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Do Minimum Length of Schooling Requirements for Professional Licenses Increase Quality?

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**Do Minimum Length of Schooling Requirements for Professional Licenses
Increase Quality?**

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Do Minimum Length of Schooling Requirements for Professional Licenses Increase Quality?

Abstract

A feature of licensing laws ignored by economists is the rule that potential licensees must meet certain length of time requirements before being allowed to take state board exams. This paper shows that these time restrictions prevent the highest potential quality entrants from entering the profession, at the same time that testing prevents the quality of entrants from being reduced. Both restrictions are shown to maximize the political support for transferring wealth to incumbent members of the profession. While the net effect of these regulations can either be to raise or lower the average wage of a professions licensees, it will unambiguously prevent the highest quality of new entrants from entering a profession.

JEL: L5, J2, I21

Key Words: Professional Licenses, Schooling, Quality

I. Introduction

Before entering a licensed profession in the United States, potential entrants are almost universally required to take classes. This does not simply take the form of requiring a fixed number of classes to be completed, but that the students spend a certain minimum period of time in school. For example, in every state an optometrist must first study in an accredited optometry school before taking either the national or state certification exams. Almost every state restricts accreditation to schools that ensure that the length of study is at least 6 terms of eight months each (Havighurst, 1973 and Bianco, 1993, pp. 697-704). Likewise, potential medical doctors must receive at least three-and-a-half years of schooling (Gee and Nourse, 1960 and Association of American Medical Colleges, 1980) and potential lawyers must spend at least two-and-a-half years taking classes in almost all states (American Bar Association, 1989). In many places, barbers must take nine months of schooling (see Table 1), and cosmetologists typically take even longer (Bianco, 1993, pp. 155-190). Similar rules exist for professions as diverse as addiction counselors, dental hygienists, electrologists, interior designers, morticians, nail technicians, nurses, and realtors (Bianco, 1993). By 1991, twenty-two states even required 100 percent attendance rates during classes for real estate licenses (National Association of Real Estate License Law Officials, 1991). In fact, the history of these time restrictions is quite long. 13th century guilds in medieval Paris and Genoa imposed rigidly regulated apprenticeships lasting as long as 11 years or 12 years (Epstein, 1991).

Contrast this with how people acquire Ph.D.'s. Surely most economists know of Ph.D. students who took only a couple of years to finish their degrees, while most spent much longer time. What would be the effect of requiring all graduate students to take at least, say, six years to complete their degree? This paper shows that if those who found the course work the easiest were generally also those with the highest returns to pursuing other careers, imposing such a time constraint raises the entry costs for the best potential entrants.

When administrators at professional schools, like medicine and law, are asked about their time requirements, the response usually focuses on the necessity of taking classes in a certain order. The difficulty with this argument is why such a restriction is necessary for professions ranging from medical care and law to barbering, but not for a profession like economics. Taking any type of class

out of order presumably increases the difficulty, but the student internalizes the benefits and costs from undertaking the more difficult course load. Assuming that a bright student taking extra classes each semester gets a B average and another student taking fewer classes each semester obtains the same B average, both supposedly master the same material.¹

Possibly, time constraints in occupational licensing requirements arise because certain skills that are acquired through experience are difficult to test. A physician's productivity may be enhanced through more classroom experience, and clinical, surgical, and laboratory skills may be difficult to evaluate through written examinations. These skills may be more easily evaluated by observing the prospective physician in a classroom setting. Presumably, an additional assumption — that the ability to evaluate these skills is impaired when a student simultaneously takes many classes — is also necessary to explain the time constraint rather than a constraint on the number of classes. Yet, even if this explanation is plausible for health care professions, it seems unlikely to apply to many of the professions that use time requirements to regulate entry into a profession. Why, for example, can not licensing boards adequately test would-be barbers' hair cutting abilities or realtors' understanding of present values and real estate law? The fact that these restrictions exist for a wide variety of licensed occupations suggests that difficulties in testing skills is not the primary explanation for minimum time requirements in occupational licensing regulations.

However, why would a professional association adopt such rules, since (as we shall show) they will lower the average ability of new entrants? If the point of the time restrictions is to solely reduce entry, why not instead just lower the pass rate on exams? The two different methods imply not only different speeds for entering a profession, but also different qualities of those who enter. What is gained by also sorting potential entrants through using the time restriction? This paper argues that at least part of the answer arises from the ability of incumbents in a profession to maximize total support for producing continued transfers. Existing licensees face a trade-off between maximizing their own rents and maximizing political support for these programs. By preventing the highest quality new entrants from entering the profession, existing members can let in more new members

¹ This assumes that the reduction in grades for the bright student is correlated with the reduction in difficult to test knowledge that was acquired during those classes.

without reducing the existing member's rents if the new entrants are of a lower ability and thus less close of a substitute for existing members. However, we show that testing plays an important role because rents will not be maximized if the quality of new entrants declines too much. Allowing additional members in through a time restriction is shown to generate more political support for the transfers.

In contrast to existing public interest models of how licensing determines who enters a profession (Leland, 1979), we allow licensees to be paid their marginal product, rather than the average product for the entire profession. However, even if all workers are paid only the occupation's average product, adding time requirements to licensing laws still makes it relatively more costly for the highest quality individuals to enter a profession. In Leland's model, licensing tests prevent low quality suppliers from entering; driving down provider's income; and thus forcing high quality, high opportunity cost professionals to leave.² One question is why it is possible for consumers to evaluate the *average* quality of care provided by the profession, but why they are not adept enough to evaluate the level of care that they themselves receive. Yet, even if Leland's assumption is true for professions like medicine where evaluating a service's quality *ex ante* is difficult and there are few repeat purchases, it fails to explain why these same rules also apply to other professions like barbering where products are easier to evaluate and repeat purchases are common. Even more puzzling, if licensing laws are trying to ensure that high quality producers stay in a profession, why are time requirements simultaneously discouraging the highest quality potential entrants from entering?

Relying upon consumer's inability to determine product quality *ex ante* also fails to explain why some of the longest apprenticeships in medieval Europe involved professions where it was relatively

² An insufficiently recognized paper by Carroll and Gaston (1981) provides direct evidence on whether licensing solves this information problem or whether it is a method of producing monopoly rents. If licensing raises the costs of optometrist services as the monopoly story says, it will cause consumers to reduce their purchases of service. Yet, if licensing is protecting quality as Leland argues, it should lower the true cost of buying high quality services and cause consumers to visit their optometrists more frequently. Carroll and Gaston use the number of blindnesses as their measure of output and find that the number of blindnesses increased after licensing was introduced. They also find strong relationships between licensing restrictions and lower quality for dentists, plumber, and electricians. Carroll and Gaston (1979) also find similar results for realtors. Other evidence by Leffler (1978), Moore (1961), Lueck et al. (1995), and Sass (1990) provide varying degrees of evidence for the public interest theory of licensing. (See also Darby and Karni (1973) concerning the difficulties in evaluating product qualities even after purchase.)

easy to evaluate the quality of the product prepurchase. For example, the apprenticeships were 10 years for making iron buckles, tables, and buttons in thirteenth century Paris and in Genoa, Italy it took 5 years to become a barber and 11 years to become a chest maker (Epstein, 1991, pp. 141-143).³

Nor is licensing the only method of preventing low quality entrants from driving out high quality incumbents.⁴ Alternative reputational mechanisms can also arise to ensure and differentiate qualities. Presumably, high ability doctors would have strong incentives to differentiate the quality of their services. If consumers indeed were capable of evaluating statistics that pertain to a large number of cases but not the information on their own particular case, it would seem that there should be safety in numbers for high-quality doctors. What is it that licensing produces that can not be replicated by doctors' groups banding together to create reputations for quality?

The following section shows the effect of schooling requirements on the quality of individuals entering a profession. Section III demonstrates that the entire debate over whether licensing increases incomes has been misdirected. The claim has been that higher wages after introducing licensing is evidence in favor of the capture theory.⁵ In contrast, we show that monopoly licensing restrictions are as consistent with lower average wages in the profession after restrictions are imposed as they are with higher average wages. Section IV explains why it pays for politicians to lower the ability of new entrants into a profession and why testing combined with schooling restrictions are best able to obtain the support maximizing mix of new entrants. The section also introduces new explanations for why licenses are nontransferable, and why licensing requirements

³ Guild statutes were quite concerned with preventing masters from enticing away another's apprentices "by offering better terms" (p. 107). In Paris, the length of the apprenticeship and its pay (almost always none) and even meals and lodging (if any) were set by guild statute and these rules were rigorously enforced. In some guilds the length of the apprenticeship depended upon how much the apprentice paid the master (pp. 106-9). According to Epstein (p. 141) the length of apprenticeships were longer: 1) the higher the wage levels of the employees, 2) the higher the quality or wealth of the customers, 3) the higher the value of the raw materials, and 4) the larger the size of the guild. (See also MacKenney (1987) for a related discussion.)

⁴ Leland (1979, p. 1330) readily acknowledges the use of legal liabilities on sellers as an alternative method of reducing quality deterioration.

⁵ Many studies show that licensing increases incomes (e.g., Holen, 1965; Maurizi, 1974; Benham and Benham, 1975; Haas-Wilson, 1986; and Shepard, 1978). Others such as Alchian and Allen (1983, p. 294), Friedman and Kuznetts (1945), Kessel (1958), and McCloskey (1982) provide theoretical arguments for this widely accepted proposition. Still others like Lueck et al. (1995) and Sass (1990) point to the lack of income increases from licensing as evidence against the capture theory. We will show that both groups are incorrect.

have exhibited the pattern of changes that they have over time. Finally, the section reinterprets Leffler's (1978) existing empirical evidence in terms of our political model.

II. Time Requirements and the Ability of Individuals Who Enter a Profession

The primary cost of human capital investment is the foregone earnings lost during schooling and training periods, and thus jobs requiring more schooling must compensate their workers more. Human capital and screening models typically assume that occupations requiring more schooling and training attract the most productive workers. This sorting of workers across jobs occurs if workers with the highest innate abilities are the most efficient in acquiring additional human capital and receive rents from the post-schooling wage differential. Thus rules imposing minimum schooling time requirements for all workers penalize those who are the most efficient in acquiring human capital. We show that if the most productive workers are also the most efficient at human capital investment, these time requirements raise the relative opportunity costs of the most productive potential entrants, thus lowering average productivity in the occupation.

Before introducing mandated schooling lengths, consider a simple infinite horizon model where workers enter one of two different professions: each occupation produces a different good (or service) and the competitive unregulated case requires a set of job-specific skills that can only be acquired in a training or schooling period. Workers differ with respect to their skills in both production of output and human capital investment. All workers of ability i can complete the schooling for occupations 1 and 2 in s_i and t_i periods, respectively. Their productivity in profession 1 is given by q_i and in profession 2 by R_i . The opportunity cost of choosing occupation 1 depends on R , s , and t . Holding constant a worker's productivity in occupation 1, workers are less likely to choose occupation 1 as R or s increase, and as t decreases.

Workers select an occupation based on their expected income; labor supply is assumed to be completely inelastic. If there are m types of workers, we order workers by their productivity in occupation 1, such that $q_1 > q_2 > \dots > q_m$. A complete characterization of the sorting of workers into occupations requires information about the differences in productivity between occupations 1 and 2 for a worker with ability i . To make this distinction, we add a subscript j to specify the

distribution of R_i , potential output in occupation 2, for all workers. If the upper and lower supports of the distribution of opportunity costs, R_{i1} and R_{i2} , are proportional to q_i , the highest ability workers are, on average, relatively more productive in all activities. This assumption also allows us to compare workers across ability groups, conditional on their rank order in the opportunity cost distribution; e.g., the opportunity costs of workers at the 20th percentile of their group's opportunity cost distribution is also proportional to q_i .⁶

If high ability workers are also more efficient in acquiring human capital, the schooling periods lengths can be ordered: $s_1 < s_2 < \dots < s_m$ and $t_1 < t_2 < \dots < t_m$. Higher ability workers are assumed to be able to acquire the same amount of human capital in less time than lower ability workers. Thus, within a given occupation, higher ability workers attend school for fewer years than lower ability workers. Labor economists typically argue that more able workers acquire more schooling, but this is based on comparisons across rather than within occupations. Our specification allows for heterogeneity in opportunity costs, holding constant a worker's productivity in occupation 1.

Consider the occupational choice decision for a given ability. Normalizing the price of output in occupation 1 to occupation 2 and assuming that individuals live forever, lifetime earnings in occupation 1 equals $\exp\{-rs_i\}Pq_i/r$ and occupation 2 equals $\exp\{-rt_i\}R_{ij}/r$, where r equals the discount rate. We define $P(i,R_{ij})$ as the minimum (reservation) price of output 1 such that a high ability worker with potential output (q_i,R_{ij}) is just willing to enter occupation 1. $P(i,R_{ij})$ is the price that equates lifetime earnings in the two occupations and is given by:

$$P(i,R_{ij}) = \exp\{r(s_i-t_i)\}(R_{ij}/q_i) \quad (1)$$

The sorting of individual workers into occupations 1 and 2 is determined by the equilibrium price of output 1, P^* . Workers select occupations on the basis of their comparative advantage; all workers with $P(i,R_{ij}) < P^*$ choose occupation 1.

Equation (1) shows that if schooling periods are equal across occupations so that $s_i = t_i$ for all i , workers of different abilities are equally likely to sort into occupation 1. Although high ability

⁶ The exact proportionality is not crucial to our analysis but greatly simplifies the mathematical and graphical exposition of the model.

workers are capable of producing more upon entering the profession, on average their opportunity costs are also proportionately higher. Supply curves do not coincide across ability groups if the schooling periods differ across occupations. Consider the case where schooling periods and hence opportunity costs are higher in occupation 1 than occupation 2. Figure 1 illustrates occupation 1's supply curves for three different types of workers: high ability (H), medium ability (M), and low ability (L), for the case $s_i = (1 + A)t_i$, with $A > 0$. Higher ability workers and workers with the smallest potential output in occupation 2 (R_{ij}) are the most likely to choose occupation 1. If $A < 0$, the reverse is true: low ability workers are the most likely to enter occupation 1.

In general, the market labor supply curve is piecewise linear, with an intercept equal to the intercept of the most able group's supply schedule. A kink occurs in the schedule each time an ability group starts sorting into this occupation and each time the total quantity of labor in an ability group is exhausted. If P^* is below $\exp\{r(At_H)\}(R_{H1}/q_H)$, no workers would choose occupation 1, and if P^* were above $\exp\{r(At_L)\}(R_{L2}/q_L)$, all workers would have sorted into occupation 1. The slope of the supply curve and location of the kinks between these two points depends on the average differences in abilities across groups and on the distribution of opportunity costs across workers within an ability group.

Consider an exogenous increase in A that increases the schooling period for occupation 1 relative to occupation 2. This increases opportunity costs for occupation 1 and increases the slope and intercept of the supply schedule for all types of workers. These shifts in relative supply schedules raise the relative wage rate (and price P) and lower the quantity of new entrants in occupation 1. The longer schooling periods are the most costly for low ability workers who take longer to acquire human capital. This result is seen by differentiating equation (1) with respect to A and q_i :

$$\frac{\partial^2 P(i, R_{ij})}{\partial A \partial q_i} = \exp\{rt_i\}(-r R_{ij} / q_i^2) < 0. \quad (2)$$

Equation (2) shows that although the supply schedule shifts up for all workers as time periods increase, the shift in supply is the largest for the least able workers. Higher ability workers have a comparative advantage in human capital investment and therefore tend to sort into occupations that require more schooling. All else equal, an exogenous increase in occupation 1's schooling

requirement discourages lower ability workers relatively more than higher ability workers from entering the occupation.

The effects of this exogenous increase in the relative schooling period for occupation 1 would be shown as an upward shift in the supply curves shown in Figure 1, with the largest shift occurring for the lowest ability supply curve. Given the proportionality of opportunity cost distributions across workers of different abilities, the fraction of high ability workers in occupation 1 unambiguously increases. The intuition behind this result is clear; a relatively longer schooling period for occupation 1 raises the relative wage in occupation 1. The combination of a higher relative wage and longer time in school is relatively more attractive for workers who have a comparative advantage in human capital investment.

Let us now introduce how occupational licensing restrictions generally raise the schooling requirement for acquiring job-specific human capital. Mandates that specify a minimum stock of occupation-specific human capital for entry into the profession favor workers who have a comparative advantage in acquiring human capital, as long as there are no restrictions on the minimum length of time in school. As noted earlier, however, most occupational licensing restrictions also specify that a minimum length of time be spent in school for all individuals, independent of their productivity or efficiency in acquiring human capital. The effect of this type of time restriction on the relative supply of high and low ability workers into a profession is analyzed below. We will focus on the more difficult case where $A > 0$ (so that the highest quality entrants have the lowest marginal costs in the unregulated market) to show the adverse sorting consequences of these minimum schooling restrictions.

Suppose that a rule is passed requiring all workers entering occupation 1 to complete at least $S > s_H$ years of training before entering the occupation. Consider first the case where $s_H < S < s_M$, so that the constraint is only binding for high ability workers. The additional time constraint raises the opportunity cost of only the highest ability potential entrants, keeping intact the supply schedules for other types of potential entrants. This restriction raises the price and reduces the quantity demanded of output 1. Less output will be produced and the marginal high ability workers (those with the highest R 's) will select occupation 2. Both medium and low ability workers benefit by the higher

price of output 1 and hence more medium and low ability workers enter the occupation. Both of these effects lead to unambiguous decreases in the average productivity of workers in occupation 1.

The effects of this regulation on price, quantity of output, and average productivity of workers in sector 1 depends on the skills acquired by high ability workers during their additional time in school ($S - s_H$). The more consumers value this schooling, the lower are the penalties incurred by high ability potential entrants. If consumers valued additional schooling enough to compensate workers for their foregone earnings, high ability workers would voluntarily choose to spend more time in school. (Or competitive market forces would lengthen the necessary schooling period for high ability workers.)

If the time requirement is increased further so that $s_M = S$, and the constraint is just binding for medium ability workers, the supply schedules of high and medium ability workers will coincide. This is illustrated in Figure 2. Despite the highest ability workers previously having the lowest opportunity costs because of their comparative advantage in acquiring human capital, the time restriction forces high ability individuals to spend as much time in school as medium ability entrants. High and medium ability workers have identical opportunity cost schedules when they are constrained to spend equal amounts of time in school because mean output in occupation 2 is proportional to a worker's productivity in occupation 1. In the absence of a some type of externality, it must be true that this additional schooling was not valued enough by consumers to compensate workers for their foregone earnings. If the additional schooling has no value to consumers, the opportunity cost of high ability workers are increased relative to other potential entrants, and if medium quality workers crowd out higher ability ones because the demand curve intersects the supply curve to the left of Q^* , the average productivity in occupation 1 declines. Even if the additional schooling has some value to consumers, relative opportunity costs increase for high ability workers.

If the time requirement is further increased so that $S > s_M$, the supply schedules for both high and medium ability workers now shift up. Any potential entrants who view the minimum time in school requirement as a binding constraint on their human capital investment decision are penalized by the regulation. The minimum schooling requirement distorts the human capital investment decision more for high ability than low ability workers. Further increases in minimum time

requirements discourage the entry of some high ability entrants (those with the highest R 's) without affecting the opportunity costs of the lower ability entrants who are unconstrained. Low ability workers are made better off by the regulation as long as the minimum time requirement is less than their wealth maximizing time in school; they face higher prices for their services in occupation 1 and no entry restrictions.

The minimum schooling requirement can also be viewed as a tax, denominated in time units, levied on potential entrants to occupation 1. Because high ability workers have the highest value of time in all activities, and are required to increase their time in school by the greatest amount, high ability workers bear the greatest tax burden from a minimum time requirement.

The model described in this section can be extended to allow for an arbitrary number of ability types. The model predicts that as long as high ability workers are capable of completing their schooling in less time than lower ability workers, minimum time requirements tax the highest ability workers and decrease the quality of entrants to an occupation. More stringent length of schooling requirements for an occupation lower the quantity of services provided, raise the price of output, and lower the quality of workers in the occupation.

If anything, the preceding discussion downplays the reduction in a profession's quality which arises from minimum schooling time restrictions. If we had assumed as Leland did, that the highest ability individuals received the smallest rents in occupation 1 (i.e., that $A < 0$), minimum time requirements increase the highest ability individual's costs when they are already the highest to begin with. Thus, in an important sense, our results are more robust than Leland's since licensing in his model only preserves quality by preventing low quality individuals from driving out high quality ones when the lowest quality individuals receive the largest rents.

III. Can Licensing that Monopolizes the Market for Incumbents Actually Lower the Average Price Paid to Those in the Profession?

While licensing restricts the quantity of services being provided and this works to raise the price paid for any unit of the service, low ability new entrants can receive a lower wage than the retiring workers that they replace. Depending upon the elasticity of supply and the relative abilities of the

suppliers of the services, it is quite possible that the lower ability of each new entrant lowers average wages by more than the restricted quantity raises it.

Take the simple case where there are only two types of potential entrants — low and high ability individuals and high ability workers are two times more productive than are low ability ones. We make the additional assumptions that only high quality individuals entered the profession when the free-market prevailed, that the elasticity of demand equals 1, and that after all of the preexisting members of the profession have retired the support maximizing output is 20 percent less than the competitive level. Under those circumstances, the wage for high ability producers will rise to 20 percent above the prelicense level, and the wage for low skilled workers will be half of that. If high and low skilled workers are equally represented among the new entrants, the average wage after the restriction in output and the new entry will be 90 percent of the free-market wage.

Obviously, our example is quite sensitive to the assumptions that we make — fewer retirements, a more inelastic demand, or a greater reduction in supply will raise the average wage, while a greater difference in productivity between low and high quality producers or a more elastic demand curve will lower it. However, as our example shows traditional licensing theory wrongly assumes that using licensing to monopolize output implies higher wages.⁷ Monopoly output restrictions for licensing can be as consistent with either lower or higher average wages. The incumbents care only what happens to their own income and the level of political support for their transfers.

IV. The Political Model

a. Explaining Why Rules that Lower the Average Ability in the Profession are Adopted

Traditionally, economists have assumed that a profession that desired to restrict entry and raise rents would lower the pass rate for the state board exams. If schooling requirements for licensing lower the ability of new entrants, why is it in the interests of those who are currently in a profession to adopt such restrictions? If Leland (1979) is correct, time restrictions that lower the quality of new entrants would be irrational for incumbents to adopt, because consumers cannot differentiate between

⁷ See footnote 5 for a review of the relevant literature that makes this claim.

low and high quality providers and all wages are determined by the average ability of people in the profession. The puzzle is deepened further by the simultaneous use of testing (which screens out low quality entrants) as well as time requirements that discourage high ability entrants.⁸

These apparently conflicting licensing rules can assist in maximizing political support. Politicians must concentrate the benefits from transfers and disperse the costs to maximize political support, but they must not concentrate the benefits on *too* small of a group. Both the time restriction on entry and standardized testing can play roles in insuring that political support is maximized from the transfers that licensing creates.

The implementation of American licensing tends to follow a particular pattern, with school requirements being instituted after licensing has been in effect for some period of time. Our discussion in the previous section implies that the initial entrants to the profession will be of a relatively high quality and that testing will most likely work to ensure that quality. The profession's existing members face the traditional trade-off between increasing marginal consumer opposition as the price of services rises and diminishing marginal support as tighter licensing standards concentrate the benefits of the higher prices on a smaller and smaller group. Politicians will undoubtedly stop short of the pure capture monopoly pricing restrictions on entry because of the influence that consumers have on politicians' behavior (Peltzman, 1976).

Suppose we start with the simplified situation where licensing has already been used to restrict the number of individuals in the profession to the political support maximizing level, but that some individuals soon will be retiring. Following Peltzman (1976), politicians maximize their political support (Ω), which is given by the sum of the expected votes from members of well-defined political groups. These groups are the incumbent members of the profession (I), potential high ability entrants (H), potential low ability entrants (L), and buyers of the service the profession provides (B). When $s_H < S < s_L$ so that increasing S removes marginal high ability workers, net political support for increasing S is given by:

⁸ Shepard (1978, pp. 188-189) argues that one motivation for state exams for dental licensing was to prevent the movement of dentists between states. He writes that, "In many cases the clinical portion of the examinations requires complicated procedures that are no longer in general use but are taught in selected states solely to prepare students for examination. As a result failure rates are, in all cases, greater for nonresident applicants than for residents."

$$\Omega = N_I \Pi_I + N_L \Pi_L - N_H \Pi_H - N_B \Pi_B \quad (3)$$

where

N_i = the number of individuals in the i th group and

Π_i = the probability that individuals in that group will turn out to vote.

An additional restriction is that all individuals who are not currently in the licensed profession can be found in one of those three groups ($N = N_I + N_H + N_L + N_B$, where the number N_I is taken as given). Individuals are also not assumed to be able to move between the groups.⁹

The probability that an individual will support licensing laws in profession 1 is determined not only by the size of the transfer but also by the cost of organizing the voters in the group. For the two types of potential entrants that relationship is given by:

$$\Pi_L = \Pi_L \left(\begin{matrix} (+) \\ \text{[exp}\{r(t_L - s_L)\} \text{]} \end{matrix} \right) \left(\begin{matrix} (+) \\ \text{[(P}\cdot\text{q}_L - R_L - C(\text{P}\cdot\text{q}_L) - X(N_L))/r] \text{]} \end{matrix} \right), W_L \quad (4a)$$

$$\Pi_H = \Pi_H \left(\begin{matrix} (+) \\ \text{[exp}\{r(t_H - S)\} \text{]} \end{matrix} \right) \left(\begin{matrix} (+) \\ \text{[(P}\cdot\text{q}_H - R_H - C(\text{P}\cdot\text{q}_H) - X(N_H))/r] \text{]} \end{matrix} \right), W_H \quad (4B)$$

where the signs above the variables indicate their first derivatives and

$C(\text{P}\cdot\text{q}_i)$ = the time cost of a voter in the i th group voting, campaigning, and becoming informed about the issues at stake in a particular election;

X = a per person cost of organizing voters in the special interest group which can vary with the number of individuals in the group (e.g., the cost of printing or distributing material);
and

W_i = the wealth of the individuals in the i th group.

Incumbents' and buyers' support functions are given by:

$$\Pi_I = \Pi_I \left(\begin{matrix} (+) \\ \text{[(P}\cdot\text{q}_H - [C(\text{P}\cdot\text{q}_H) + X(N_I)]]/r \text{]} \end{matrix} \right), W_I \quad (4c)$$

and

$$\Pi_B = \Pi_B \left(\begin{matrix} (-) (+) \\ \text{[S, } W_B \text{]} \end{matrix} \right) \quad (4d)$$

⁹ As Stigler (1972) points out successful transfer strategies require that transfers occur between groups which are fairly easy to differentiate and that it is costly for voters to change identification between the groups.

There are three components to the professions' existing and potential members support function: the net rents received from entering occupation 1, the political costs spent on organizing, and voters' wealth. Both higher demand and longer time requirements are assumed to increase the price of the service. Higher net transfers to those entering the profession produce a higher probability that the new entrants will vote, though following Stigler (1971), Peltzman (1976), and many others we assume that support increases at a decreasing rate with the level of transfers. Likewise, greater wealth mitigates the effect on support of any increase in transfers.

For the moment, let us ignore the effect that new entry has on either the price or the rents received by the existing members in the profession and concentrate on what type of new entrant will most increase political support. We will also briefly simplify our discussion and assume that:

$$q_H = 2 q_L \quad \text{and} \quad (5a)$$

$$R_H = 2 R_L . \quad (5b)$$

Condition (5a) implies that the price for high ability providers will be twice as high as that for low ability ones and when combined with condition (5b) implies that the rents the new entrants receive, excluding their costs of creating the transfers, will be two times higher for the high ability individuals. These conditions are sufficient to explain why the low ability providers will be the preferred ones to enter the profession. Two low ability entrants produce the same total output and rents as one high ability entrant, but the low ability entrants produce more total expected votes because of our assumption that support increases at a decreasing rate with the level of transfers. Existing entrants would seem to prefer letting in only low ability entrants and a lower quality mix of new entrants could be accomplished by raising the time requirement for licensing sufficiently high.

If we adjust for the possibility that low and high ability workers do not produce the same output, so that substitutability is limited, the preceding result is even stronger. For example, certain surgical techniques may only be well performed by high quality surgeons, and two surgeons who are both half as good may be completely unable to perform those techniques. In the extreme when there is no substitutability, so that new lower quality entrants are essentially entering a different profession, admitting low quality entrants generates more total political support for licensing among new entrants, but it does so without lowering incumbents' rents.

b. How Low is the Support Maximizing Quality From Schooling Requirements?: The Role of Standardized Testing

The question is now how low will the quality of new entrants go? It is unlikely that existing members of a profession only want entrants who are the lowest quality individuals. There are, however, two possible explanations for why this does not occur. One important consideration involves the size of rents that individuals receive. Even though the time costs of voting are twice as high for the high ability entrant, the per voter cost of organizing support (X) implies that the net transfer to low quality new entrants will be less than half the size of the transfer received by the high quality entrants.¹⁰ In the extreme, if new entrant ability is sufficiently low, new low quality entrants will not only reduce incumbents rents, but the rents of new entrants will not cover their political organization costs ($X + C = P \cdot q_i - R_i$) and they will not add to the expected number of votes themselves. Allowing in such new low quality incumbents produces individuals who have nothing to lose by failing to support the licensing laws ($\Pi_L = 0$). In addition, their entry also reduces the support provided by incumbents.¹¹ The problem is compounded by the fact that low quality entrants will continue to enter occupation 1 as long as: $P \cdot q_i - R_{ij} \geq 0$, even when they do not cover the costs of political involvement ($C + X$). Even if these low quality entrants do vote, their small or nonexistent investments in political information make them unreliable allies. For incumbents, there are only costs and no benefits from allowing in these potential low quality entrants.

Incumbents thus face a dilemma: how to lower the quality of new entrants so that they can increase expected support, but not lower the quality of new entrants to the point that those who enter may have no incentive to support the licensing laws. There is also the related question of how to control the number of new entrants within the desired level of quality. Increasing the time requirement and using it as a pure queuing device can reduce the number of new entrants, but it will

¹⁰ The assumption of fixed per person organization costs is not really essential to our results. The crucial restriction is simply that the per person organization costs do not fall appreciably faster than the per person transfer as the number of individuals receiving the transfer increases.

¹¹ If incumbents subsidize the organization costs of new low quality members, it reduces the rents of incumbents even further. The more important question is that such a transfer can be made to any group to win support. It is not clear that there is anything unique about these very lowest quality producers that make such a transfer preferred.

do so only by moving further and further down the quality scale. Nor can we simply randomly restrict the number of new entrants, since that would still allow many of these lowest quality entrants to join the profession. To prevent this, something is required to increase the costs of potential low quality entrants. One method of screening out the lowest ability individuals so as to maximize political support is to use the standardized testing we observe with state board exams.

Unlike other hypotheses that have explained licensing testing restrictions, we rely neither upon mistakes made by consumers in differentiating high and low quality providers (Leland, 1979) nor upon the simple assumption that the sole goal of such restrictions is to reduce entry. In fact, we argue that both hypotheses have some merit. Testing does raise the quality of entrants and it does restrict the number of entrants, but it does this to transfer money to existing members of the profession, not to protect consumers against low quality. While support maximization still requires the old maxim of concentrating the benefits and dispersing the costs, these last two sections imply that benefits cannot be either too concentrated or too dispersed. While schooling time requirements work to ensure that benefits are not too concentrated, standardized testing works to ensure that they are not too dispersed.

c. Implications for Why Licenses are Not Transferable

Most discussions in economics assume that the transferability of assets is wealth creating as resources move from lower to higher valued uses. If the point of licensing is really just to increase incumbents' rents by restricting the number, and not the quality, of new entrants, transferable licenses would appear to be the least costly method of accomplishing that goal. Past discussions of professional licensing have concentrated on the observation that the sunk investments employed in competing for licenses prevent lower cost producers from entering the profession (Lott, 1987).¹² More restrictive licensing rules raise prices and increase the sunk nontransferable investments made in obtaining the license. Without transferability, initial producers will remain in the profession as

¹² Pashigian (1979, pp. 17-20) provides evidence that the state specific nature of these sunk investments appears to be small.

long as they receive a positive rent on this investment. However, if licenses were transferable, the highest cost producers would simply sell their licenses to lower cost individuals.

This cost of nontransferability, that less efficient producers would tend to remain in the market too long, raises the question as to why licenses aren't transferable. Our hypothesis explains why licensing is not transferable without having to rely on either poorly informed consumers or misled voters.¹³ If producers are paid according to their marginal products, the highest ability entrants will earn the greatest rents from obtaining a license and thus will pay the most to enter. But as we have just seen, the support maximizing entrant is of relatively low ability. Allowing transferability of licenses would increase the total supply of services produced and thus lower the price received by those incumbents who were not planning on retiring in the near future.

d. Explaining How Licensing Constraints Change Over Time?

Schooling requirements frequently increase in a series of steps instead of a one time change. For example, since the early 1950's 37 states have made 83 changes in prelicensing schooling restrictions for real estate salesman, but Delaware's 1985 and Oklahoma's 1993 legal changes represent the only two instances where a state reduced these schooling requirements.¹⁴ To explain this, we can extend the previous discussion, which focused solely on the ability of new entrants, by relaxing the assumption that the price and quantity of the service is taken as fixed. As the preceding discussion indicates, replacing retiring workers with lower quality entrants increases the marginal political support for creating transfers through licensing. The profession can use this increased political capital to acquire greater transfers by not replacing all the high quality retirees with enough low

13 While he does not discuss transferability, Leland's (1979) model definitely implies a different answer. In his model since the lowest ability producers have the lowest opportunity costs and obtain the highest rents from entering the profession, they are also willing to pay the most for a license. Transferable licensing would provide no additional protection for consumers than they faced without licensing. The other argument was that even though transferability would seem to increase the wealth of those already in the profession, support for transferability would be inconsistent with the claim that professional licensing was useful to ensure quality. (See Lott (1987, pp. 454-5) for a discussion of these two alternative explanations.)

14 This information is based on a telephone survey that I did of real estate licensing in the 48 contiguous states. The information concerning Delaware was obtained from Jim Brennan, head of the state relicensing commission. Similarly, written information for Oklahoma was obtained from the Oklahoma Real Estate Commission. The telephone survey was done because the information that could be obtained directly from the National Association of Real Estate License Law Officials only went back to 1979 and did not provide sufficient detail on all the legal changes that occurred over time.

quality entrants to maintain the same total output, and thus allowing the quality adjusted earnings of workers to rise.

These increased earnings not only benefit existing members of the profession but also benefit new members and change the type of new member who will most increase support. According to the model in Section III.a., because of the per person political organizing costs, higher wages do not affect both types of entrants equally since they produce the greatest percentage change in rents for the lowest ability workers. These workers also have the greatest marginal increase in their probability of voting from obtaining an additional dollar. Hence an increase in wages lowers the support maximizing quality of new entrants. Licensing restrictions thus change over time because the support maximizing quality of entrants depends upon the quality of the profession's existing members.

As more older workers retire, the profession will continue to restrict the number of new entrants, further raising the profession's quality adjusted wage and thus further lowering the desired ability of new entrants. However, this will obviously not continue on forever. As with any monopoly, continually smaller outputs and higher prices will result in smaller and smaller increases in total monopoly rents and thus progressively smaller increases in political support. In addition, as Peltzman notes (1976, p. 224), the profession will stop restricting new entry before the monopoly output is reached not only because of the diminishing support from additional transfers but also because the rising marginal opposition.

e. Reinterpreting Existing Evidence

Finally, our model is weakly consistent with existing empirical evidence that licensing is merely a response to increased quality assurance demanded by customers. Leffler (1978) finds that states with a large proportion of high income individuals tended to have lower pass rates on licensing examines for doctors, while states with a relatively large portion of their population below the poverty line had higher pass rates. His explanation rests on the reasonable assumption that high income is associated with an increased demand for quality medical care. However, his results are

also consistent with our Peltzman (1976) type explanation which assumes that the level of opposition for any given level of transfers declines as the wealth of the net losers increases.

Figure 3 shows the marginal support and opposition curves with respect to the length of the schooling requirement that follow from these assumptions.¹⁵ Greater consumer wealth means that the marginal opposition from any reduction in wealth due to longer minimum schooling requirements will be reduced (i.e., less negative).

$$\frac{\partial^2 \underline{\Omega}}{\partial S \partial W_B} = \overset{(-)}{\Omega_{\Pi_B W_B}} \overset{(-)}{\Pi_{B_S}} + \overset{(+)}{\Omega_{\Pi_B}} \overset{(+)}{\Pi_{B_S W_B}} > 0. \quad (6)$$

An exogenous increase in consumer wealth thus shifts down the marginal opposition curve as shown from MO₀ to MO₁.

However, this is essentially a long run discussion where all rents are completely competed away by potential entrants. Consistent with Leffler's (1978) cross-sectional evidence, areas with wealthier consumers will be more likely to adopt all types of licensing restrictions. Yet, in the short run, where changes in consumer wealth produces unexpected windfalls in producer wealth, the discussion is more complicated. The preceding discussion is then most consistent with the assumption that the licensed service is a "border line" normal good. To the extent that it is a normal good, the net effect on increasing the support for increased schooling requirements is reduced. Higher demand increases the wealth of incumbents, reduces their efforts to further raise restrictions,

¹⁵ The marginal support curve in figure 1 is negatively sloped and the marginal opposition curve is positively sloped because

$$\frac{\partial^2 \underline{\Omega}}{\partial S \partial S} = \overset{(-)}{\Omega_{\Pi_I S}} \overset{(+)}{\Pi_{I_S}} + \overset{(+)}{\Omega_{\Pi_I}} \overset{(-)}{\Pi_{I_{SS}}} + \overset{(+)}{\Omega_{\Pi_L S}} \overset{(-)}{\Pi_{L_S}} + \overset{(+)}{\Omega_{\Pi_L}} \overset{(-)}{\Pi_{L_{SS}}} < 0$$

and

$$\frac{\partial^2 \underline{\Omega}}{\partial S \partial S} = \overset{(-)}{\Omega_{\Pi_B S}} \overset{(+)}{\Pi_{B_S}} + \overset{(+)}{\Omega_{\Pi_B}} \overset{(-)}{\Pi_{B_{SS}}} + \overset{(+)}{\Omega_{\Pi_H S}} \overset{(-)}{\Pi_{H_S}} + \overset{(-)}{\Omega_{\Pi_H}} \overset{(+)}{\Pi_{H_{SS}}} < 0.$$

and shifts the marginal support curve downward. Alternatively, the effect is strengthened if the service is an inferior good.

V. Conclusion

Traditional discussions of licensing mistakenly assume that the effect of licensing restrictions is to raise price. Other work which explains licensing as an attempt to ensure service quality is inconsistent with institutional constraints that ensure that licenses can not be obtained in less than a certain length of time. Our paper has explained time restrictions as a method of preventing the highest potential ability entrants from entering the profession, while standardized testing prevents the lowest quality ones from entering. The net effect of these regulations can either be to raise or lower the average wage of those licensed in a profession. However, licensing regulations using minimum time restrictions will unambiguously prevent the highest quality new entrants from entering a profession. We have also provided a political support maximization explanation based upon wealth transfers for why it is for politicians to reduce the ability of those who enter the profession, but not to reduce the ability of new entrants by too much.

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Table 1: The Schooling Time Required to Obtain Barber's Licenses by State (Apprenticeship requirements are listed only when they can serve as a Substitute for Schooling)*

<u>State</u>	<u>Length of Course Work Requirement at an Approved Barbering School</u>
Alabama	There are only county and no statewide regulations of barbering.
Alaska	1,650 hours (a maximum of 10 hours schooling per day and not more than 6 days per week) or 2,000 hours of training in an apprenticeship program (students are not paid during their apprenticeships). 90 percent of those taking the state board examines choose schooling over the apprenticeship program to enter the profession.
Arizona	1,500 hours (a maximum of 8 hours schooling per day, not more than 6 days per week, and a minimum of 9.25 months)
Arkansas	20 days of study
California	1,500 hours (a maximum of 8 hours schooling per day and not more than 5 days per week)
Colorado	1,250 hours (a maximum of 40 hours schooling per week)
Connecticut	1,500 hours (in not less than 9 months)
Delaware	1,500 hours (in not less than 38 weeks)
Florida	1,200 hours (in not less than 9 months)
Georgia	1,500 hours (a maximum of 40 hours schooling per week)
Hawaii	1,500 hours of course work (there is only one in Hawaii, a maximum of 8 hours schooling per day and not more than 5 days per week) or 1,500 hours in apprenticeship program (there are no restrictions on pay for apprenticeships)
Idaho	1,700 hours (a maximum of 8 hours schooling per day and not more than 6 days per week), must complete schooling within 10.5 months
Illinois	1,500 hours (in not less than 9 months and not more than three years)
Indiana	1,500 hours (a minimum of 30 hours and a maximum of 40 hours schooling per week)
Iowa	2,100 hours (a maximum of 8 hours schooling per day and not more than 6 days per week), must complete schooling within a 10 month period
Kansas	1,500 hours (a maximum of 8 hours schooling per day and not more than 5 days per week)
Kentucky	1,500 hours (a maximum of 8 hours schooling per day and not more than 5 days per week)
Louisiana	1,550 hours (8 hours per day, 5 days a week, for 9 months)
Maine	1,500 hours in not less than nine months
Maryland	1,200 hours (a minimum of 20 hours and a maximum of 40 hours schooling per week)

* The data here was obtained from a telephone survey of state licensing agencies during March 1995. A similar survey was also done for real estate agents during June and July 1994, and it is available from the author. Based upon this survey, the detailed listing of state rules provided by Bianco (1993) should be regarded as very incomplete and should be used only to provide a very rough notion that these time restrictions exist..

Massachusetts	1,000 hours over six months
Michigan	2,000 hours (a maximum of 40 hours schooling per week)
Minnesota	1,500 hours of course work (a maximum of 40 hours per week) or 1 year apprenticeship
Mississippi	1,500 hours (a maximum of 160 hours per month)
Missouri	1,000 hours (no other time restrictions)
Montana	1,500 hours in not less than 11 months
Nebraska	2,100 hours (a maximum of 10 hours schooling per day and not more than 5 days per week)
Nevada	1,500 hours (a maximum of 40 hours per week)
New Hampshire	1,500 hours in not less than 12 months
New Jersey	1,200 hours (a maximum of 40 hours per week)
New Mexico	1,200 hours in not less than 10 months
New York	18 months of course work and 6 months of apprenticeship or 24 months of apprenticeship (no restrictions on salary earned during apprenticeship)
North Carolina	1,528 hours in not less than 9 months
North Dakota	1,550 hours (a maximum of 8 hours schooling per day and not more than 5 days per week)
Ohio	1,800 hours of study from an approved barber's school (a maximum of 40 hours per week)
Oklahoma	1,500 hours of course work in not less than nine-months or 3,000 hours as an apprentice in not less than eighteen months (no salary restrictions).
Oregon	There is one barbering school that was grandfathered in for rules that were passed in 1977 and 1,300 hours are required for that school's students. Students at all other schools are required to take 1,800 hours. School hours are limited to a maximum of 40 hours per week.
Pennsylvania	1,500 hours in not less than 9 months
Rhode Island	1,500 hours of course work, apprenticeship hours can be substituted (most applicants take 1,000 hour course in Massachusetts and then return to state for 500 hour apprenticeship)
South Carolina	1,500 hours in not less than 9 months
South Dakota	Must meet licensing requirements in another state, there are no barber schools in the state
Tennessee	1,500 hours (a maximum of 40 hours per week and over a minimum of 9 months)
Texas	1,500 hours of course work (in not less than 9 months) or as an apprentice
Utah	2,000 hours in not less than 12 months
Vermont	1,300 hours (a maximum of 40 hours per week)
Virginia	1,500 hours (no additional time restrictions)
Washington	1,000 hours (all maximum number of hour per week rules were eliminated in 1991)
West Virginia	1,800 hours (a maximum of 40 hours per week)

Wisconsin 1,800 hours of schooling (in not less than 10 months) or an apprenticeship of 3,712 hours and 288 hours (apprentices are paid the minimum wage and the program can not last less than 2 years nor more than 4 years)

Wyoming Must meet licensing requirements in another state, there are no barber schools in the state

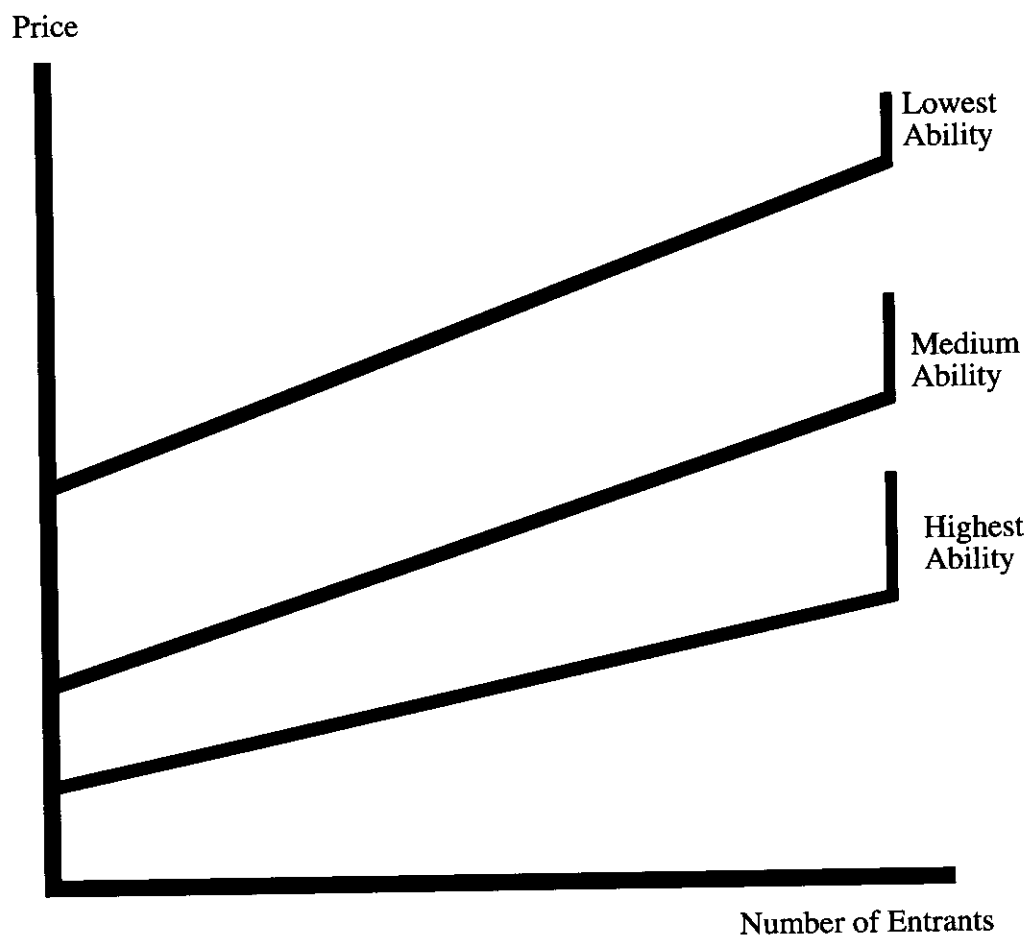


Figure 1

**Supply Curves for Potential Entrants
in Occupation 1**

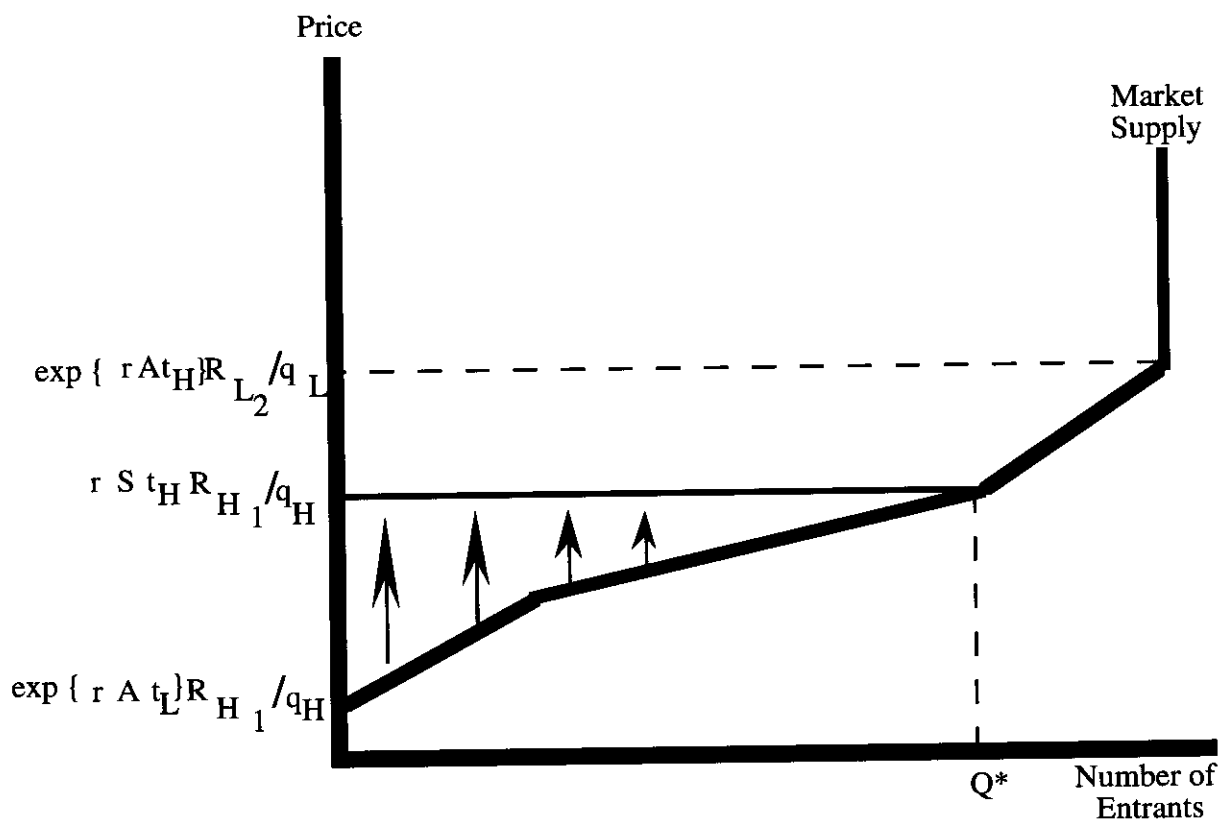


Figure 2

Market Supply of Potential Entrants as the Schooling Requirement Becomes Binding on the Highest Ability Entrants in Occupation 1

Marginal Support
and Opposition

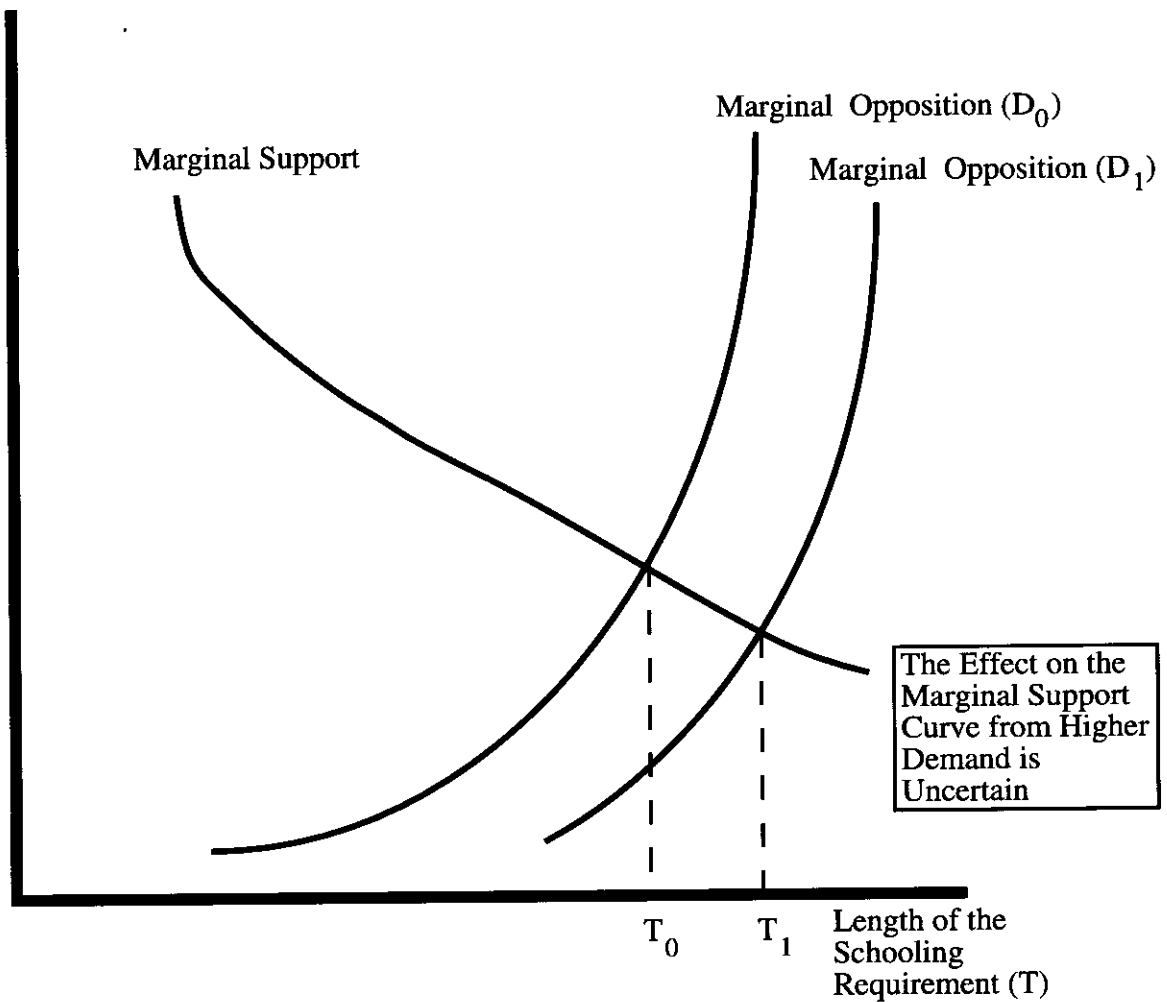


Figure 3

The Effect of an Increase in Demand for Professional Services on the Length of the Schooling Requirement (where $D_0 < D_1$)