Chapter 4. Separation
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When a successful business venture develops an innovation, its launch yields high profits temporarily, then profits fall towards zero as the innovation disseminates and competition intensifies. Over its lifetime, the venture’s profits equal a fraction of the innovation’s social value – usually a small fraction – and the rest goes to other firms as profits and to consumers as “surplus.”¹ Since the social value of an innovation far exceeds the innovator’s profits, venture profits provide deficient incentives to innovate.

To increase innovation, law and policy should increase its profitability. Figure 4.1 expresses this idea. (It is essentially the same as Figure 2.4 in Chapter 2.). The vertical axis represents venture profits, which equal the discounted present value of the stream of revenues from the innovation’s sales, minus the discounted present value of its development and production costs. The horizontal axis arrays ventures by profitability from high on the left to low on the right. With open competition, investors will finance ventures until profits fall to zero. Development stops when the present discounted value of revenues equals the present discounted value of development and production costs.

Figure 4.1 contrasts venture profits under two different legal regimes. Under the original law, venture profits reach 0 at innovation I. Improved law changes the situation by shifting the venture profit curve up as indicated by the arrows, so venture profits reach 0 at innovation I*. Thus improved law increases the number of innovations that get developed from I to I*. The figure depicts the increase in one period of time. If better law increases innovations in every future period of time, then the sustained growth rate increases. (Figure 4.1 depicts one of several ways that improved law increases growth by increasing the profitability of innovation.²)

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¹ By definition, the consumer’s surplus equals the difference between the price that a consumer would be willing to pay for a good and the price that he actually pays.

² Figure 4.1 does not depict the speed with which an innovation is developed. In a race to innovate, the expectation of higher profits may cause an entrepreneur to develop an innovation faster. Faster development affects infra-marginal innovations, not just the marginal innovation I*.
How much should law ideally increase the profits of innovative ventures? To maximize social welfare, according to the overtaking principle, law and policy should increase venture profits as much as possible. You might doubt the overtaking principle or the conditions that make it true, but when you consider the historical record you cannot doubt that sustained growth in a comprehensive measure of consumption dramatically improves social welfare. Nor can you doubt that faster sustained growth would increase social welfare faster. In any case, this book is playing the intellectual game of law and growth economics whose objective is to maximize sustained growth.

**Paradox of Growth**

Law and policy rests on a paradox, like “This statement is false.” The paradox of growth is that rapid innovation requires competition for extraordinary profits. This is a paradox because “perfect competition” in economic theory implies that all firms earn ordinary profits. If some firms earn extraordinary profits, competition must be imperfect.

How can law and policy combine intense competition and extraordinary profits for innovators? Patent law illustrates the solution. Chapter 2 distinguished a venture’s phases into development, launch, and imitation. Patent
law opens competition to develop patentable innovations, closes competition when development succeeds and the inventor gets a patent, and restores competition eventually when the patent expires. The formula for maximizing growth is open competition to innovate plus temporary market power for successful innovators.

With open competition to innovate, everyone is free to launch a venture and develop an innovation. Firms compete to launch business ventures and earn extraordinary profits. The development of innovations is very risky, and entrepreneurs take the risk in the hope of earning extraordinary profits. Monopoly is more profitable than competition. With higher profits, more ventures launch. Ventures launch until the marginal venture expects to earn zero profits, as depicted in Figure 4.1. Market power for innovators causes more competition to innovate.

Subsequent chapters in this book apply this formula to different bodies of law. Besides patents, many other kinds of law affect a business venture – property, contracts, torts, corporations, finance, regulations, antitrust, and taxation, to name a few. They should have the same aim as patents and use the same formula to combine competition and market power. The aim is to maximize the profitability of ventures in open competition to develop innovations. The gain from growth in the long run will overtake the loss from higher prices in the short run.

This is not the conventional approach in the economic analysis of law. The conventional approach first observes that a venture incurs losses in development, so overall profitability requires extra profits after development. How much extra? The usual words are “sufficient,” “adequate,” “cost-recovery,” or “break-even.” Second, the conventional approach notes that market power for a firm increases the price of its product to consumers. The words are “excessive,” “inefficient,” or “distorting.” Third, the conventional logic concludes that law affecting market power should balance the gain from faster innovation and the loss from higher prices for consumers. The words are “tradeoff” and “optimal.” Unlike the conventional approach, our words are “maximize innovation.”

3 A patent cycle begins with competition for a market, and ends with competition in a market. The phrase “competition for a market” was used by Bill Baxter to analyze antitrust law.
Producer’s Market Power

In microeconomics, perfect competition and monopoly are extremes on a continuum of power to set a good’s price. At the extreme of perfect competition, each seller must take the market price, not set a price. No seller can charge more than the market price because each buyer has so many alternative sellers. The demand curve is perfectly elastic. Furthermore, competition among sellers drives the market price down to the cost of production, so each seller receives ordinary profits. Moving along the continuum, as market structure becomes less competitive, a seller can set a price. Each buyer has imperfect alternatives among the sellers. The seller who charges a higher price will make fewer sales, not zero sales as in perfect competition. The demand curve is imperfectly elastic. Moving farther along the continuum, as the seller’s market power increases, buyers have fewer choices. At the extreme of monopoly, there is only one seller. Everyone who wants the good must buy from the monopolist. The monopolist sets the price above the cost of production and earns extraordinary profits.

When a firm uses market power to increase its price, part of the buyers’ losses transfers to the seller as higher profits, and part of the buyers’ losses does not transfer to the seller. “Deadweight” describes a loss without an offsetting gain. To illustrate numerically, assume that a seller earns 0 profits under perfect competition and 100 under monopoly. A change from competition to monopoly transfers 100 from buyers to the seller. According to standard economics, the seller gains less from monopoly than the buyers lose. Thus if monopoly causes the seller to gain 100, buyers may lose, say, 130. The difference of 30 is the deadweight loss.

Firms with market power partially solve the deadweight loss problem of monopoly by writing contracts. If there were no obstacles to bargaining, the monopolist and the buyers could write contracts that eliminate the deadweight loss. The contracts would charge according to a price schedule, not a single price. The schedule discriminates according to how many units of the good the buyer buys, charging a higher price for the first unit and a lower price for the last unit. By definition, a perfectly discriminating monopoly charges the reservation price to each buyer, so the marginal rate of substitution equals the marginal rate of transformation as required for static efficiency. With zero transaction costs, perfect discrimination eliminates the deadweight loss of monopoly. The deadweight loss occurs because the higher price causes buyers to purchase less of the good. When buyers forego some purchases, the buyers lose the gains that they would have enjoyed from these foregone goods, and the seller gains nothing from goods that buyers do not buy.

The standard analysis is somewhat more complicated than these remarks suggest because of the difference between long run and short run effects. In the long run, all of the deadweight loss falls on buyers, but in the short run sellers can also bear part of the deadweight loss. Note that in the standard graphical analysis, the transfer is a rectangle and the deadweight burden is a triangle.
power can raise prices to buyers and enjoy extraordinary profits. Static economics condemns market power as inefficient because the deadweight loss reduces wealth.

In contrast, growth economics condemns market power when it slows growth, and absolves market power when it increases growth. When does market power retard innovation, and when does it enhance innovation? As we explain, the identity of the buyers determines whether market power retards or enhances innovation.

Market power slows growth when a producer who does not innovate raises prices to innovators, so the cost of developing innovations increases and the profitability of innovation decreases. When profitability decreases, the marginal venture in Figure 4.1 shifts to the left as depicted by a move from $I^*$ to $I$. To prevent this slowing of innovation and growth, law and policy should suppress market power by non-innovating producers against innovators.

Besides raising the cost of developing innovations, market power of non-innovating producers has another bad effect. Prices guide entrepreneurs in deciding which innovations to develop. Market power of non-innovating producers has the bad effect of aiming innovation at the wrong target. Innovators develop substitutes that are no better than the original good, instead of developing better goods. We call this distortion of inventive activity the “mistargetting effect”.

To illustrate, a cartel that controls diamond mines and raises diamond prices spurs the development of manufactured diamonds. Manufacturers will profit from developing diamonds so long as the cost does not exceed the cartel’s price. Since mined and manufactured diamonds virtually indistinguishable, the only gain to society from manufacturing diamonds is to undermine the cartel’s price. The cartel’s price could be undermined directly by laws and policies aimed at reducing the market power of the diamond monopoly, without the cost of developing manufactured diamonds.

To illustrate abstractly, if the competitive price of good $\alpha$ is more than good $\beta$, then society values $\alpha$ more than $\beta$. However, the producers of $\beta$ might have more market power than the producers of $\alpha$, so the price of $\beta$ might occur because transaction costs makes perfect price discrimination impossible. Chapter 5 discusses these theoretical claims at length.
exceed the price of $\alpha$. Since the price of $\beta$ exceeds the price of $\alpha$, innovators might foresee higher profits from developing substitutes for $\beta$ rather than $\alpha$, even though society benefits more from the opposite.

When market power raises a good’s price, more innovators try to invent substitutes for it. The invention of a perfect substitute is costly. However, a perfect substitute is no better than the original good. The only consequence of inventing the substitute is to reduce the distortion from monopoly pricing. Law and policy could reduce market power without the expense of developing the substitute.

Economists sometimes make the same point in different language. By definition, a “rent” is income from owning something that is scarce. Compared to perfect competition, market power makes a good relatively scarce. Thus monopoly profits are “rents” from having market power. High prices charged by producers with market power causes innovators to invent substitutes. Inventing substitutes for over-priced goods enables the inventors to get a share of the rents for themselves. Thus market power causes innovators to “seek rents” instead of inventing better products.

We have explained two reasons why market power of non-innovating producers against innovators retards growth. The first and most important reason is the transfer of profits from innovators to non-innovators. The second and less important reason is mistargetting innovation. This analysis in growth economics reinforces the usual condemnation of producer’s monopoly in static economics.

### Innovator’s Market Power

If market power is condemned for non-innovating producers, what about market power for innovators? Does market power for innovators enhance or inhibit growth? Either effect is possible. This chapter describes the form of market power among innovators that usually enhances growth, and the next chapter describes the form that usually inhibits growth. The difference depends on who buys from the innovator. Divide buyers into non-innovating producers, consumers, and innovators. When the buyers are non-innovating producers and consumers, the innovator’s market power increases the inno-
vations price, which transfers wealth from producers and consumers to the innovator. The transfer increases the average profits of innovative ventures, which causes the marginal venture in Figure 4.1 to shift to the right as depicted by the move from I to I*. More resources are devoted to innovation and fewer resources are devoted to production and consumption. Thus market power for innovators against producers and consumers enhances growth.

Besides transferring wealth, the innovator’s monopoly imposes a deadweight loss on producers and consumers. If maximizing growth is the aim, the deadweight loss does not matter in the long run. The benefits of faster growth from an innovator receiving monopoly profits overtake the costs of the deadweight loss to consumers and producers (the “overtaking principle in Chapter 1).

To illustrate by our numerical example, assume that an innovator’s monopoly imposes costs of 130 on non-innovating producers and consumers. 100 transfers to the innovator as profits and 30 is deadweight loss. The transfer of 100 increases the profitability and rate of innovation. Faster growth creates long run benefits for producers and consumers that overtake the temporary loss totaling 130.

Consider new pharmaceutical drugs. Stronger monopoly powers for pharmaceutical innovators immediately increase the prices of drugs paid by consumers. The higher profits of pharmaceutical innovators cause faster development of better drugs. Consumers lose from higher drug prices and gain more from better drugs. Thus relatively cheap ulcer drugs replaced relatively expensive ulcer surgery.

Similarly, cotton manufacturers buy ever-improving looms. Patents on looms increase the price of cotton textiles in the short run, but patents increase innovations that lower prices in the long run.

The three effects of market power are transfer, deadweight loss, and mistanalysis. Analyzing these effects on growth implies a simple conclusion for law and policy. Growth economics prescribes market power for (non-innovating) production against innovation and consumption, and growth economics prescribes market power for innovations against consuming and (non-innovating) producing. In both cases, the aim is the same: to increase
the profitability of innovative ventures. We have arrived at the *separation principle*: law and policy should treat market power differently for producing and innovating, proscribing it for producing without innovating, and prescribing it for selling innovations for production and consumption.⁷

The separation principle can be explained in terms of externalities. Innovations build on each other. The value of each innovation spills over to other innovations, with large effects on growth. Each innovator contributes to economic growth that benefits others. Making an innovation increases growth whose benefits spill over from the innovator to others. In contrast, consuming an innovation or using it in production does not necessarily causes benefits to spill over to others. Thus innovation has larger external benefits than consuming or producing without innovating. The separation principle calls for transfers in favor of innovative activities with large external benefits.

### Conclusion

In static economics, monopoly causes buyers to pay more than the marginal cost of goods, so too little is consumed and produced. The remedy is to abolish market power and to restore competition whenever possible. In growth economics, however, market power is necessary to increase the profitability of ventures competing to innovate. Crossing the boundary between static efficiency and growth changes economics, like crossing the border from France to Germany changes languages.

Market power of sellers has three consequences affecting growth: transfer, deadweight loss, and mistargeting. When (non-innovating) producers have market power in the sale of goods to innovators, all three effects reduce growth and human welfare. Conversely, when innovators have market power against non-innovating producers, the overall effect increases growth and human welfare. The transfer of profits from static to dynamic activities increases growth, in spite of mistargetting, and deadweight loss.

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⁷ Note that the three effects of monopoly align in static and growth economics to reinforce the proscription of producer monopolies against innovators. The three effects do not align with respect to the prescription for innovator’s monopolies against producers. The prescription for innovator’s monopolies against producers rests on the transfers to innovators overtaking deadweight loss and mistargeting.
These facts imply the *separation principle*: to maximize growth, law and policy should separate innovation and (non-innovating) production. Growth economics proscribes market power for non-innovating production, and it prescribes market power for innovating against consuming and producing. The next chapter will analyze the effect of market power by innovators against each other.