component of strategic management. They have, however, been the subject of considerable research in the management literature.

This book is not about the models per se; however, some of the managerial models will inform our discussion of type. As suggested, Baumol type is related to the fundamentals of the Baumol model: there is a correlation between price and total revenue, depending on the price elasticity of demand. When a price reduction is observed, rival management should stop and think: is it a one-shot price reduction to increase total revenue or not? How rival management respond depends on their belief system and on what they observe as signals in the market.

So type is ascribed to management as a unique, and sometimes idiosyncratic, behavioural characteristic that can be inferred from understanding the motives of management. Arguably, management in debates over strategy can look to behavioural theories about type to gain a better appreciation of the assumptions and foundations of their own business acumen. For type to be relevant to understanding modern business, we will argue throughout that outcomes, as measured by key financial indicators, are equally likely across management but that information about a competitor's management type delivers a competitive advantage.

Oligopoly n < 5

Five is the key number of competitors (n) in a market. With five or fewer competitors, each competitor becomes increasingly aware of the degree of mutual interdependence amongst the group. Framework Tn=3 could provide management with a framework for assessing the

competitive environment in markets increasingly defined by a smaller number of competing firms. How small? Markets are increasingly characterised by five or fewer rival competitors, the quintessential oligopoly market structure. In everyday experience, management as a team are concerned with price and quantity outcomes in an oligopoly market and how those outcomes could change from one particular circumstance to another in that competitive environment. For example, the appointment of a new chief executive officer by a rival could change the outcomes and indeed the dimensions of the game.

In the literature, dissatisfaction with the simple conception of a firm as a mechanism that transforms atomistic inputs into marketable outputs has resulted in alternative perspectives on the firm. New emphasis has been placed on the internal structure of the corporate firm, and the emerging managerial theory emphasises the complex nature of the modern corporate firm. In their pioneering work, Berle and Means (1932) describe the diminishing influence of shareholders in the decision-making process of large corporations in the United States from the turn of the 20th century. This left much of the decision making to management, whose objectives, it was suggested, could be different from those of the owners of the firm. If, in terms of its influence on managers' salaries, size of firm, for example, was more important than firms' profitability, then growth could be a more important objective of firms than profit. This is the key to unlocking the third variable.

Other reasons were advanced as to why management may be more preoccupied by sales or revenue maximisation than by profit maximisation (Baumol, 1967). If sales fail to rise, this is often equated with reduced market share and market power, and, consequently, with increased vulnerability to the actions of competitors. Under a zero-sum constraint, management may not realise their sales targets as rivals poach market share. When asked about the way his company performs, an executive would typically reply in terms of what the firm's levels of sales are. The financial market and retail distributors are more responsive to a firm with rising sales. The model developed by Baumol attempts to reconcile the behavioural conflict between profit maximisation and the maximisation of the firm's sales, its total revenue. It assumes

that the firm maximises sales revenue subject to a minimum profit constraint.

Elasticity

The revenue-maximising level of output is the level at which the marginal revenue is 0 and the elasticity of demand is 1. For a Baumol total, revenue sales maximising firm prices are low when demand is elastic, that is, for every 10 per cent reduction in price, total revenue would increase by at least 10 per cent. Embedded in the demand relationship is a measurement of how responsive demand is to price changes. This is called price elasticity, ϵp. It is a key link between price and total revenue. A supplier will supply more if the price increases, subject to production constraints. However, at the higher price with greater supply, a key question remains: Is the total revenue accruing from the additional supply higher than before the price change? This goes to the heart of the concept of elasticity, which measures the responsiveness of demand to price:

$$\epsilon p = \%\Delta q / \%\Delta p$$

Remember that the formula for total revenue (TR) is TR = p.q. So any change in TR can come about from either a price change $\%\Delta p$ or a change in demand (at a given price) $\%\Delta q$.

The q is the amount of product purchased by the normal rational consumer. For some products, if the price increases, then TR will increase. There are products for which TR will increase only if the price actually falls. The former are inelastic products, and the latter are elastic products — the key driver is the responsiveness of demand to price changes. This is clearly illustrated later in this chapter.

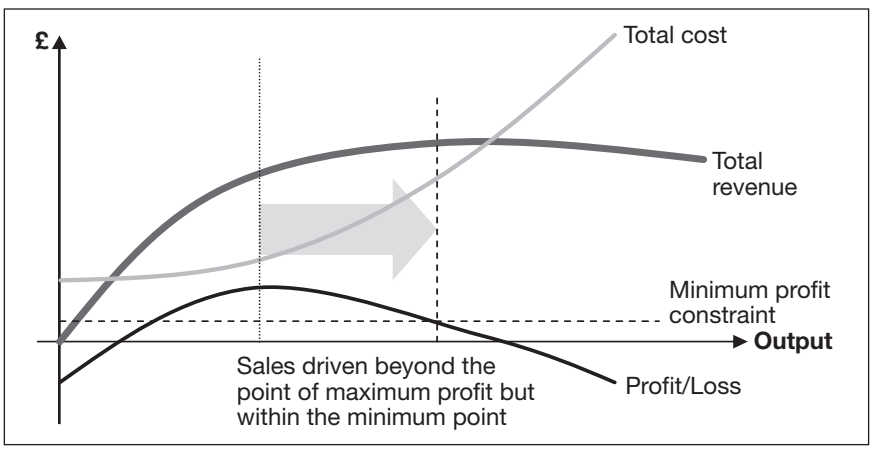
Baumol Type

A Baumol type focuses on pricing as a driver of revenue and volumes but may face a cost-volume constraint. Market share is the Z variable and lower profit margins are in a trade-off with higher volumes. Competitors would observe a Baumol-type strategy based on leveraging

revenues from a pricing policy. Provided demand is sufficiently elastic, a price reduction should produce the increase in intended sales revenue. It is by reducing price that management are able to maximise revenue yield from the asset. This is better known in the industry as yield per passenger, average revenue per user (ARPU) or simply 'bums on seats' pricing.

The business model works until elasticity falls: initially elasticity is high as consumers switch from good or service x to the Baumol good or service y, but the preference set of the once-x-now-y consumers changes as they experience the good but with lower opportunity costs. These are known as switching costs. To understand this, recall that the revenue is $TR = p.q$ and that $\Delta TR = \Delta p.q$ is to be followed by Δq at the new lower p, Δp. There is a sequence in pricing as revenue awaits the lag in quantity-sales response. For various reasons, particularly to do with quality and price, consumers may be weary of a price reduction from the higher priced elastic segment. In that segment, the higher prices have been sustained and supported probably by increased advertising and consumer persuasion. Or the Δq may not materialise as consumers remain loyal to a rival player, or indeed, even with $\Delta p = 8$, the final lower price may still be higher relative to a rival's

Figure 3.1
Baumol Model



price. So Baumol pricing, favoured by the low-cost airlines model of revenue yield management, would fit into the top right-hand corner of Table 3.1.

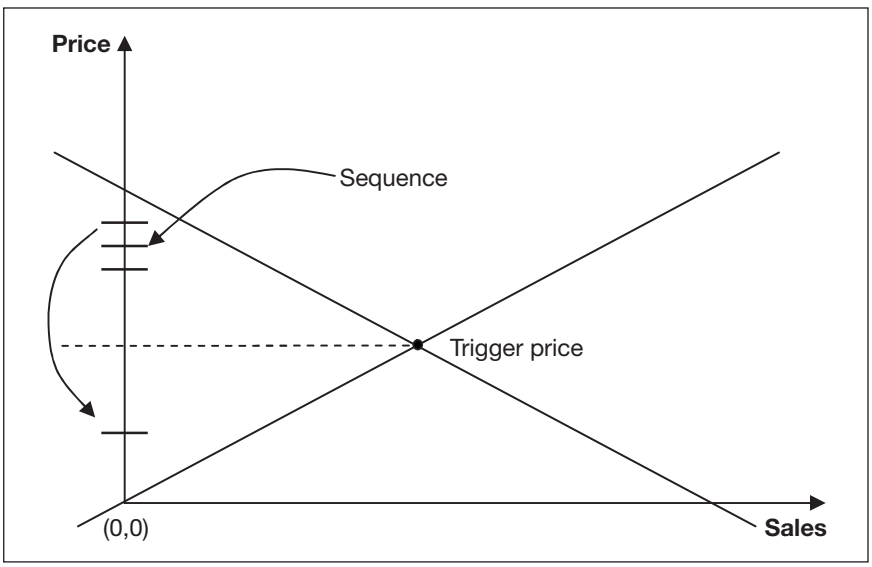
Table 3.1
Total Revenue Test

	Price Increase	Price Decrease
Ep > 1 Elastic	TR decreases	TR increases
Ep < 1 Inelastic	TR increases	TR decreases

Paradox of Tumbling Price

There is a trigger price, at which point elasticity changes from an elastic range above the trigger price to an inelastic range below the trigger price (see Figure 3.2). At the trigger price ep = 1. It is significant because

Figure 3.2
Trigger Price



it determines the total revenue response to any price change. Consider the following example: if the current price is 40p and a trigger price is to be computer-generated at 31p, it will be strategic for management not to proceed with a 10p reduction in price, because at 30p the reduced price is less than the trigger price: 30p < 31p. Instead, a price reduction of less than 9p (no more than 8p) would fall within the trigger price boundary constraint, and as price falls from 40p to 32p, revenue should increase under the total revenue test. The trigger price can complement the mark-up price P > AVC and the net margin price P > AC, where AVC is average variable cost and AC is the total average cost.

Sales Fuel Profits

The paradox can be overcome by price positioning with different prices at different times for different consumers. The paradox adds to the complexity of what price to charge by raising the issue of how much the reduction or increase in price should be. That belies the fact that management would always wish to reduce price, outside the remit of price wars, price promotion and price discrimination. Conversely, increasing price from a relatively lower base requires sufficient spend on advertising to ensure that that segment of the demand function complies with inelasticity. Empirical evidence has concluded that increased advertising expenditure rescues the elasticity of demand less than 1, but this applies to the entire range of the demand and refers to the overall slope of the demand (Schmalensee, 1979). In the segment, management should think of the low price as a penetration price strategy, and once price is well below a trigger price, only then should a price increase be considered. And if advertising expense is increased, the lower segment encroaches more of the entire demand. In other words, an inelastic entire demand will have a greater probability of inelastic segments. It is important for management in general to realise that sales revenue growth (ΔTR) adjusted for market growth represents market share gain. Essentially, management are creating demand as well as building a brand.

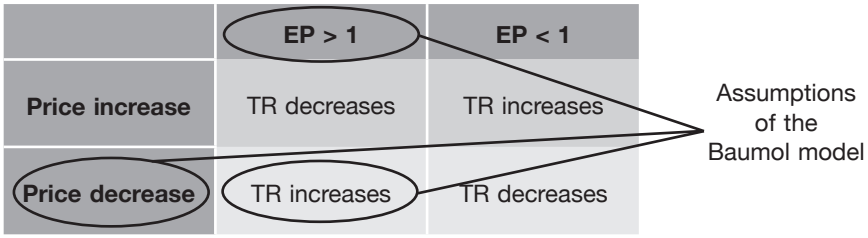
Mr Mun and Mr Hotelling

A strategy to achieve sales revenue growth can be found in Mun's mercantilist theories. According to Mun's strategy, a product enters the market at a lower price, market share is cultivated, and then, only then, should price increase, ensuring a small but insignificant drop in sales revenue. This strategy is better known in marketing as 'penetration pricing'. If a trigger price is high, because of the low level of elasticity, then management should consider positioning the product's price at the higher end of the price scale and, in effect, be dissuaded from reducing price. In the latter case, even with the poaching of market share by generic products, branded products should distance their price as far away as allowed by the boundaries of the trigger price from the relatively lower priced generic.

This line of argument accords with an interpretation of Hotelling's maximal differentiation principle. And as an intermediary price strategy, price discrimination should be considered as a deliberate non-price war attempt to offer consumers a range of prices for the same product. First-degree discrimination requires arbitrage and negotiation and is more appropriate for the pricing of services. For example, in holding on to clients' accounts, advertising executives may engage in this form of pricing. But it is the second and third degrees that should interest the discerning strategic player. With second-degree pricing, volume discounts, as well as coupon pricing and the 'six-pack phenomenon', are offered. Under third-degree pricing, depending on how the market is fragmented, different prices could be charged to different consumers at different times of day. Ironically, third-degree pricing allows management to pass the total revenue test, as the relatively lower price is charged to the more elastic segment of the market (see Table 3.2).

Each of these pricing strategies allows management to price-position their products while taking cognizance of the boundaries of the trigger price. Price as a signal impacts on the magnitude of any price change and also guides as to the appropriateness of the price direction, for a given demand function. While recognising that demand can both shift and change in slope, the trigger price develops a strategic angle when complemented by the three price strategies just discussed. What

Table 3.2
Price Elasticity and the Impact of Pricing Decisions Revenue



is important is the relevance of elasticity to the debate; it is more than a response variable, and it has a very important and strategic role to play in any pricing game. While the behavioural models help to instill greater realism into economic modelling, the profit constraint is still an absolute. Should the firm continue to make extremely irrational decisions, then eventually the economic consequences of failing to maximise the profitability of the company will take their toll. The degree of leeway in performance would therefore be proportional to the size of the firm, its market share and the profit margins that it enjoys. Ultimately, it depends on management type.

Elasticity and the Want Paradox

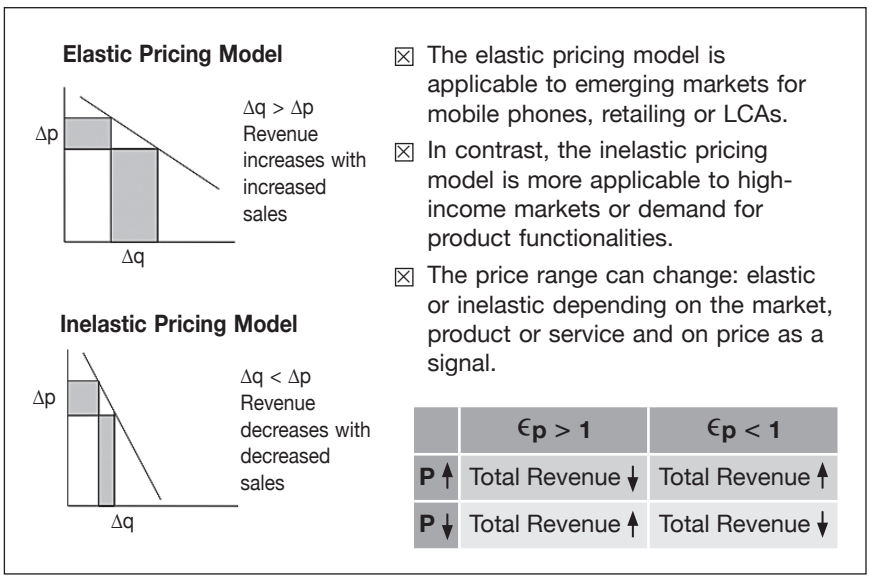
If price is the key driver of revenues in the business model, then product price elasticity of demand has to be computed. Although net total revenue will increase for a product with elastic demand, as price falls there is a danger that in a product market wherein consumers expect more 'bells and whistles' net total revenue will fall as price falls. In other words, 'bells and whistles' reduce the price elasticity of demand. This has an interesting application to the low-cost airlines (LCA) pricing model. Low prices initially persuade passengers to switch from rail or ship to plane, but as passengers become more accustomed to airline travel, they expect more bells and whistles for the low price. A change in their elasticity will frustrate the revenue projections within the LCA pricing model, unless:

(1) there is greater price discrimination to exploit different elasticities of demand, or
(2) the geography of the market expands.

Paradoxically, as the LCA player enters new markets, the increase in player competition in the geographic market will generate an elastic (industry) demand (see Figure 3.3).

Significantly, passengers who may never have travelled by plane will be most vociferous in demanding the bells and whistles. It is the phenomenon of the want paradox: we do not need the product called 'unknown', but once it is available we all want 'unknown' and wonder how we survived without it. The fax machine, email and mobile phones are modern examples of this phenomenon, the impact of which is to reduce price elasticity. But product life cycle may be short, as new 'unknown' products emerge, displacing existing products — for example, email replacing fax — or more bells and whistles are expected, as with mobile phones, where preference is as likely to be determined

Figure 3.3
Pricing and Total Revenue Test



by the pixel quality of the inbuilt camera, the speed of video download, gigabyte capacity for music content or some other functionality as it is by the actual price or tariff charged.

But do we — as rational consumers — buy goods? The purchase of a smartphone, for example, is about belonging to an ecosystem — the iOS; buying coffee is more about the coffee experience, and buying a house is more about living in a preferred neighbourhood. In other words, the product is a process wherein you — the consumer — want x rather than the good that produces x. The consumer has time-dependent preferences. Price and income are of secondary importance in explaining demand as the rational consumer waits. It is not that an iPhone 5 is a smartphone *per se* that can explain its demand, but rather it is the **process** that you — the consumer — want. Consequently, demand is inelastic and the rational consumer's real price can be defined by the zero price (0,0) equation:

$$(0, 0) + \text{Opportunity costs (waiting time)} = \text{Real Price}$$

The player delays the product to market, a rational consumer waits; the more the consumer is prepared to wait, the longer the delay to market. The delay creates an inelastic demand and, on arrival, the price of the good is higher than it would otherwise be in a competitive market. The player does not carry inventory; you — the consumer — however, do incur waiting costs. Later, in Chapter 5, we address this phenomenon as 'production driving demand' and integrate it into a strategic response from a player faced with consumers with time-dependent preferences.