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ABSTRACT

The objective of the research is to examine how vocational proprietary schools in the Chicago area function by analyzing the schools as an industry and by treating the proprietary school as an economic entity. Several aspects of proprietary schools are analyzed: the stability, profitability, and general fiscal characteristics of the industry; the mechanics of market structure and operation within a subsector; the effect of labor market conditions on the demand for proprietary school training; the responsiveness of a proprietary school to changing market conditions and changing technology; and the influence on a school of the recent and rapid expansion of a community college offering similar courses. One chapter of the study is devoted to a time and area analysis of the cosmetology industry, and a final chapter summarizes the major findings of the research. The study is supported by a large number of statistical tables, charts, and appendixes. (Author/PR)

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The absence of a discernable relationship between tuition and quality of training within one subsector of the industry may stem from the partition of the sector into local markets by strong ethnographical and geographical constraints and by a lack of comparative information about training opportunities. However, demand for training is related to a number of standard measures of labor market conditions as well as to some unique measures. The ability of the proprietor to perceive these changing conditions and to adapt the school's resources to meet them is all important in maintaining a viable operation. The preponderance of evidence indicates that community colleges have a detrimental effect on proprietary schools.

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Inspite of the efforts of all of these people and many others whom I have not mentioned, I alone am responsible for the errors and shortcomings that remain.

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CHAPTER I

INTRODUCTION

As the nation's student body has expanded to include the "new" student,[1] increasing curricular emphasis has been placed on vocational education, and the proprietary school, long ignored by educational policymakers or relegated to a peripheral role in the overall educational system, has been one of the post-secondary institutions benefiting from the growing demand for training opportunities.

The Second Newman Report in discussing the implications of egalitarian commitment for education purposes stated that

> public policy . . . should encourage much more than just access to some institution labeled "college." What we believe is an appropriate goal of public policy beyond that of access, is the provision for more meaningful choices among many forms of post secondary education . . . (especially) . . . for those whose educational capabilities and interests do not square with the existing institutions.[2]

With increasing educational costs and with educational goals shifting from objectives of access to ones of choice, proprietary schools are receiving more attention. Determination, however, of the role proprietary schools should play in the educational system is not possible until we know more about these schools, their students and operations. The objective here is to increase our understanding of vocational

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[1] Cross, P. K., Beyond the Open Door. San Francisco: Jossey-Boss, 1971.

[2] The Second Newman Report: National Policy and Higher Education, Report of a Special Task Force to the Secretary of Health, Education, and Welfare. Cambridge, Mass.: The MIT Press, 1973, p. 6.

proprietary schools and how they function by analyzing the schools as an industry and by treating the proprietary school as an economic entity. As the nation examines its educational priorities and resources, it is crucial for future planning that we not assume the proprietary school sector to be simply a private version of public vocational education, but recognize that its functions and responses may be unique.

To this end, we examine how the schools, as private, profit-motivated firms, respond to a number of factors, all of which have implications for their operations and eventual survival. In one or more situations we examine how labor market conditions alter the demand for proprietary school training, how a proprietary school responds to changing market conditions and adapts to changing technology, and how another school is affected by the recent and rapid expansion of a community college offering similar courses. Finally, we examine the mechanics of market structure and operation within a subsector of the proprietary school industry. Our overall objective is to explore facets of the proprietary school behavior that may be relevant in correctly assessing and planning for the sector's contribution to the educational system.

Review of the Literature

Relative to the amount of research available on other aspects of the educational system, studies of proprietary schools are few. Johnson's recent review of the literature[1] contains most of these studies and because of her work duplication here is not necessary. Major types of proprietary school studies, however, should be mentioned, as well as a few particular studies that are most closely related to the research reported here. Most studies concerning proprietary schools can be classified into three categories. One group consists of descriptive studies or historical studies of individual schools or the industry, such as Clark and Sloan's Classrooms on Main Street, Miller and Hamilton's The Independent Business School in American Education, or Bolino's Occupational Education as a Source of Economic Growth. Another group contains studies of proprietary schools which are essentially surveys: Belitsky's Private Vocational Schools and Their Students and Katz' A State of the Art Study on the Independent Private School Industry in the State of Illinois. A third group of studies are comparative in nature, examining

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[1] Johnson, Susan E., Proprietary Education: A Search of the Literature. Center for Research and Development in Higher Education, University of California, Berkeley, California, 1974.

characteristics of proprietary schools and their students in relation to those of their closest counterpart in the public sector--community colleges and their students. Two of the largest studies of this type are Wilms' Proprietary versus Public Vocational Training and the Comparative Study of Proprietary and Non-Proprietary Vocational Training Programs by the American Institutes for Research in the Behavioral Sciences.

Analysis of the proprietary school as a business enterprise has been quite limited. Two studies consider proprietary schools from an investment point of view. Freeman shows that the private rate of return to an individual investment in private post-secondary vocational training is comparable to the return achieved on college education.[1] O'Neill's study of naval training costs indicates that the private school sector can perform certain training tasks at substantially less cost than the military and without compromising quality.[2] The only study that treats the proprietary school as a business is by Erickson who describes the operations of several individual schools, points out the competitive market in which a proprietary school operates, and reviews considerations that are required in adjusting costs and revenues.[3]

While these studies are important, they are only initial probes into the role and operation of proprietary schools. We know of no previous attempt to analyze intra-market behavior, the stability of the schools' existence or flexibility of operations under fluctuations of the labor market or development of potentially competitive public institutions.

Scope of Research

The analysis in this research uses several distinct perspectives on the proprietary school industry and several different sets of data. The research includes time and area

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[1] Freeman, Richard, "Post-School Investments in Occupational Training," October 1972 (mimeo).

[2] O'Neill, D. M., "Meeting the Navy's Needs for Technically-trained Personnel: Alternative Procurement Strategies," CNA Research Contribution No. 155, Institute of Naval Studies, Center for Naval Analysis, Washington, D.C., August 1970.

[3] Erickson, E. W., "A Report on Proprietary Business Schools," October 1971 (mimeo).

studies, using longitudinal and cross sectional data. At one point a subsector of the industry is analyzed in aggregate, at another point the individual school is the unit of analysis. Parts of the research may be described as descriptive, analytical, and theoretical, but only by inquiry from several points of view can a comprehensive understanding of the function and role of the industry emerge.

This chapter offers a brief mention of other relevant literature, a summary of subjects developed in other chapters, and a statement about the quality of data. Chapter II contains extensive information on the financial characteristics of a sample of vocational proprietary schools as well as an examination of the diversity and profitability of proprietary schools and the institutional stability of certain subsectors of the industry.

Chapters III and IV are both micro studies of individual schools but address separate issues. The central question in Chapter III is the relationship between a proprietary school and a community college offering similar training. Earlier studies have cited reasons to suppose either a competitive or a complementary relationship should exist between the two types of institutions, but none have yet tried to identify the relationship itself or measure its impact in terms of shifts in student populations. The question examined in this chapter has considerable bearing on the issue of duplication of services between public and private institutions, and by extension on the issue of allocation of educational resources.

Chapter IV deals with the responsiveness of a technical proprietary school to various changes--some beyond the school's control and others over which the school has decisive influence. The importance of wages, unemployment, training costs, and industrial demand for technicians to demand for training is analyzed, and the position that the school occupies in serving student and industrial demand is examined theoretically. Several unique labor market conditions are evaluated in terms of their influence on the school's operations, and an examination is made of the development and the consequences of school decisions to change its product mix. This chapter provides some specific insights into a proprietary school's responses to economic considerations and elucidates the sensitive position occupied by a school that operates on the frontier of technological change.

Chapter V is a time and area analysis of the largest single subsector of the industry--cosmetology. The first part of the chapter contains an analysis of the elements of

demand for cosmetology training, an analysis of the nature of supply adjustments, and a short exposition of the relationship between proprietary cosmetology training and cosmetology training offered in public institutions. The second half of the chapter is an analysis of the structure and functioning of the market.

The last chapter summarizes the major findings of the research by consolidating the important themes that appeared throughout the research, although often through different means, and discusses the implications of the results for educational policy and in light of other current developments in related educational research and policy.

Quality of Data

Research involving private enterprises is often hampered by owners' reluctance to provide the data sought by researchers. Understandably, firms may feel that the research is a waste of their time or that disclosure may give away "trade secrets" or may simply not have the data. The American Institutes for Research comparative study of proprietary and non-proprietary school training reported that "All the interviewed school directors stated that they would be unwilling or unable to provide a detailed breakdown in dollar amounts of sources of their income or of categories of expenditures."[1] Whatever the reason, making such data public is not an obligation of private institutions as it often is of public institutions and therefore the difficulty of obtaining sufficient and reliable data from private firms often renders the findings useless to many research efforts or subject to extreme reservations.

The data in this research come from several sources and although they are not always the exact data that would be sought if the world existed for research, they are often complete, unbiased by self-reporting, and, in spite of whatever shortcomings they have, are the best that exist at the moment.

Data on school enrollments and the number sitting for and passing the state licensing examination for the cosmetology industry were obtained from records maintained by the Illinois

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[1]American Institutes for Research in the Behavioral Sciences, A Comparative Study of Proprietary and Non-Proprietary Vocational Training Programs. Palo Alto, Calif.: November 1972, p. 26.

Department of Registration and Education. Information on tuition and fees in the cosmetology industry was obtained directly from the schools: only three of eighty-one schools refused to provide this information. Vast amounts of financial data on an industry sample were obtained from required statements submitted to the Illinois Office of the Superintendent of Public Instruction, where the files were virtually open to the investigator. Although many entries on the financial forms were not completed, considering the progressiveness of Illinois' monitoring activities of proprietary schools, this body of data is probably more complete than most other bodies of similar data.

In both of the micro studies the owners allowed full access to school records regarding all aspects the research required. Information was collected by the investigator from school records and was not compiled for the researcher by the school.

CHAPTER II

AN OVERVIEW OF THE VOCATIONAL PROPRIETARY SCHOOL INDUSTRY

If a prospective student were to open the 1974 Chicago telephone directory to the section in the yellow pages headed "schools," he would find twenty-six pages of listings, a large percent of which could loosely be defined as "proprietary schools." Between the listings for AAA Driving School and Zinser Training Center, he could choose from schools specializing in everything from accounting to ventriloquism, from a school owned by IBM to a neighborhood cooking school. Perhaps the chief impression the student would receive is that the proprietary school industry is incredibly diverse, and his impression would be justified. However, this diversity of training opportunities is not viewed universally as a blessing. To some, this variety of schooling options in the private sector seems a strength, complementing the established public system. To others, the diversity represents an inherent "shadiness." Most likely the industry is neither, on the one hand, a panacea for problems of occupational training, nor, on the other, a modern version of the traveling medicine show. Indeed, the features of the industry, except for vague impressions, are obscure.

One characteristic, however, is immediately obvious. The proprietary school industry in Illinois is a major source of post-secondary training. An estimate of the total number of schools by type and the number of students attending them is given in Table 1. From these estimates we see that in 1972 approximately 114,940 students were enrolled in resident training in some 543 schools, to which we add approximately 500,000 enrolled in forty-six home study schools. Five-sixths of the total enrollments are in the home study or correspondence schools, some of which operate on a very large scale. The American School, one of the nation's largest correspondence schools, has annual enrollments of 50,000 students. On a full-time basis there was an equivalent of 65,000 resident students enrolled in Illinois vocationally

TABLE 1*

ESTIMATES OF THE NUMBER BY TYPE OF ILLINOIS PROPRIETARY SCHOOLS AND THE NUMBER OF STUDENTS ENROLLED ANNUALLY

Number of Schools	Kind of Schools	Annual Enrollment
83	Business	24,900
89	Vocational (includes 5 truck driving schools)	32,200
30	Self-Improvement	6,000
46	Home Study	500,000
150	Cosmetology	15,000
24	Barber	2,400
1	Mortuary Science	240
91	Commercial Drivers Training	27,300
86	Pilot Flight and Ground	12,900
589	Total Number of Schools and Students Enrolled in Illinois Proprietary Schools	614,940

*Estimates in Table 1 presented by H. H. Katz, A State of the Art Study on the Independent Private School Industry in the State of Illinois, State of Illinois, Advisory Council on Vocational Education, May 1973, chart 7, p. 51.

oriented proprietary schools in 1972 and about the same number of vocational students in Illinois community colleges.[1] There can be little question, then, of the importance of this sector in post-secondary training.

The purpose of this chapter is to delineate further the characteristics of the industry. Since a distinguishing feature of the proprietary school is its position in the marketplace, we are particularly interested in the financial characteristics that mark the school as a business.

Restrictions and Definitions

regulatory agencies.--In Illinois several different agencies control proprietary schools. The Department of Transportation of the Federal Aviation Administration controls pilot flight and ground schools. The Illinois Office of the Secretary of State regulates truck driving schools and non-commercial driving schools and the Illinois Department of Registration and Education licenses cosmetology, barber, and mortuary science schools. The balance--business, trade and technical, and others--is under the jurisdiction of the Office of the Superintendent of Public Instruction. The sample used in this chapter is limited to schools regulated by the Office of the Superintendent of Public Instruction (OSPI) because of the problem of data accessibility and because that agency covers the largest number and greatest diversity of schools.

vocational.--"Vocational" is commonly considered synonymous with "trade and technical" as used in the phrase "private business and vocational schools." However, throughout this study "vocational" describes any school offering training that could be considered career training: modeling schools, for example, are included as "vocational" since they undoubtedly serve as career training for some people, although in general they might be considered avocational. Furthermore, "vocational" is restricted to training for which a post-high school degree is not required.

proprietary.--A proprietary school is privately owned but may be profit-oriented or non-profit. Because the number of non-profit schools, as defined by IRS regulations, is quite small and because these schools are often associated with trade or professional associations, receiving support through association dues, the non-profit schools are excluded from all analysis involving financial characteristics.

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[1] Estimated from data provided in H. H. Katz, A State of the Art Study on the Independent Private School Industry in the State of Illinois. State of Illinois Advisory Council on Vocational Education, 1973, p. 51.

sample.--The sample includes those vocational proprietary schools under OSPI jurisdiction, located in the Chicago SMSA, which had received approval by February 1973 to operate for that year.[1] The sample of 147 schools is probably a conservative count of the total number of schools approved to operate in 1973 because schools that were late in filing applications could not be distinguished from schools not intending to renew licenses and were therefore excluded.

Structure of the Industry by Ownership, Tax Status, and Areas of Instruction

The impression of diversity throughout the industry is supported by data given in Table 2 showing the schools categorized by ownership status. Still, over 70 percent of the schools have ownership concentrated in one person or in a few, often related, people. The balance consists of schools owned by corporations (chiefly those whose primary business is other than education). A different view of the structure of the industry by ownership (columns 3 through 5 of Table 2) shows that the single-owner schools have on the average only one-third the enrollment of schools that are subsidiaries of corporations (87 versus 289), but they attract 21 percent of total enrollment compared to 34 percent for the large corporate schools.

The large majority of vocational proprietary schools are profit-oriented: of the 147 schools in the sample, only ten have been given tax-exempt status by the IRS. A similar majority exists with respect to the place of instruction. Over 80 percent of the schools offer resident training, 75 percent of them resident training exclusively. The balance are correspondence schools.

Diversification within a number of schools is so extensive that no single category fully captures the essence of their training programs. Nevertheless, to provide some approximate indication of the number of schools offering particular instruction, each school was categorized according to what was assessed to be its primary area of instruction. Considerable subjective evaluation was inevitable. A decision to place a school in a certain category was made on the basis of what the investigator personally knew of the school, what information was presented in the school's catalogue and in the records maintained by OSPI.

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[1] A number of seasonal tax schools, namely the H. & R. Block school with its numerous branches, were excluded.

TABLE 2

NUMBER OF SCHOOLS AND ENROLLMENT CATEGORIZED BY OWNERSHIP STATUS[a]

	(1) Number of Schools	(2) Percentage of Total	(3)[a] Mean Enroll. Per School	(4) Number on Which Mean is Based	(5) Percentage of Total Enrollment
Single Owner	57	39.6	87.4	37	21.3
Small Number of Owners	45	31.3	191.7	33	41.7
Small Corporation	7	4.9	129.5	2	1.7
Subsidiary of Parent Corporation	35	24.3	289.3	18	34.3
	144[b]	100.1[c]	166.8	91[d]	99.0

[a] Columns 3 through 5 include only those that are not exclusively correspondence or non-profit.

[b] In the tables in this chapter, when the total figure does not equal 147, the difference constitutes the number of schools for which data was not given.

[c] Rounding error.

[d] Ownership for one school not specified.

Table 3 gives the number and percentage distribution of the schools according to the primary area of instruction in each school. Diversity again is striking. Trade and technical schools and business and secretarial schools, often considered the main substance of the proprietary school industry, are clearly the two largest single groups of schools, but together they constitute only 35 percent of the total number. The next largest group, the data processing schools, are only half as numerous as the trade and technical schools.

TABLE 3

VOCATIONAL PROPRIETARY SCHOOLS CATEGORIZED BY PRIMARY AREA OF INSTRUCTION

Primary Area	Number	Percentage of Total Schools
Trade and Technical	28	19.0
Business and Secretarial	23	15.6
Data Processing	13	8.8
General Education	11	7.5
Applied Arts	10	6.8
Modeling	10	6.8
Public Services (Law Enforcement, Detective, Broadcasting)	8	5.4
Health Related	4	2.7
Transportation	4	2.7
Public Relations (Leadership, Salesmanship)	4	2.7
Miscellaneous (Cooking, Dog Grooming, Real Estate, Travel Agency, Bartending, etc.)	32	21.8
Total	147	99.8[a]

[a]Rounding error.

Along with the data processing schools and comprising approximately the same percentage of the total are schools providing general education, public services, applied arts, and modeling. The bulk of the remaining 30 percent consists of a gamut of limited demand schools--from cooking to dog grooming to bartending to ventriloquism.

Several features of the industry are more apparent. Most of the schools are profit-oriented and restrict training to resident students. Ownership of the schools is distributed among single owners, small groups, and large parent corporations.

Measures of Size

Another perspective from which to view the industry is to assess its size, in terms of assets, income, enrollment, and profits, characteristics relevant to the operation of the schools as an industry. In addition to figures presented for the total sample, comparisons are made among five subsectors of the industry: trade and technical, business and secretarial, data processing, general education, and a miscellaneous group containing the balance of the schools. For convenience, this fifth category will be referred to as "specialty" schools.

To insure some comparability among groups, the sample was restricted to schools for which adequate information existed and which (1) were licensed for 1973 by February of that year, (2) had a tax status that was not non-profit under IRS provisions, (3) was not exclusively a correspondence school, and (4) had financial data that referred to the school itself and not to a parent corporation.[1] Furthermore, because of frequent extreme values among the variables, mean values are often misleading; thus, median values are usually more appropriate measures for making inter-group comparisons. Unless specified, "average" and "typical" refer to the median.

Although there is considerable variation in the total assets of schools, fully half operate with assets of $30,000 or less, and 21 percent have assets of $10,000 or less. The financial ease with which a prospective school owner can enter the industry has undoubtedly been a major contribution to the characteristic of industry flexibility.

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[1] Many of the large corporate-owned schools submit annual reports of parent corporations. Exclusion of these schools probably has a downward bias on the average size of schools in comparisons including financial data.

Two other sources of possible bias are (1) the date of the fiscal report from which the financial data is obtained, and (2) the interval of time covered by the financial statement. All applications are made for 1973. The financial statements are for the most current year, but because of different fiscal years some schools submit statements with recent dates and others submit statements that are a year old or more. No attempt is made to adjust figures to a specific point in time. Also, the interval of time covered in the financial statements ranges from one to twelve months. Income and expenditures are assumed to be distributed evenly throughout the year and are adjusted to an annual basis.

Table 4 shows that the distribution of schools by assets is highly skewed to the right, largely due to the large number of specialty schools that apparently require little capital outlay. The sharpest contrast is between the trade and technical schools, with average assets of $96,000, and general education schools, with assets of $20,300. In fact, the mean amount of the assets of a trade and technical school is nearly five times as much as for a general education school. Undoubtedly the assets reflect the greater equipment costs required for training in technical fields. A comparison with business schools, which have about the same level of enrollments, suggests that more than half of the trade and technical schools' physical assets may be in equipment. The estimate is diminished slightly if we assume that necessary space per student is greater in trade and technical than in other schools.

Data processing is another field in which equipment costs could be high because of expensive computer facilities. However, the difference between the mean ($86,100) and median ($29,300) suggests that probably a few large schools may own their computers while the majority lease computer facilities.

The typical school annually receives $79,500 in income from tuition and miscellaneous sources. The differences between mean and median income for trade and technical schools and for data processing schools again indicate that each of these groups probably has one or two very large schools. Still, the average trade and technical school operates with revenues twice as large as the average for all schools and nine times as large as the typical data processing school.

A comparison of income with assets shows that a large amount of capital is not necessarily required to generate considerable income. Income is greater than assets, and generally twice as much for all schools except the data processing schools. These computer schools have in the last few years undergone a contraction in their numbers, following the rapid expansion of the "glamour" field in the 1960's, and the low income/asset ratio may reflect general economic difficulties that these schools are now experiencing. In contrast, the highest income/asset ratio is in the general education school, where average assets of $20,000 generate income of $70,000.

Table 3 showed that the trade and technical and the business and secretarial schools together compose a smaller portion of the total number of schools than is generally thought. The impression of dominance is not completely unjustified, however, for although the trade and technical together with the business and secretarial schools comprise

TABLE 4

COMPARISON BY SECTOR OF ASSETS, INCOME, ENROLLMENT, LENGTH OF COURSE, AND PROFITS

Sector	(1) (000) Assets	(2) (000) Income	(3) Enrollment[a]	(4) Length of Course[b]	(5) (000) Profits
Trade & Technical (no. of sch.)	354.8 *	709.0	293*	799	45.9
	96.0	178.6	111	850	6.4
	9	10	14	16	10
Business	50.5	141.8	150	1156***	11.3
	39.8	108.3	147	1165	4.6
	13	13	20	22	13
Data processing	86.1	120.8	215	528	6.0
	29.3	19.5	176	509	3.8
	9	8	10	13	5
General education	20.6*	106.2	145	256***	9.2
	20.3	69.0	67	98	9.7
	5	6	7	5	6
Specialty schools	41.3	109.6	123*	305	9.7
	26.6	37.0	52	90	5.3
	35	36	40	45	35
Total	86.9	198.4	167	595	14.9
	30.4	79.5	78	386	5.6
	71	73	91	101	69

[a] Excludes 20 schools that reported zero enrollment.

[b] Length of course is given in hours

Significance levels: * = .10; ** = .05; *** = .01.

* Indicates a significant difference between the largest and smallest values for the denoted variable.

35 percent of all schools (in this sample), they earn 60 percent of all school income and enroll 73 percent of all students.

Of 111 schools, twenty had no students enrolled at the date of reporting;[1] for the other 91 schools average enrollment[2] was 78. Although the largest schools are found in the trade and technical group, data processing schools have, on the average, the largest enrollments. The average data processing school has about 175 students; business schools, the category with the second largest average enrollment, have about 25 fewer students than the data processing schools. Specialty schools, the largest group, are quite small, generally enrolling only 50 students. Although there is a statistically significant difference between the mean size of trade and technical schools and specialty schools, the strong skewness in both distributions diminishes the importance that would normally be attached to the statistical difference.

Perhaps the only interesting observation to be made about the profit averages[3] alone is that there is no significant difference in average profits among all groups of schools, although at the medians the schools giving general education reap the largest profits. Contributing to this situation is probably the minimal overhead costs of training, since no expensive equipment or particular technical expertise is required to teach basic education skills. The lowest profit average is found in the data processing group, suggesting again the current contraction within that sector.

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[1] Because the figures refer to current enrollments, some of those schools reporting zero enrollment may have had students at other times during the year or may be schools just opening.

[2] Enrollment figures were taken from the application forms each school files with OSPI. The figures are current enrollment. With only the school's aggregate enrollment given it is not possible to determine the distribution of students among various programs within a school. Furthermore, without that information it is futile to estimate annual enrollment.

[3] Profit figures may not accurately measure the relative prosperity of a school for two reasons. First, profit maximization may not be its primary goal. A school seeking growth may spend its would-be profits on equipment or expanding school capacity. Second, the owner of a school may withdraw profits in the form of salary. If he pays himself less during bad years and more during prosperous years, the true volatility of profits will be dampened.

These rough measures of size--assets, income, enrollments, and profits--suggest a market, like most retail markets, in which the characteristics of the sector largely determine the relationships among the financial data. There is no clear relationship between the measures of size in this sample of the industry: the large assets and income of the trade and technical school do not guarantee large profits or the largest average enrollment. Rather, the trade and technical schools, by the nature of the training they offer in fields governed in large part by complex technology, are required to make heavy outlays for equipment and personnel with technical expertise.

At the other extreme are the general education schools, having the lowest average assets, but with relatively high incomes. Based on medians for the general education subsector, assets generate 3-1/2 times their value in annual income. These schools are obviously operating with different requirements than those of the trade and technical schools. The very existence of these schools is a peculiar phenomenon. With compulsory schooling for children and a plethora of remedial services offered in government training centers, adult continuing education facilities, and community colleges, one might wonder how these proprietary schools survive in such an environment.

According to an inquiry into the effectiveness of Chicago's vocational education programs in public high schools, conducted by the Chicago Daily News staff, many high school students cannot get jobs because public schools (1) use outdated equipment in training them, and (2) accept work that in the business world is unacceptable. Their inquiry showed that a majority of Chicago high school graduates read poorly, cannot spell or punctuate sentences properly, and have trouble calculating the simplest problems in arithmetic. Moreover, these students often lack proper work attitudes and habits.[1] None of these observations are, of course, a surprise to educators conversant with problems of urban education, but the findings do offer a plausible explanation for the recent establishment of proprietary schools offering general education (only one school in this group was operating before 1967)[2] in

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[1] Chicago Daily News, April 19, 1974, pp. 1, 20.

[2] Comparison with general education schools listed in a 1951 directory of Illinois schools shows that twenty years ago opportunities for private post-compulsory general education were very limited. Only three schools might have been proprietary schools and judging from their names probably offered evening instruction for adults.

that they provide basic skills that students fail to attain in public schools and which are necessary for employment.

We have then at one extreme of the size spectrum trade and technical schools, the largest schools by several measures, and at the other end general education schools, typically generating the highest profits with the smallest physical assets.

Elements of Profitability

Some inferences about the structure of the proprietary school industry may be drawn from the crude measures of size presented in the previous section. However, an examination of relative cost and size data offers an entirely different perspective on the differences among the types of schools. Proprietary schools are at once schools and businesses, and the ideal comparison would be between measures of school success and business success. Measures of the former are not available, but profits are a measure of business success in the short run and over a period of time an indication of a superior, or at least acceptable, product. In this section we examine profits and some of the elements of a school's operations that influence its profitability as a business. We will compare the various sectors with respect to student-faculty ratio, cost per hour of instruction, percentage of income spent on enrolling students and advertising, and rates of return.

Although there is no significant difference in student-faculty ratios[1] among sectors, data processing schools have the highest ratios and general education schools the lowest (see Table 5). This situation corresponds to relative enrollment sizes: data processing schools have the

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[1] The average student-faculty ratio is computed as 14.9 but, because of the necessary means of computation, represents a minimum estimate. The ratio is not based upon actual ratios existing in classrooms, but upon the ratio of the school's total current enrollment and faculty count, with the assumption that all teachers share equally in the number of classes they instruct. The largest discrepancies undoubtedly occur between part-time and full-time faculty whose status is not distinguished in the OSPI records. If we assume that for a school that has day and evening classes, half the faculty teach full time and the other half part-time, then the faculty-student ratio should be adjusted upwards by one-third (to an average of approximately 20). The diversity of school schedules and teaching loads, however, is so extreme that it is difficult to know what would represent an accurate adjustment for all schools. Without any a priori reason for expecting a greater distortion in the ratio in one sector than in another, the computed ratios are presented without adjustment.

TABLE 5

COMPARISONS BY SECTOR OF THE STUDENT/FACULTY RATIO, COST PER HOUR OF INSTRUCTION, ENROLLMENT EXPENDITURES PER STUDENT, PERCENTAGE OF INCOME SPENT ON ENROLLMENT, PERCENTAGE OF INCOME SPENT ON ADVERTISING, AND PROFITS AS A PERCENT OF ASSETS

Sector	(1) Stu/Fac. Ratio	(2) Cost Per Hour	(3) Enroll-ment Cost	(4) Enroll.Exp. % of Income	(5) Adv.Exp. % of Inc.	(6) Rate of Return %
Trade & (mean)	19.5	1.65***	$762	19.5	5.4	61.1
technical (median)	17.0	1.49	197	18.3	4.3	18.2
(no. of sch.)	14	14	6	6	9	9
Business	19.5	1.77	110	19.5	11.5	3.9
	14.7	1.43	69	11.2	8.9	10.6
	20	17	9	9	11	12
Data processing	24.5	2.57	221	22.3	22.7	14.5
	24.8	2.48	139	22.4	12.5	17.7
	7	10	5	5	7	5
General education	15.6	2.95	78	12.1	7.7	32.5
	11.1	2.86	57	9.2	5.4	35.4
	7	5	5	5	6	5
Specialty	18.3	4.24***	219	17.6	11.5	47.0
	12.9	3.00	86	11.3	9.0	18.3
	40	38	19	23	24	34
Total	19.0	3.03	255	18.1	11.5	37.4
	14.9	2.35	92	12.0	8.3	14.0
	88	84	44	48	57	65

*Indicates a significant difference between the largest and smallest values for that variable.

Significant levels: * = .10; ** = .05; *** = .01.

largest median enrollment and general education schools have the second lowest enrollments. This high-low split could be a characteristic of the types of schools but could, and more probably does, illustrate economies of scale. A school with only a few students must still offer a number of courses and classes. Even though expansion of enrollment requires adding more teachers, the number of additional teachers probably increases more slowly than the number of students up to some minimum level of efficiency of scale.

Variation in average tuition charge per instruction hour[1] is considerable and statistically significant. The overall average is $2.35, but specialty schools charge $3.00, trade and technical schools $1.49, and business schools $1.43 (see Table 5). Two reasons seem plausible for the significant difference . One is that some specialized schools may have limited markets that will support only one school thus placing the school in a monopolistic position with respect to the school's product. A more probable explanation is that overhead costs in specialty schools, where courses are generally short, must be covered in a shorter period of time than in schools that typically have long training programs. Data on course length[2] shown in Table 4 supports this supposition. Courses in trade and technical and business schools last six to nine months, typically, while specialty school courses generally last the equivalent of only three weeks. Fixed costs and certain start-up costs in a specialty school

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[1]The tuition cost per instruction hour is computed by taking the tuition and number of hours required for what appeared as a typical course. The choice in many cases in selecting an appropriate course was judgmental. No information was available on the distribution of enrollment among courses; selection was based on school data on the number of courses offered by type, the distribution of instructors by the subjects they taught, and general information provided by school catalogues.

[2]The method of determining course length was similar to the method used in assigning each school to a primary area of instruction. Through a review of information available for each school, one course was chosen as representing that school's curricular offering. Caution should be taken in interpreting any results using average length of training, because the course that appears in the catalogue to be the most probable mainstay of a school's business may not have many students. For example, business school brochures give the impression that a nine-month secretarial or clerk-typist course is the most typical course. However, it is probably true that, while few students remain in training for more than nine months or a year in these schools, many, and possibly a majority, attend for much shorter periods of time.

must be made in less than one-tenth the time available for a trade and technical or business school to cover its costs. The negative relationship between average tuition per hour and length of training observed between specialty and trade and technical and business schools also extends to the other sectors.

Because proprietary schools are a less visible sector of the educational system and because, of course, they must attract students to stay in business, they actively recruit and advertise for students; however, no attempt, to the writer's knowledge, has been made to determine how much capital goes into enrollment efforts. One of the criticisms leveled against proprietary schools is that the money spent on "non-productive" operations such as recruiting could better be spent improving the training programs. Although this argument ignores the realities of any business (in which even the best product must compete with others for the attention of the consumer), the expenditures on advertising and recruitment deserve investigation if for no other reason than the general criticism they draw.[1] Furthermore, information about the cost structures of proprietary schools is relevant to policy decisions regarding the establishment of tuition refund schedules. Proprietary schools are coming under increasing governmental regulation, and one of the major concerns of the regulatory agencies is the protection of the consumer through adequate refund policies. What constitutes an appropriate refund policy is not clear; it is clear, however, that account must be taken of a school's distribution of expenses.[2]

Column 3 of Table 5 gives the annual dollar amount spent on enrollment[3] activities (recruitment and advertisement) per current enrollee. The mean for all schools is $255,

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[1] This is not to imply that public schools do not advertise, for indeed they do, but it goes under the name of providing a public service, i.e., informing the public of educational opportunities.

[2] For a fuller discussion of this point see W. D. Hyde, Jr., "Comments on the Federal Trade Commission Proposed Trade Regulation Ruling Concerning Proprietary Vocational Schools," October 1974 (mimeo).

[3] The median amount spent on enrollment by schools represents 13.2 percent of the median income of all schools. Enrollment expenses include salaries and commissions for recruiting and related personnel, travel expenses, advertising costs, and expenditures for public relations, catalogues, and miscellany.

although more than half of all schools spend less than $100 per current enrollment. While these figures seem high, the median for trade and technical schools is twice the amount for all schools; however, the average trade and technical school student who completes training generally remains in school for the equivalent of seven months (assuming 30 hours per week as full time)--more than twice the time for all students.[1]

Another way to evaluate the commitment to enrollment costs, and one that is not tied to the uncertainty of enrollment figures, is to compute the percentage of revenue or tuition used for recruitment and advertising. The overall median tuition is $695. The median amount of money spent by a school for enrollment purposes is $92, or 13.2 percent of the tuition. Estimates of recruitment expenditures as a percentage of annual revenue yield results approximately the same: column 4 in Table 5 shows that the median percentage is 12.0 percent. Data processing schools, however, spend nearly twice as much of their income, 22.4 percent, on recruitment as other schools. An explanation for the high percentage expenditures for recruitment in data processing schools can only be speculative. During the 1960's the sector underwent very rapid growth with a large influx of new schools. The industry offered training in a "glamour" field and attracted a large number of students. One possibility is that during the current contraction of student demand in this sector, advertising and promotional budgets have not yet been adjusted to the lower levels of income of these schools. This condition, however, is not likely because generally advertising is one of the first areas of expenditures that

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[1] Tending to widen the gap between the amounts spent by school sectors is the fact that in shorter courses, such as those in specialty schools, current enrollment represents a smaller fraction of annual enrollment than for schools such as the trade and technical schools or business schools with longer programs. Any attempt to adjust current enrollments to annual rates would subsequently reduce the enrollment cost per enrollee in specialty and general education schools more than in trade and technical or business schools, thus widening the difference between the average amount spent among the sectors. In a detailed study of a technical school in which the exact number of enrollments per year was known, the average enrollment cost was $85. If the relationship between this figure and the amounts reported for trade and technical schools in column 3 is taken as representative of the probable relationship existing within other sectors, then the actual cost of enrollment may be reduced by approximately half.

businesses curtail in declining markets. On the other hand, schools may feel that only through heavy advertising can they hope to attract students in this tight market period. Another possibility (equally unsubstantiated) is that demand for data processing schools is more elastic than for other schools so that differences or apparent differences through advertising result in relatively large shifts in students' preferences among data processing schools. Under these conditions each data processing school would try to differentiate its product from others.

Several interesting relationships emerge when we separate direct advertising expenditure as a percent of income from all recruitment expenditures as a percentage of income. While the percentage spent for advertising is about two-thirds of the median recruitment percentage, general education and data processing schools spend only about half of the recruitment expenditures on direct advertising. Specialty schools seem to rely on direct advertising rather than recruiting agents, probably because (1) the schools offer training that appeals to a fairly specific group of people, and (2) the shortness of their courses (and lower tuitions) makes it uneconomical to support the heavy costs of employing agents. On the other hand, trade and technical schools, which spend on the average 18.3 percent of income on total recruitment, spend only 4.3 percent of income on direct advertising, the bulk presumably going for other recruitment expenses such as recruiting agents.

Proprietary schools are for the most part "profit-oriented" schools and the factors mentioned to this point can reasonably be considered relevant to a school's profitability, but it is unclear just how profitable they are. Table 4 showed that the median profit was $5,600, but an examination of rates of return (profits after taxes as a percentage of assets)[1] reveals two particularly interesting things about the profitability of proprietary schools.

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[1] The relevant concept for measuring profitability is the rate of return on invested capital, i.e., the ratio of profits to equity. In the absence of information on equity, assets may be used in lieu of equity without distorting the relative differences between subsectors if the ratio of liabilities to assets is constant. However, the estimates of profitability will be understated by means of the excess of assets over equity.

One is that the average rate of return for proprietary schools is above average. The rate of return on equity for all manufacturing corporations in the U.S. in 1972 was 10.3 percent.[1] The median rate of return for the proprietary school sample was 14.0 percent (see Table 5). The most profitable sector was the general education school sector in which the rate of return was 35.4 percent, approximately twice as high as the next most profitable sectors, trade and technical and specialty schools, which averaged a return of about 18 percent.[2] Business schools, in contrast, earned only a 10.6 median return on their investments and some business schools had heavy losses implied by the lower mean of 3.9 percent.

One's first reaction to these figures is that the returns seem, particularly in the general education sector, excessively high. However, two caveats should be entered. The information used in computing profitability is derived from a single point in time (one year). Observation of the schools over a period of time might indicate that the current rates of return reflect a temporary market disequilibrium. The other consideration is that a high rate of return in some enterprises reflects inherent high risks of the business. The other aspect of proprietary school profitability--volatility of profits--suggests that risks may be substantial. Despite a median return of 14.0 percent to the industry, a number of schools received much higher rates of return. The overall mean was 37.4 percent, but a fact not discernible from information provided in Table 5 is that 25 percent of the schools had losses for the year. With such extreme variation in profitability the seemingly high mean rates of return may be quite reasonable in the context of inherent risks.[3]

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[1] Economic Report of the President, January 1973. USGPO, 1973, p. 280. (The rate is an average of the first three quarters.)

[2] The mean rate of return for trade and technical schools seems unrealistically high. It is very probable that assets (or profits) were incorrectly reported, but without having any additional information on the accuracy of the reported figures discarding observations simply on the basis of extremity seems inadvisable. Instead, median values are used for comparisons.

[3] Chapter IV examines a number of conditions that illustrate the types of risks that school owners must often take.

Stability of the Proprietary School Industry

Perhaps because of an actual or perceived practice of a handful of proprietary schools of entering a market area, making a quick "buck" and then moving on to another city, the entire industry is coming under increasing governmental provision designed to protect the consumer against the consequences of possible school failures.

There is nothing unethical about a school operating for only a short time: the concern arises with the implication that such a school is irresponsible to its students. A number of reputable but temporary tax schools open each year, their business being seasonal. In fact, it is in the nature of proprietary schools to meet educational demands not met elsewhere, and in doing so proprietary schools often enter a new field, staying as long as there is sufficient demand. Some fields of occupational training, such as neon glass bending and railroad engineering, have disappeared through changing technology. Technology also opens new areas, the largest and most notable being data processing and computer technology.

While most states have enacted some regulations governing proprietary schools, Illinois has been one of the most progressive in its attempts to improve the quality of the schools and to insure that schools are sufficiently solvent to meet commitments to their students. Through the Office of the Superintendent of Public Instruction which controls the vast majority of proprietary schools excepting those offering instruction in licensed occupations (such as cosmetology and barbering), the state has continually improved its rules and regulations since the agency's inception in 1956. According to the original rules, a school was required to file an annual application which specified the following: ownership, courses of instruction offered, equipment available for training activities, and qualifications of each instructor. A school had to show that it had financial resources available to maintain the school and had to provide a surety company bond for $10,000 for the protection of the contracted rights of students. School catalogues or published materials had to give complete information on the purposes and objectives of training offered, to state prerequisite training or educational attainment for admission, to give the title, hours of instruction, content, and duration of each course, and to state the tuition and fees of the school.

Since 1956 many of the previously mentioned regulations have been made more explicit and new requirements added. Financial statements, certified by a public accountant, including balance sheet with profit and loss statements must be submitted. A pro-rated tuition refund policy has been

instituted, and schools providing job placement assistance must provide the state with data on the number of graduates employed. In an attempt to assure qualified instructors, all new instructors must have had a course in methods of teaching. And to monitor the schools' actual operations, the state regulatory personnel make at least an annual inspection of each school.[1]

The relative effectiveness of these provisions in reducing student complaints and in stabilizing the industry is indeterminable. Clearly the regulations have prohibited some schools from operating, because the files of the Private Business and Vocational Schools unit, the policing agent under OSPI, indicate numerous such instances. But the question remains as to how much less stable the industry would be without the regulations. Perhaps information comparable to our data on school failure rates and the longevity of schools in Illinois will become available from other states without the regulations of Illinois so that an assessment of the effectiveness of government regulation can be made.

Obtaining time series data retroactively on proprietary schools requires a certain amount of "detective" work to permit piecing together fragmentary information from a number of sources. To determine the change in the proprietary school industry profile over a number of years this type of piecing together of information was necessary, and mainly successful because of old lists and records maintained by OSPI.

We obtained information on two aspects of the industry's stability--school turnover rates and the age distribution of currently existing schools and schools that have failed. Estimates of turnover rates are biased upwards, because we could not in some cases determine whether a name change of a school represented a change of ownership. In collecting these data a change of school name was assumed to reflect a change of ownership and thus the failure and establishment of another school. Of course this need not always be the case, but without more detailed information, this procedure was used to keep the direction of bias constant. This method of calculating changes in schools also underestimates the ages of schools.

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[1] Criteria for Evaluation: Private Business Schools Conferring Degrees, State of Illinois, September 1956, and Rules and Regulations: Private Business and Vocational Schools, State of Illinois, Private Business and Vocational Education Unit, Springfield, Illinois, July 1971.

school turnover rates.--The turnover rate, the percentage of schools operating in one year and not operating in the next, was computed for the business school and the data processing school sectors from 1963 to 1973.[1] The results in Table 6 show a discernible difference in the turnover rates of the two sectors. During the period, 12.7 percent of the business schools in operation in any given year were not in operation the following year. For data processing schools the figure was nearly twice as high, 24.7 percent. The particularly high turnover rate of data processing schools is probably a result of the sector's contraction. From 1963 to 1969 the number of data processing schools rose steadily from 8 to 37 and from 1963 through 1968 only 13 schools closed. However, beginning in 1969 when there were 37 data processing schools, the number of schools operating each year declined until, by 1973, there were only 9 still operating, the same number as in 1964. During the contractionary years of 1969 to 1973, the turnover rate rose dramatically, to 40, 50, and nearly 60 percent.

The business schools, however, experienced much less volatility, maintaining approximately 30 schools throughout the period. Placing aside the unusually high rate for 1963 (which was the first year some of the data were available and may contain measurement error), there still is an upward trend in the turnover rate of business schools.

failure rates and age distribution of schools.--Between 1963 and 1973, 64 data processing schools closed. The mean life expectancy of these schools was 2.7 years, and half of them lasted no more than 1.5 years (Table 7). The mean length of time that the closed business schools lasted was 10.7 years, four times as long as the data processing schools. However, if we compare the average duration of the closed schools to their currently operating counterparts, a curious fact emerges: unlike data processing schools which closed within a few years of opening, closed business schools were relatively well-established "old" firms. Comparison of the means and medians in Table 7 shows that the skewness for business schools is greater than for data processing schools. In other words, in relative terms, old business schools are dying more frequently than old data processing schools. In

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[1] Because of administrative changes involving responsibility for supervising various sectors of the industry, records on business schools and data processing schools were found to be the only ones complete enough for analysis.

TABLE 6

TURNOVER RATES FOR PROPRIETARY BUSINESS AND DATA PROCESSING SCHOOLS, 1963-1973

Year	Total Schools Operating	New Schools	Closed Before Next Year	Percentage Closed	
		Business Schools			
1963	31	6	7	22.5	
1964	25	1	1	4.0	
1965	26	2	1	3.8	
1966	29	4	1	3.4	
1967	30	2	2	6.6	
1968	36	8	5	13.8	12.7
1969	37	6	8	21.6	
1970	30	1	4	13.3	
1971	30	4	6	20.0	
1972	28	4	5	17.8	
1973	23	0			
		Data Processing Schools			
1963	8	3	1	12.5	
1964	9	2	0	0.0	
1965	16	7	1	6.3	
1966	17	2	3	17.6	
1967	18	4	2	11.1	
1968	29	13	6	20.6	24.7
1969	37	14	15	40.5	
1970	36	14	13	36.1	
1971	27	4	12	44.4	
1972	19	4	11	57.8	
1973	9	1			

Computed from OSPI records.

TABLE 7

COMPARISON OF SCHOOL AGES BETWEEN CURRENT AND CLOSED PROPRIETARY DATA PROCESSING AND BUSINESS SCHOOLS, 1963-1973

	Data Processing Schools		Business Schools	
	current	closed	current	closed
mean	13.5	2.7	24.1	10.7
median	6.5	1.5	14.0	5.0
number of schools	13	64	22	21

absolute terms the frequency distribution in Table 8 shows that three-fourths of the closed data processing schools failed within the first three years of their operation and that none of the closing schools were more than ten years old. This clearly indicates that risk of failure is most prominent at the beginning. It is understandable that a new school faces many problems: it may lack experience in teaching and administration or a reputation in its community and must incur start-up costs that make it particularly vulnerable to early financial misfortunes.

TABLE 8

FREQUENCY DISTRIBUTION OF THE AGE UPON FAILURE OF CLOSED PROPRIETARY BUSINESS AND DATA PROCESSING SCHOOLS, 1963-1973

	Data Processing Schools		Business Schools	
Age in Years Upon Failure	Number Failing	Percentage Failing	Number Failing	Percentage Failing
1-3	48	75.0	9	42.9
4-6	10	15.6	3	14.3
7-9	6	9.4	1	4.8
10 and over	0	0.0	8	38.1
Total	64	100.0	21	100.0

The conventional survival pattern found among the data processing schools, however, is not as clearly typified in the business schools. The initial pattern is the same, showing that the largest percentage (43%) of the closed business schools failed within the first three years of operation, but there is an unusually large number of business schools, "established" schools, that also closed. Thirty-eight percent of the business schools that closed during the period were 10 years old or older. Apparently some force other than the typical start-up difficulties are affecting the entire sector.

One of the most likely causes for the large number of failures among established proprietary business schools is the expansion of other institutions providing similar training, i.e., the community colleges. While we cannot be sure of any causal relationship between the expansion of the community colleges and the decline of the proprietary schools, the evidence we have is consistent with such a relationship. If the community colleges have caused a reduction in the number of proprietary schools, we should observe the following: (a) a disproportionately high failure rate among proprietary schools during the years of the most rapid expansion of the community colleges, and (b) a disproportionately high failure rate among proprietary schools offering training closest in character to training offered in the community colleges.

The impetus for the community college system in Illinois began with the Illinois Junior College Act of 1965 which created the framework in which each Illinois resident would have access to a community college. It took a year or more before many junior college districts established their own colleges; nevertheless a comparison between any of the early years of the community college system and one of the more recent years indicates by any measure a tremendous expansion of educational activities within the community colleges. Table 9 shows that in three years enrollment in vocationally oriented programs in community colleges more than doubled while in a four-year period the number of vocational programs and credit hours purchased increased four-fold.

The decline of proprietary schools was not restricted to any one year just as the expansion of the community colleges extended over several years, but from Table 6 we see that from 1968 to 1972 the annual failure rate for business schools was 17.3 percent while the overall rate (1963-1973) was 12.7 percent. For the data processing schools comparable figures were 39.9 percent and 24.7 percent, respectively. In spite of the possible contractionary phase of the data processing schools resulting from an over-expanded market from earlier years, the failure rates for both sectors during

TABLE 9

VOCATIONAL ENROLLMENT, CREDIT HOURS, AND PROGRAMS IN ILLINOIS COMMUNITY COLLEGES, 1966-1970

	1966 (Fall)	1970 (Fall)
Individuals Enrolled	17,673 (1967)	42,703
Number of Programs	239	927
Number of Credit Hours	74,421	330,949

Source: Third Biennial Report, 1969-1970, Illinois Junior College Board, March 1971, p. 18.

the expansion of the community colleges was approximately half again what it was for the overall period.

Of the proprietary school sectors established for other analyses in this chapter, the community colleges provide training that is most similar to that offered in the trade and technical, business, and data processing school sectors. General education or remedial education programs are offered in many community colleges, but as already mentioned the growth or proprietary schools providing general education represents a unique situation. The specialty school sector with all of its unusual programs is the sector that the community colleges are least likely to duplicate.

Unfortunately, we do not have data on the failure rates among the other sectors of the proprietary school industry, but the change in the number of schools in each sector during this period of community college expansion can serve as a crude indication of the growth within each sector. The data in Table 10 clearly show that the schools that offered training most similar to that available in the

TABLE 10

GROWTH OF PROPRIETARY SCHOOLS BY SECTOR, 1965-1972

	Number of Schools 1965	1972	Change	Percentage Change
Trade & Technical	20	22	2	10
Business	26	26	0	0
Data Processing	16	15	-1	- 6
General Education	0	9	9	-
Specialty	39	58	19	49

community colleges experienced virtually no growth. The number of trade and technical schools increased by 10 percent from 1965 to 1972. The number of business schools remained unchanged, and the number of data processing schools declined by 6 percent. The number of specialty schools, however, increased by 49 percent. In sum, the evidence presented here, although based on limited data, clearly indicates that (1) failure rates of proprietary schools increased by half during the time the community colleges were burgeoning, and (2) there was virtually no growth in those types of proprietary schools offering training similar to that available in community colleges, although other types of proprietary schools increased by approximately 50 percent.

Characteristics of the Profitable School

To this point we have examined the structure of the industry through measures of size and elements that influence profitability with emphasis on the differences existing among major sectors of the industry. Now that we have some understanding of the size, diversity, and financial characteristics of proprietary schools and some feel for the differences among types of schools, we might logically ask what it is that makes a school profitable. Are there common features among the most profitable schools distinctly different from other proprietary schools? To answer these questions the 13 schools with the highest rates of return (20 percent of the sample) were evaluated and compared with the industry as a whole. As always with aggregate data, we must be careful not to infer cause but rather to suggest characteristics that appear to be associated with profitability.

The types of training represented in the most profitable sample (MPS) are nearly as diverse as in the industry sample (IS). MPS includes a business school, two trade schools, two general education schools, self-improvement and modeling schools, and two data processing schools. The remainder of the schools are specialty schools, as defined earlier, providing training such as bartending, real estate, and cooking.

The single most distinguishing feature of the MPS is their ownership: nine are owned by single individuals and four by small groups of people. None of them are owned by parent corporations.[1]

Quite conceivably much of the success of the MPS school may lie in its ownership. With full control vested in a single individual, a school can shift its resources quickly to meet changes in demand. Centralized control in itself, however, may be only a partial explanation for the schools' profitability. Clearly, there exist owner-administrators whose managerial and leadership qualities may be a school's most important asset. Moreover, single owners as a whole may have a much deeper knowledge of and commitment to a school's operations than a group of individuals, controlling different aspects of the school's operations or delegating to someone else the responsibility and authority to manage the school. The value of these intangible assets go unmeasured.

Table 11 gives comparisons for a number of other characteristics, the interpretations of which should be made in light of caveats mentioned earlier regarding accuracy of measurement and assumptions underlying the measurement.

Data in Table 11 confirm the earlier statement regarding the huge variation in profitability found within the industry. The MPS schools have a rate of return of 111 percent--staggering in absolute and relative terms. In absolute terms, it means that these schools generate profits greater than the value of their physical assets. In relative terms their rate of return is three times as great as the mean rate of return for proprietary schools and ten times as great as for manufacturing corporations.[2]

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[1] The probability of one of the large corporations being included in the MPS group is diminished by the exclusion of those for which financial data was given for the parent corporation. Nevertheless, there were 14 schools eligible.

[2] Even when the possibility of reporting error is accounted for, the rates are high. The median rate of return for the MPS is 88 percent and 14 percent for the IS schools.

TABLE 11

COMPARISON OF THE MOST PROFITABLE PROPRIETARY SCHOOL SAMPLE (MPS) WITH THE PROPRIETARY SCHOOL INDUSTRY SAMPLE (IS)

Characteristic	MPS Mean	IS Mean
Assets	$18,000	$ 86,900
Income	$80,200	$198,400
Enrollment	131	167
Tuition	$ 382	$ 922
Course Length (hrs.)	389	595
Tuition/hr. of Instruction	$ 3.27	$ 3.03
Student/Faculty Ratio	31.4	19.0
Rate of Return	111.5%	37.4%
Enrollment Expenditure Per Enrollee	$ 63	$ 255
Enrollment Expenditure as % of Revenue	11.0%	18.1%

Several of the characteristics reported in Table 11 seem to offer a partial explanation. The MPS schools operates with very low physical assets, less than one-fourth those of the IS school, and even though tuition in MPS is half of the tuition in IS schools, the MPS school maintains an enrollment level that is nearly as large as for schools with much larger assets.

MPS schools also have higher student/faculty ratios, probably one of the critical factors in determining profits. Instructional costs often account for 60 percent of operating costs and thus any school that can maintain large classes may reduce operating costs considerably.

Another aspect of the MPS is the relatively small amount they spend to enroll students. The mean amount spent per student on enrollment is $255. For the MPS the figure is $63. Why MPS schools spend less is only conjectural. One possibility is that the school's advertising and recruitment needs are subsidized by its students. In the long run, profits can be interpreted as an indication of a satisfactory product: if students are well satisfied with their training, they may recommend the school to their friends, and thereby reduce the school's need to inform and encourage the public. The "established" nature of the MPS, discussed in the previous section, lends support to the idea of long-run satisfaction which may tend to reduce a school's need to actively recruit. An equally plausible possibility is that demand for training provided by these schools is relatively inelastic[1] and therefore there is a low ceiling on returns to expenditures on recruitment.

When all of these factors are considered that may affect profitability, it is still perplexing to find such high rates of return. If the industry is so profitable, why do not other schools enter. Part of the high rates may be explained as offsetting inherent risks in the industry, and part may be attributed to certain intangible assets--continuous operation under the same person for a number of years, community good will, and thorough knowledge by the owner of the school's operations, students, and market environment--which if they could be combined with physical assets in computing profitability might substantially reduce the rate of return.[2] Moreover, the fact that some owners may have skills or knowledge of their trades that take years to acquire may serve as an impediment to the entrance of other individuals, and possibly result in a premium on that type of training.

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[1]The inelasticity could be the reflection of superior quality for which there are relatively few substitutes.

[2]The high rates of return may also be inflated by reporting procedures. Some owners, rather than receive full pay through a salary, may take partial pay through salary and the remainder through corporate profits.

CHAPTER III

COMPETITORS OR PARTNERS? THE RELATIONSHIP BETWEEN THE PROPRIETARY SCHOOL AND THE COMMUNITY COLLEGE

Introduction

The purpose of this chapter is to determine (1) the relation between public and private post-secondary vocational training, specifically the competition between public community colleges and proprietary schools offering similar training, and (2) the impact of that relationship on the operations of the proprietary school.

The approach used is to focus upon a micro-study of a geographical area that contains a proprietary business school and a community college offering business courses in its curriculum and to examine the changes in enrollments and in the geographical distribution of the students in the schools during a period of time when no known exogenous factors were introduced. The specific findings of this work, while unique, are derived from theory that should allow some generalization as to the prevailing relationship between community colleges and proprietary schools and the effect of the former on the latter's operations.

Question of Relationship with the Community College

There has been considerable debate about the plausible competition between, or complimentarity of, community colleges and proprietary schools. Several studies have tried to discern differences in the characteristics of students attending one or the other of the schools or in the characteristics of the schools themselves. Podesta and Kincaid were perhaps the first to state what has now become a more commonly held claim that the proprietary school has operational characteristics--flexibility in course offerings, frequency and

duration of offerings, and intensity of training--that differ from those of the public school.[1]

In a national comparative study of proprietary and non-proprietary vocational training programs the American Institute for Research in the Behavioral Sciences found no substantial difference in age or socioeconomic background of the students.[2] Wellford Wilms in another study of similar purpose but different design also found no significant differences, although the proprietary school student is more apt to have a lower socio-economic origin than the community college student, and to be of a minority group, a public school drop-out, and a product of a general or vocational program (rather than a college preparatory program).[3] And in a third study done on the proprietary school industry in Illinois, H. H. Katz argues that public and proprietary schools serve complimentary roles. His position is that each student has unique capabilities and that proprietary schools cater to students who have abilities perhaps different from those of students attending public schools.[4]

Absolute resolution of the distinctness of the institutions is, of course, impossible; competition or complimentarity are relative concepts. Although these differences in characteristics of institutions and students may or may not exist, the real issue concerning the relationship between these two types of institutions and critical to the proprietary school's very survival is whether one school draws significantly upon the potential student population of the other school. These previous studies have attempted to indicate probable cause for a particular relationship but none have tried to identify the relationship itself.

Theoretical Considerations

The theoretical construct for explaining the relationship between the proprietary school and community college is derived from the theory of consumer behavior. A purchase depends upon (1) individual tastes or preferences of the buyer

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[1] H. Kincaid and E. Podesta, An Exploratory Survey of Proprietary Vocational Schools. Palo Alto: Stanford Research Institute, 1966.

[2] American Institutes for Research, A Comparative Study of Proprietary and Nonproprietary Vocational Training Programs.

[3] W. W. Wilms, Proprietary Versus Public Vocational Training. Berkeley: Center for Research and Development in Higher Education, 1973.

[4] H. H. Katz, Independent Private School Industry in the State of Illinois.

(2) the buyer's income, and (3) the price and quality of the item relative to other commodities. Assuming that (1) and (2) are constant over the period of observation the only consideration is with the number of substitutes, their quality and prices.

The conventional way of measuring product substitutes or product complementarity is by computing the cross-elasticity of demand for the product--the percentage change in quantity A purchased for a given percentage change in the price of B. The more similar the products, the greater the cross-elasticity. However, seldom if ever does perfect substitutability exist. Even in the instance of identical products there are generally other costs or benefits associated with the products that make the cross-elasticity considerably less than infinite. For example, gasoline at different pumps but of the same brand are generally considered identical products, but the cross-elasticity of demand could be less than infinite because transaction costs are not zero.

In the case of the proprietary school and the community college the quality of training opportunities in business programs in the two institutions may not be of equal value. To attribute shifts of enrollments between the schools to changes in tuitions we need only assume that the ratio of the value of training in one school to the value of training in the other school remains constant over the period of observation. However, the situation for which we have data for both the community college and the proprietary school does not provide for the normal comparison of prices and quantities in some initial period with prices and quantities of the same products in a subsequent period because at the time of the first observation the community college did not exist. This analysis is designed to compare prices and enrollments in the proprietary school before and after the establishment of the community college. Tuition at the community college varies, based on the geographical location of the student, and because tuition at the proprietary school is the same for all students, the tuition differential existing among students who switch from one school to the other also varies. This tuition differential is the basis for our comparison of the proprietary school's enrollment rates in geographical regions where the community college tuition varies. Shifts in enrollment rates at the proprietary school, taken from these geographical areas measured before and after the establishment of the community college then serve as indicators of the impact of the community college on the student population attending the proprietary school.

Setting aside the issue of the institutions' cost functions and assuming that the community college, because of its subsidized nature, can offer training for less cost to the student than can the proprietary school which must cover its

costs through tuition exclusively, we hypothesize that the establishment of the community college will coincide with a drop in enrollment at the proprietary school. As this hypothesis is rather obvious it is also not very precise. A drop in enrollment at the proprietary school with the opening and expansion of a nearby community college is suggestive, but not conclusive evidence, of causality. Better evidence can be provided. To this end we further hypothesize that the greatest drop in enrollment at the proprietary school will occur among students coming from areas that have the greatest pre- to post-community college tuition differential between the community college and the proprietary school.

Critical to this analysis are the choice of schools, the years selected for observation and the tuition policies of the Illinois community colleges. It is desirable to eliminate as far as possible any exogenous variables that might confuse the analysis of the relation between the selected community college and proprietary school.

The proprietary school selected has been in business for more than twenty years, serving the same community, offering business and secretarial courses. The community college was established in 1965 and in addition to offering academic and general education programs also has vocational courses and programs including business and commerce courses similar to those offered by the proprietary school.

Selecting the years for observation required meeting several criteria. The first was that one observation be before the community college began, and the other after it began. Another consideration was that the years be far enough apart to give the community college time to establish its own programs and to attract students and yet close enough together to avoid substantial changes in populations and transportation networks. And finally the observations should be made during a period of years when no other schools entered or left the area. To satisfy these conditions the years 1963-64 and 1965-67 were selected for comparison.[1]

The importance of this analysis depends heavily upon the method of assessing student tuitions within the community college system. As a result of the Illinois Junior College Act of 1965 the state was divided into a number of junior or community college districts, each of which could establish a community college and become eligible for state financial aid upon meeting certain demographic specifications. However,

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[1] The two years before, and the three years after, the establishment of Triton were pooled to eliminate annual fluctuations and to increase the number of observations.

the single largest source of the college's revenue (45%) is obtained from local taxes and therefore the community college district feels justified in charging more tuition for students from outside the district than for those students coming from within the district. Thus, when a community college begins there is greater incentive, in tuition savings, for an in-district student to switch from a proprietary school to the community college than for an out-of-district student to do so.

The Proprietary School

Freeman Business Schools, Inc. is owned and operated by Mr. and Mrs. Freeman who in 1950 bought the school which had been one of the six branch schools of Metropolitan Business College dating back to the nineteenth century. Under Freeman's ownership the school has changed its location four times, but all locations are within two miles of each other and within Oak Park or Forest Park, two suburbs directly west and adjoining the city limits of Chicago. The school has been at its current location in the northeast sector of Forest Park for the last decade.

The school offers and has always offered both diploma programs and individual courses. The programs available are the secretarial, executive, legal or medical secretarial, junior accounting, clerk-typist, bookkeeper, and keypunch or clerk-typist and keypunch. Although the programs are scheduled for 16, 24, 48, or 60 weeks encompassing 400 to 1500 hours of instruction, training opportunities are very flexible. Nearly all of the courses listed under the programs can be taken individually, and the majority of the school's students do enroll for specific courses rather than for a program. Furthermore if a person is interested in a program and already has certain capabilities the school often waives the course requirements in that area.

The flexibility found in the curriculum is also evident in the scheduling of students. The school maintains day and evening classes but often agrees to alter schedules within certain limits to accommodate students' other commitments. In fact, over the years, many of the students have come to Freeman's with the goal of obtaining sufficient training to obtain employment. In recognition of this, the owners charge a monthly fee for training--especially for courses such as typing and shorthand--and allow the student to attend for as many months as he wishes.

The Community College

Triton College, a community college and technica institute for the community college district No. 504, is located three miles from Freeman Business Schools, Inc. (.BB)

in River Forest. In its first year of operation in 1965, 1200 students attended; within six years enrollment increased tenfold.

Persons interested in vocational training can register either in one of the career education curricula or in the school of continuing education. A student choosing career education generally has an intention of acquiring either an associate degree in science (which requires two years of full-time schooling or its equivalent) or a one-year career certificate. The school offers programs and courses similar to those given at FBS.[1]

Analysis and Findings

Our sample[2] shows that the level of enrollment at FBS fluctuates from year to year, but during the early 1960's enrollments declined rather sharply and have not returned to the higher enrollment levels of the 1950's.

TABLE 12

NUMBER OF MATRICULATIONS IN FBS BY YEAR, 1950-1971 (year = 1 Sept. to 31 August)

Year	Matriculants	Year	Matriculants
1950	52	1961	116
1951	63	1962	101
1952	67	1963	88
1953	100	1964	71
1954	116	1965	52
1955	131	1966	46
1956	106	1967	45
1957	87	1968	63
1958	100	1969	46
1959	136	1970	32
1960	98	1971	38

[1] See Appendix 1 for a listing of programs and courses.

[2] The sample is based on one-third of the individual student enrollment cards and excludes students attending under a federal aid program. The sample also excludes a few students known to be less than 17 years of age at time of enrollment. The purpose of these exclusions was to limit the school's population to students that could attend the community college and who are responsive to economic considerations.

A comparison of the average annual number of students attending before 1965 with those in 1965 and later years (see Table 12), shows that the average fell from 95.5 to 46.0 an overall decrease of 51.8 percent. Looking at just the two years before Triton began (1963 and 1964) and the three years after it began (1965, 1966, 1967), over which period the number of matriculants dropped 40.0 percent, we see that 77.2 percent of the overall drop occurred in the years immediately surrounding the date of the establishment of the neighboring community college.

The issue now is to show that the decline was primarily due to the establishment of the community college. Our analytic approach depends upon the financing structure of the community college system that allows a community college to charge different tuition rates according to the community college district in which the student resides. With the community college charging different rates to students residing in different districts there will be a greater tuition differential between Triton and FBS for some students than for others. Thus, although there is an overall drop in enrollment at FBS occurring at the time the community college was established, which could be coincidental, pre- to post-Triton differentials in the geographical distribution of FBS's students that coincides with the community college district boundaries offer far less ambiguity of interpretation.[1]

A review of tuition rates indicates that even out-of-district tuition at Triton for a comparable unit of training was no more and probably less than at FBS. From 1965 through 1967 Triton charged $5.00 per credit hour for district residents and $15.00 for out-of-district students. Most of the evening courses carried 2 credit hours so that a course typically cost $10 (plus often some nominal registration fee). Typical of FBS's offerings was a four-month shorthand course for $65 and a three-month typing course for $55. Since both of these courses were very popular and ran about the same length of time as similar courses at Triton, $60 is a reasonable estimate of the tuition for a short course at FBS. However, Triton's classes met only once a week for twelve weeks, while FBS's classes met twice a week. Although the duration of the class sessions at Triton probably was longer than at FBS's even if we double the tuition at Triton so that the number of class hours is comparable, the tuition difference is substantial.

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[1] Tuition policies among community college districts are modified according to district capabilities. A fuller explanation appears in Appendix 2.

TABLE 13

SCHOOLING OPTIONS AND TUITION RATES FOR THREE-MONTH COURSES AT TRITON AND FBS

Student Residence	Schools of Attendance		
	(1) FBS	(2) In-District (Triton)	(3) Chicago-Cicero-Berwyn
In Triton District	$60	$10($20)	$16($32)
Out of Triton District	$60	$30($60)	$ 5($5) or $16($32)
Chicago-Cicero-Berwyn	$60	$30($60)	$ 5($5)

An in-district student at Triton pays no more than one-third of the amount he would have to pay to FBS. For the out-of-district student, attendance at Triton may entail a tuition savings relative to FBS; at Triton he pays at the most the same amount but may pay only half as much as the charge at FBS. Thus, although there is a greater financial incentive for an in-district student to shift to Triton when it opened there may well be some tuition savings available for anyone deciding to change schools. If the ten and thirty dollar tuition fees are used, the tuition savings differential will be twenty dollars; forty dollars otherwise.

It is also interesting to note that out-of-district students attending either Triton or FBS pay considerably more tuition than they need. Whatever the reasons they are averse to attending their own district community college, they are paying something for that choice. Furthermore, they could probably save tuition costs by transferring to Triton where tuition, although more than in their home community college, would be no more and probably less than what they must pay at FBS (compare column 3 with columns 1 and 2 in Table 13).

Our aim is to determine whether the enrollment drop at the proprietary school is the result of the establishment of a competing program at the community college by examining students' responses to the tuition savings differential that occurs between community college districts. The analytic procedure involves ordinary least squares regression analysis. Variation in the dependent variable, the percent of FBS students at a given time residing in a particular census tract, is explained in terms of a student's capability to save tuition by switching schools (based on residence within or outside the Triton community college district) and controlling for several transaction cost and student background variables.

Assuming transportation costs uniform throughout the area per unit of travel, distance should be negatively related to the percentage of FBS students coming from a particular area. However, absolute distance may not be as important, especially at short distances, as relative distances, the distance to a proprietary school compared to the distance to a community college. With Triton and FBS 3.2 miles apart, a student who is 4 miles away from FBS but in the direction of Triton expectedly has a greater probability of attending Triton than if he lived four miles from FBS but in the opposite direction. To control for this effect the ratio of the distance to FBS to the distance to Triton is entered as another explanatory variable.

Two other variables, measures of socioeconomic status, income and education may also affect enrollment levels, but the direction of effect is not certain. On the one hand, students of higher economic status can more easily afford the tuition, and therefore we might expect the attendance rate to increase with SES. On the other hand, there is some evidence that proprietary school students have slightly lower socioeconomic status than public community college students. Because of the potential influence these variables may have, both are considered as control variables.

Our objective is to determine the difference in the percentage of FBS' students residing within a particular district before and after the establishment of the nearby community college. Analysis is based on the comparison of results of employing ordinary least squares regressions on the observations prior to and after the establishment of Triton. Because the potential tuition-savings differential is greater for persons residing in-district, we expect a decline in the proportion of FBS students coming from in-district in the "after" analysis compared to the enrollment distribution found in the "before" analysis. That is, the IO coefficient should be less in the "after" situation than in the "before" situation.

The unit of observation is the census tract as reported in the 1970 U.S. census. The two time periods are September 1963 through August 1965 and September 1965 through August 1968. Only those census tracts in which a FBS student resided, who attended the school sometime during the period mentioned, are used as observations. The two years before the establishment of Triton are considered in aggregate to increase sample size, as are the three years since the establishment of the community college.

The specific variables are as follows:

A = dependent variable = percent of FBS students matriculating from September 1963 through August 1965 residing in a particular census tract.[1]

B = dependent variable = similar to variable A except that the time period is from September 1965 through August 1968.

IO = the tuition-savings differential, a dummy variable for residence; 1 = within the district; 0 = otherwise.

D = distance from student's resident tract to FBS expressed in miles.

Ratio = the ratio of the distance to FBS to the distance to Triton.

Y = median income for families and unrelated individuals of the student's resident tract.[2]

ED = median number of years of formal schooling for adults 25 years of age or older in the student's resident tract.

The simple correlation coefficients given in Table 5 show that several of the variables are highly interrelated. The relationship between Y and ED is so strong that either variable is sufficient to use as a measure of socioeconomic level. In further analysis only ED is used.

Unfortunately the multicollinearity between IO and ED is unavoidable. The district lines that create the tuition differential also happen to represent for the most part a division between city and suburb, a division commonly recognized as demarcating populations of different income and educational levels.

The difficulty is to identify the amount of variation in the change in the student distribution attributable to

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[1] Students residing inordinately far from FBS, those residing out of state or with unknown addresses were deleted.

[2] In some of the outlying suburbs for which exact location of student's street address was not known, the observation was based on the data available for the town (Wheaton, for example).

TABLE 14

ZERO ORDER CORRELATION MATRIX OF VARIABLES
IN FBS REGRESSION

	B	A	IO	D	Ratio	Y
A	.45					
IO	.23	.28				
D	-.32	-.22	.20			
Ratio	-.21	-.14	.12	.12		
Y	.01	.00	.45	.38	.10	
ED	.29	.34	.63	.18	-.03	.58

r must be $\geq$ .26 to be significant at the .01 level.

socioeconomic level and that attributable to the tuition differential. Although we can not get an exact estimate of the influence of the tuition differential through the use of the district variable (IO) we can establish the variable's relative importance by excluding IO from one equation and ED from another.

Table 15 gives the estimated coefficients for the regressions made on the observations before and after the establishment of the community college. Unfortunately the results of the "before" analysis are discouragingly similar to the results of the "after" analysis indicating that no essential difference exists between the geographical distribution of FBS's students before and after the establishment of the community college. The tuition savings differential variable (IO) by itself in both cases has a significant coefficient, but the standard deviation of the variables in both sets of equations is so large (equal to their means) that the difference between the IO coefficients (compare equations 1 and 9) is of no consequence.

Equations 4, 5, and 6 and equations 12, 13, and 14 show that the tuition savings differential and educational level explain nearly the same amount of variation in the distribution of the students. The R^2 is .242 when ED is excluded and .249 when IO is excluded. When both are included

TABLE 15

REGRESSION COEFFICIENTS (STANDARDIZED) FOR
FBS's STUDENT DISTRIBUTION (N = 100)

Equation/ Variable	IO	D	RATIO	ED	R^2
		"Before"			
(1)	.227 (2.31)[a]				.052
(2)	.301 (3.22)	-.375 (-4.02)			.187
(3)	.282 (2.90)		-.270 (-2.78)		.121
(4)	.346 (3.75)	-.356 (-3.91)	-.241 (-2.65)		.242
(5)	.200 (1.69)	-.371 (-4.12)	-.204 (-2.22)	.223 (1.92)	.271
(6)		-.359 (-3.96)	-.161 (-1.81)	.348 (3.87)	.249
(7)	.128 (1.10)	-.390 (-4.25)		.277 (2.40)	.233
(8)	.162 (1.27)		-.241 (-2.45)	.181 (1.45)	.140
		"After"			
(9)	.278 (2.87)				.077
(10)	.334 (3.52)	-.287 (-3.02)			.157
(11)	.320 (3.28)		-.204 (-2.10)		.117
(12)	.368 (3.86)	-.272 (-2.89)	-.182 (-1.93)		.188
(13)	.196 (1.61)	-.290 (-3.13)	-.138 (-1.46)	.264 (2.21)	.228
(14)		-.278 (-2.99)	-.096 (-1.05)	.387 (4.18)	.207

TABLE 15--Continued

Equation/ Variable	IO	D	RATIO	ED	R^2
(15)	.148 (1.25)	-.303 (-3.25)		.301 (2.56)	.211
(16)	.166 (1.31)		-.167 (-1.70)	.231 (1.86)	.148

a = t-statistic in parentheses

R^2 = .271, and the coefficient of IO drops substantially from its value in equation 4, but is still significant at the .05 level. It contributes .022 (=.271-.249) to the coefficient of multiple determination, explaining 8.1 percent of the total variation explained by the variables. In the "after" regressions corresponding coefficients of multiple determination are lower than in the "before" equations but reflect essentially the same relationship of the variables' explanatory powers.[1]

Comparing equations 5 and 13, the two equations containing all the system variables, we see that the coefficient for IO, the critical variable in this analysis, is virtually the same in both equations. Unfortunately these findings do not allow us to draw any substantive conclusions about the existence or effect of competition between the public and private schools.

In trying to explain the unexpected lack of empirical support for the theoretical position put forward two probabilities come to mind. One is that the model was not properly specified. Other important but unknown variables may have been overlooked, and the data in Table 12 suggests this possibility. If we were to exclude the observation in 1960, there was a continuous decline in enrollment from 1959, six years before the beginning of the community college. The variable or variables accounting for that decline may be necessary to properly identify the effect of the tuition savings differential.

[1] This method of determining the amount of variation explained by an additional variable provides exact estimates only when covariances between independent variables are zero. The fact that the variables are correlated understates the true explanatory power of the variable in this case.

The other source of possible distortion in the estimated regression coefficients is the bias that is introduced through the anormal distribution of the dependent variable. The dependent variable is the percentage of FBS' students residing within a particular census tract. Because the number of students and the size of the census tracts are small, many observations are based on frequencies of one or zero. With only a few tracts having frequencies greater than one, the distribution has a right-hand skew. We do not know how serious these distortions are, but limitations of data and knowledge of other possibly relevant parameters prevent further analysis along these lines.

So far we have looked at only one side of the question of competition among institutions, however. If instead of thinking in terms of the student population leaving FBS, we consider the reasons people may have for remaining at FBS, especially in the face of higher tuition fees, more progress may be possible. The apparent insensitivity of the consumer to cost factors may be because training in the schools are not good substitutes. If we consider the institutions as offering different products or lines of products, we may be able to identify particular products that appear to be more highly substitutable.

One of the most visible differences between the offerings of Triton and FBS during the first few years of Triton's operations was the schedules of training available. The study of ETI indicated that similar programs offered at different times can appeal to entirely different populations. As another attempt to identify the amount of substitution between the proprietary school and community college we can define separate products by training schedules and examine changes in enrollment levels by program over the interval during which the community college began. We expect the greatest program decline to occur in the program that is the best substitute for the program offered at the community college.

For the first three years Triton had only an evening program that lasted generally three months. FBS, however, offered day and evening programs with almost completely flexible duration. If we divide FBS students into those attending during the day and evening and again divide them into students who attended for approximately two months or less (short) and those who attended for more than two months (long) we expect the greatest drop in enrollment to occur among those attending in the evening for more than two months (evening long).[1]

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[1] FBS' programs have all existed continuously during the period in question and no substantial changes were made so that a particular program decline cannot easily be attributed to changes in internal operations.

TABLE 16

ENROLLMENTS IN FBS's SHORT AND LONG DAY AND EVENING PROGRAMS, 1963-1965 AND 1965-1967

Program	Before (Sept.1963-Aug.1965)	After (Sept.1965-Aug.1967)	% Change
Day Short	22	25	+14
Day Long	25	19	-24
Evening Short	73	45	-38
Evening Long	39	9	-77

Although the evening long matches the Triton program better than the other three groups we might also anticipate a substantial drop in the evening short.

Table 16 shows that the greatest drop did occur among students enrolled in long evening programs, and that the second largest drop occurred in the evening short program. In the transition of the two years before to the two years after the opening of Triton FBS evening long enrollments dropped 77 percent and evening shorts declined 38 percent. Day enrollments during this same period dropped only 6 percent. This finding is the best evidence we have substantiating partial substitutability between these two educational institutions. But when one school draws so completely upon a particular sub-group of another school's constituency it can not do so without altering the school's operations and the nature of the school's curriculum.

The obvious effect of the loss of a subsector of students is to narrow the product line that a school can offer. In this case it resulted in the loss of the major portion of FBS's evening programs.

In keeping with the theory of consumer behavior the elasticity of substitution increases with the passage of time. As people become more informed of the option and come to realize its benefits, more consumers change products. The most rapid change occurs among products most similar, and less rapidly among products less substitutable. In this situation the students in the evening long programs are apt to leave first, followed by some of the students in evening short programs. Of course, overlap between these two groups

is expected, but nevertheless a pattern should be discernible. We can verify the presence of this behavior by examining the average length of time a student spends at FBS. Even though the number of students composing the average drops with successive years, the average length of training should first shorten rather suddenly as the evening longs leave and then gradually rise as evening shorts also switch.

TABLE 17

AVERAGE LENGTH (IN MONTHS) OF STUDENT TRAINING AT FBS, 1960-1970

Year (Jan.-Dec.)	Median No. of Months
1960	2.90
1961	3.20
1962	3.13
1963	3.32
1964	2.41
1965	1.89
1966	1.33
1967	2.09
1968	2.46
1969	2.77
1970	2.89

During the early 1960's the student on average spent about three months at FBS (see Table 17). In 1964 (perhaps anticipating the opening of the community college), 1965, and 1966 the average length of training dropped, and to as low an average as 1.3 months, and then began to rise. By the late 1960's the average length of training returned to nearly what it had been a decade earlier, but with most of the students now in day programs. With nearly the entire demand for a particular program eliminated from the school it may quickly become impractical for the school to continue offering any program. Such forced streaming of a school's product has consequences for both the school and its students. The school may be forced to close, not because all of its students have switched to the public school, but because the public school offerings have overlapped with the private school offerings to such a degree that overhead costs are not covered by revenues generated from demand for the remainder of distinct educational services offered by the private school. When the interests of students who preferred

the services offered by a private school forced out of business are not met by the public school, the students either do not return to school or they settle for some less desirable alternative. The net result is a reduction in the overall variety of educational options available and a distortion in allocation of resources.[1]

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[1] For a fuller exposition of this point see section headed "Implications of Competition from Community Colleges" in Chapter VI.

CHAPTER IV

A LINK BETWEEN INDUSTRY AND STUDENTS

This chapter, the second micro study, deals primarily with the function of the proprietary school as an interface between the interests of industry and students. The success that a proprietary school has in relating industry conditions to student concerns depends largely upon how well the school owner (or manager) can perceive and adapt to changing conditions. Unlike in the last chapter in which one major question was addressed, this chapter deals with a number of related issues including the impact of changing labor market conditions, technology, and public educational policies on demand for proprietary school training and the school's response to these changes.

Diversity, as we saw in Chapter II, is a dominant feature of the vocational proprietary school industry and because the school discussed in this chapter is one of several technical schools that may operate under different constraints and conditions than other types of schools, three of these major distinctions of the trade and technical sector should be pointed out. First, the number of training channels available to acquire trade or technical skills are more numerous than for some other types of vocational training (cosmetology discussed in Chapter V is illustrative of an occupation with very restricted means of entry). An automobile mechanic, for example, has a number of alternatives to proprietary school training--public schools, company training programs, apprenticeships, or "tinkering" on his own--for acquiring necessary skills. Thus, when we analyze variations in demand for proprietary school training in an occupational field with numerous alternative channels of entry available, the response of student demand in proprietary schools to changing exogenous conditions may be dampened or accentuated by altered conditions among the other means of training acquisition.

Second, trade and technical proprietary schools are relatively few in number. Proprietary trade and technical schools in the Chicago area serve roughly the same number of

students as do cosmetology schools in the same area but there are five times as many cosmetology schools as trade and technical schools. In a technical field, such as electronics, overhead costs of human and physical capital are substantial, raising entry costs and making entry of new firms more difficult. Consequently supply adjustments occur mainly through changes in size of firms rather than changes in number of firms. Changes often occur simply through increasing the number of instructors, opening a spare classroom, or extending the school's hours of operation, without enlarging permanent plant facilities.

And third, the utility of training in a trade and technical school is more diverse than in many other fields. The student in a trade school may wish to use his training to acquire employment in industry, or for avocational interests, or perhaps to set up his own business. In contrast, one is not likely to attend a mortuary science school to start a hobby. Because of the varied utility of the training acquired at trade and technical schools (as well as in some other types of vocational training) the schools have considerable freedom of choice in designing courses, curricula, and objectives. All of the factors over which a school has some control are fused to form the school's product, which is more than simply the skilled graduate. The total product includes less tangible but equally important elements, such as quality of training, the reputation of the school in the industry and among potential students, the type of student--his motivation and occupational expectations--and training within a certain length of time at a particular time.

However, there are pressures that limit the degrees of freedom of a proprietary school in establishing curricula and operations. Primarily, the school is constrained by the need to (1) meet the demands of industry and (2) relate these demands to the public that the school serves. Much of the success of a school depends upon its ability to train students adequately for existing job positions in industry; therefore, in a very real sense, a school's freedom to alter its curriculum exists only within the parameters specified by industry's needs. Consequently, the ability of a school owner to perceive changes in the market place and in the technology of an occupation and to act on those perceptions is critical for maintaining a successful operation. The ability to add new courses or delete obsolete courses at the appropriate time and to continually up-date techniques carries a premium among proprietary school owners and is, in large part, responsible for a profitable operation.

Equally important for a school's success is the ability to inform potential students of the existence of training opportunities and of the subsequent opportunities to use the acquired training. Since the student is the

person who generally pays for the training, a school owner who expects to attract students must show sufficient cause for the student to make the investment in schooling. In more stable fields such as cosmetology or in areas where a shortage is well known, the difficulty of informing the public of employment opportunities may be minimal; nevertheless, the proprietary school is an agent that serves to link potential students to industrial demand, and performing this task is the over-riding consideration that governs the school owner's decisions and activities.

Although each vocational school has unique characteristics, this study should reveal some of the common problems confronting proprietary schools. The actual manner in which the school owner solves his problems through decisions to change curricula, schedules, student appeal, or prices depends on how he views the school, its position with respect to other schools, and conditions in the economy, however, the resources that a school brings to bear on an issue may reasonably be generalized to similar circumstances in other schools.

Choice of Schools

The selection of a school for this study was governed by four considerations: the willingness of a school to cooperate, the availability of records, the usefulness of the information obtained from the records, and continuous management under the same individual. Recent and frequent changes of administrative officers in one school considered for analysis would have made nearly impossible the task of obtaining first hand information about many decisions made in previous years. Another school had been sold and reorganized into two separate schools. Reconstructing curricula and tracing student files would have been inordinately costly, if not impossible. The school finally chosen was the Electronics Technical Institute of Chicago (ETI).

ETI is an appropriate choice, aside from the reasons given above, because it has recently expanded its product line by offering a day program of instruction, and we will be able to examine the changes made by the school to attract day students and to see the effect of the new program and student on the school's operations and total product. ETI is also of particular interest because it epitomizes the fundamental characteristic of many technical schools to operate on the frontier of technological innovation. For such schools, sensitivity to changing industrial demands and making changes at an appropriate time carries a high premium. The more rapidly economic and technological conditions change, the higher the premium on the owner's ability to be flexible and perceptive enough to meet the changes.

A final distinction of ETI, as a technical school, from other types of schools is the relatively small number of schools in the sub-sector. ETI operates in a market shared, in varying degrees, by ten other private schools, five of which have very little impact on ETI. Two of them are primarily committed to engineering; one is a highly diversified school offering business courses as well as trade and technical courses; one school, with an air-conditioning and heating course, caters primarily to Spanish-speaking people; and another school, also offering air-conditioning and heating, draws most of its students through company sponsored employee training programs. The remaining five schools have curricula that overlap substantially with ETI's and draw upon the same student population. An indication of stability within the sub-sector is that ETI, despite its 24 years of operation, is younger than its five primary competitors. The other schools extend back as far as the 1900's. It is also interesting to note that, perhaps as part of the current interest of corporations in proprietary schools as an investment, all of the other schools have been purchased in recent years by larger corporations.[1]

Because of this stability in the number of schools in the field, fluctuations in demand for training are absorbed primarily by the six schools in expanding or contracting their operations, and probably the stability in number of schools represents a long run equilibrium. Although a school may have greater success in a particular year or in a particular course than another school, these schools essentially capture the market, and fluctuations in the economy or changes in technology will affect all the schools, within limits, uniformly.

Background to Electronics Technical Institute

Electronics Technical Institute (ETI) was founded in 1950 by Harold M. Rabin as the Chicago School of Television Repair, offering training in radio and television servicing. Over the years, electronics related courses were added or deleted and existing courses modified. Later the school's name was changed to Electronics Technical Institute to more accurately reflect its diversified training, and the school was incorporated in 1964.

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[1] Illinois Institute of Technology, one of the five competitors, is not a subsidiary of a parent corporation since it is a private, non-profit institution of higher education.

ETI is a specialized school, although it does offer several different courses. Presently the curricula at ETI consists of two major categories of courses. One group of courses focuses on practical "hands-on" skills required to gain entry into the electronics servicing fields. The other group of courses is more extensive, offering a more academic approach to electronics.

In the first group are technician's servicing courses in television and radio (hereafter referred to as TV), air-conditioning, refrigeration and heating (HC), and electronics (ES). Each course is offered during the day on a full-time basis and on a part-time basis in the evenings and on Saturdays. Tuition is $985 for each of the 480 hour (16 week) day-time courses. Part-time programs cost slightly less ($915) and give 300 total hours of instruction distributed over 50 weeks.

The two courses in the second group are offered only during the day on a full-time basis. The first is an electronics technology course (ET) that offers training in a broad area of electronics: the goal of this course is "to train the qualified high school graduate to be a skilled electronics technician capable of working under the direction of an engineering staff either in the design, manufacture or service of a wide variety of electronics equipment."[1] The course costs $2250 and required 50 weeks of training. The other course in this group is an electro-mechanical computer engineering technology course that terminates with an associate degree after two years of training. Through an agreement with Roosevelt University, students take the required non-technical courses at Roosevelt.

ETI's enrollment generally fluctuates between 200 and 300 students, and over the years it has graduated more than 6000 people. The school is typical of other schools in the Chicago area that have an interest in the same field of training service technicians in that most of the schools are members of either the National Association of Trade and Technical Schools or the Illinois Association of Trade and Technical Schools, and all of them are located in or near the center of Chicago, easily accessible by public transportation.

EXTERNAL FORCES ON THE SCHOOL

We see that on the one hand a school has wide latitude in the management of its operations, but on the other hand there are certain forces over which it has little control.

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[1] "Electronics Technical Institute: A Self-Evaluation Report," January 31, 1973, p. 3.

The remainder of this chapter deals with each of these sets of elements separately. The first part analyzes the external forces, such as labor market conditions, technological changes, and possible competition from public institutions, that a school must adapt to in order to survive. The second part deals with decisions concerning situations and activities over which the school exercises relatively full control.

Technological Change

Under ideal conditions a school owner would like to anticipate changes in technology. Often, accurate forecasting is not possible, but in any event the owner must learn to live with the technological state given by the market. One of the inevitable situations facing technical schools is growing complexity of technology within any field, the consequence of which for the student is a longer course to achieve the same relative level of competence. At the same time, the longer course may alter the success of the program in terms of the student completion rate. Thus the problem of growing technology and corresponding course length can pose a continuing threat to the total product of the school, particularly if we assume that the efficient training program encompasses an integral body of knowledge and that industry prefers to employ individuals who have the full amount of training over individuals with partial training. Given the ultimate goal of the student in attending school--the acquisition of a job skill and subsequent employment--we can expect the student completion rate to serve as a measure of the success of a school in achieving its intermediary goal of producing a qualified graduate.[1]

Of the numerous courses that have been a part of ETI's history, the TV/radio service technician's (TV) course was the program upon which the school was founded and has continued to be the strongest and most continuous program through the years. Despite the stability of this course's curriculum and its consistent appeal to the same population (the employed lower-middle class blue-collar worker) increasing technological sophistication has forced the school to expand the course. In the early years of the school's operation, the TV course was 8, 10, and 12 weeks long and trained the student to make full service repairs. Today the goal of the course is the same, but the training now takes

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[1] The goal of a profit-motivated firm is ultimately to maximize profits or assets, but these measures of prosperity supposedly rest upon continued production of a satisfactory product which in this instance we assume is primarily the qualified graduate.

50 weeks. The apparent consequence of the lengthened course is a decrease in the proportion of students completing the training.

Figure 1 shows the profile of the TV course matriculation and graduation levels from 1954 to 1972, and Table 18 shows that each time the course was lengthened the student completion rate corresponding to that period decreased. Between October 1955 and March 1959, when the course was 16 weeks long, 96 percent of the entering students graduated, but between January 1971 and March 1972, when the course was 50 weeks in duration, only 51 percent finished. A plausible proposition is that attrition, by definition a function of time, increases with the lengthening of the course. However an increasing drop-out rate should not be considered solely the consequence of random attrition associated with a longer course. A more subtle reason may lie in the underlying disparity between how industry and students value training.

We first need to make some simplifying assumptions that will allow us to more easily explain the role of the proprietary school owner in trying to adjust the length of training to the needs of industry and the student population and to explain how the drop-out rate is more than a matter of random attrition.

The first assumption, and one that we will relax later, is that there exists a state of perfect knowledge--preventing any discrepancy in how industry and students perceive the net benefits associated with different lengths of training. The second assumption is that perfect substitutability exists between lengths of training, L_i and L_j, at any given technological stage. Although this assumption is not very realistic it removes the problem of considering the number of students at each L and lets us examine the relation between changes in costs and benefits associated with course length and the optimal length of training. Under this assumption a change in technology may change the wage ratio W_{L_i}/W_{L_j} and the number of students in training L_i or L_j but at a given level of technology shifts in relative numbers of students in training L_i or L_j would not affect the wage ratio. The third assumption simplifies calculations of net earning streams accruing to various training by specifying that changes in foregone earnings during training are attributed solely to the investment made in the training program. Thus a job taken as an alternative to training offers constant earnings during the period of training.

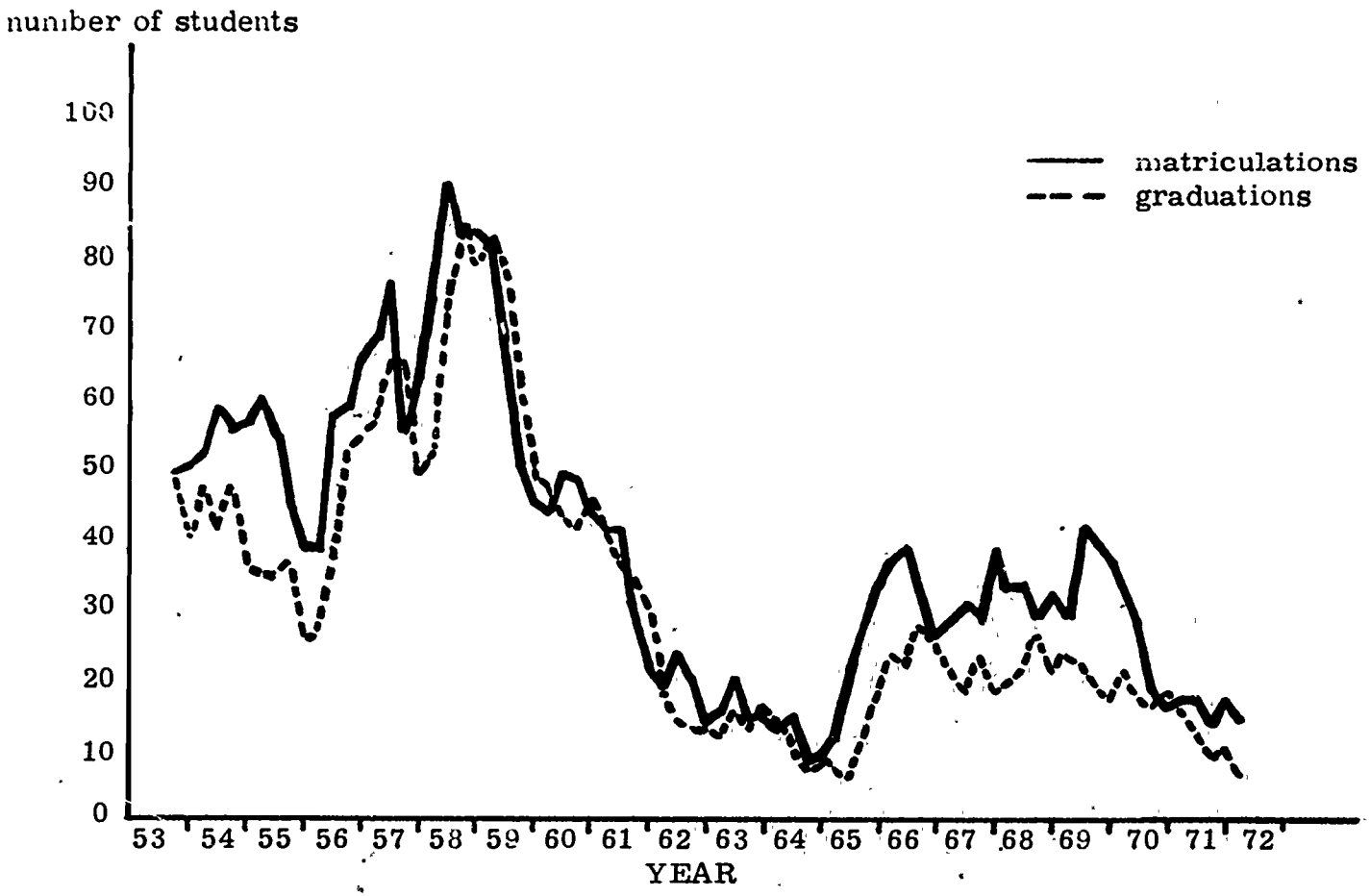

Figure 1. Quarterly matriculations and graduations (computed from a 5-quarter moving average) in the part-time non-Spanish TV program (based on 20% sample)

TABLE 18

COMPLETION RATES FOR ETI's PART-TIME TV COURSE[a]

(1) Course Length	(2) STARTING Starting Dates	(3) Number Starting	(4) GRADUATING Graduating Dates	(5) Number Graduating	(6) Percentage Graduating (5/3x100)
8-12 weeks[b]	Apr.'53-Sept.'55	112[c]	Apr.'53-Dec.'55	84	75.0[d]
16 weeks	Oct.'55-Mar.'59	186	Jan.'56-July'59	178	95.7
20 weeks	Apr.'59-Mar.'64	133	Aug.'59-July'64	115	86.5
26-30 weeks[e]	Apr.'64-Dec.'67	69	Aug.'64-July'68	55	79.7
40 weeks	Jan.'68-Dec.'70	78	Aug.'68-Oct.'71	51	65.4
50 weeks[f]	Jan.'71-Mar.'72	101	Nov.'71-Feb.'73	51	50.5

[a] Courses given in Spanish are excluded.

[b] For the early years of the 1950's records frequently were not completed, and because of difficulty in identifying the dates of attendance and the length of the course, all TV courses through September 1955 were included in the first category.

[c] The count is from a 20 percent sample of individual attendance records.

[d] For the first years of the school's operation many individual attendance records were incomplete, and thus many students who may have graduated were counted as not graduating in our tally.

[e] These two categories are grouped together because of the small number of cases and uncertainty of the date when the course length was changed.

[f] The figures for this period are from a 100 percent sample of enrollments and graduations.

Beginning with a static situation, one without technological or market change, we can establish profiles of returns (present value of expected incremental earnings resulting from training) over a range of training (lengths) and foregone earnings (discounted to the present) which together will indicate the amount of tuition that students are willing to pay for training of a particular length.

The crux of the problem for the proprietary school owner is to provide the optimum combination in course content (type of training), course duration and cost to satisfy both industrial sector demands and student population demands. If we assume that each unit of time spent in training leads to an incremental, although not necessarily equal, increase in skill embodied in the student, and that an employee's wage in the market is systematically related to his skill, the returns may be expressed as a function of the length of course. Most likely the rate of accumulation of a skill is not uniform over time. The profile of returns (NR) to length of training (L) (see Figure 2) may be concave, with $\frac{\partial R}{\partial L} > 0$ and $\frac{\partial^2 R}{\partial L^2} < 0$; thus initial training is valued more highly than subsequent training. Or the profile might be "s"-shaped with a rapid rise in value of training occurring only after a short "orientation" period, during which time spent learning in school has very little value to industry and thus offers little return in earnings to the student.

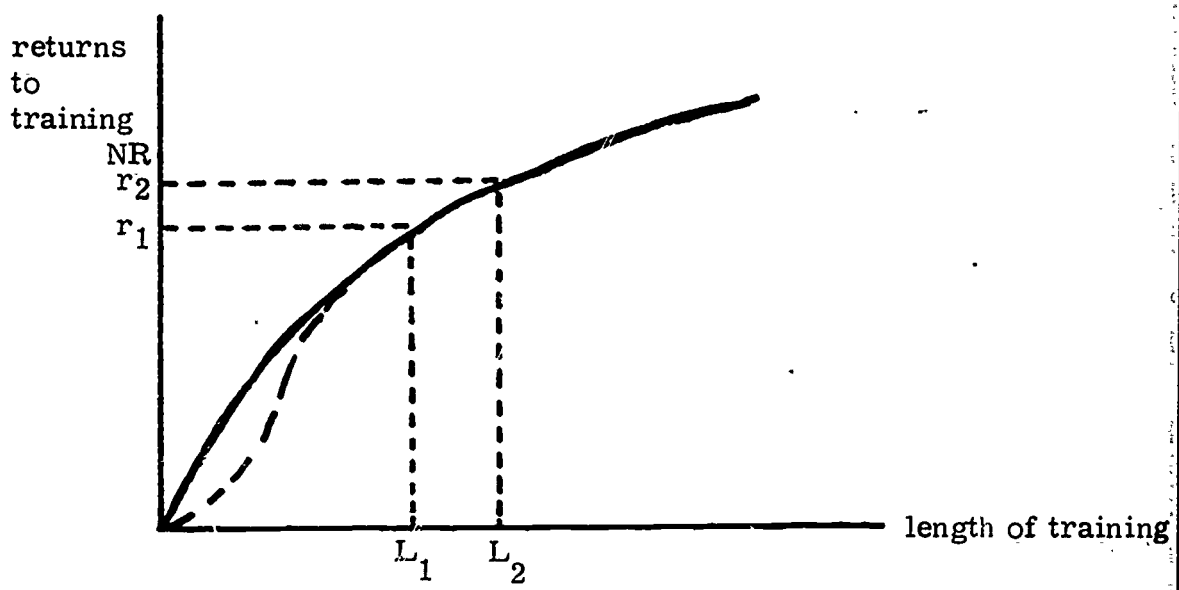

Fig. 2.--Profile of Returns to Length of Training.

The precise shape of the curve at the lower end may not be important, however, especially if the curve is S-shaped. Smaller initial marginal returns are unlikely to cover initial costs, and it will obviously then be better not to train at all than to make so truncated an investment. There is also probably an upper limit to the amount of training that will be taken. After some "saturation" level L_2 the marginal value to industry of an additional unit of training approaches zero. Although the NR profile for each industry and type of training may be different, each has a range of wages (r_1 to r_2) and training levels (L_1 to L_2) that are acceptable to that industry.

The cost to the student consists of direct costs, primarily tuition, and indirect costs, mainly foregone earnings, both of which are also related to length of training.

If foregone earnings of each day spent in training is the same for each day of the course, then foregone earnings (FE) cost per unit of length is constant, i.e., $\frac{\partial FE}{\partial L} > 0$ and $\frac{\partial^2 FE}{\partial L^2} = 0$. But rarely is this the case; more likely marginal foregone earnings increase with length of training. With each day of learning a student foregoes more to remain in school. Rigidities of market institutions that place a premium on completion, however, may create an increasing gap between the present value of earnings of the student who drops out with no further training investment and the present value of prospective earnings for the person who finishes training and enters the labor market. The premium placed on completion varies among occupations. In the case of cosmetology the completion premium is maximal--one is trained for only one occupation and course completion is necessary to practice cosmetology. Foregone earnings therefore are virtually constant for each unit of training, but with the terminal unit of training potential returns jump sharply. In some other areas, such as secretarial training where accumulated skills are immediately marketable, foregone earnings increase nearly proportional to the portion of training completed, and the completion premium is minimal.

The amount that a student is willing to pay for a course of a particular length depends both on his foregone earnings (FE) and the future returns (NR) that he will receive in added earnings as a result of taking that training. Expressing these returns as the present value of the expected incremental earnings stream, we can show how much tuition a person would be willing to pay for a course of a certain

length. Placing the NR curve in the same figure with the FE profile (Figure 3) the vertial difference between NR and FE at, say, L_i is the amount that the person is willing to pay for training of length L_i. Thus for a school to offer in an economically feasible manner a course of length L_i it must be able to provide such a course for no more than A_2-A_1.

A proprietary school could not operate with a course length less than L_L or longer than L_U without charging a negative tuition, i.e., paying the student to attend because in these areas student costs exceed returns. Any course with length $\geq L_L$ and $\leq L_U$ is possible. However not all course lengths are equally plausible because of a firm's (school's) cost structure.

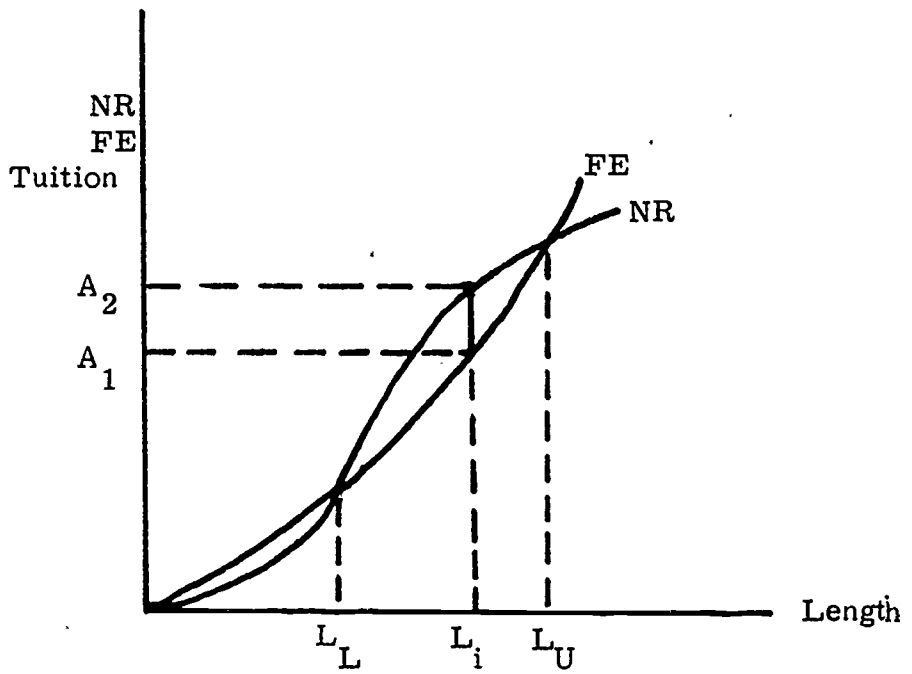

Fig. 3.--Profiles of Returns and Foregone Earnings Showing Course Length and Tuition.

Whether a school offers a course L_i depends on (1) the number of students preferring that length of course, (2) the ability of the school to provide that course for no more than A_2-A_1, and (3) the profitability of offering alternative

courses. The selection of course length--that which will maximize the school's present value of expected net income depends upon the array of demand schedules for given course lengths and the school's costs associated with the course length. Without knowing the various demand schedules for different course lengths and the location and shape of a school's cost curves we are not able to determine what point along the L_L-L_U interval the school will choose for its course length. Moreover, moving toward the point where the vertical distance between NR and FE is greatest does not necessarily mean that profits are increased, for both the aggregate demand schedule for various lengths and the changes in costs associated with the longer course must be considered before a determination of the profit-maximization locus can be made.

To this point we have assumed perfect knowledge; more likely a difference will exist between what school proprietors and potential students perceive as the NR and FE profiles. School proprietors may observe or predict associations between wage prospects and amounts of training that differ from the wage relationships that many students or potential students expect. To illustrate, Figure 4 shows a school proprietor's projection of associations between wages and duration of training as curve NR_1. If this projection is correct, point D on curve NR_1 will provide a good estimate of student returns to training L_2. The student, however, through misinformation or false perception of market conditions may believe that a course of L_1 would be sufficient to command a wage equivalent to R. (Similarly the FE curve may be perceived differently.) In a situation of this kind the proprietary school must in a real sense serve as a "go-between" for industry and individual demand.

Whether the offered course length is more in keeping with the performance of industry or the student population depends largely upon the perspective of the school owner. To maximize current profits the owner will operate with a short-run perspective, tailoring the course length (and thus amount of training) to satisfy the individual by establishing course L_1. Completion rates typically would be high, but industry might view the product (the skilled graduate) as unsatisfactory. As many proprietary schools rely heavily upon job placement of their graduates for their reputation and continuing successful operations, most owners would be reluctant to take a short-run view. The other extreme would be to tailor the course length to satisfy industry by establishing course L_2. With course L_2, however, students may

either not attend at all, considering the course excessive in length, or drop out before completing the entire course. In the first instance the school loses customers and in the latter the school's students, without achieving the level of competence that we assume industry attaches to completion, do not achieve those goals for which they had enrolled in the school. The school owner must weigh the consequences associated with having a certain percentage of drop-outs against the costs of an inadequate course in terms of employers' dissatisfaction with the school's graduates. The outcome is selection of some course with a length intermediate to L_1 and L_2.

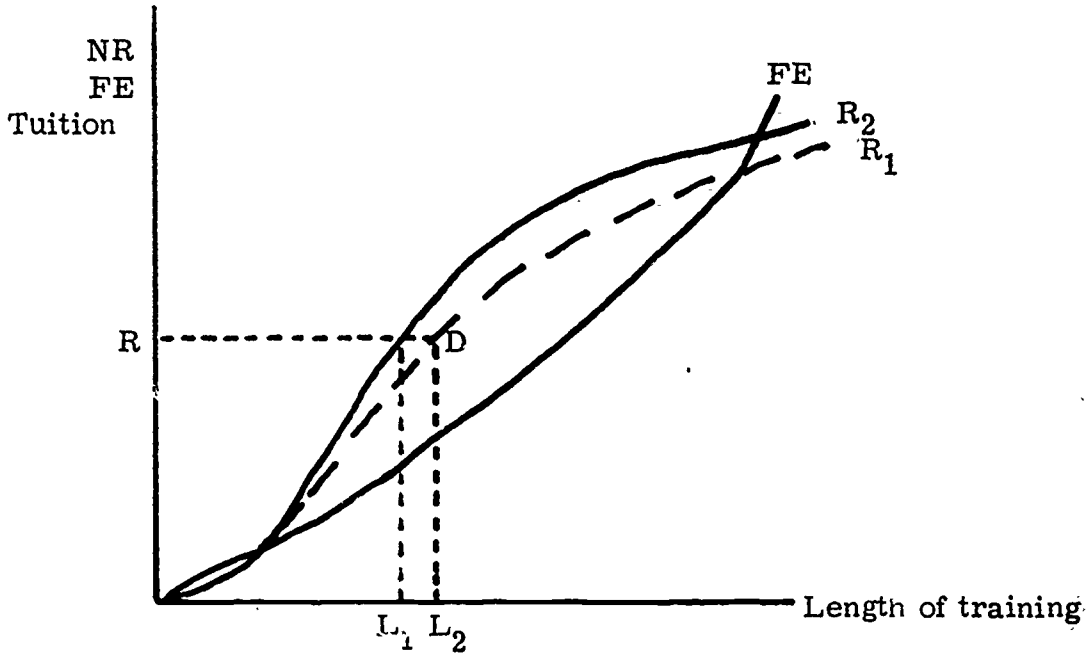

Fig. 4.--Profiles of Returns and Foregone Earnings with Differing Student and Owner Perceptions.

To this point we have assumed a static model without any technological or market changes. In fact, any initial discrepancy in perception of costs or returns to training between industry and students would diminish in a static situation as both groups become more knowledgeable of the economic state of affairs. Only through continuous changes in technology and requirements for skills and errors in predicting these changes is a continuing differential possible. A special problem arises with effects of changes in technology altering the actual market NR line. If for illustration we assume that growing complexity of technology requires increasing the amount of training to enable one to achieve the same

level of competence as could be achieved with less training in earlier times, the industry NR profile will shift outwards, to the right, from NR_2 to NR_1, creating a larger gap between the preferred amount of training desired by industry and student.[1]

If the true NR curve is continually moving to the right the proprietor may prefer to anticipate industrial demand by offering a course that at any given instant is closer to the L desired by industry than that preferred by students. Thus, although the owner is free to determine L, an optimal length is properly considered a function of the difference between the length of training preferred by the two sectors, the rate of change in that difference, and the ability of the proprietor to identify the characteristics of the actual NR curve.

In summary, the proprietary school owner, serving as a link between industry and student demand, sets the length of training so that he maximizes the present value of his expected profit; however, the student may have a different notion than that of industry of what value is attached to a certain amount of training, and recognizing and assessing this difference is confounded by technological changes that may widen the differences in perception. As long as a difference persists the school owner faces the eroding influence which that difference, often the result of technological change, has on the school's completion rate, in addition to the random attrition that increases with the lengthening course.[2]

The difficulty that the school owner faces in trying to convince potential students of the importance of technological changes is illustrated by the following example. In

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[1] The NR line need not shift to the right with increasing technology. Other possibilities exist. For example, technology could simplify the skills required and might result in the NR line moving to the left, or remaining stationary. To illustrate the adjustment process we assume that the NR line is moving in one direction and that the faster technological change occurs the greater the gap although students may be adjusting their perception of the location and shape of the NR curve.

[2] In an occupational field where changes in technology frequently occur, an alternative to continually lengthening a course (and one not explored in this paper) is for a school to offer training that upgrades individuals in mid-career rather than training that is designed to cover all aspects of the occupational technology.

1953 the Federal Communications Commission approved color television broadcasting,[1] and in 1954 the owner invested in all of the latest color television equipment, but at that time he could not convince potential students that there would be plenty of jobs for people with training in this specialty. Only after several years when color television became more popular was the proprietor able to make good on his investment.

A school operating in a highly technical area is subject to many unforeseen changes in technology and the ability of a proprietary school to operate on the frontier of technological change requires flexibility and innovation. As we review the influences of competition from public institutions and market conditions, these same qualities of the school are manifested.

Competition with Public Institutions

Another source of external forces that influence proprietary schools is the vocational training offered by public institutions, the central issue in Chapter III. Over the years, ETI has been confronted with two distinctly different developments in public vocational training programs--the development of vocational courses in the community colleges and the establishment of a state training program--and in both instances there is no evidence that the public institutions impeded the success of this proprietary school.[2] Nor, might we add, are our data complete enough, in the case of comparison with the community colleges, to maintain that the relationship is complementary.

In the 1960's ETI ran a very successful wiring and soldering course, and, for reasons explained in the next section, was virtually the only school offering such training. In early 1963, after ETI had offered its course for a year, the State Employment Service (SES) announced that it would provide free training in wiring and soldering for 200 persons.

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[1] Electronic Market Data Book, 1973 (Electronic Industries Association, Washington, D.C., 1973), p. 4.

[2] It is not certain how many proprietary school students may have attended community colleges at one time, but their interest in ETI is evidenced by the fact that one out of every five "tear-off" inquiries are from current or past community college students, who, according to the owner, say they are disappointed with the caliber of training in the community colleges or that the training takes too much time.

SES had contracted with another proprietary school in Chicago to provide the training.[1] Some of the staff at ETI were apprehensive about the effect on ETI of the state-offered free training. In an overall evaluation of the course, undertaken in hopes of avoiding an enrollment decline, the owner discovered that operating costs were not being covered by tuition revenue of the program and decided that either the course would have to be discontinued or tuition raised. The owner, while concerned, was not convinced that the SES training would siphon off more of the school's potential students (see Figure 5). He knew that his program had a good reputation among the students and among employers. He provided good training and graduates got jobs. He decided to raise the tuition from $89 to $139, for the same course.[2] Enrollments did not decline, in fact after several months they climbed and soon surpassed the earlier peak. Possibly the course represented a superior product for which there were no adequate substitutes. The course could have offered better training, such that employers preferred the proprietary school graduates to those of the SES training, and the students, knowing this to be the situation, were willing to pay considerably more, if necessary, to get what they wanted, i.e., a high probability of employment at a specified wage. The rise in enrollment shortly after the tuition increase is probably coincidental. More likely enrollments would have risen anyway. The enrollment dip in 1963-64 probably represents the initial response to the SES training and an information or "feedback" and training lag between industry and the students. Before a shift occurs of students returning to ETI, students must take the SES training, find employment, hold employment long enough for industry to evaluate their work and then have industry's hiring practices reflect the productivity differential and have that information transmitted to other prospective students.

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[1] For some unknown reason, ETI was not notified that SES was letting bids for the contract and never had the opportunity to bid for the contract.

[2] Conventional theory of the firm assumes that the firm sets its price to maximize profit, but this 56 percent rise in tuition for the same course and the subsequent rise in enrollments suggests that the school owner may not always know what the optimal price is.

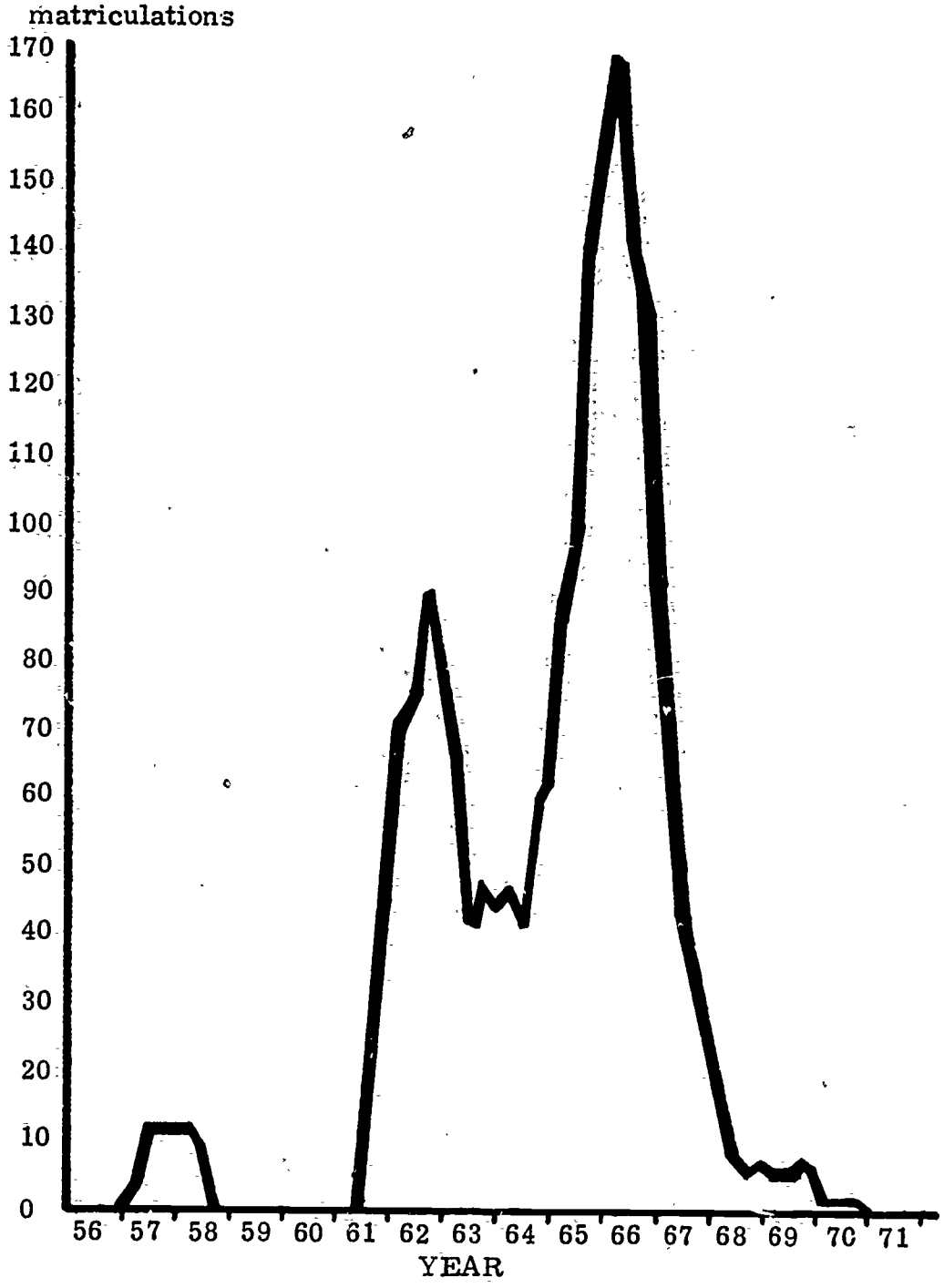

Figure 5. Quarterly matriculations (computed from a 5-quarter moving average) in ETI's wiring and soldering course (based on a 20% sample)

The situation existing between community colleges and ETI is less clear.[1] The institutions may differ in the product they offer and in the type of student they attract. Less disagreement surrounds the issue of what the schools offer, particularly in terms of curricula. Kincaid and Podesta in 1966 were the first to point out that proprietary schools offer shorter courses and more flexible programs.[2]

Less certain is the issue of who is attracted by each institution. A study by the American Institutes for Research found that there were no significant differences among student characteristics in vocational proprietary and non-proprietary schools, but the inclusion of non-profit private schools with public junior colleges may have blurred the differences in student characteristics of the two groups of schools. Wellford Wilms in Proprietary versus Public Vocational Training found that proprietary school students have a lower socio-economic background and educational achievement prior to entering vocational school than do students in community colleges.[3] In contrast, a study issued by HEW Vocational

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[1] A complete determination of the relationship between the two types of institutions requires evaluating differences in student input, curricula, output (occupational attainment), and costs. Various studies have estimated student and curricular differences, often with mutually contradictory results. W. Wilms is attempting to determine the differences in occupational attainment and earnings, and once we have determined what these differences are, we will then be in a better position to weigh the costs of the differences. Already there are some indications that cost differentials are substantial and that the content of training in several instances is comparable. In 1970 the Institute of Naval Studies published a report showing that the U.S. Navy could procure electronics technicians at less than half the cost of in-house training ($1400 versus $2900) through contracts with proprietary schools. (David M. O'Neill, Meeting the Navy's Needs for Technically-trained Personnel; Alternative Procurement Strategies.) In Chapter V we show that private cosmetology schools provide similar training to that of the community colleges for less than half the price of the public schools. Indeed, the Chicago Daily News (April 13-14, 1974) in a recent series on public vocational education estimated that the public "school system spends about $1200 a year per student in teachers' salaries alone in its cosmetology programs while the average private school can provide the entire training for less than $600.

[2] H. Kincaid and E. Podesta, An Exploratory Survey of Proprietary Vocational Schools

[3] W. W. Wilms, Proprietary versus Public Vocational Training

Review Task Force (1970), which was based on data from the Belitsky and the Kincaid-Podesta studies, suggests that the proprietary school student is a "higher quality" input than his counterpart in the community college.[1] If we accept the proposition that differences exist between the student bodies of the two institutions, the recurring question is whether the populations from which the schools draw their students are sufficiently distinct so that one institution does not increase its enrollment only at the expense of the other institution. In this instance it appears that ETI has satisfactorily maintained its level of enrollments in the face of rapid growth of the community colleges.

The number of students in public post-secondary occupational programs in Illinois in 1966 was less than 4,000; in 1970 it was nearly 43,000--a ten-fold increase in five years.[2] But from 1968-69 to 1971-72, the years for which we have information on community college enrollments, the number of students who enrolled in Chicago community colleges or in community colleges in the rest of the SMSA in courses that are the same as or similar to courses in ETI did not rise, as did the overall trend. Table 19 shows that the Chicago and SMSA community college enrollment in TV/radio, heating and cooling, and electronics courses varied widely from year to year, but the relative enrollment in a particular course varies inversely between the two institutions. That is, TV, ETI's most popular course, has had no enrollments in the community colleges for the last two years, and electronics technology, the most popular course in the community colleges (of the courses offered by both types of schools), is the course with the lowest enrollment at ETI. Unfortunately, the lack of information over a larger number of years and the lack of a more definite year-to-year trend bar us from suggesting causality between enrollment fluctuations of the proprietary school and the community colleges. Overall, enrollments in the community college programs and in ETI (see Figure 6) have fluctuated considerably, with a net increase in the four years of approximately 30 percent in the community colleges and no definite trend in ETI. Whether enrollment in ETI would have increased more without the community college programs is not discernible, but it is apparent that enrollments in ETI courses also offered by the community colleges have not been depressed.

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[1] Susan E. Johnson, Proprietary Education: A Search of the Literature.

[2] Third Biennial Report 1969-1970, Illinois Junior College Board, March 1971, p. 18, and Statistical Detail--Disbursement of Funds and Occupational Enrollment, July 1, 1965-June 30, 1966, State of Illinois, Board of Vocational Education and Rehabilitation, Division of Vocational and Technical Education, Part C.

TABLE 19

COMPARISON BETWEEN ENROLLMENTS IN COMMUNITY COLLEGES IN CHICAGO AND IN THE BALANCE OF THE SMSA (IN COURSES SIMILAR TO COURSES OFFERED BY ETI) AND ENROLLMENTS IN ETI, 1969-1972

A. Enrollments in Community Colleges in Courses Similar to Courses Offered by ETI[a]

	Chicago	SMSA[b]	Chicago	SMSA	Chicago	SMSA	Chicago	SMSA
	1968-69		1969-70		1970-71		1971-72	
TV/Radio	0	6	0	38	0	0	0	0
HC	175	71	125	134	227	266	425	318
Electronics	310	928	252	855	212	982	350	874
Total	485	1003	377	1027	439	1248	775	1192
	1488		1404		1687		1967	

B. Enrollment estimates in ETI

	1968-1969[c,d]	1969-1970[d]	1970-1971[e]	1971-1972[e]
TV	120	175	92	196
HC	30	150	40	133
Electronics	20	60	34	27
	170	385	166	356

[a]Source: Division of Vocational and Technical Education, Board of Vocational Education and Rehabilitation, State of Illinois. Computed from state records on reimbursement funds for vocational education. These figures are appropriate for rough aggregate approximation only because individual school data obtained from the Division of Vocational and Technical Education often differs from the data presented by individual reporting schools. Some of the differences could be accounted for by different reporting procedures or reporting dates, but in some cases the differences are too diverse to be the consequence of bookkeeping practices.

[b]Represents the SMSA schools excluding those in Chicago.

[c]The year is 1 July to 30 June.

[d]Figures are based upon a 20 percent sample.

[e]Figures are based upon a 100 percent sample.

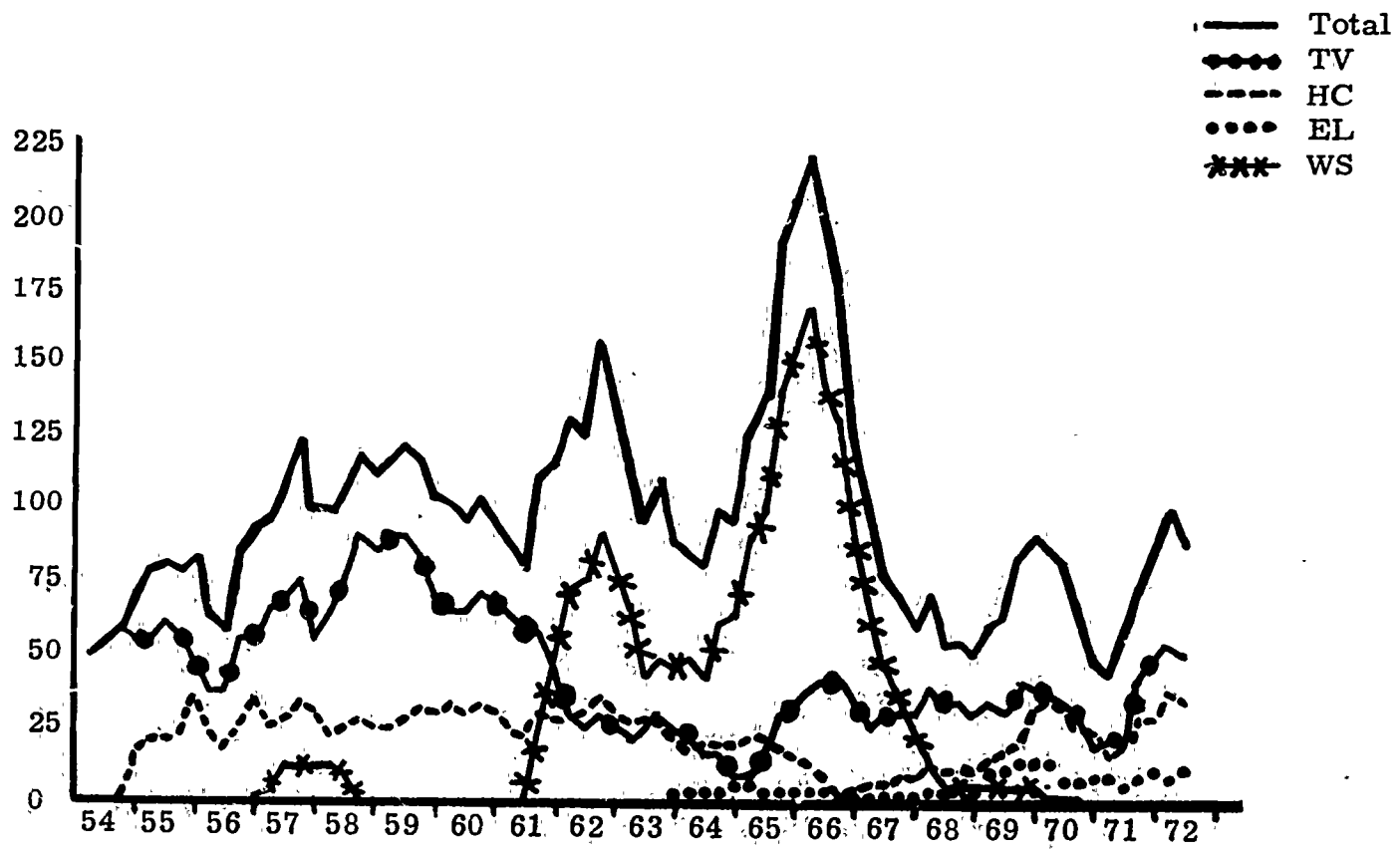

Figure 6. Quarterly matriculations (computed from a 5 quarter moving average) in ETI by course (based on a 20% sample), 1954-1972

Labor Market Conditions

A person's decision to take training is based on an individual decision model. The decision involves weighing expected costs associated with training and expected returns offered in the marketplace as a result of the training. When aggregated, individual demands for training form the school's demand curve. This demand for schooling, however, is a derived demand, existing only through the marketplace demand for individuals with a particular skill. In this context, a school's demand curve, the aggregation of individual's demands for training, is also the aggregation of individual supply prices at which an individual will enter an occupation or training for an occupation. Thus, focusing on the individual's decision to take training, and not the decision of a firm to offer training, the relevant concepts are demand for skilled labor (determined in the marketplace) and supply of trained individuals to the marketplace. To the extent that training occurs in the schools, supply can be evaluated in terms of aggregated individual demands for school training.

In making a decision to purchase training the prospective student weighs the present value of expected costs of training with the present value of the expected increase in returns accruing from that training. Expected costs consist of direct and indirect costs: direct costs (considering only monetary costs) are primarily tuition, and indirect costs, foregone earnings. Assuming that the decision is made at the point in time at which training begins, the present value of the student's costs is $\sum_{t=0}^{n}\frac{(W_a)_t}{(1+r)^t} + \sum_{t=0}^{n}\frac{T_t}{(1+r)^t}$ where

W_a = the wage foregone or the wage rate available if the student chose not to take the contemplated training; T = tuition; t = the time period; n = the last year of training; and r = the discount rate.

In similar present value notation, the value, V, of the training is:

$$\sum_{t=n+1}^{t=l}\frac{(W_c - W_a)_t}{(1+r)^t}$$

where W_c = the expected wage available with the training and

l = the last year of earnings.

Representing the two components of costs by $\Sigma W_a \left(= \sum_{t=0}^{n} \frac{(W_a)_t}{(1+r)^t}\right)$ and $\Sigma T \left(= \sum_{t=0}^{n} \frac{T_t}{(1+r)^t}\right)$ a student will take a training program provided $[V-(\Sigma W_a+\Sigma T)]^* > [V-(\Sigma W_a+\Sigma T)]^i$ where '*' is the contemplated course, and 'i' is any other alternative.[1]

To adapt the individual decision model to available empirical data some modifications are necessary. Wage data, although from a time series, are point observations of earnings and not earning streams or present values of income streams. Furthermore, we assume discrete increments between wages for various levels of training. In this analysis W_c is the initial wage of a trained laborer, and W_a is the average wage available in an alternative occupation presumably not requiring the training. Because the earnings profile of the worker with W_a is relatively flat compared to an individual with W_c (who receives more increasing wages for his increasing productivity) and because W_a is measured at some intermediate point on the earnings profile while W_c is measured at an initial point on the earnings profile, using the wage rates as proxies for the present value of expected earnings streams therefore understates W_c to a greater extent than it does W_a. Empirical results will understate the importance of the wage difference.

Analysis of demand for training is based upon time series data available for the number of matriculations in ETI's evening TV course (excluding the Spanish program--see Figure 1 for matriculation levels), the major component of the school's curriculum throughout the school's history.

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[1] Determination of the number of individuals choosing a particular program will depend upon individual preferences and abilities.

Demand for ETI training (supply of students to the TV-repair field),[1] measured by the flow of matriculants, is a function of the expected wage in the field, W_{TV}, and the wage available elsewhere, W_A (without the training).

W_{TV} should be positively related to demand for training, and W_A, negatively related. Cost, both in terms of tuition and the length of time spent in training (duration of foregone wage), should be negatively related to demand. Per capita disposable personal income, a measure of ability to pay, should directly affect the level of enrollments.

The structural equation for demand for training is the following:

$$M = \alpha_0 + \alpha_1 W_{TV} + \alpha_2 W_A + \alpha_3 L + \alpha_4 Y + \alpha_5 T + e$$

where M = annual number of matriculants in ETI's evening (non-Spanish) TV-radio repair course.

W_{TV} = the hourly wage generally paid to an inexperienced but trained TV repair technician in one of Chicago's largest electronics repair companies, in 1958 dollars.

W_A = the average hourly earnings of production or non-supervisory workers on private non-agricultural payrolls, in 1958 dollars.

L = length of the evening non-Spanish TV course in weeks.

T = tuition, in 1953 dollars.

Y = per capita disposable personal income in the U.S., in 1958 dollars and $\alpha_1, \alpha_4 > 0$ and α_2, α_3 and $\alpha_5 < 0$ and e = error term.

These variables are the essential variables required in the demand equation; however, an ordinary least squares regression analysis will produce biased estimates of the regression coefficients because enrollment is interrelated with the wage

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[1] As mentioned earlier, we assume that because of the highly stable nature of the trade and technical schools supply adjustments occur through changes in school enrollment and that such changes are distributed evenly among schools offering TV-repair technology.

paid TV service technicians. The flow of technicians into the marketplace will affect the relative scarcity of technicians and thus the wage that industry pays to attract the technicians. To eliminate the bias caused by the interdependence of enrollments and wages, a two-stage least squares regression analysis is employed.[1] The results are presented in Table 20.[2]

The results moderately support our propositions. Tuition is negatively related to demand, but length of training, the other aspect of cost, has a slightly positive but insignificant coefficient.[3] Disposable personal income and earnings in the TV repair field have the expected positive coefficients, but the strongest relationship is that between alternative wages and enrollments. Significant at the .05 level W_a has a strong negative effect on demand. It appears that the major deterent to enrolling in school training for TV repair work has been the relative rise in earnings offered in other occupations.

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[1] The bias is attributed to the lack of independence between the error term and W_{TV}. Dependence results from W_{TV} being a function of M and the residual. When ordinary least squares is used, the residual in the W_{TV} function is pooled with the error term in the M function. Two stage least squares corrects for this bias by removing the stochastic effect in the W_{TV} function. The procedure is to regress W_{TV} on all exogenous variables within the system and then to substitute the estimated W_{TV} values, free of any error term, into the M function.

The wage paid trained technicians is based upon the need for technicians, and need, we assume, depends upon the relative scarcity of technicians which in turn is a function of the number of available technicians (M) and the number of television receivers needing servicing. As a proxy for the need for TV servicing, the percentage change in the U.S. stock of television receivers (S) is used in the equation of demand for technicians. Thus W_{TV} is regressed on S and the other exogenous variables; the estimated values of W_{TV} are then substituted into the M equation in place of the actual W_{TV} values.

[2] Appendix 3 gives the correlation matrix for the variables and the results of some other modified regression equations.

[3] Length of training is both a quality and a cost variable and the coefficient measures the net effect. The positive coefficient may mean that a longer course contributes less to costs than to returns (expected wages). Since the TV program is taken in the evening, foregone costs generally equal the value of leisure time, usually considered less than the value of time spent in employment.

TABLE 20

REGRESSION OF ENROLLMENT ON WAGES, LENGTH OF TRAINING, TUITION, AND DISPOSABLE INCOME, 1954-1972[a]

	Ordinary Least Squares		Two-State Least Squares	
Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
W_{TV}	7,030	2.06	20,100	1.40*
W_A	-24,100	-2.91	24,700	-2.04**
L	.049	1.40	.0332	0.63
T	-17.3	-1.51	-10.5	-0.58
Y	140	2.02	144	1.43*
Constant	134	1.41	-107	-0.38
R^2	.68		.32	
Durbin-Watson Statistic	1.88		2.01	

* = significant at the .10 level

** = significant at the .05 level

[a]Two variations were made to the equation system but both were omitted because they resulted in no substantial change in results. One was the inclusion of the male unemployment rate as an explanatory variable. The coefficient's t-value was close to zero. The other change was an adjustment to the S variable in the other equation. In the 1970's solid state technology reduced the number of repairs per set to one-third of the number of repairs on conventional sets. Observations for those years having solid state sets were adjusted to express the number of sets in terms of repairs necessary for conventional sets. The adjusted figures (placed in parentheses in Appendix 4) showed a decreasing and even a negative rate of growth in the stock but did not sufficiently alter the regression coefficients to warrant further consideration.

The hourly wage of the TV repair apprentice has risen only 1.1 percent in real terms[1] over a period of time when the average production worker's real hourly wage increased 35.9 percent (see Appendix 4). In sum, it appears that, to the extent that ETI is representative of schools offering TV repair courses and possibly other proprietary schools, the argument that rising costs have been responsible for declining enrollments is erroneous. Rising disposable personal income has offset the increase in cost. The situation is more accurately attributed to a relative decline in expected wages for people entering the TV repair field[2]--a situation over which the private school owner has little control.

The three specific labor factors--unionization, equality of employment opportunity, and relative labor costs--have caused equally unavoidable changes in the school's curricula and serve to illustrate the difficulties that a technical proprietary school faces.

Results of unionizing fruit harvesters were felt, strangely enough, by Chicago proprietary schools. In the late 1950's and early 1960's migrant fruit pickers from Mexico worked in the northern mid-west region. After finishing a season's work, many of them with extended visas would stop in Chicago, especially during the winter, to obtain a trade before returning to Mexico. For several years business in the Spanish language programs in TV and HC buoyed the school's enrollments (see Figure 7). The training was quite successful with a 95 percent completion rate, and many times a brother of a student in a preceding year would enroll the following year.

In 1965 and 1966, as unionization spread among the fruit cultivators and with local political pressure to hire nationals, employment opportunities for migrants diminished, and thus the demand for the Spanish language programs at the proprietary schools. ETI and the other proprietary schools, while perceptive enough to capitalize on the situation while it existed, were helpless to prevent the enrollment decline in the Spanish programs.

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[1] The failure of apprenticeship wages to keep pace with other wages may be the consequence of a change in industrial training policy -- industry may prefer to train its own employees.

[2] Wages of journeymen TV repair technicians have increased more than the apprentices' (28.3% versus 1.1%) but still lag behind the gains of the production worker.

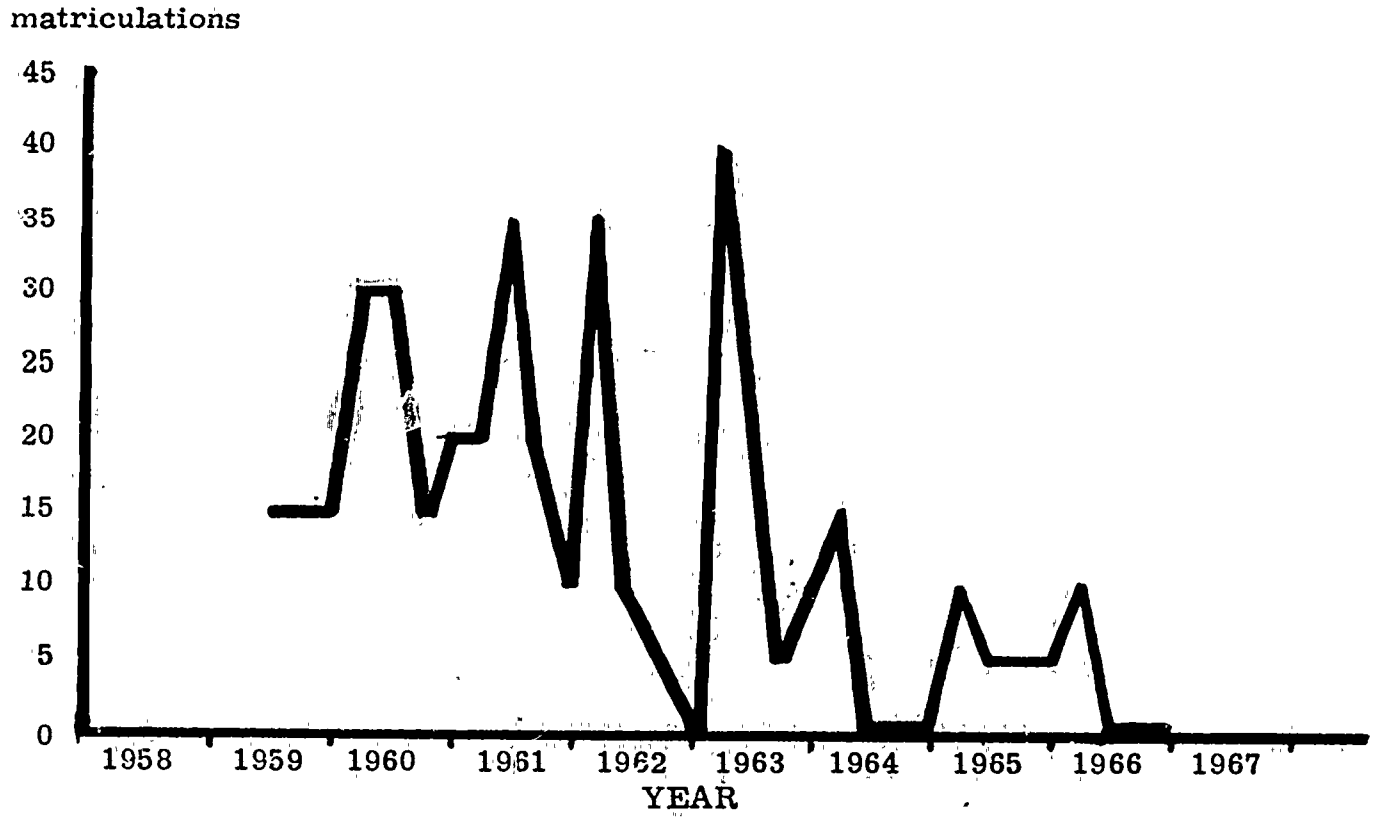

Figure 7. Quarterly Matriculations in Spanish-language programs at ETI (based on 20% sample)

The incident of inequality of employment opportunities focuses on a racial situation that existed in the 1950's and, similar to the unionization issue, represents a situation that a school owner could easily overlook. In 1957 the owner of ETI believed from reading newspaper advertisements that there was sufficient industrial demand to warrant offering a course in wiring and soldering. To insure that he was correct in his assessment and to insure that if he decided to run the course his graduates would get jobs, he contacted several large companies and received their assurance that they would hire as many people as he could train. Using his past experience in industry with mass production of electronics parts, he designed a curriculum that would offer instruction to fit the needs of the companies. He began the course the same year. When the first graduates sought jobs with the companies, they were turned down. The graduates, all women, were black. At that time most companies' policies prohibited mixing black and white workers and there were almost no black firms in existence. Immediately he stopped taking new students and only with difficulty found employment for the women already trained.

However, five years later, at the beginning of 1962, an executive of an electronics manufacturing company remembered ETI's wiring and soldering course and inquired into the possibility of starting the course again. Feeling that the racial barrier in employment was less severe than it had been in 1957 and with the prompting from the industry, he again offered the course. This time it was an instant success. In the first quarter more than 100 women enrolled, and enrollments grew to a peak rate of more than 200 per quarter in 1966 (see Figure 5, p. 72). The course, which appealed almost exclusively to lower income black women, many of them housewives, was scheduled during days, evenings, and Saturdays to make it easily available. Classes generally met twice a week for eight weeks. Industry demand for people with this type of training was so great that many companies hired students before they had finished the course, and everyone who sought employment was employed. However, demand for the training stopped almost as quickly as it started, primarily because of the third market condition we wish to mention, relative production (labor) costs.

In 1968 and 1969, the demand, after being heavy since the program's inception, vanished. American industry recognized the relatively less expensive cost of Japanese labor and began importing manufactured components. As the owner said, "The women stopped coming almost sooner than the ads disappeared from the newspapers."

SCHOOL DECISIONS

To this point we have shown various market phenomena encountered by proprietary schools. Often their most appropriate response is to adapt as best they can to the given situation. This is what ETI did when it offered the Spanish-language courses for Mexican migrant workers, and when it had to wait for market "readiness" to offer its color television maintenance course and wiring and soldering course. But the school, because it is not in a perfectly competitive market, can exert some influence over its destiny through altering such things as its product and price, for example, when tuition was raised for the wiring and soldering course in the face of apparent public competition. The single most substantial change has been the intentional effort, made only in the last few years, to expand the school's product line by offering a day program.

For the first 20 years of the school's operation, its product was tailored to appeal to the motivated, ambitious employed male who was willing to give up his leisure time in the evening or on Saturdays to attend classes. The owner simply believed that the kind of training he offered would not appeal to the type of person who could attend a day-time program. The change in his awareness came primarily through (1) inquiries from community college student drop-outs, and (2) expansion of government training programs in which proprietary schools were beginning to share.

The decision to offer a day program, the owner perceived, would not involve merely an expansion of the schedule, but rather would mean enlarging the appeal of the school to include an entirely different student accompanied by substantive product adjustment to meet the needs of the new students. In planning for a day program he reasoned that students available for full-time day classes are usually unemployed, either people seeking work or those unemployed out of choice, often because they are continuing their education. Members of this latter group--many of them recent high school graduates, military veterans, and students transferring from other training schools--are likely to be younger, less financially independent and in some cases more attuned to schooling and academic programs than the presumably older, possibly less-educated, employment-experienced individuals who attend evening programs.

To attract this different student the owner enlarged the curricula, increased the school's "visibility," and lessened the financial obstacles that often prevent or discourage an unemployed youth from attending school. As part of his efforts to broaden the appeal of the school, the owner designed the electronics technology and electromechanics courses and offered them in the day program. The latter course

of instruction was made available with the awareness that some of the potential day-time students might be people looking for an alternative to the junior or community college. The course is given as a joint program between ETI and Roosevelt University and terminates in an associate degree.

To increase the school's visibility and prestige and as a prerequisite for participation in some federal government student aid programs, the owner sought national accreditation. In 1968 he received accreditation from the National Association of Trade and Technical Schools (NATTS), one of the few national accrediting agencies recognized by the U.S. Office of Education.

An immediate consequence of accreditation was ETI's participation in 1970 in an Office of Education demonstration project, through the Manpower Development Training Act, to upgrade disadvantaged employees. The Office of Education contracted with the United Business Schools Association (UBSA) to train in private business, trade and technical schools approximately 1000 under-employed persons for promotion and higher wages. UBSA, to provide the students with a greater choice of occupational training programs, subcontracted with the National Association of Trade and Technical Schools.[1] ETI, as a member of NATTS, applied for participation, and in April 1970 a class of 15 students began a six-month heating and cooling course. Although the OE Project Upgrade was a demonstration project not intended to be continued, it was considered successful and led to subsequent training activities in the proprietary schools under the MDTA program. The initial participation in government supported training programs may well have served as a catalyst in the owner's decision to offer a day program. Although the Project Upgrade students attended a night course, the Project confirmed to him the possibility of a more diffuse student market for his product.

To encourage the young student to attend, by lowering financial barriers, the owner applied for, and received, qualification as an eligible institution under the Federally Insured Student Loan and the Illinois guaranteed loan programs.

The response to the day program has been substantial. Since 1971 when the day program was instituted, approximately half of the school's 600 enrollments have been in the day

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[1] Richard Fulton, Final Report on MDTA Project Upgrade, U.S. Office of Education (Contract # EC-0-9-180014-4742(335)), May 3, 1971, p. 1.

program.[1] The significant difference in age between the full- and part-time student (22.8 versus 26.7) indicates that, as the owner suspected, the day program appeals to a group of people with different interests and needs than the evening students.

The Impact of the Day Student on ETI

ETI has been successful in offering its new product in terms of attracting day students, but an overall assessment of the product cannot be made without evaluating the students and their performance, because they, while consumers of the training, are also an important input. Their performance constitutes part of the school's product package--providing training, maintaining its reputation among employers and potential students, and assuring a high probability of satisfactory employment for its graduates.

Using completion rates again to compare day and evening and Saturday student performances, we find ambiguous results. The data we collected came from a 20 percent sample of student attendance records, over the history of the school, and, because of our interest in a more detailed analysis of the current student population, from a 100 percent sample of student records from 1971 to 1973. The data indicate that the completion rate is directly linked to course length. Table 18 showed that over the years the completion rate has declined as the course length increased and Table 21 indicates that students in the shorter day program (generally 16 weeks) have a higher completion rate than students in the evening courses (50 weeks). For the 369 full-time students beginning between January 1971 and December 1972 there were 230 or 62 percent graduating between May 197 and April 1973. For a comparable period of time, the completion rate for part-time students was 47 percent (Table 21).

Information obtained in ETI school reports show that (1) completion rates have increased over time and (2) the day and evening programs have similar completion rates. The 1968

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[1] When the day program began, the level of evening school enrollments dropped off. Concluding, however, that the day program was competing for the same group of students attending the evening programs is probably incorrect. The owner claims that the evening school enrollment decline was an idiosyncracy of recruiting practices. Representatives, although they received a straight percentage commission on all sales, were simply able to recruit day students easier than evening students and thus followed the line of least resistance--resulting in less emphasis placed on evening programs.

TABLE 21

COURSE COMPLETION RATES FOR ETI STUDENTS BASED ON A 100 PERCENT SAMPLE OF INDIVIDUAL ATTENDANCE RECORDS FROM 1971 TO 1973

	Number Starting	Number Graduating	Percentage Graduating
day[a]	369	230	62.3
evening[b]	234	111	47.4
TV day	198	110	55.6
TV evening	128	63	49.2
HC day	117	91	77.8
HC evening	94	42	44.7
ES day	23	12	52.2
ES evening	12	6	50.0
ET day	26	16	61.5

[a]Inclusive dates are from January 1971 to December 1972 for starting and May 1971 to April 1973 for graduating.

[b]Inclusive dates are from January 1971 to December 1972 for starting, and November 1971 to December 1973 for graduating.

application for accreditation in NATTS reported that approximately 67 percent of the students included in the sample graduated (Table 22, Part A). In a sample of classes in 1972, 78 percent of the students graduated, and this completion rate was the same for both day and evening classes(Table 22, Part B).

The differences between the data collected from sampled individual records and school reports may be reconciled in several ways. First, because we had to judge completions by the indicated dates of attendance, there may be variation between recorded and actual attendance. There appears to be a tendency to omit recording student attendance toward the end of a course; thus, while some individuals may have actually graduated, we recorded it as an incomplete. Second, students who sign up for a course and then never begin or attend for only a week may be deleted from the school's tally in computing completion rates. And third, the school's figures, based on a small sample, are drawn from particular classes of students, and may not be representative.

TABLE 22

COURSE COMPLETION RATES BASED ON ETI's REPORTS

A. Completion rates for students due to finish between January 1967 and January 1968[a]

Course	Number Enrolled	Number Graduating	Percentage Graduating
TV-electronics[b]	98	61	62.0
Air-cond.-refrig.[c]	52	38	73.0
Total	150	99	67.0

B. Completion rates for students in seven classes beginning in 1971 or 1972[d]

Course	Number Started	Number Completed	Percentage Completed
TV-day	21	17	81.0
TV-evening	9	7	77.8
HC-day	20	15	75.0
HC-evening	9	7	77.8
ES-day	4	3	75.0
ES-evening	5	4	80.0
ET-day	11	9	81.8
Total-day	56	44	78.6
Total-evening	23	18	78.3

[a]Source: ETI's Application for Accreditation to the National Association of Trade and Technical Schools, Document B, Part VI, March 1968.

[b]Initially "electronics" was incorporated into the TV courses, and only in more recent years has it evolved into a separate course.

[c]Heating, which had been a separate program in the 1950's and early 1960's, was gradually fused with the cooling courses in the late 1960's.

[d]Source: ETI's Self-Evaluation Report, January 1973, p. 9.

From these differences in sampling it seems plausible that our data could have underestimated the actual completion rate of students, but because the school data was drawn from two points in time rather than over a continuous number of years and because all of our results for longitudinal and day-evening course completion rate differentials consistently indicate a higher completion rate for shorter courses, we can reasonably assume greater reliability in the relative levels of completion shown in Tables 18 and 21 than in the relative differences in levels of completion indicated in the 1968 and 1973 reports. Considering the sample results, their sources and possible causes for deviations, the most satisfactory interpretation seems to be (1) that completion rates may be higher overall than indicated by the 100 percent sample, (2) that completion rates have dropped as the course length has increased, and (3) that full-time students have higher completion rates than part-time students.

Whether or not this assessment of completion rates for day and evening programs is correct, there are two factors, possibly working in opposite directions, that may influence completion. One is the course length which is inversely related to the student completion rate; thus we could expect the relative frequency of completions in the 16-week full-time program to be greater than in the 50-week part-time program. But differences in student characteristics between full-time and part-time students could offset the effect of the difference in course length if the part-time student were more persevering, intelligent, or enrolled in easier courses, than the day students. Unfortunately we have no objective indications of their aptitudes or abilities, much less their motivation. A useful distinction, however, and one that may reflect capability and motivation differences among students is that made between students attending ETI with public aid assistance and those without aid. In past years students were responsible for paying their own tuition, insuring to some extent that only highly motivated students attended. With the advent of the day program and public aid students it was thought that the aid students might cause a deterioration of commitment and interest among the student body. ETI maintained an "open door" policy for public aid students, accepting whoever the State Employment Service (SES) sent them, and thereby surrendering any control it might have over student input. ETI was susceptible to whatever detrimental influence the aid students might introduce.

The first class of aid students suffered the same shortcoming evidenced and documented in other schools--the self-fulfilling prophecy. The first class was part of the U.S. Office of Education demonstration project in 1970 which provided training for class-sized groups of students under the Manpower Development Training Program. Students and teachers knew that

the class was composed of disadvantaged public aid recipients and consequently both groups' expectations and subsequent performances were inferior to those normally established by the school and its students.

To avoid pre-set failure conditions, subsequent public aid students were received on an individual referral basis from SES and were mixed into regular classes. Since that first class, ETI has enrolled 144 public aid students in 1971 and 1972. Available information indicates that the public aid students performed better than non-aid students as measured by completion rates and their subsequent employment dispositions.

Of the 144 aid students attending ETI in 1971 and 1972, 66.7 percent graduated, compared to only 53.3 percent of the non-aid students (see Table 23). Part of the disparity is due to the difference between full- and part-time training but even when comparison is restricted to the full-time program (in which all aid students attend) the non-aid completion rate rises to only 58.8 percent, still considerably lower than the rate for public aid students. An often cited explanation for

TABLE 23

COURSE COMPLETION RATES FOR PUBLIC AID AND NON-AID STUDENTS FOR ETI, 1971 AND 1972

		Aid Students	Non-Aid Students	Total
Full Time Students	Enrollments	144	226	370
	Completions	96	133	229
	Completion %	66.7	58.8	61.9
Part Time Students	Enrollments		232	232
	Completions	--	111	111
	Completion %		47.8	47.8
Total Students	Enrollments	144	458	602
	Completions	96	244	340
	Completion %	66.7	53.3	56.5

the high retention rate among government subsidized students is the incentive to continue receiving subsistence allowances.[1] If

[1] Enrollment in different courses could also be an explanation for differing rates of completion, but the data show that the distribution of students among courses was similar in both groups. Of the 144 aid students, 56 percent enrolled in TV, 34 percent in HC, 1 percent in ES, and 8 percent in ET. For the non-aid students, the distribution among the same courses was 53, 37, 7, and 3 percent.

this were the sole purpose for maintaining their attendance then the objectives for which the aid programs were established would hardly be justified; however, data on subsequent employment activities of the graduates do not support the notion of unusual "passive school attendance" among aid students.

Assuming that gainful employment is the primary goal of the government agency in referring individuals to ETI and of the students in attending school, employment success of graduates is used as a measure of the effectiveness of the training program. Table 24 gives the employment disposition of students recently graduated from the day program.[1] Because the sample is so small, no importance can be attached to small differences in percentage and because the number of cases for which we have no definite information is a considerable percentage of the total number of cases, the percentages in other categories could range widely if an accurate disposition were determined for all persons. Nevertheless, of the aid students, 30 percent were reported as having received employment upon graduation; 27 percent of the non-aid graduates received employment. The difference is slight and could be the result of reporting procedures or of different methods used to obtain employment. Aid-students receive assistance from the school and from the State Employment Service, a joint service which may result in greater placement effort for aid students than for non-aid students. In addition, the fact that 4 percent of aid students and 8 percent of the non-aid students did not want employment assistance could be interpreted to mean that (a) they had already found or expected to find employment on their own, or (b) they were not seeking employment. If (a) is correct then both groups do nearly equally well in obtaining employment. The fairly large percentage of students for whom information is not available[2] precludes conclusively

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[1] Data for evening students is of no consequence because nearly all of them are already employed.

[2] Information on employment status of students obtained from the school's 1973 Self-Evaluation Report indicates higher employment rates than we observed from the sampled attendance cards. Again, as with the data on completion rates, student's status may not always be entered on the card, especially if the school obtains the information after the student has left the school. The table below shows that only 12.4 percent of the graduates were not working or may not have found work. Considering the large percentage of students for which information is not available in Table 24 it is quite possible that if these students did find employment the percentage in our sample of students working would be nearly the same as the figures reported in the school's report. In another survey although the number of responding institutions was very small,

TABLE 24

EMPLOYMENT DISPOSITION OF DAY STUDENTS GRADUATING FROM 1971 THROUGH APRIL 1973

Student Employment Disposition	Public Aid Students Number	Public Aid Students Percent	Non-Aid Students Number	Non-Aid Students Percent
Employment Received	30	30.3	39	27.3
Already employed[a]	2	2.0	4	2.8
Does Not Want Job Assistance	4	4.0	12	8.4
Ineligible for Job Assistance[b]	4	4.0	10	7.0
Unemployed	-		3	2.1
Miscellaneous[c]	7	7.1	12	8.4
Information not Available	52	62.5	60	42.0
Total	99	99.9[d]	143	100.0

[a]Some students receive jobs before the course is completed.

[b]Students are ineligible if they owe the school money, are foreigners, or finished the course but failed.

[c]Contains students continuing their schooling and those entering the military.

[d]Rounding error accounts from the deviation from 100.0%.

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the schools surveyed by the American Institutes for Research also indicated that about the same percentage (11.9) of students do not get employment or go on to further schooling.

Employment Disposition of Graduates From Five Classes in ETI in 1972, Drawn from ETI's Self-Evaluation Report, January 1973, p. 8.

	Number	Percentage
Placed Before Graduation	11	10.5
Within 30 Days of Graduation	51	48.6
Within 60 days of Graduation	17	16.2
After 60 days	5	4.8
Military	3	2.9
Other Occupations	5	4.8
Unemployed	6	5.7
Unknown	7	6.7
Total	105	100.2

determining whether one group of students performs better than the other. But our data do indicate, contrary to some popular notions, that public aid students are not necessarily performing less well than non-aid students.

OVERALL ASSESSMENT

We have seen ETI successfully anticipate, and adjust to, industrial demand and enter a new market area, the day-time program, without apparent deterioration in product. But the final success of a proprietary school, as with any profit-motivated firm, is measured in terms of its profits.[1] Simply increasing the number of students by offering a day program does not guarantee a more successful operation. Profits depend on the relationship between revenue, a combination of students and tuition, and costs, with greater profits occurring, ceteris paribus, by lowering unit costs or raising revenue. An effective way to reduce unit costs is to increase volume so that overhead costs are spread over a larger number of units as would be the case in using the plant for more hours of the day or operating classes with a high student-teacher ratio. Raising revenue often involves incurring further costs for such things as advertising, recruitment, or curricula modifications to attract more students. Before viewing the school's rather volatile profits it is instructive to see what changes in budget item expenditures and receipts underlie the sharp changes in profits.

Not surprising is the paucity of data from proprietary schools indicating how costs and revenues vary to determine profits. Proprietary schools by definition are privately owned and are as reluctant as any other private competitive firm to disclose publicly their financial expenditures and assets. Furthermore, a school simply may not have the information. In a study of proprietary and non-proprietary schools by the American Institutes for Research in the Behavioral Sciences, the authors indicate that they were unable to make a financial evaluation of the schools, ". . . difficulty was continually encountered in attempting to gather data regarding school finances. In fact, 38 out of the 65 participating schools could provide no data in this area . . . the data were

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[1] Proprietary schools are often criticized for being "profit-oriented," as though the phrase automatically implied that schools behave irresponsibly by cutting corners on services provided to the student in order to make a profit. Yet educational accountability, something new to public school systems, has always underlain the operations of proprietary schools; a profit margin is a valid indication of the success of a school in meeting the needs of both industry and the public.

simply unavailable or indefinable in any consistent manner."[1] Only through the generous cooperation of the owner of ETI do we have financial information on the school's expenditures from 1965 to 1972.[2]

Since 1965 the most prominent aspects of the school's operations have been (1) the expansive but concentrated program in wiring and soldering in the 1960's and (2) the day program which represents a diversification of product and increase in total enrollment.

In the case of the wiring and soldering course, the year (using a fiscal period from June to May to coincide with the financial data) of peak enrollment was 1966 (see Figure 5,

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[1] American Institutes for Research in the Behavioral Sciences, A Comparative Study of Proprietary and Non-Proprietary Vocational Training Programs 1: 48. It is also interesting to note, as was shown in the introductory chapter, that financial information on the private school industry as a whole is very incomplete. Although each school is required by Illinois law to file an annual application, much of the financial data requested is simply not supplied. Some schools submit statements of parent corporations, which is satisfactory for the needs of the Office of the Superintendent of Public Instruction, but may not even mention the school in its report and of course is useless for our purposes.

[2] The data are presented in rather aggregate form and a few caveats should be entered concerning interpretation of the figures. (The information was extracted from annual, unaudited statements of income based on cash flow.) First, certain figures have been arbitrarily proportioned among categories of expenditures; for example, salaries are listed in the school's statement as a single item. Upon consultation with the owner, we have assigned 60 percent of those costs to instructional expenditures and the balance to administrative expenditures. Second, the costs of some activities cannot be properly identified. For example, although the principal cost in recruitment is the salesman's commission, there is also some administrative cost associated with recruitment but no practical way to identify what part of administrative activities are spent on recruitment. And third, reported profits may not always be a true reflection of the school's profits. Because the owner is able to establish his own salary from year to year, he is free to withdraw salaries of varying amounts. If we assume that during more prosperous years he draws more than during less prosperous years, then reported profits understate the actual volatility of profits. Even with these limitations, some interesting observations are possible.

p. 72). In a year of particularly high enrollment and student concentration within one program, we might expect higher revenue from the larger number of students, higher instructional costs relative to other years as more teacher hours are needed to provide the instruction, but lower instructional costs relative to total revenue because of reduced unit cost made possible by operating at a higher student-teacher ratio through increased volume. The figures in Tables 25 and 26 support our expectations. Total revenue, well above other years, is surpassed in amount only by the revenue in 1972 (Table 25).

TABLE 25

ETI REVENUE AND EXPENDITURES FROM 1965 THROUGH 1972

Year	Total Revenues	EXPENDITURES				
		Recruitment	Instruction	Administration	Overhead	Advertising
1965	100.0%[a]	100.0%	100.0%	100.0%	100.0%	100.0%
1966	138.4	117.5	118.1	116.1	124.8	108.0
1967	123.1	114.9	104.9	105.2	110.9	102.5
1968	108.3	105.6	109.9	112.3	102.1	118.1
1969	103.9	100.4	115.7	131.9	105.8	74.2
1970	117.1	135.7	111.4	120.2	114.1	66.4
1971	117.3	141.4	111.3	122.2	120.5	113.6
1972	193.1	173.1	160.2	160.2	119.1	118.4

[a]The dollar amount for each year (June 1 to May 31) is deflated to 1958 dollars and then, to prevent specifying actual amounts, the figures are converted to percentages of the amount in 1965.

Similarly, instructional costs were higher in 1966 than in all years except 1972, and yet instructional costs as a percentage of total revenue were lower in 1966 than in most other years (Table 26).

TABLE 26

DISTRIBUTION OF ETI EXPENDITURES AS PERCENTAGES OF TOTAL REVENUE, 1965 THROUGH 1972

Year	Recruitment	Instruction	Administration	Overhead	Advertising	Profit
1965	14.8[a]	42.4	27.2	11.5	7.4	4.1
1966	12.5	36.2	22.9	10.4	5.8	17.9
1967	13.8	36.2	23.3	10.4	6.2	16.3
1968	14.4	43.0	28.3	10.8	8.1	3.3
1969	14.3	47.2	34.6	11.7	5.3	-7.8
1970	17.2	40.4	28.0	11.2	5.1	3.3
1971	17.8	40.3	28.4	11.8	7.2	2.5
1972	13.2	35.2	22.6	7.1	4.5	22.2

[a]Horizontal summations of percentages do not equal 100.0 because of (1) double counting advertisement as both a separate entity and an element of recruitment and (2) rounding percentages.

Assessing the outcome of offering the day program requires examining the expenditures and revenue associated with that program. The school diversified its product line as an attempt to attract more students and consequently more revenue, but the diversification itself involves higher costs, some of them start-up costs. For example, the school owner, anticipating that the day student would have a greater need for financial assistance, sought to become eligible for government student loan programs. While participation may eventually insure revenue to the school via greater student enrollment, there are costs attached to participating in these programs. One of the common problems initially faced by a proprietary school is the cost of applying, which involves submitting lengthy application forms and a certified audit which costs several thousand dollars. Unless the school expects to attract a number of students through participation in the program initial costs may be prohibitive. For example, the process of becoming an eligible lender under the Federally Insured Student

Loan (FISL) program is illustrative. Accompanying the detailed application form must be a certified audit which may cost up to $5,000 for a medium-sized school. If the application is approved, then the school's credit limit is established by the FISL program, based on such things as the school's size and whether it is a new member, and FISL also sets the ceiling on the interest rate that the lender institution can charge. If interest rates go above FISL rates, then the lender may pay the difference itself, or decline participation. Thus, to get, say, a $30,000 line of credit a school such as ETI may have to spend up to 20 percent of that amount to apply and participate in the program. Similar problems are encountered in participating in the federal Manpower Training program.

The net result is that marketing a new product involves not only increased instructional costs and typical overhead costs, but also unique costs associated with entering a particular market. Making the new product sufficiently attractive to the potential students who would be attending the day program required that ETI be eligible to receive government aid students and be able to service non-aid students with need for financial assistance. The decision to offer a new product, thereby enlarging the school's market, involves careful weighing of costs and benefits to the school.

With the onset of the day program in 1971, one would expect many of the school's costs to rise relative to earlier years, especially those costs associated with offering a new product and with attracting new students, such as administrative, recruitment, and advertising costs. But if the school is successful in increasing its enrollment, as it has been, then some costs should decline as a percentage of total revenue, particularly overhead costs. The major item of overhead costs is rent, which is relatively constant regardless of whether the facilities are used a few hours each evening or all day.

Table 25 shows that most costs did increase in 1972 relative to the previous year, especially recruitment (+23%), instruction (+44%), and administration (+31%). Revenue was nearly twice what it was in 1965, but, curiously enough, nearly the same in 1971, the first year of the day program, as in 1970. Part of the explanation for the flat revenue in 1971 is that, although the day program was introduced in 1971, much of the increase in revenue in calendar year 1971 is reflected in the 1972 revenue figure because the fiscal reporting year begins in June 1971. Furthermore, the nearly 50 percent increase in tuition in the beginning of 1971, which accounts for some of the revenue increase in 1972, also helped to keep

revenue up in 1971 by partially off-setting the general decline in enrollments throughout that year.[1]

During the 1965-1972 period, 1969 was the only year the school had a deficit and it appears that the causes were a slight decline in revenue resulting from a reduction in the number of students (see Figure 6 and footnote 1, p. 99) and increases in instructional and administrative costs. Actually these increases are probably the result of a 11 percent increase in salaries for instructors and staff and a one-time increase to the school's officer. The reduction in instructional and administrative costs in the following year (1970) is not the result of reducing salaries, but the consequence of reducing the compensation to the officer. (Because instructional salaries are computed as a percentage of salary amounts, a reduction in the officer's pay is reflected in instructional costs.) It is also interesting to note that expenses for advertisement (Table 25) are probably the most variable costs since it is the item most curtailed in the deficit year. And recruitment costs, paralleling the number of commissions made by salesmen for recruiting students, are expected to decline with enrollment.

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[1] Enrollment figures for 1970 and 1971 may contain sampling errors. School enrollment tallies indicate that there was a slight drop in students in 1971, but not as severe a drop as our sample suggests. The estimates we obtained (from a 20 percent sample) for the years from 1965 to 1972 for the TV, HC, ES, and ET courses are as follows:

1965	1966	1967	1968	1969	1970	1971	1972
135	230	115	165	150	385	165	345

Information compiled on a different basis by the school is difficult to interpret in our context because the students were tallied by student status ("drop-out," "no-start," or graduates) by year. For example, referring to the table below that contains the school information of students' status, if, of three students who enroll in 1970, one never starts, another quits in 1971, and the third graduates in 1972, each student would be tallied in a different year although all three began in 1970.

Status	1970	1971	1972
"no-starts"	132	103	135
"drop-outs"	33	34	28
graduates	180	153	211

When we combine the costs and revenues of ETI and evaluate the profitability of the school's operations, Table 27 shows that 1966 and 1972, the two years coinciding with the school's greatest concentration of students within a curriculum and expansion of enrollments, were the school's most profitable years. More striking is the great variation in profits. Profits in 1966 were over 6 times as great as in 1965, and from 1971 to 1972 there was nearly a 15-fold increase. Perhaps such volatility of profits is a capsular commentary on the sensitive role that proprietary schools fill in responding to continuously changing market and technological conditions.

TABLE 27

ETI REVENUE AND PROFIT FROM 1965 THROUGH 1972
(COMPUTED AS IN TABLE 25)

Year	Revenue	Profits
1965	100.0	100.0
1966	138.4	602.6
1967	123.1	486.8
1968	108.3	89.5
1969	103.9	-197.4
1970	117.1	94.7
1971	117.3	71.1
1972	193.1	1042.1

CHAPTER V

THE COSMETOLOGY SCHOOL INDUSTRY

This chapter, composed of three sections, examines cosmetology schools in the Chicago SMSA as an economic entity. Section I is a short general description of the industry and its students. Section II examines the industry through longitudinal data, focusing on three facets of the industry; the factors of demand for training, particularly the influence of the unemployment rate and foregone earnings; supply adjustment through changes in the number of schools; and the relation of non-proprietary cosmetology schools to proprietary cosmetology schools. An examination of variations, particularly price variation, within the cosmetology industry, using cross-sectional data, constitutes Section III.

SECTION I: A General Description

Cosmetology in Illinois

Cosmetology in Illinois is a licensed occupation. The prospective cosmetologist must pass a written and a practical state-administered examination to receive her[1] license for a nominal fee. A prerequisite for sitting for a state examination is either successful completion of a state approved course in beauty culture that meets state standards governing the curriculum, or completion of an apprenticeship program. Licenses must be renewed annually for continued eligibility to practice. A person wanting to return to practice after allowing her license to expire for five or more years must take the state examination again. Up to that time, back payment of the annual license fees is sufficient to obtain a current license. Consequently, many women, deciding to quit but thinking they may wish to return to practice, continue to renew their licenses rather than incur the greater burden of re-passing the examination. An

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[1] Men occasionally enter cosmetology, but the vast majority (90 percent or more) of cosmetologists are women.

indication of the proportion of licensed to practicing cosmetologists is given by the fact that in 1969-70 there were 78,464[1] renewals issued, although the U.S. Census reported only 23,089 females in Illinois with earnings in 1969 as cosmetologists.[2]

Entry into the occupation is generally limited to those who pass through the proprietary beauty schools. Of the 7,300 students in Illinois entering cosmetology training in 1972, about 7 percent enrolled in cosmetology programs in community colleges or public high schools, and a smaller percent began an apprenticeship. Approximately 90 percent attended proprietary schools.[3]

The Cosmetology School

Table 28 shows that in 1966 there were 2477 beauty culture schools in the U.S. and that 6.1 percent of them were in Illinois. In January, 1973, of 159[4] beauty culture schools in Illinois, 56 percent were located in the Chicago SMSA which contains 62 percent of the State's population of females over 17 years of age.[5]

Tuition rates in private cosmetology schools in the Chicago area during the summer of 1973 were as low as $200 and as high as $1300, but 67 percent of the schools charged between $400 and $700. Revenue of cosmetology schools from educational programs is often supplemented from sales of cosmetic supplies and by business brought in by regular partrons. Unlike many other types of vocational schools, cosmetology schools do not overlap into other areas of training with the possible exception of a few schools that incorporate personality development or personal fashion into their programs.

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[1] "Examining Committees and Licensing Statistics," (Illinois Department of Registration and Education. Springfield, Ill., n.d.

[2] U.S. Department of Commerce, Bureau of the Census, 1970. PC(1)-D15 Illinois, p. 1114.

[3] "Examining Committees and Licensing Statistics," op. cit.

[4] Computed from the daily enrollment sheets, Beauty Culture Section, Illinois Department of Registration and Education.

[5] Bureau of the Census, 1970. PC(1)-D15 Illinois, table 143.

TABLE 28

NUMBER OF COSMETOLOGY SCHOOLS, STUDENTS, AND PRACTICING COSMETOLOGISTS

	Cosmetology Schools	Cosmetology Students	Practicing Cosmetologists
Illinois	151[a]	7,556[b]	23,089[c]
U.S.	2,477[d]	272,470[e]	253,400[f]
Ratio (Ill./U.S.) percentage	6.1	2.8	9.1[g]

Notes:

[a]The figure is weighted by the monthly number of schools, which ranged from 146 to 158. Source: Computed from the Illinois Department of Registration and Education records, 1966.

[b]Actual number of students enrolling in cosmetology training in 1966. Source: Computed from Illinois Department of Registration and Education records.

[c]Females with earnings in 1969 as cosmetologists. Source: U.S. Census, PC(1)-D15 Illinois, 1970, p. 1114.

[d]Source: Belitsky, A. Harvey. Private Vocational Schools and Their Students. (Cambridge, Mass.: Schenkman Publishing Company, Inc., 1969), p. 9, table 2-1.

[e]Data are for 1966. The basis for reporting students is not given. Source: Belitsky, p. 9.

[f]Number of employees in beauty shops, March 1968. Source: Employment and Earnings, 16 no. 1(July 1969): 21.

[g]The ratio of practicing cosmetologists is biased upwards because of the exclusion from the U.S. figure of those beauticians who may work in their homes.

n.b. The number of students in cosmetology in the U.S. is probably overestimated. It is unlikely that the number of students is greater than the number of practicing beauticians. In fact, in 1966, the year the Illinois students were counted, there were only 226,100 practicing beauticians in the U.S., indicating an even greater ratio between the number of students and practicing cosmetologists. Source: same as (f) above. A ratio, computed from the Illinois data, of the number of practicing cosmetologists to the number of students, applied to the national estimate would reduce the estimate of the number of students to less than one-third of the reported 272,470.

The Cosmetologist and Student

Cosmetology has a high turnover rate. Table 1 shows that Illinois has one cosmetology student for every three practicing cosmetologists. The figures for the nation (although questionable in accuracy, see note to Table 1) indicate the magnitude of turnovers to be even greater than the ratio for Illinois.

The age distribution of cosmetologists is bimodal, similar to the age distribution for all women in the labor force, with the larger group aged 20 to 24 and the secondary group aged 35 to 54. Current average income for full-time beauticians is $125 to $150 per week.[1]

Of a hypothetical hundred newly enrolled students in beauty culture, 70 are likely to be teenagers, 25 to be working girls slightly older, and 5 to be middle-aged. Of the teenagers, about half complete their training, but within a year after graduation only a few will still be practicing. Among the older women, the completion rates are higher and more of them continue in their work. Overall, 60 to 95 of the original 100 matriculants drop out or leave the occupation within a year from the scheduled date of completion.[2]

Completion of the course normally takes one year, and students are generally free to enroll at any time. The shortest time necessary for completion is nine months of full time attendance; some take two and even three years on a part time basis. Because many of the 1500 hours consist of practical work that can be done throughout the day the curriculum is adaptable to an individual's personal schedule.

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[1] The Census reports a figure of $4,044 for average annual earnings of cosmetologists with earnings in 1969. Earnings of $150 a week give an annual figure of $7,500. The discrepancy may be due to (1) an increase of wages since 1969, and (2) unreported income in earnings and tips. If tips were excluded in reported earnings, then earnings should be adjusted upwards by approximately 25 percent, bringing the annual figure reported by the census more in line with the income estimated by school owners.

[2] Information in this paragraph is from personal conversations with Mrs. Tilly Carlson of New Image Academy of Beauty Culture and Mr. Sam Greco of Vogue Academy of Beauty Culture.

SECTION II: Longitudinal Analysis

Introduction

The vocational proprietary school is an independent, profit-motivated school with a primary goal of training people for employment in a particular vocation. In economic terms, the school is an individual firm selling a product in a market. To stay in business it must operate under the economic constraints imposed by supply and demand conditions. Supply of opportunities to receive training in the schools is a function of expected profits which are based upon expected costs and expected demand. Expected demand is a function of actual demand in some past period, current prices, and income. Actual demand for the services of proprietary schools depends on costs and benefits, such as tuition, foregone income, unemployment, and future wages, of training in proprietary schools and in alternative programs.

The prospective student views vocational training as an intermediate step in acquiring satisfactory employment. He attends a proprietary school to learn a skill which will enhance his "value" in the labor market. Therefore, demand for a school's product will depend upon conditions in the labor market as perceived by the prospective student.

Supply response occurs through (1) changes in size of schools, and (2) changes in the number of schools; the particular form that supply adjustment takes depends upon the competitiveness of the industry. In a purely competitive market, all schools operate at an optimal size and supply adjustments are made through the opening and closing of marginal firms (schools). No market is perfectly competitive; however, the adaptability of the number of schools in the industry to changes in demand may give an indication of how easily marginal firms enter and leave the market, a condition that implies, ceteris paribus, a competitive market.

Demand for Training

Analyses of demand for schooling in terms of fluctuations in labor market conditions--unemployment and wage levels--are few. Three studies have examined the impact of cyclical unemployment on enrollment rates in public schools. The first study in 1965 by Beverly Duncan shows consistently, although not with statistical significance, that "over the last sixty years fluctuations about the long-term trend toward rising educational attainment for males have coincided with

changes in the job market,"[1] i.e., when jobs are scarce, students defer leaving school, but when the employment level is low the drop-out rate increases. Robert M. Fearn, using cross-sectional data, also shows that public school enrollment rates for teenagers are positively related to the unemployment rate.[2] Linda Nasif Edwards in the other study, using time series data, finds that the relationship between unemployment and school enrollment for boys is significantly positive, but negative (and not significant) for girls. Her explanation for this difference is that home productivity sets a floor to declining opportunity costs for teenaged girls in the downward phase of the cycle, and therefore the opportunity costs for teenaged girls vary less over the cycle than do the opportunity costs of teenaged boys.[3]

The different enrollment response of the sexes to the level of unemployment may also reflect a different perception of the objective schooling. Among middle class families, college attendance increased for sons during periods of rising or high unemployment but declined for daughters. The negative relationship for daughters is attributed to a parental income effect. Parents may tend to view education for their daughters more as a consumption item and therefore during times of high unemployment (and presumably lower income) educational spending is reduced. Education for the sons, however, appears more as an investment and during periods of high unemployment, foregone earnings decline, making it less expensive for a person expecting to enter employment to attend school. We know of no study of this type that deals with vocational proprietary training, and the differences between schooling and training may be too large to allow extrapolation of earlier results to proprietary school training.[4] However, the hypothesis explored here is that the demand among women for training (as determined in the cosmetology field) is responsive to the same economic

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[1] Beverly Duncan, "Dropouts and the Unemployed," JPE, April 1965, p. 133.

[2] Robert M. Fearn, "Labor Force and School Participation of Teenagers," Ph.D. dissertation, University of Chicago, June 1968, p. 78.

[3] Linda Nasif Edwards, "School Retention of Teenage Males and Females Over the Business Cycle," mimeo, p. 1.

[4] Lawrence S. Olson, "Formal, Post-Secondary, Vocational School Training: A Preliminary Study," mimeo, 19 November 1973, p. 27.

considerations facing men; that is, we expect demand to be positively related to unemployment and negatively related to foregone earnings.

This analysis will also attempt to measure the impact of the federal minimum wage on demand for cosmetology training. The proposition is that an effective minimum wage will depress the demand for training. As the legislated wage rises (raising the pay of unskilled labor) the incentive (the increase in expected returns to the training over expected returns without training) to invest in training decreases. There is a contention that there is no such thing as an "effective" minimum wage because of the "ratchet effect" that a legislated wage hike has on other wages. Actually the net effect of legislated wages on demand for training is confused by dual effects.

Each time the minimum wage is raised, opportunity costs increase for those covered by the raise, exerting a downward influence on demand for training, but concommitantly unemployment rises as fewer workers are hired at the higher wage. For those people put out of work or unable to find work because of the wage increase or forced into a more crowded unprotected sector, opportunity costs decrease, encouraging enrollment. Because of this relationship between foregone earnings and unemployment, both variables need to be considered jointly in analyzing components of demand for training.[1]

The theoretical framework for explaining demand for cosmetology training is the same as the individual decision model elaborated in Chapter IV. Long run equilibrium is assumed with the annual time series data representing fluctuations about that equilibrium. Demand for training is treated as synonymous with the supply of individuals to an occupation.[2] Demand for trained personnel is determined in the labor market. Similarly, the focus is on the students; the school serves simply as the mechanism through which the students flow.

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[1] Yale Brozen, "The Effects of Statutory Minimum Wage Increases on Teen-Age Employment," Journal of Law and Economics, 12, no. 1 (April 1969): 110.

[2] No further exposition of the individual decision model is made here because of its explanation in Chapter IV (see pp. 77-78.)

A decision to make an investment in training requires comparing expected costs of the training with the expected increase in benefits resulting from the additional training. Excluding non-monetary considerations, dollar income constitutes the primary returns, and the investment in training represents the costs, both direct and indirect. A cosmetologist's earnings commonly consist of either a certain percent of each patron's fee or all earnings above an initial fixed amount. In either case the cosmetologist's income depends upon the fee (plus tips) per customer and the number of customers served.

Direct costs are primarily tuition and supplies; indirect costs are the earnings foregone (the product of the foregone wage rate and the period of time over which the wage is foregone) by pursuing cosmetology training rather than taking employment in some alternative field. For purposes of this analysis, cosmetology is considered a semi-skilled occupation, and the alternative to taking training is considered employment as an unskilled laborer for which the federal minimum wage rate approximates the wage foregone for a person in cosmetology training.

Continuing in a fashion parallel to the previous analysis of demand at ETI, the theoretical framework for estimating determinants of demand involves a simultaneous equations system (because of the interrelated supply and demand components), and unavoidably the theory must also be tested with data that have some serious shortcomings.

As with the analysis of ETI, demand for training (supply of students to the cosmetology schools) is a function of the difference between the present value of expected income with the training and present value of expected income without the training. Components of these values can be approximated by expected wage upon completion of training, earnings foregone during training, direct costs of the training, the probability of receiving employment and the ability to pay for the training. The demand for cosmetologists is determined in the market place, and the market wage will depend upon the relative need for cosmetology services. The level of per capita income and the number of people seeking cosmetology services should have a positive effect on the cosmetology wage level, and the flow of cosmetologists into the occupation, a negative effect.[1]

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[1]The relation between the stock of cosmetologists and the flow of students into training and the occupation requires some explanation. If demand for cosmetology services is constant and the market is in equilibrium, the flow of students

One of the most serious shortcomings of the data available for analyzing demand is the proxy wage variable used for cosmetologists' wages. Annual salary data do not exist to the writer's knowledge. In lieu of actual wage date, the cost of personal care services (cosmetology services, barbering, and bath services) deflated by the consumer price index is used as an indicator of the wage of cosmetologists.

Aside from the questionable validity of the wage variable for cosmetologists, the data for the wage variables (wage of the cosmetologist and wage of individuals not taking the training) represent different points on the earnings stream profiles than the wage variables used in the analysis of ETI. Using an average career wage as a proxy for the present value of earnings available without training and using an initial wage offered newly trained individuals for the net present value of expected earnings with the training tends to diminish the real difference between the values of the two earnings streams. In this analysis of cosmetologists' training, a reverse bias may arise. The wage variable for cosmetologists represents an intermediate point along the earnings stream profile, and the wage obtainable without the training is never any lower than that of the wage variable assuming that the job is covered by minimum wage legislation. The wage variables for this analysis, therefore, may tend to overstate the real importance of the wage differences.

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into cosmetology would also be constant. When demand or market conditions change, however, the degree to which changes in supply occur through changes in the flow of students into the field depends upon the responsiveness of other mechanisms available for adjusting the stock of cosmetologists. Negative adjustments to the change in the stock occur through retirement (R_t). An increase in demand increases the benefits to the beauticians and encourages fewer people to leave the occupation. A relative increase in supply has the opposite effect. Positive adjustments to the growth of the stock occur through the flow of cosmetology students into the industry (M) and through recidivism (R_c), a particularly common phenomenon among members of the female work force. Thus the change in supply, ΔS, equals $M + R_c - R_t$, or $M \cong \Delta S + R_t - R_c$. How completely a change in supply is met by M depends upon how sensitive R_t and R_c are to changes in earnings potentials. If changes in stock occur quickly and easily through R_t and R_c then the net effect is a weaker relation between demand for training and demand for the services of cosmetologists.

Another unavoidable mis-specification arises from the lack of data for tuition costs. However, omission may not be too serious; tuition as a portion of total cost on the average is about 15 percent,[1] and, as shown in Appendix 6, an estimate of demand arc elasticity of cost is less than -.3.

Thus, at this point, the supply of individuals to the industry (assumed to be synonymous with demand for training) can be specified as some function of expected wages, foregone wages (a combination of a foregone wage rate and foregone time), income and unemployment. Demand for cosmetologists can be expressed as some function of relative expected wages of cosmetologists, income, population, and unemployment. However, specification of the structural equations is an additional problem. Not only may the data not measure accurately enough the parameters we hope to estimate, but the correlations among some of the variables are so high that serious problems of multicollinearity arise.

Some insight into the seriousness of measurement error of the variables may be achieved by observing the behavior of variables under different variable and equation specifications. For example, an ideal cost variable would be constructed as the foregone wage rate times the length of time earnings are foregone plus the direct cost of tuition. The data available for foregone wage, however, may not be very accurate and by entering it separately into the equation we may gain some understanding of its importance.[2] Similarly, the length of training is not strictly a cost variable; it may be also a measure of quality. Other things equal, an employer may prefer someone with more training to someone with less. One could argue that the value of the longer course will be reflected in wages, but that assumes a perfectly flexible and responsive economy. If the impact of the length of course is fully reflected in the wage then the course length variable should

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[1] If tuition is $550 and foregone earnings are $3000 (1500 hours times $2.00), tuition would be 15.5 percent of total monetary costs.

[2] Dividing a variable into various components and entering them separately constitutes a mis-specification in that the effects of the variables are assumed to be additive whereas they were assumed to be multiplicative initially. However, there may be some trade-off between mis-specification and multicollinearity in achieving empirical resolution. Although the former is potentially a more serious problem, both concepts are relative, and in this case the former may not be as severe a problem as the latter.

explain nothing. If it were to have, for instance, a negative coefficient, it would indicate that the longer course raises costs more than returns.

Trying to estimate certain parameters using different variable specifications is one approach that may reduce the problem of multicollinearity. Table 29 gives the zero-order correlation matrix and shows that many of the variables have correlations of .8 and .9 and higher. Population and income are so highly correlated that they approximate an identity. To eliminate some of the collinearity a conventional specification of relative wages is used, i.e., W/FW. Also because of the near identity between population and income, P is deleted. The structural equations below allow coefficient estimation by ordinary least squares (OLS), two-stage least squares (2SLS), and indirect least squares (ILS) which provide some basis for checking the severity of mis-specifications in the equations.[1]

(1) $M = \alpha_0 + \alpha_1 W/FW + \alpha_2 FT + \alpha_3 U + e_m$

and (2) $W/FW = \beta_0 + \beta_1 M + \beta_2 U + \beta_3 Y + e_w$

where,

M = the number sitting for the state licensing examination for the first time[2]

W = the wage of cosmetologists (personal care services costs) deflated by the consumer price index

FT = the foregone wage (federal minimum wage rate) deflated by the consumer price index

FW = duration of foregone earnings (number of hours required to complete training)

U = the unemployment rate for women 16 to 19 years of age in the U.S.

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[1] See Appendix 8 for some alternative specifications and estimating procedures.

[2] The preferred measure of demand for cosmetology training is the annual number of school entrants. For an explanation of the relation between M and the number of school entrants see Appendix 6.

TABLE 29

ZERO-ORDER CORRELATION MATRIX OF VARIABLES USED IN EQUATIONS OF DEMAND FOR COSMETOLOGY TRAINING

	M	W	FT	FW	U	Y	P	W/FW
W	.65							
FT	.21	.81						
FW	.72	.83	.69					
U	.84	.76	.38	.73				
Y	.57	.96	.89	.86	.68			
P	.56	.97	.89	.83	.69	.99		
W/FW	-.04	.38	.28	-.20	.12	.27	.31	
W/FT·FW	-.25	-.64	-.87	-.81	-.35	-.78	-.76	.22

M* = matriculants for cosmetology training

W = cosmetology wages

FT = foregone time in training

FW = foregone wage rate

U = unemployment rate

Y = personal income

P = population

*For a more complete definition of the variables see p. 111 and p. 113.

Y = per capita disposable personal income in the U.S. deflated by the consumer price index

P = the female population 16 years old or older in Illinois

e_m, e_w = error terms

and where α_1, α_3 and β_3, are expected to be > 0 and α_2, β_1 and β_2 are expected to be < 0.

The estimated coefficients of the various least squares regressions appear in Table 29A.[1] The results support the hypothesized relationships although we cannot be very confident about the estimates. Relative cosmetology wages are positively related to demand for training,[2] and the federal minimum wage is inversely related to demand.

The coefficients for both foregone time in training and the unemployment rate are positive although considerably stronger in the indirect least squares estimate than in the two-stage least squares. T-values computed for coefficients derived from the 2SLS technique, however, are reduced by correlation among independent variables, and furthermore, autocorrelation, which does not bias coefficient estimates but does inflate computed t-values, may be significant. The Durbin-Watson statistic indicates either that there is autocorrelation or that it is indeterminate depending upon whether the 1 percent or 5 percent level of significance is used.

In sum, while several of the determinants of demand for training have been identified and their impact estimated, data limitations seriously curtail the degree of confidence we have in the estimates.

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[1] The data matrix for the variables appears in Appendix 7.

[2] The negative coefficient for W/FW in the ordinary least squares estimate is not an appropriate estimate of the effect of the relative wage because of the bias arising from the interdependence of W/FW and the error term in the supply equation.

TABLE 29A

REGRESSIONS OF DEMAND FOR COSMETOLOGY TRAINING

	Ordinary Least Squares			
Variable	Estimated Coefficient	t-Statistic	Estimated Coefficient	t-Statistic
M	Dependent Variable		-.264E-2	-1.26
W/FW	-23.4	-1.02	dep. var	
FT	-.683	-0.67		
U	516	6.96	.947	0.69
Y			.096	
Constant	-23.8	-0.01	79.9	1.18
R^2	.73		.15	
Durbin-Watson statistic	1.35		.85	

TABLE 29A--Continued

2-Stage Least Squares			
Estimated Coefficient	t-Statistic	Estimated Coefficient	t-Statistic
dep.var		-.112E-2	-0.29
1300	0.17	dep.var	
-15.9	-0.18		
446	0.42	.203	0.09
		.096	1.17
-117,000	-0.18	84.1	5.06
--		.13	
.67		.75	

TABLE 29A--Continued

	Indirect Least Squares			
Variable	Estimated Coefficient	t-Statistic	Estimated Coefficient	t-Statistic
M	dep.var.			
W/FW			dep.var.	
FT	-6.46	-2.80	.727E-2	0.28
U	288	2.63	-.121	-0.10
Y	50.7	2.58	.039	0.18
Constant	-3120	-2.76	87.6	6.84
R^2	.79		.08	
Durbin-Watson statistic	.82		.70	

Supply Adjustment in the Cosmetology Training Industry

Supply adjustments in a market occur through (i) changes in number of firms (schools), and (ii) changes in size of firms. Given a competitive industry, the shape of the firms' cost curves and the size of the unit of production determine the means by which an adjustment will occur. If each school has a unique minimum point on its long run average cost curve, then a change in supply will generally occur through changes in the number of firms. If the typical unit of production is large relative to the total industry, the adjustment path will be "sawtoothed." Increased demand will lead to temporary excessive profits for existing firms while they expand output: only when aggregate demand has increased sufficiently to justify entry of another firm will equilibrium be restored. Moreover, if the long run cost curve of a firm had an extensive region over which average costs remained constant, supply adjustment would occur predominantly through adjustments in firm size. In actuality, markets generally show varying degrees of both forms of supply adjustments, but the facility of the number of schools to change with changes in demand is indicative of high divisibility in units of production which suggests low entry costs--characteristic of a competitive environment.

Our purpose in this section is to see how responsive the industry is, in terms of supply adjustments occurring through changes in the number of schools, to changes in demand for training.

Two avenues of approach are available, given data on the number of schools and their students. One is to examine the relationship between number of schools and number of students. Our expectation is that changes in the number of schools will be quite responsive to changes in demand. Entering and leaving the cosmetology school industry is accomplished easily and inexpensively: changing a shop to a school requires a small amount of additional training, and the major expenses, overhead costs, are the same. The speed with which schools leave the industry may not be as rapid as that with which schools enter because of auxiliary income accruing to schools from such things as cosmetic sales and regular patrons, services which may carry a school through a business slowdown.

The supply adjustment process, however, is not mechanistic or simultaneous. Supply decisions, decisions to open or close a school, are based on expected demand for a particular period, and expected demand is often derived from past demand. The longer the lead time necessary to open or close a firm, the greater influence earlier periods should have on supply decisions. Because lead time for cosmetology

schools is minimal, it is questionable whether demand in more than the present year and immediately past year exerts an influence on supply decisions. If this line of reasoning is correct we can expect changes in number of schools to parallel changes in demand.

A regression of the number of schools[1] on demand (i.e., the number of "graduates"[2]--those sitting for the state examination for the first time) shows that the number of schools is positively and significantly related to the level of demand,[3] but the validity of these results is weakened by the high degree of autocorrelation among residuals (Table 30). The estimate of the regression coefficient is unbiased, but the sample variance of the coefficient underestimates the true variance, the variance of residuals is understated, and the significance levels of t-statistics are no longer correct. (For a fuller explanation see Johnson, Econometric Methods, p. 246.) The cause of this autocorrelation may be that the observations after 1966 constitute a cluster located above the other observations.

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[1] Data are the number of proprietary cosmetology schools listed in the classified ads section of annual telephone directories for the Chicago area from 1950 to 1972.

[2] The number of graduates in 1967 and afterwards are adjusted upwards (by 66.8/56.7--the ratio of average completion rates before and after 1966) to account for the drop in completion rate caused by the lengthened course. In the demand analysis this adjustment was unnecessary because we were measuring demand as the number of people finishing the course, and the impact on demand of the longer course was included in foregone earnings. In this analysis we are concerned not so much with the number of graduates as with the volume of students in training. Although we do not know the actual volume, we assume that the number of graduates (adjusted for completion rates) bears a reasonably constant relation to the number of matriculations. Post-1966 figures are made consistent with pre-1966 figures by computing the number of graduates that would have graduated if the completion rate had been the same after 1966 as before.

[3] The estimate of the regression coefficient contains an upward bias. As the metropolitan area expands, a growing proportion of the schools in the Chicago SMSA probably list themselves in the Chicago telephone directory. Comparing the number of schools in Tables 31 and 36, one sees that, in 1963, 48 of 63 schools were listed; in 1972, 65 of 77.

TABLE 30

REGRESSION OF NUMBER OF SCHOOLS ON DEMAND (NUMBER OF GRADUATES), 1950 THROUGH 1972

Variable	Standardized Regression Coefficient	R^2
Demand	.479 (2.50)[a]	.229

Durbin-Watson statistic = 0.444
a = t-statistic

School owners and potential owners after 1966 perhaps were responding to something different from what they were responding to before 1966. If school owners set current decisions based only on past and current demand there is no reason for the jump in the number of schools from 1966 to 1967--the number of matriculants was approximately the same. But if the increase in course length, which occurred in 1966, carried particular significance, they may have been anticipating a change in demand. The number of schools (see Table 31) increased steadily throughout the fifties and sixties following a downturn in the early fifties, but in 1967, the year after the lengthened program became effective, a net of nine additional schools were operating, but the level of matriculants declined. Possibly the school owners misjudged the implications of the course change. The steady growth of demand in the 1960's capped by a beefed-up program may have spelled further expansion of the industry to many cosmetology school owners. Subsequent years indicate that this assessment was wrong. From the high in 1967, the number of schools has dropped (see Table 31), a readjustment for possibly underestimating the importance of the increased cost of foregone earnings to the student.[1]

[1] If this explanation is correct we wonder why the misinterpretation of lengthening the course appears to be restricted to Chicago. Table 31 shows that the 1966-1967 net increase in the number of schools in the Chicago area was 9, but the net increase in Illinois was only 6 (152 to 158). Therefore there was a net decrease of three schools outside the Chicago area between 1966 and 1967. Possibly demand grew more in the Chicago area than in the rest of Illinois. However, when demand is disaggregated into Chicago and non-Chicago areas, the number of matriculants in the Chicago SMSA

TABLE 31

BEAUTY CULTURE SCHOOLS AND MATRICULANTS

Year	No. of schools in Chicago telephone directory	Demand (no. sitting for state exam)[a]	No. of schools in Illinois	Matriculants in Illinois
1950	30	1561		
1951	23	1054		
1952	24	1025		
1953	22	1040		
1954	23	1236		
1955	28	1810		
1956	30	1906		
1957	32	2061		
1958	34	2405		
1959	36	3363		
1960	36	4159		
1961	41	5554		
1962	45	5623		
1963	48	5448	120	8043
1964	49	5243	131	8398
1965	55	5431	143	9429
1966	60	6687	152	7556
1967	69	5047	158	7436
1968	68	4840	159	8102
1969	67	5092	164	7666
1970	66	5340	159	7032
1971	67	5078	160	7307
1972	65	4709	156	7273

[a]Figures for 1967-1972 are adjusted for the average completion rate attained in years prior to 1967.

Lengthening the course may have raised the prevailing ratio of the number of schools to the number of students. To test for this possible shift, we enter a dummy variable with value "0" for the years up to 1966 and "1" afterwards. If the relation between the number of schools and demand is the same among the years before 1967 as it is after 1966, then the estimated regression coefficient for demand derived from the entire time series and using the dummy variable should be lower than the coefficient obtained without the inclusion of the dummy variable, and the autocorrelation should be lessened.

TABLE 32

REGRESSION OF NUMBER OF SCHOOLS ON DEMAND AND A DUMMY VARIABLE, 1950 THROUGH 1972

Variable	Standardized Regression Coefficient	R^2
demand	.162 (1.15)[a]	.678
dummy variable	.741 (5.27)	

Durbin-Watson statistic = 0.632
a = t-statistic in parentheses

drops from 5200 in 1966 to 4995 in 1967; for the rest of the state there is a slight rise, from 2356 to 2441.

One other explanation might be that the nature of a school's location affects the facility of identifying a school's potential market area. In smaller towns it may be easier to assess how many schools the town is able to support, and consequently there is less chance of misinterpreting the effect that an event will have on demand for training. In a large metropolitan area, where it may be more difficult to identify a potential market area, there may be more latitude in judging the consequences of an event, and thus also more chance for error.

We might expect increased direct costs (tuition) to accompany the longer course, but school owners generally say that the longer course did not effect their tuition. If this is so, it suggests that over this range the marginal cost to the school of time spent on each student is zero.

Table 32 shows that both of these conditions are met; however, the Durbin-Watson statistic still indicates autocorrelation although not as severe as without the supply shifter. Acknowledging the serial correlation, it would be more appropriate to examine first differences, which also provide a finer measure of the adjustment process by explaining changes in number of schools in terms of changes in demand.

Table 33 shows that changes in the number of schools explain less of the variation of changes in demand than did the number of schools explain variation in demand. The inclusion of a dummy variable for observations after 1966 makes virtually no difference in the sign of the coefficient.

TABLE 33

REGRESSION OF THE CHANGE IN NUMBER OF SCHOOLS ON THE CHANGE IN DEMAND, 1950-1972

Equation	Variables		R^2	Durbin-Watson Statistic
	Change in Demand	Dummy Variable		
(1)	.468 (2.37)[a]		.219	1.10
(2)	.464 (2.31)	-.129 (-0.64)	.235	1.11

a = t-statistic

If we omit the observations from 1967 to 1972 as representing deviant behavior from the normal process of extrapolating expected demand from past demand, we find that the multiple correlation coefficient increases and the autocorrelation decreases compared to the results given by the similar regression for the entire series and is only slightly below the values obtained when using a dummy variable. However, when we use the changes in the number of schools and changes in demand the results are much better than the results for the full series, with or without the dummy variable. The full series with or without the dummy variable explains practically none of the variation in change in the number of schools. The shortened series used in Table 35 shows that changes in demand do have a positive and significant (s=.025) effect on changes in the number of cosmetology schools, and Durbin-Watson statistic indicates that we cannot reject the hypothesis of zero autocorrelation at the 1 percent level. In sum, it seems that

barring any extraordinary change in the marketplace, supply adjustment occurring through changes in number of schools is sensitive to changes in demand.

TABLE 34

REGRESSION OF NUMBER OF SCHOOLS ON DEMAND, 1950-1966

Variable	Standardized Regression Coefficient	R^2
Demand	.950 (11.77)[a]	.90

Durbin-Watson statistic = 0.605
a = t-statistic

TABLE 35

REGRESSION OF THE CHANGE IN NUMBER OF SCHOOLS ON THE CHANGE IN DEMAND, 1950 THROUGH 1966

Variable	Standardized Regression Coefficient	R^2
change in demand	.546 (2.44)[a]	.30

Durbin-Watson statistic = 1.23
a = t-statistic in parentheses

The other approach available for evaluating the nature of supply adjustment is to examine the changes in average size of schools. Maintaining the same assumptions mentioned on p. 117, the distribution of schools by enrollment size should remain relatively stable from year to year. If, however, entry costs are high, an increase in supply more likely will occur through changes in firm size (than through the creation of new schools). This shift in the distribution of schools by size will be observed in enrollment mean values for the schools.

Table 36 indicates that from 1963 to 1972, the years for which there is enrollment data by school, the trend was toward a smaller school. Average enrollment per school declined nearly 50 percent while overall demand declined only slightly (see Table 31) and the number of schools increased by approximately 25 percent. According to the proposition regarding the supply adjustment mechanism, the observed slight decline in total demand (equated to total supply at an equilibrium point) should be met by a decline in the number of schools and a relatively stable mean size.

TABLE 36

SIZE OF COSMETOLOGY SCHOOLS IN CHICAGO SMSA, 1963-1972

Year	Mean	Standard Deviation	Number
1963	83.4	93.1	63
1964	74.8	70.4	73
1965	76.4	65.6	78
1966	57.2	50.4	86
1967	56.2	43.1	86
1968	61.8	48.8	85
1969	54.0	40.9	84
1970	44.7	31.7	84
1971	45.5	33.0	85
1972	47.6	34.9	77

Because determination of how well the cosmetology sector's adjustment occurred in this manner is relative, comparison with other schools is necessary. Although we do not have data on another sector of schools, information presented in one of the micro-studies of a school within a high entry cost industry shows that the volatility in enrollment size is several times that found among the cosmetology schools. Thus the degree to which supply adjustments occur through changes in school size may not be as extreme as the results in Table 36 might suggest.

Proprietary and Non-Proprietary Cosmetology Training

Ninety percent or more of training in cosmetology occurs in proprietary schools; the balance is given in community colleges and public vocational high schools. There is also a private non-profit school, and three state or regional schools (for instance, the Illinois School for the

Deaf and others for wards of the state). Even though the analysis of demand and supply adjustment included data for graduates of all schools, the non-proprietary group of schools is small enough not to seriously affect the results of an industry-wide analysis; however, there are a few instances where the relationship that evolves between a community college and private cosmetology schools seems to depend upon policy established locally.

High schools, although they have the larger portion of public school cosmetology enrollment, do not occupy the potentially competitive position that community colleges do. Some high schools offering cosmetology training provide only a certain portion of the training; the balance is obtained elsewhere. Furthermore, community colleges and proprietary schools are not allowed to recruit students out of high school.

The number of community colleges offering cosmetology training and enrollments in those schools appear to have peaked in 1970 and 1971 (see Table 37). The decline or leveling off of cosmetology training in the community colleges may be in part due to evolving coordination that is arising in some communities between public and private educational institutions, but other communities offer a sharp contrast. Two examples illustrate the disparity that can exist between local public policy in two communities.

In the Moline-Rock Island area, an agreement has been reached whereby the high school or community college with students desiring cosmetology training contracts to private beauty culture schools for their training. This arrangement began in 1971 when the Area Vocational Center at the United Township High School of East Moline contracted with Cele Whan Academy of Beauty to give 60 students 500 hours of instruction. The program was continued in 1972, and was joined by Blackhawk Community College. Students have several options under the joint program; for instance, a student may take the first 500 hours of training while in high school, the other 1000 hours while in college. Beginning in September 1973 the contract was extended to include three additional private schools.

Based upon 1972-1973 results at Cele Whan, a larger than average percentage of students complete training and pass the state licensing examination. Moreover, the cost to the community college student is less than the tuition at a private school and private tuition is less than the total cost of a program in a community college. A student pays $450 of the $665 tuition charged by Cele Whan. Blackhawk

TABLE 37

NUMBER OF MATRICULANTS IN ILLINOIS COMMUNITY COLLEGES, PUBLIC HIGH SCHOOLS, AND PROPRIETARY SCHOOLS, 1963-1972
(Beauty Culture Matriculants)

Year	Community Colleges	High[a] Schools	Proprietary Schools	Total
1963	92(2)[b]	261(7)	7690(120)	8043
1964	103(2)	346(9)	7949(131)	8398
1965	166(3)	284(8)	8979(143)	9429
1966	130(4)	266(7)	7160(152)	7556
1967	123(4)	232(8)	7081(158)	7436
1968	109(4)	291(9)	7702(159)	8102
1969	105(3)	290(9)	7271(164)	7666
1970	155(4)	319(9)	6558(159)	7032
1971	146(5)	363(9)	6798(160)	7307
1972	139(5)	345(9)	6789(156)	7273
1973	97(4)	403(11)	6441(160)	6941

[a]The private non-profit school and the three state or regional schools are included in the high school tally.

[b]The number in parentheses is the number of schools giving cosmetology training.

pays the balance.[1] By contrast, the cost for a public school to provide such training may be $1200 a year in teachers' salaries alone.[2]

An entirely different situation exists in Centralia, a town of less than 20,000 people with three beauty culture programs, two in proprietary cosmetology schools and one in the community college. In this case the community college and the proprietary schools may duplicate services.

The private schools had been in business for several years before Kaskaskia, the community college, began offering its own cosmetology program in 1970-71. During 1970, 1971, and 1972 total enrollment in those private cosmetology schools remained stable, declining only in 1973.[3] Whether the per school enrollment would have increased prior to 1973 if Kaskaskia had not initiated its own program is not certain. The community college may draw more heavily from distant areas than do the private schools, which would allow the community college to cater to a population generally outside the market area of the private schools. Also, school preferences may vary by age. A reason given for the greater attraction of the community college among young people is that students prefer the social setting of a public school with its auxiliary services, but many older women prefer private schools.

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[1] Conversation with Miss Cele Whan on 12 September 1973.

[2] Chicago Daily News, "Private Help Urged for Beauty Students," by Thomas E. Sellers, April 13-14, 1974. Another estimate indicates that the cost may be at least $1100. Average first year costs per student for the least expensive curriculum (generally business or business related which have large enrollments and low capital overhead) in six unidentified Illinois community colleges averaged over $875. Considering that vocational courses are generally 20 to 100 percent more expensive than liberal arts programs or general business, an estimate of $1100 is a conservative estimate. Source: An Exploratory Analysis of Differential Program Costs of Selected Occupational Curricula in Selected Illinois Junior Colleges by Robert M. Tomlinson and Chester S. Rzonca. State of Illinois, Board of Vocational Education and Rehabilitation, Division of Vocational and Technical Education, Research and Development Unit. January 1971.

[3] Curtailment of support by government agencies (such as welfare programs, Manpower Training, and Vocational Rehabilitation) for training in cosmetology schools may be partially responsible for the static or declining enrollments.

Training students in a relatively short period of time and finding employment for graduates are, in many cases, two of the apparent advantages a proprietary school can offer its students. Kaskaskia, however, can train a student about as quickly as a proprietary school (a year versus nine months),[1] and apparently has no trouble placing its students. With these advantages equalized the proprietary schools are placed under particularly severe pressure by the subsidized public programs.

The eventual outcome between the role of public and private cosmetology schools in providing training is not certain. If the community colleges offer very similar training in terms of occupationally skilled graduates, training schedules, and learning environment, most likely the private schools will be forced to close. If however, more community colleges realize that private schools can do the same job less expensively and decide to contract with the private schools or drop their programs entirely (as Triton Junior College did in 1973), the cosmetology proprietary schools will probably survive.

SECTION III: Cross-Sectional Analysis

Variations within the Cosmetology School Industry

Having examined some of the factors in the last section that affect the proprietary cosmetology school industry, we will look in this section within the industry and try to explain the wide variation, especially in price, that exists among Chicago area cosmetology schools at a point in time.

By definition a competitive market requires a homogeneous product, a product so similar that buyers are indifferent as to the firm from which they make their purchases. A natural consequence of this condition, assuming that other requirements of a competitive market are met, is a single price. Given a homogeneous product, a seller can raise or lower his price and still remain in business without becoming philanthropic only if one of the other assumptions--perfect knowledge among buyers and sellers as to costs and prices,

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[1] The experience at Kaskaskia has been that given the option of going beyond the first year of training (which terminates with a certificate and qualifies the student to sit for the state examination) for a second year to receive an associate degree, none of the students do. They attend primarily to become qualified to sit for the examination.

free mobility of resources into and out of the market, and sufficiency of sellers and buyers (so that singly no one affects the price)--does not hold.

In the cosmetology school industry we observe a wide range in price, quality and size; nevertheless we contend that the market is competitive. Our rationale is that the cosmetology school industry is composed of numerous sub-markets offering different products, products differentiated by quality and established in response to differences in individuals' incomes and preferences for training. One can look at the cosmetology school industry as a network of intermixed competitive markets offering products that differ from one another through differences in quality. Within each sub-market, the product sells at one price and all schools operate at optimal size given their product quality. Comparing across sub-markets we expect high quality products to cost more than low quality products, and thus, we expect tuition (price) and quality to be positively related.

Complicating the relation may be interaction between school size and quality. Quality affects costs and cost curves influence optimal size. Also, high quality products plausibly require more overhead, more elaborate equipment and more specialized instruction, than is easily borne by small schools.[1] Thus quality and size may be positively related, particularly at the smaller end of the size continuum. At the other end of the size spectrum we may find a reversal of the relationship. Large schools may not experience further increases in economies of scale; management problems may develop and instructor time per student may fall, resulting in a deterioration of quality. The net balance of these two effects is uncertain.

Finally, there may be a relationship between tuition and size. If size is positively related to quality, and quality to tuition, one expects a positive relation between size and tuition, but economies of scale may reduce the per unit output cost, allowing price to drop. Because we do not know to what extent economies of scale exist and therefore the price level associated with the optimal size, we

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[1] Specifying relationships between educational quality and the factors inducing quality is an uncertain business (particularly in light of recent research that portrays conventional wisdom in this area as less certain than formerly thought). Human input, of teachers and students, undoubtedly is important, and with no information on either teacher or student abilities, we may be deleting variables as important as any of those that are included.

have no a priori basis for predicting the relation between tuition and size.

If these stated conditions exist within the cosmetology school industry in the Chicago SMSA, we expect tuition to have a positive relation to quality, and quality to have a positive relation with size for lower values of size and possibly a negative relation for larger values. However, if any of the assumptions of pure competition are violated, relationships between variables may change. For example, if market constraints hinder entry of new schools or if information about schooling options is lacking, prices may rise without an accompanying increase in quality, and size may vary inversely with tuition. Because imperfections in the market place are likely, we need to be aware of that possibility when analyzing the data. Before viewing relationships among variables, we first examine the characteristics of individual variables.

Size of Schools

Information on the size of schools was obtained from the records of the Beauty Culture Section of the Illinois Department of Registration and Education, and the figures refer to the number of matriculants in beauty culture schools for 1973.[1]

Table 38 shows the distribution of the 81 proprietary cosmetology schools in the Chicago SMSA by size, as of June 1973. The strong right hand skew of the distribution is made apparent by the mean size of 47.6, with 50 percent of the schools on average having no more than 37.6 matriculants. Also interesting is the rather large variance of the distribution, with the standard deviation equal to four-fifths of the mean.

Tuition of Schools

Two problems of measurement occur in determining dollar cost to the student. First, a school's stated tuition may or may not include required and/or optional items for the course such as books, a manikin set, and instruments of the trade. Second, tuition levels may change from the date for which the tuition is requested to the date the information is recorded and also because of the common practice among schools of offering "specials," temporarily reduced rates lasting from one month to many months.

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[1] Hereafter, "size" refers to the number of matriculants in a school.

TABLE 38

FREQUENCY DISTRIBUTION OF COSMETOLOGY SCHOOLS BY SIZE

Enrollment Size	Number of Schools	Percentage	Cumulative Percentage
0- 9	4	4.9	4.9
10-19	16	19.8	24.7
20-29	11	13.6	38.3
30-39	16	19.8	58.0
40-49	7	8.6	66.7
50-59	6	7.4	74.1
60-69	6	7.4	81.5
70-79	3	3.7	85.2
80-89	2	2.5	87.7
90-99	2	2.5	90.1
100-109	0	0	90.1
110-119	3	3.7	93.8
120-129	1	1.2	95.1
130-139	0	0	95.1
140-149	2	2.5	97.5
150-159	0	0	97.5
160-169	0	0	97.5
170-179	2	2.5	100.0
Total	81	100.0	100.0

mode = 19.0 mean = 47.6
median= 37.6 s.d. = 38.3

Through a short qu tionnaire mailed to the schools, information was obtained on current tuition, additional student expenses, the length of time the current tuition has been in effect, and the tuition level before that time. Schools that did not reply were reached by telephone and information was acquired over the phone or by mailing another questionnaire. Seventy-six of the 81 schools volunteered the information; three schools (outside the city limits) refused to participate; one school, open in June 1973, was closed in November when the questionnaire was sent out; and one school owner did not reply and could not be reached. Tuition for each school was computed by calculating the tuition that was in effect as of June 1973 and adding to that figure any additional student expenses that were reported. Because school owners may include different items in computing additional expenses, errors of measurement may have

occurred in some individual instances, but in aggregated form the data should exhibit no bias.

Another equally unavoidable source of measurement error is error that may occur by associating size with reported tuition. A disproportionate number of students may have matriculated at a time when a "special" tuition or tuition different from the reported tuition was in effect. Again, while this procedure might be unsatisfactory for an individual school, the distortion is likely to be negligible for grouped data.

The distribution of schools by tuition (Table 39) could also be considered skewed to the right even though the median lies slightly to the right of the mean. The school with the smallest tuition lies within 2 standard deviations of the mean, but schools with large tuitions lie 3 and nearly 4 standard deviations from the mean.

Quality of Product

Vocational proprietary schools sell opportunities, under varying conditions, for an individual to acquire a skill. Nevertheless, the generally recognized product is the skilled graduate. Thus the school, perhaps erroneously, is evaluated in terms of its inputs and the unknown inputs of its students. A more accurate approach to estimating the quality of the school itself would be a "value-added" approach whereby students' skills and abilities are measured immediately before and after training with the differences attributed to school quality. Unfortunately no data on cosmetology students' abilities or prior education is available. The measures of school "quality" used in this section do represent a combination of school and student inputs; however, part of the analysis involves comparisons among groups of schools that serve different types of communities. To the extent that social and economic factors of a community are likely to affect school retention and performance of a person from that community, stratification of economically and educationally disadvantaged communities provides a control for variation in student input.

Three measures of "quality" are available. One (Q1) is the completion rate, defined empirically as the ratio of the number of graduates in 1973 sitting for the state licensing examination for the first time to the matriculants in 1972 expressed as a percentage.[1] Validity of this measurement

[1] The number of girls graduating from cosmetology schools is not known, but because passing the state licensing examination is a prerequisite to practicing and because the examination is given every month, it is reasonable to expect the number sitting for the examination for the first time in a given year to nearly perfectly reflect the number of graduates within the same year.

TABLE 39

FREQUENCY DISTRIBUTION OF COSMETOLOGY SCHOOLS BY TUITION

Tuition ($)	Number of Schools	Percentage	Cumulative Percentage
150-199	1	1.3	1.3
200-249	3	3.9	5.3
250-299	6	7.9	13.2
300-349	2	2.6	15.8
350-399	5	6.6	22.4
400-449	5	6.6	28.9
450-499	10	13.2	42.1
500-549	5	6.6	48.7
550-599	12	15.8	64.5
600-649	12	15.8	80.3
650-699	7	9.2	89.5
700-750	1	1.3	90.8
750-799	1	1.3	92.1
800-849	1	1.3	93.4
850-899	1	1.3	94.7
900-949	0	0	94.7
950-999	0	0	94.7
1000-1049	2	2.6	97.4
1050-1099	0	0	97.4
1100-1149	1	1.3	98.7
1150-1199	0	0	98.7
1200-1249	0	0	98.7
1250-1299	0	0	98.7
1300-1349	1	1.3	100.0
Total	76	100.0	100.0
mode = 490 median= 550		mean = 539 s.d. = 199	

rests upon the assumption that the average duration of training is a year. The minimum time is nine months for those attending full time, and although some girls attending part time take two or even three years to finish, school managers and owners estimate that the average time is about one year. It should be noted that completion implies something different in the case of the beauty culture schools than in the case of academic institutions. In the latter, a high drop-out rate may signify the operation of an academically selective process. In the former case, because academic standards are seldom the

cause of a student's leaving school, a low rate of completion may suggest a failure on the part of the school to offer an interesting and worthwhile program or the need of students to quit for financial or personal reasons. Only in an economically depressed area might one expect the number of students dropping out for reasons of economic hardship to affect the completion rate.

A second measure of quality (Q2) is the ratio of the number of persons who pass the examination on the first attempt to the number sitting for the examination for the first time, expressed as a percent. While this variable indicates how well a school trains its students (and the innate ability of students), it is influenced by the completion rate. If the number of completions in a year is zero (assuming the number of matriculants was not zero the year before), Q1 is zero, but Q2 is indeterminate.

The third quality index (Q3), which combines Q1 and Q2, is the ratio of the number passing the examination in 1973 to the number matriculating the previous year, in percentage points. Although Q3 is the most appropriate overall measure of quality, Q1 and Q2 measure more accurately than Q3 the two separate components of quality.

Tables 40 and 41 show the frequency distributions of Q1 and Q2. Q1 is distributed symmetrically about its mean of 50.9, and Q2 is strongly skewed to the left. Most of the larger values are within 1 standard deviation of the mean while smaller values extend to nearly 4 standard deviations from the mean. Q3, a combination of Q1 and Q2, has a distribution intermediate to that of Q1 and Q2. The main characteristics of the three distributions are compared in Table 42.

Relations Among Variables

The zero-order correlation matrix (Table 43), as a first step in examining relationships among variables, yields some unanticipated results:

1) a significant positive correlation between size and tuition
2) a non-significant correlation between tuition and quality
3) a non-significant, but consistently negative, correlation between size and quality.

The strongest correlation exists between tuition and size; yet that relationship, as hypothesized, is derived from relations between size and quality and quality and tuition. Optimal size depends on the cost curve which, in turn depends on the quality of product chosen for production. Tuition

TABLE 40

FREQUENCY DISTRIBUTION OF PERCENTAGE COMPLETING COSMETOLOGY TRAINING (Q1)

% Completing Training	Number of Schools	Percentage	Cumulative Percentage
0 - 4.9	3	3.8	3.8
5.0- 9.9	2	2.6	6.4
10.0-14.9	0	0	6.4
15.0-19.9	1	1.3	7.7
20.0-24.9	1	1.3	9.0
25.0-29.9	2	2.6	11.5
30.0-34.9	8	10.3	21.8
35.0-39.9	5	6.4	28.2
40.0-49.9	9	11.5	39.7
45.0-49.9	8	10.3	50.0
50.0-54.9	8	10.3	60.3
55.0-59.9	6	7.7	67.9
60.0-64.9	9	11.5	79.5
65.0-69.9	3	3.8	83.3
70.0-74.9	6	7.7	91.0
75.0-79.9	2	2.6	93.6
80.0-84.9	2	2.6	96.2
85.0-89.9	1	1.3	97.4
90.0-94.9	1	1.3	98.7
95.0-99.9	0	0	98.7
100	1	1.3	100.0
Total	78	100.0	100.0

mode = 47 mean = 49.6
median = 49.5 s.d. = 20.4

TABLE 41

FREQUENCY DISTRIBUTION OF PERCENTAGE PASSING THE LICENSING EXAMINATION (Q2)

Percent Passing	Number of Schools	Percentage	Cumulative Percentage
30.0-34.9	1	1.3	1.3
35.0-39.9	0	0	1.3
40.0-44.9	1	1.3	2.7
45.0-49.9	0	0	2.7
50.0-54.9	3	4.0	6.7
55.0-59.9	0	0	6.7
60.0-64.9	1	1.3	8.0
65.0-69.9	3	4.0	12.0
70.0-74.9	2	2.7	14.7
75.0-79.9	7	9.3	24.0
80.0-84.9	11	14.7	38.7
85.0-89.9	14	18.7	57.3
90.0-94.9	12	16.0	73.3
95.0-99.9	12	16.0	89.3
100	8	10.7	100.0
Total	75	100.0	

mode = 100 mean = 84.6
median = 87.9 s.d. = 14.0

TABLE 42

COMPARISON OF MEASURES OF QUALITY

	Q1	Q2	Q3
Mode	47	100	37
Median	49.5	87.9	43.5
Mean	49.6	84.6	42.9
Standard Deviation	20.4	14.0	19.2
Observed Range	0-100	30-100*	0-91
Potential Range	0-100	0-100	0-100

*Q2 is indeterminate whenever Q1 is zero; therefore Q2 is computed for only those observations with Q1 not equal to zero.

TABLE 43

SIMPLE CORRELATION COEFFICIENTS (N= 81)

	Tuition	Size	Q1	Q2
Size	0.301[a] .004			
Q1	0.021 .432	-0.002 .492		
Q2	-0.093 .221	-0.035 .382	0.427 .001	
Q3	0.006 .480	-0.013 .456	0.964 .001	0.626 .001

[a]In all correlation matrices the top value is the correlation coefficient and the bottom value is the significance level for a one-tail test.

depends on quality and economies of scale associated with the optimal size of school for a product of a specified quality. It is unlikely to find tuition and size related without also finding strong correlations among other pairs of variables. Because we know that size, tuition, and Q2 have skewed distributions, extreme individual observations may be disproportionately affecting correlations.

From the frequency distributions one finds that three of the four largest schools are also among the four most expensive schools and that one of these three has the worst quality of all schools.[1] If we delete this single observation, several of the coefficients are drastically changed. Comparing the correlations in Table 44 with the findings in Table 43, the following differences are noteworthy:

[1]To avoid the possibility of identifying specific schools through association with individual school data, comparison of the four schools is omitted.

TABLE 44

SIMPLE CORRELATION COEFFICIENTS (N = 80)

	Tuition	Size	Q1	Q2
Size	0.223 .028			
Q1	0.090 .226	0.099 .195		
Q2	0.035 .388	0.170 .074	0.349 .001	
Q3	0.076 .263	0.090 .281	0.962 .001	0.582 .001

1) a reduction in the correlation of tuition and size, although the correlation still remains significant at the .05 level.

2) a slight shift toward a more positive correlation of all three quality variables with tuition, although the correlation remains insignificant.

3) a complete reversal of the sign of correlation between quality and size; Q2 even becomes significant at the 0.1 level.

The positive signs of the correlations between tuition and quality are in the direction that we expect, although the coefficients are not significant. Correlation between size and quality supports the proposition that small schools may not have the capability for offering a high quality product. In aggregate the data indicate that as product quality increases the cost curve moves up and to the right, i.e., tuition rises and optimal size expands, but one might expect more significant coefficients. Possibly non-linear joint distributions exist among variables.

As a means of exploring this possibility, we divide tuition, quality, and size into higher, middle, and lower thirds and compute mean values of the other variables fc

each third.[1] The most prominent contrasts (in Table 45) are the relations between size and tuition and quality and tuition. The "U"-or slightly "J"-shape of the joint distribution between size and tuition indicates that small, and large schools particularly, charge more tuition than medium sized schools, although schools divided by level of tuition show moderately increasing size with rising tuition, i.e., while small and large schools definitely charge more than other schools, many low and high tuition schools are not small and large, respectively.

The interesting relation between quality and tuition is the inverted "U"-shape between Q2 and tuition. Schools that do an average job of preparing their students to pass the examination charge nearly $100 more, on the average, than either the best or worst schools.

No plausible a priori reason exists for medium quality schools charging significantly more than other schools or for definitely lower and higher quality schools charging less. We began with the proposition that the cosmetology training industry is not a homogeneous group of schools but the intermixing of several markets offering different products on the basis of quality differentiation; however, our data suggest that other factors may be differentiating the industry. One of the most likely factors that could differentiate an industry such as cosmetology training in an urban area is the natural constraints that occur through community differences within a city.

Cosmetology schools, unlike other vocational proprietary schools, predominantly serve the community within which they are located. This community relationship is made apparent by comparing the geographical distribution of cosmetology schools with the distribution of other types of vocational proprietary schools. Of the 81 cosmetology schools in the Chicago SMSA, only three are located in the hub of the city where transportation systems converge, but for all other types of vocational proprietary schools in the Chicago area a majority is located near the center of the city. Nearly 40 percent of cosmetology schools are in suburbs, but only a handful of other vocational schools are <u>not</u> within the city limits. Consequently, cosmetology schools within a

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[1] The advantage of this type of comparison, although difficult to interpret, is that it requires recoding only one variable at a time, thus losing less of the original information.

TABLE 45

PARTIAL CROSSTABULATIONS OF TUITION, SIZE, AND QUALITY (N = 80)

	(Passing) Q1			(Completion) Q2			Q3		
	L (29)	M (50)	H (71)	L (72)	M (88)	H (97)	L (22)	M (43)	H (62)
Tuition	515	512	571	491	604	514	534	502	562
Size	45.3	47.4	47.0	41.5	48.0	49.8	44.0	51.9	44.1

	Size				Tuition		
	L (16)	M (37)	H (87)		L (338)	M (535)	H (718)
Tuition	545	476	583	Size	42.4	47.8	49.1
Q1	45.1	51.4	53.5	Q1	49.5	46.0	53.8
Q2	85.0	83.4	87.7	Q2	83.2	86.0	86.7
Q3	39.4	44.1	46.4	Q3	41.8	40.3	47.1

community are far more subject to any constraints that may arise within, or next to, that community than are other types of proprietary schools.

To the end of identifying the importance of community differences in creating sub-markets and different behavior among cosmetology schools, the two largest minority groups in Chicago, the Spanish-speaking community and the black community, are analyzed separately and in comparison with each other and the majority group of schools. The next section is a short description of the demographic characteristics of these two groups that will provide a framework for our subsequent analysis.

The Black Minority

According to the 1970 Census there were 1.2 million blacks in the Chicago SMSA, 96.1 percent of whom lived in Cook County, and of those living in Cook County 93.2 percent lived within the city limits of Chicago, so that nearly 90 percent of the blacks lived in a relatively small part of the SMSA (for non-blacks the comparable percentage is about 39 percent).

Because our interest is in locating heavy concentrations of blacks, we designated all census tracts that had a majority of black residents, 2000 or more (based on average population per tract), as black. The black tracts form two regions. The largest black area spreads southward in an inverted "V" shape from the center of Chicago, tapering down again near the southern suburbs. Constricting the group laterally is Lake Michigan to the east, Lake Calumet and the Calumet River to the southwest and a white ethnic group to the west. The second area is considerably smaller. It begins just west of the center of the city and runs westerly to the county line, which forms a boundary with Oak Park, a white suburb. The definiteness of the two areas is indicated by the fact that of 238 census tracts designated as black, only six do not have at least one common side with other black tracts.

The Spanish Minority[1]

Of the 327,168 Spanish-speaking people in the Chicago SMSA reported in the 1970 Census, 247,343 or 75.6 percent lived in Chicago, but they constituted only 7.3 percent of Chicago's total population. For this smaller minority the conventional level used in the Census, of 400 Spanish residents per tract, was used in designating Spanish tracts.

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[1] This group includes those who consider Spanish their mother tongue or those whose head of household speaks Spanish as his primary language.

Although the distribution is more dispersed than for black areas two strongly Spanish communities appear. The largest group lies to the northwest of the city center, just north of the second black community. A second Spanish area forms a band running east-west just south of the second black community. In addition to these areas, there is a large, less solidly defined Spanish area in a large area to the north of the city center peppered with Spanish tracts, a much smaller area to the southwest, and an even smaller group to the extreme southeast.

Using the same measure of cohesion as for the black community, we find that of 153 designated Spanish tracts, 13 do not have at least one common side with other Spanish tracts, but only two of the 13 are located in the areas north or south of the second black community; thus the two areas of Spanish concentration are quite solid.

Comparisons Among Black, Spanish, and Majority Area Schools

Ten cosmetology schools are located in or near the Spanish communities, and four of them offer, in varying degrees, instruction in Spanish as well as in English. Of the 16 schools in the two black areas, 13 are in the large southern section, and the rest are in the western section. Because the western section represents a special situation which we will discuss later, the present analysis is limited to the southern area and its schools. "Majority" schools, the balance of schools, are the total minus the 10 Spanish and 16 black area schools. Data on these three groups of schools are presented in Table 46. There are several important findings concerning the differences among these three groups of schools.

First, there are significant differences between average tuition: black area schools average $658, nearly $150 more than the average in majority schools, and Spanish area schools average $375, more than $130 less than the average in majority schools. Also, the small variance in Spanish area schools' tuition suggests a highly uniform group of schools. Second, most of the minority area schools are smaller than majority schools. The particularly large standard deviation for Spanish area schools is due to one very large school which raises the mean size of that group considerably above the median. And third, the quality of minority area schools is significantly lower than majority area schools. Overall, we see that Spanish area schools are quite homogeneous in quality and tuition while distribution of tuition and quality among black and majority area schools is more diffuse. Of more concern is the disparity between tuition and quality among the communities.

TABLE 46

COMPARISON OF BLACK, MAJORITY, AND SPANISH AREA SCHOOLS

	Black				Majority				Spanish		
	Mean	S.D.	N	t-stat.[a]	Mean	S.D.	N	t-stat.	Mean	S.D.	N
Tuition	658	172	13	2.75**	512	166	51	-4.46***	375	60.3	9
Size	27.5	30.2	13	-2.36**	49.5	30.6	55	-0.35	43.8	50.4	10
Q1	36.3	24.8	11	-2.27*	54.3	19.4	55	-2.94**	43.8	17.3	9
Q2	81.7	19.9	9	-0.77	86.9	10.6	54	-1.08	81.2	15.2	9
Q3	30.5	23.4	11	-2.28*	47.5	17.8	55	-2.51**	36.3	11.3	9

[a]The first column of t-values are based on comparisons between black and majority area schools; the second column of t-values compares Spanish area schools with majority area schools.

Level of Significance: * = .05
** = .01
*** = .001

Both minority communities have an equally significantly lower quality (which is not inconsistent with the expectations of the "quality" measures) than the majority group; however, black area schools charge significantly more tuition, and Spanish area schools significantly less, than majority schools.

Considering the generally low level of income among Spanish-speaking people in Chicago (see Table 47) it is understandable that schools in the Spanish community must keep tuition low to remain within reach of their potential students (although the consequences of so doing may be a product of reduced quality). This rationale, however, means that tuition in schools in black areas (where income is even lower than in Spanish areas) should be at least as low as in Spanish area schools. Yet, we observe an extremely high tuition level in the black area schools.[1]

TABLE 47

COMPARISON OF SPANISH-SPEAKING, BLACK, AND TOTAL POPULATION IN CHICAGO BY MEDIAN INCOME AND MEDIAN SCHOOL YEARS

	Median Income of Families & Unrelated Individuals	Median School Yrs. Completed
Chicago census tracts with 400 or more Spanish language persons:	$7,441	8.7
Chicago census tracts with 400 or more black persons:	$6,382	10.8
All persons in Chicago:	$7,983	11.2

Any attempt to explain differences in tuition must begin with a proper identification of what the quality variable actually measures. As stated earlier, because the school quality variables are actually derived from a combination of student and school inputs, the performance attributed

[1] A possibly important variable in explaining tuition levels, but one of yet unknown significance, is the role of government student aid programs. A school that is qualified to train students with government financial aid is essentially selling to a class of buyers with subsidies tied to the product.

to school inputs is generally indeterminate.[1] However, in this analysis we assume that student input is similar in both the Spanish and black area schools (to the extent that student input is related to the general socioeconomic level--in terms of education and income--of the community).[2] Thus any differences in output between these two groups is the result of school inputs. Fortunately, in the comparison of black and Spanish area schools, analysis of tuition differentials is made still easier by the uniformity of quality measurements--that is, measured outputs of the schools. Student inputs are similar and overall outputs are similar; this suggests that school inputs are similar. If so, differences in tuition must be due to differential costs of school inputs or attributed to market constraints or imperfections. Possibilities for substantial cost differentials between black area schools and Spanish area schools, however, are not convincing. Costs associated with location, such as rent and insurance, are probably similar. Delinquency and vandalism are probably as prevalent in the south side black community as in the west side Spanish area. Land values also are either similar, or, if different, probably higher in the Spanish areas which are closer to the city business and commercial districts than the black area. Another possible reason for differential costs might be the distaste among teachers to work in high crime areas or the result of racial discrimination on behalf of the teachers, but neither of these explanations seem plausible. Undoubtedly crime may be a deterent to employment; however, both of the communities in this analysis are high crime areas so that no substantial differential should exist between them. The most likely racial situation between teachers and students that might alter school costs would be the costs of attracting teachers of a different race or ethnic group from that of a school's students. But in talking with school owners and managers, it is apparent that most schools hire instructors who have cultural backgrounds similar to the students. In sum, it seems likely that the large, significant difference between tuition levels in the Spanish and black area schools is not dependent on quality considerations or school costs.

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[1] A fuller discussion of the quality measurements and the influence of student inputs upon these measures is given in Appendix 9 .

[2] This is a highly simplified approach. It proxies community characteristics for individual characteristics and ignores the influence of other traits, such as motivation, that constitute student input. Nevertheless it does delineate the generally accepted distinction of the disadvantaged black and Spanish (often Chicano) communities.

Further Analysis and Comparison Among Schools

To this point, the empirical results have not supported the hypothesized conditions expected to exist among schools. Part of this failure is probably due to the lack of better estimates for costs of school inputs and evaluation of student inputs. However, the single most impressive finding is the tuition difference between Spanish and black area schools. While there undoubtedly are some differences between cost structures and student inputs in Spanish and black area schools, we have given some evidence that those differences should be less than whatever differences exist between either the Spanish and black area schools and the majority group of schools. Furthermore, on the basis of these differences, tuition and measured quality should be more similar between Spanish and black area schools than between either Spanish or black area schools and the majority schools. The fact is that while quality is about the same in Spanish and black area schools the mean tuition in black area schools is $283 higher than the mean tuition in Spanish area schools (a highly significant difference--see Table 46).

At this point, partially to summarize and to clarify, all factors that might, singly or in combination with other factors, affect the tuition differential are listed--including some that have already been discussed. The list includes the following: (a) higher costs of production, (b) higher preference among residents of the black community for beauty culture training, (c) a confined sub-market whose members are deprived of an opportunity to share in the availability of options open to other students, (d) an agreement among schools to set prices, (e) distortion of free market pricing through government subsidies, (f) lack of information among students about schooling options, and (g) lack of information among potential school owners about the profitability of the industry. Some of these conditions can be ruled out immediately as highly improbable or contrary to evidence.

(a). The black community is a community with lower than average income and education, and in a socio-economically depressed area several factors could influence production costs. Land values and rent should be less than in either business and commercial areas or suburban areas where social milieu enhances land values, but other overhead items such as insurance and maintenance may be higher. Furthermore, it may require greater school input to attain the same level of quality and preparedness for a student from a depressed neighborhood than for a girl from another area. While these costs are quite real, they do not provide an adequate explanation. The Spanish area is in the same socio-economic situation as the black area, but those schools have very low tuitions.

(b). If a higher preference exists among residents of the black community for beauty culture training, the proper response would be for more schools to enter the community, not for existing schools to charge extraordinary tuition.

(c). If students in the black community are effectively barred from attending schools outside their own community because of social barriers between races, costs of transportation to reach other areas, or ignorance about opportunities existing elsewhere, cosmetology schools in the community would have a "captive" clientele, making it possible for them to earn excessive profits by charging higher tuition, but with 13 schools within this one area, competition among schools should be sufficient to keep price equated to minimum average cost. If profits do rise, entry of new schools should return the market to competitive equilibrium.

The four remaining possibilities involve violations of conditions assumed of a competitive market--the existence of imperfect knowledge and/or aberration from a uniform market pricing mechanism. Estimation of the importance of these factors, while speculative, deserves further attention. Two situations could exist, singly or jointly. One is that school owners, going on the assumption that they operate in a demographically isolated area and in one where ignorance of the industry prevails, agree to a high minimum tuition level. One school owner stated that a few years ago some of the owners in the black area schools did make an effort to agree upon a "fair" tuition floor, but that rising costs and "special" tuition offers have obscured the agreement. Nevertheless, the general effect of such an agreement could still persist.

The behavior of some school owners suggests that they consciously attempt to curtail the free flow of information about their school and their competitors. When telephoned by a woman (who stated her association with this research project), many school owners would not give information on tuition or additional fees. Their reply was that they could give our such information only upon a personal visit to the school. However, a man calling the same schools encountered no difficulty in obtaining the same information. One might infer from this behavior that school owners feel that giving out information over the phone allows the potential student to "shop" in an objective manner whereas if the person visits the school the owner may "bargain" or feel that subjective influences may sway the girl into enrolling.

Partial detachment from a free market pricing mechanism may arise from participation in government student financial aid programs. The net effect of these programs is to provide the student with a subsidy which, through

income and substitution effects, increases the amount of money that the person is willing to spend for schooling. A student receiving a subsidy, in the form of a loan or grant such as that available through the Federal Insured Student Loan or Basic Education Opportunity Grant program, is willing to spend more in aggregate (his money plus the government money) for training than he would if he had to pay the full amount himself. Therefore, schools eligible for and participating in such programs may find it advantageous to raise tuition if a sizeable fraction of their business comes from students participating in the government programs, or they may even create a two-tier pricing system, one price for government aid students and a lower tuition for non-support students.[1]

Another important consideration (and one that is related to production costs) is the less than free flow of resources, in this case the free movement of students, between communities offering cosmetology training. The black community represents a geographical and demographical island--isolated from the rest of the Chicago area. As described before, the blacks in the south are confined on the east and southeast sides by geographical constraints. To the west lies a Polish and German ethnic group that does not mix with blacks. The division is so sharp that for 28 continuous city blocks every census tract east of one of the north-south streets is classified as black, and not one on the west side of the street.[2]

The options for a black person to attend a school outside the community are (1) going a considerable distance further south to one of two schools located in the suburbs, (2) taking daily transportation to one of three schools in the downtown area to the north, or (3) crossing over into "hostile" territory to the west. Few are likely to go to the suburbs, and they are less likely to enter a strongly anti-black neighborhood. Some may go downtown, but even

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[1] "Bargaining" with students in setting tuition may also occur in some schools. If the practice is more prevalent in black area schools, it could explain the high tuition rates. School owners may state an unusually high tuition figure which allows them to bargain down with the student. Another possible explanation for the higher tuition rates in black area schools than elsewhere is that a school must raise its tuition to offset losses occurring through a high drop-out rate.

[2] The sharp distinction between regions is also manifested in tuition levels. One might expect black area schools located near the borders, where proximity to other non-black area schools exist, to have tuition levels lower than the general level prevailing within the black area, but in fact the tuitions of these peripheral schools are within a few dollars of the black area school mean.

if they use public transportation the cost of commuting from the south side to the city center would be over $200 for a nine-month period, not to mention the cost of commuting time. In terms of average cosmetology school tuition, this represents a 40 percent add-on cost to cash outlay. In a very real sense they form a "captive" market.

The situation in the smaller black community immediately west of the city center which we have ignored to this point adds additional support to our explanations of pricing behavior. Within this community there are three cosmetology schools. The average tuition, size, and overall quality of these schools are $970, 113.3, and 22.2, respectively. Tuition and size are significantly greater than average ($522 and 45.7 for all 78 other schools) and quality is significantly less (43.7 for all 78 other schools). In this community the situation is similar to that in the southern community but more severe because of the greater degree of isolation. As mentioned earlier, Spanish neighborhoods lie to the north and south of the black community. To the west is Oak Park, a heavily Scandinavian and Eastern European suburb. To the northwest lies a Polish community; to the southwest, Cicero, a strongly anti-black Italian, Czechslovakian, and Polish suburb. Isolation of this black community is exacerbated by the nearly total absence of mixing with adjoining ethnic groups. Of the 59 census tracts in the western region designated as black, only one is also designated as either Spanish or Polish.

To recapitulate, the precise reason for high tuition in the black communities is not definite. Although we do not have information on production costs and while differential costs could account for some of the tuition difference, it does not seem reasonable that production costs could vary widely enough to account for the large difference in tuition. A stronger reason is that there is a serious lack of information about business and schooling opportunities but again it is questionable whether this line of reasoning can fully explain the tuition difference. Another possible explanation is that the data on reported tuition rates do not accurately report actual tuition rates; however, we currently have no way to verify this possibility. Finally, it could be that black area students have inordinately high preferences for neighborhood schools, thus creating a limited monopoly for each school. However, it seems implausible that black area students have much stronger preferences for nearby schools than other students. While some of the tuition differential may be attributed to each of the possibilities just mentioned, it seems probable that the geographical and ethnographical isolation of the black communities (and the costs of leaving the areas) and a lack of information are central factors in explaining the tuition differences found among communities.

Majority Schools

To the extent that the Spanish and black communities represent low economic and educational conditions and that black area schools deviate from a competitive situation, exclusion of schools in these two groups from the analysis of the rest of the schools partially removes the possibility of misinterpreting Q1 as an environmental variable rather than as a measure of quality of cosmetology schools. Furthermore it removes a group of schools known to deviate from competitive conditions.

The remaining 56 schools should be operating in an open market, free from geographical and demographical constraints and serving a population that can reasonably afford to purchase the products. If more definite relationships can be established among tuition, quality, and size, these remaining schools should provide an opportunity for analysis previously denied.

The information in Table 46 indicates three things about the majority schools. They are larger, offer better quality, and are intermediate in price compared to the black and Spanish area schools. Correlations in Table 48 show that size and tuition is the only significant correlation (s = .007), and it remains positive as it was in Table 44. The relation between tuition and Q1 increases very slightly over the results reported in Table 44, and the size-quality relation is considerably weaker.

TABLE 48

SIMPLE CORRELATION COEFFICIENTS FOR MAJORITY SCHOOLS

	Tuition	Size	Q1	Q2
Size	0.340 (.007)			
Q1	0.147 (.152)	0.107 (.218)		
Q2	-0.043 (.384)	0.097 (.242)	0.325 (.008)	
Q3	0.106 (.230)	0.059 (.334)	0.962 (.001)	0.536 (.001)

When viewing the entire population of schools we came to suspect that the data contained extreme data points and possible non-linearities of relations among variables. To check for this possibility significance levels were computed for Chi-square goodness-of-fit values based on crosstabulations of pairs of variables recoded into quintiles. This procedure deflates the importance that extreme observations have in calculating correlation coefficients, and also will indicate strong patterns in joint distributions among variables whether linear or not.

Results of the Chi-square tests, given in Table 49, indicate three important facts. One is that the relation between size and tuition, significant throughout the correlation matrices, completely disappears. The chi-square yields a significance value of 0.67. A few extreme points of the skewed frequency distributions (Tables 38 and 39) have affected previous correlations. Second, the only reasonably high significant value occurs for size and Q2, a relation that showed no particular importance in the correlation matrices. The relationship between tuition and Q2, the only other relation that could be considered even slightly significant, is consistent with the correlation coefficient. And third, no other relationship is significant.

TABLE 49

SIGNIFICANCE LEVELS FOR CHI-SQUARE VALUES OF 5x5 CROSSTABULATION TABLES[a]

Tuition and Size	s = 0.67
Tuition and Q1	s = 0.79
Tuition and Q2	s = 0.12[b]
Tuition and Q3	s = 0.53
Size and Q1	s = 0.93
Size and Q2	s = 0.01[b]
Size and Q3	s = 0.78

[a]With 56 observations a five by five table, yielding an expected value of slightly more than two observations per cell, is the largest size feasible. See Walker and Lev, p. 107, for further explanation.

[b]The crosstabulation for this pair of variables is given in Appendix 10.

A visual inspection (Appendix 10) of even the two relationships with the most significant values does not evidence strong systematic patterns, however. The average expected cell count is two, and while several cells have no observations

there is no apparent order to the occurrences of these high and low cell counts.

Reverting to the raw data (Figures 11-1 and 11-2 in Appendix 11 for the same two relationships, we see that the observations appear to be distributed fairly randomly, with a few outliers in both tuition and quality. Perhaps the most we can extract from these figures is that Figure 11-2 tells us something about what kinds of schools do not exist. Small schools may be of any quality, and high quality schools may be any size, but large schools are not low quality schools (and as we know, this characteristic of majority schools does not apply to the other groups of schools).

Throughout this chapter many results varied from what was expected, given classical theory of competition and a specified individual decision model; however, several of the assumptions necessary for a competitive market were violated and in some cases tests of theoretical propositions were considerably weakened by lack of sufficient empirical data. Nevertheless, some unexpected results were found, the most interesting perhaps being the division of the cosmetology school industry into distinct ethnographic and geographic sub-markets and the resulting behavior of the schools stemming partially from that market structure. Moreover a lack of information may account for some of the unexpected relationship between tuition and quality, but, as already pointed out, school "quality" is not easily identified and isolated and a number of other factors which we have either not identified or measured, if included, might further explain some of the relationships.

CHAPTER VI

SUMMARY AND IMPLICATIONS

Private, profit-oriented vocational schools--the proprietary school industry--have provided a myriad of training opportunities to millions of people for centuries. Nevertheless, these schools have received little attention in the midst of a vast cumulation of data and publications on education especially over the last two decades. The research in this report was conducted in order to identify the nature and performance of this diverse, semi-visible part of the educational sector. Until more is known about the operations of proprietary schools we cannot prescribe what role they should have or what resulting modifications should be made in educational policies to improve the American educational system.

Characteristics of the Proprietary School Industry

Perhaps the most outstanding feature of the proprietary school industry is that it is a part of both the educational system and the business world. Proprietary schools are different from other types of educational institutions in that they are profit-motivated. They come into existence by responding to a specific demand for services that is not being met by other educational institutions. Their survival depends upon serving the conscious needs of students: failure to do so results in failure of the school as a business. Unlike "public" schools, the only financial support for the proprietary school is what it raises through student fees. In this sense proprietary schools are the ultimate in educational accountability: purchases of training opportunities are transacted directly between school and student.

Among business firms proprietary schools are unique in that units of production are not standardized. Each item produced is different. The school cannot control one primary

resource necessary for producing skilled graduates--the student. Disregard or underestimation of the importance of this major distinction between human beings and other "raw materials" in a production process is probably the cause of much misunderstanding of what proprietary schools can and should do. Proprietary schools do not, of and by themselves, train people for jobs--they provide training opportunities.

Compounding the misconceptions arising from the hybrid nature of the proprietary school, many educators fail to recognize the extent of diversity within this industry, not just in types of training, but also in size, ownership, diversification, and fiscal characteristics. When one thinks of the proprietary school industry, one commonly envisions the trade and technical and the business schools; however, these schools form only a third of the number of vocational resident proprietary schools though enrolling three-fourths of all resident students. With the inclusion of other schools (such as pilot-training, cosmetology, and barbering schools) that were excluded from the industry-wide sample, the percentage would be reduced to approximately 15 percent. Besides trade and technical schools and business schools, the industry includes data processing, general education, applied arts, public services, health, transportation, plus a miscellaneous host such as dog grooming, bartending, real estate, cooking, and florist schools. Many schools could be classified under several categories and many might be called avocational as well as vocational. A salient point is that these schools enroll as many as do vocational programs in community colleges, but in a much broader range of learning opportunities.

The diversity within the industry, then, is striking by virtually any measure. While some schools may have as few as two or three students, others have more than a thousand students; the typical school has only 50 to 100 students. Although the average amount of physical assets is small, there is great variation; half of the schools have no more than $30,000 in physical assets and one out of five operates with less than $10,000 of assets, but a few schools have assets totaling more than a million dollars. Two-fifths of the schools are controlled by single owners, and at the other extreme 25 percent are owned by parent corporations. Diversity is found also in the schedules of courses and programs that are offered and in the diversification within each school (some offer only one specific course while others offer dozens of c urses in different occupational fields).

Economic Conditions Influencing Demand for Training

An initial task when scrutinizing proprietary schools is to identify sets of forces the schools respond to and how they respond. Operating a school successfully requires the combination of a number of important business and educational skills, and because of fluctuations in economic conditions beyond the control of a school risks may be high.

A proprietary school must identify and measure the student demand for its training, without which the school cannot exist. However, we found that student demand is a complex function of several factors, many of which are not within a school's control and some of which we could not identify. An attempt was made to evaluate the impact of some standard measures of labor market conditions on demand for training. Despite inability to make precise estimates, two findings are of interest. First, demand for vocational training among women expecting to enter the labor market varies directly with the rate of unemployment. Earlier studies indicated that the sexes (in public high schools) responded differently to the unemployment level. That is, perceived costs and returns based upon expected utility to the person in the labor market were different for the two sexes. In the case of cosmetology training, where presumably the women's intention of labor market participation is the same as for men in general, the response to the unemployment rate was positive, as among men.

Second, wages were found to affect demand for training. Over the years technical schools have had to raise tuition to offset higher costs of providing training opportunities and these higher tuition costs are sometimes cited as a reason for the general decline in enrollments. However, the analysis of demand for training at the Electronics Technical Institute (ETI) indicates that rising tuition is not the cause of the downward trend. Although tuition in real terms more than doubled in the last twenty years, rising per capita disposable personal income has more than offset the negative influence of higher tuition. The most significant variable explaining the rise and fall in enrollment is the rate available to an individual lacking the training. Real wages for the TV-radio technician have remained virtually constant for twenty years while wages for an average industrial worker without the training have risen substantially. The result has been a reduction in the incentive (expected wage increase) to take such training. A similar analysis was attempted with data on the cosmetology school industry using the federal minimum wage as the alternative wage. Because of statistical complications, the results were not conclusive,

but indications were consistent with the findings in ETI. With each legislative enactment raising the minimum wage the incentive for the individual to invest in semi-skilled training opportunities will diminish unless wages for the semi-skilled are increased proportionally.

Aside from the standard indicators of labor market conditions, numerous other exogenous variables can have strong influence on proprietary schools. The expansion of the computer industry was followed in the 1960's by explosive growth of data processing and computer schools. Unionization of fruit harvesters had a curious and unanticipated effect on demand for training at ETI. Wage increases, precipitated by unionization, eliminated the demand for a particular group of immigrant workers who annually acquired training at trade schools in Chicago at the end of the harvest season. Once the demand for these people as harvesters was eliminated so was the demand for the classes designed for them in the trade schools. In another instance, the trade school had a very popular course in wiring and soldering of electronic components; for more than a year this school matriculated about 30 students every month. One year later the school did not enroll 30 students in that course all year because manufacturers had shifted to using Japanese imports.

Internal Influences on School Success

One could describe the other equally dramatic effects upon proprietary schools, but the sensitivity of proprietary schools is not solely the consequence of fluctuating market conditions or of changing technology. The very nature of the proprietary school--its functions and management--is also a critical aspect of the industry's sensitive role.

Since many schools are small, attracting a few additional students can make the difference between a reasonable profit and a substantial loss. The proprietary school industry is highly leveraged and therefore inherently risky. Since a dollar of assets generally generates two or three dollars of annual income, skill in controlling costs can yield rewarding profits. In the case of ETI, a 1 percent increase in revenue may generate a 10 to 15 percent increase in profits; but the leverage works in the opposite direction as well. If revenue falls without accompanying reductions in costs, heavy losses may ensue. During the year in which ETI had a loss, a 1 percent decline in revenue resulted in a 60 percent decline in profits.

However, the ability to control costs comes at a premium. In fields where there is constant flux in economic conditions, technology, labor market, and government regulations, controlling costs requires continuous effort, and the

owner's ability to perceive the implications of exogenous changes and to adapt his school's operations accordingly is all important. Compounding this task is the difficulty of acting with proper timing. In the case of ETI, the 1954 decision to offer a course in color-television repair reflected an accurate perception of the direction of technological development, but the timing was faulty.

Obviously, to remain in business a school must be able to offset some misjudgments of market demand or errors in timing with other more successful responses to market needs. For instance, the owner of ETI raised tuition in a wiring and soldering course in the face of competition from public institutions because he was not clearing the costs of the program. Nevertheless demand for the course did not diminish; from the students' point of view, ETI apparently offered a superior training opportunity for which there was no adequate substitute. The impact of such a program on a school's success is twofold. Revenue is increased through higher tuition and enrollment, and unit overhead costs and instructional costs are reduced by achieving a more optimal student-faculty ratio--a variable that is positively associated with the most profitable schools.

In stressing the role of the proprietor, whether owner or manager, we must realize that often a single individual is responsible for the design of the product, its production, and its marketing--a number of important functions, any one of which can affect a school's profitability and eventual survival.

An examination of rates of return for proprietary schools clearly reflects the presence of these critical internal factors. The rate of return to physical capital (assets) for the typical proprietary school is 14 percent, slightly above the average for manufacturing corporations (10 percent), but has tremendous variation and volatility. The most profitable schools have returns exceeding 100 percent, but fully 25 percent of all proprietary schools suffer losses. The implied volatility is supported by the fact that ETI profits varied more than 1000 percent over a period of time when physical assets were relatively constant.

The discrepancy between the rate of return for proprietary schools and that for manufacturing corporations may well be due to the greater risks within the proprietary school industry which already has been mentioned. The omission of non-physical assets in computing rates of return could also be a partial explanation. In many schools, the owner, through years of experience, learns how to curtail costs, how to increase appeal of programs and courses, and how to best market training programs. The contribution of these intangible assets to profits in many cases may be as important as physical assets.

The balance that the proprietor strikes between meeting industrial demand and student demand also affects the success of the school. The two demands, however, may operate in opposite directions. Industry may prefer laborers with skills that require more training than the student feels is necessary. The student, paying for the costs of the training, tries to obtain a job without incurring any more costs than he considers necessary. The proprietary school in a very real sense serves as a "go-between": if the proprietor designs his programs solely to suit industry, he stands to lose appeal among prospective students. If he favors the student, he may not be providing industry with a satisfactory product--the adequately trained graduate. The proprietor's job is to maximize net satisfaction of industry and the students. The more rapidly exogenous changes occur, indicators used in making adjustments become less clear, and the more difficult the proprietor's work becomes. Operating on a frontier of technological change increases the premium for accurate perception of how to respond to the two demand factors. Appropriately enough, the rewards for the person who can fill this important and timely training role, of linking industry and labor, are substantial, as are the penalties for faulty judgments.

Relationship with Community Colleges

One central task of this research was to delineate the relationship between proprietary schools and their nearest counterpart in the public sector--community colleges. Previous studies have offered explanations of why the relationship between community colleges and proprietary schools might be complementary or competitive, but none of the studies tried to specify the relationship itself. In this research the question of the relationship between the two types of institutions was addressed in several ways, with mixed results.

The clearest case for relegating specific occupational training to one or the other institutions can be made for cosmetology. Ninety percent of cosmetology training occurs in proprietary schools. The little training that is offered in community colleges has higher direct costs than in the proprietary schools: $1200 just for instructional costs in the community colleges versus $550 for the entire tuition and equipment costs in the average proprietary school. Considering the uniform occupational objectives attainable with such training there seems to be little reason for public schools to serve in this capacity. Indeed, after initial experimentation with cosmetology training community colleges are beginning to relinguish this field of training to

proprietary schools. In one community college administrators acknowledged that the proprietary schools could serve the public interest more efficiently and accordingly discontinued the cosmetology program. Another community college, preferring not to relinquish complete control over cosmetology training though realizing the advantage offered by proprietary schools, contracts with local proprietary schools.

There was some indication that students may have definite preferences for acquiring certain types of training in particular institutions (see Chapter IV). A comparison of enrollments among courses in a technical school with enrollments among technical courses in the city's community colleges showed that relative enrollment in a particular course varied inversely between the two institutions. That is, the TV and radio repair course, ETI's most popular course, has had no enrollments in the community colleges for the last two years, and electronics technology, the most popular course in the community college (of courses offered by both types of schools), is the course with the lowest enrollment at ETI. Whether ETI actually is better equipped to train TV-repair technicians or the community colleges to train electronic technicians or whether the difference is coincidental--or stems from ill-defined student habits--can be only a matter for speculation. These bits of information indicate that some "settlement" has been reached between the two institutions.

More direct and comprehensive evidence shows a detrimental effect of competing programs of community colleges on the general economic viability of proprietary schools.

The analysis of proprietary school failure rates and of growth trends in proprietary schools showed that school failures increased 50 percent during the years of most rapid expansion of community colleges. Furthermore, proprietary schools that offered training most similar to that offered in community colleges showed no increase in number; however, the number of specialty schools providing training not usually duplicated by community colleges increased 50 percent.

One analysis (reported in Chapter III) focused on identifying the relationship between a business proprietary school and a nearby community college that offered similar programs. A multi-variate regression analysis to explain enrollment shifts between the two institutions in terms of potential tuition-savings proved to be inconclusive because there was not enough information to specify the model adequately. A different technique, however, gave further evidence of the probable impact of the community college on

the proprietary school. Students at the business school (FBS) were grouped into four training schedules by length and day or night classes. The four training schedules were compared before and after establishment of a nearby community college. The hypothesis that the greatest decline of enrollment would occur in the schedule that is the closest to the schedule of training offered in the community college was supported. There was a 77 percent decline in FBS enrollments in the long, evening course (which most closely approximated the schedule provided by the community college), while for the schedules not offered by the community college the net decline was only 5 percent. More recently the community college has added other schedules and now the proprietary school is on the verge of closing.

Implications of Competition From Community Colleges

We now arrive at the key issue: of what consequence is it if community colleges competing with proprietary schools threaten the survival of individual proprietary schools and the growth of the proprietary school industry? A meaningful answer will revolve around the values we place on the services, functions, and costs lost or gained by such a restructuring of the educational system and on having an efficient and effective educational system. First, the number (variety) of services (training opportunities under varying conditions) will probably be diminished. Although the public school may increase the number of services that it offers, services from the educational system overall will be diminished by the number of unique services that the proprietary school offered at the time it closed and which were not incorporated into the community colleges.

A major misallocation occurs through shifts in the expenditure of educational monies. Through tax subsidization, public schools offer their services to the public below cost. Private schools, of course, must meet all costs through the tuition they charge. Naturally, if a public community college opens, offering services which students attending a private school consider identical, the students will switch schools. Some additional switching may occur among students who, with other things equal, prefer the particular services of the private school but who are willing to give up their first choice and accept a lesser choice for the tuition savings.

As the variety of the private school's educational services is diminished by offerings in the public school, total demand for private schooling declines. Overhead costs which once were shared by all students taking different

courses now must be supported by a diminishing number of students. Eventually the school may be forced to close, not because all of its students have switched to the public school but because the latter's offerings have overlapped with the private curricula to such a degree that overhead costs are not covered by revenues generated from demand for the remainder of distinct educational services offered by the private school.

When the interests of students who preferred the services offered by a private school that has been forced out of business are not met by the public school, the students either do not return to school or they settle for some less desirable alternative. To the extent that these students choose some service available within the public school, subsidization distorts the mixture of options that would be pursued without the subsidy. To the extent that these students choose not to return to school, the subsidy results in the purchase of fewer educational services. The net effect is that either more or less money is allocated to particular educational services than would occur in a market without this form of subsidization.

Even though this distortion in allocation occurs, there are benefits resulting from subsidization: namely, enhancement of educational opportunities for individuals who cannot afford the full costs of education and increased productivity of these individuals at work.

However, these same benefits could be attained without decreasing the total diversity of educational services by tying the subsidy to the individual rather than to the institution. Some progress is being made in this direction by making educational loans and grants available, and many government programs now include proprietary schools within the recognized field of post-secondary education.

Another consideration in weighing the relative merits of the proprietary school and the community college is cost of the services. There may well be justification for keeping certain programs within one or both types of institutions, but there also is increasing evidence that a number of programs are unnecessarily duplicated. If we wish to allocate our limited resources wisely we must decide which institution in such cases is better suited to provide the training. Recent research has found that aside from small differences (1) the type of student attending a vocational proprietary school is similar to that attending vocational programs in community colleges, (2) student total cost (direct and indirect) are remarkably similar in a number of occupational

areas, and (3) subsequent employment status is similar.[1] With all three of these important factors determined, the only major issue remaining is evaluating the social costs of each institution. Drawing upon some fragmentary evidence (presented in Chapter V), it appears that if the value of community-college subsidies were included in costs, proprietary schools could provide the same quality of service for no more, and often for much less, than do the community colleges.

And finally, proprietary schools may function as a bellwether for public educational institutions. Proprietors frequently go to industry and ask whether a particular skill would be used. Finding a suitable, required skill, the proprietor can design, package, and sell a training program within months. It may well be that many community colleges are as responsive as they are because the activities of proprietary schools quickly point up training needs and gaps in offerings.

Implications of Government Interest in Proprietary Schools

A number of federal government agencies--the Labor Department, the Federal Trade Commission, the Veterans Administration, the Bureau of Indian Affairs, and the National Institute of Education, to name a few--are for various reasons, from either a business or educational perspective, interested in proprietary schools. From these interests have come significant changes of educational practices. Some of these changes substantially improved our educational system, and only through careful, deliberate, and informed decisions can we continue to improve our system of education. However, several recent proposals indicate that adequate consideration is not being given to a number of features of proprietary schools. Although the proposals undoubtedly originated from good intentions, the full consequences that may flow from implementation of the proposals have not been thoroughly evaluated. The concern to protect the prospective proprietary school student from making costly and possibly ill-informed decisions about schooling is illustrative.

Most probably students do not have very good information regarding educational options, but the fact that students do not have as much information as might be preferred does not necessarily warrant implementation of

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[1] W. W. Wilms, The Effectiveness of Public and Proprietary Occupational Training, Berkeley: Center for Research and Development in Higher Education, 1974.

sweeping changes which require certain proprietary schools to provide employment and earnings data on their graduates, as has been recently recommended. A number of intermediate, but very important, steps should first be considered. The analysis in Chapter V showed that no discernible relationship existed between tuition and quality among the 81 cosmetology schools in the Chicago area even though tuition ranged from $200 to $1300 for a similar type and amount of training. In any type of training program, quality of product may vary according to student characteristics because the student, in an educational situation, is part of both input and product. However, even when communities were stratified by socioeconomic characteristics, no discernible relationship between tuition and quality of training existed. Part of the reason may be that prospective students do not have sufficient information to make a wise choice of schools, and there is some evidence that cosmetology school owners intentionally seek to block the free flow of comparative information regarding tuition rates and other features of a school's program.

However, even if the information were available it is not at all clear that students would choose any differently than they do now. In the training for cosmetology, for instance, schools appear to have strong neighborhood influences and to serve local markets. Strong demographical and geographical constraints effectively isolate some communities. A prospective student may well prefer to attend a nearby cosmetology school than one offering better training for less money but located elsewhere.

Furthermore, public information services typically serve those who least need them and serve least those who most need them. Before we impose a serious burden upon proprietary schools or spend large sums of monies (which would be necessary to obtain and disseminate the information) to provide such a service, we ought to have some inkling of how much practical use will stem from such efforts.

Even if students did avail themselves of the information, would it make any difference in what training they eventually choose? By itself, the fact that only a small percentage of proprietary school graduates receive employment in the occupation for which they were trained hardly justifies drawing the conclusion that students should have more information. It may well be that an equally small percentage of students in any type of training actually obtain employment in that field. Many students choose to change vocations. In a study of changes in vocational choices by community-college students, fully half of the sample changed their

vocational choices within an 18-month period.[1] Assuming that a number of students do not wish to change their vocational choice, what option do they have if the "screening" or "pyramiding" is equally great for all occupations? Clearly the appropriate perspective is not that the schools fail because they provide for only a small percentage of the total, but that they are successful in providing greater opportunities than any other system. Although many people may not obtain the exact job they would like to have, acquiring training may be the only chance a number of people have for obtaining any employment.

And finally, no thought has been given to who would be responsible for collecting such data or who would bear the costs of collecting the data necessary to provide prospective students with the basis for an informed choice. It is assumed implicitly that the proprietary school will be the agent. Yet, knowing how sensitive the financial structures of proprietary schools are, it is questionable whether they could bear these costs. If faced with the choice of collecting the data to allow them to make employment claims or relinguishing all claims to any vocational relevance, many might well choose the latter or (if the rules are too penalistic) simply close down--providing prospective students with less rather than more information and fewer training options.

In short, the enthusiasm for providing prospective students with more complete information has not been accompanied by either a consideration of possible alternatives or of the costs of information. Certainly little evidence of the likely effectiveness of such a policy has been offered. A more modest approach recommends itself: first estimate the probable cost of obtaining the desired information and probable usefulness of it. For example, a first step might be to experiment at the local level. Licensed schools, such as cosmetology, for which tuition and quality measures are readily available might simply be required to disclose such information to prospective students. After an appropriate length of time, the relationship between tuition, quality indicators, and enrollments could again be examined to see if students in fact give any attention to available information. It could be that students judge and choose schools on bases quite other than either the employment status of graduates or such other school attributes as are ncluded in the data collected and measured.

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[1] C. S. Scott, R. H. Fenske, and E. J. Maxey, "Vocational Choice Change Patterns of a National Sample of Community-Junior College Students," ACT Research Report No. 64, May 1974, p. 4.

Certainly any experimentation must involve not just proprietary schools but all schools offering similar training. As long as one of our goals is to serve the best interests of consumers by improving the flow of information when individuals make a decision concerning the purchase of education, we ought to require all institutions providing similar training to supply the same statistics. Compelling one institution to provide information which when presented by itself might appear damaging to the school but when presented in contrast to other institutions indicates superior performance is misleading to the student and unfair to the school. The drop-out rate in proprietary schools, for example, has been cited as a "problem." More to the point, this is a problem for all post-compulsory schooling. Surely every proprietary school would like to lower its drop-out rate, but the quoted 23 percent completion rate of computer school students or the 57 percent completion rate of business school students can be claimed to be as much a "solution" as a "problem." One must keep in mind the fact that in some community colleges about 20 percent of those beginning data processing courses finish and only 23 percent of those in business programs[1] (half the proprietary school completion rate).

From this extended discussion of government concern with proprietary schools should come a recognition that increased visibility of proprietary schools within the educational system is not without its hazards. Educational planning which touches the proprietary schools must be done with careful evaluation of costs, benefits, nd consequences to the individual and society.

Historically, proprietary schools have survived in the face of forces over which they have little control, and which rarely enter the planning of public institutions, by shifting resources to meet changes in market and technological conditions and in student interests and by careful internal decisions. In recent years these conventional forces that govern a proprietary school's operations have been joined by competition from community colleges and by increased interest from educators and government, neither of which is necessarily harmful to the industry. But we must recognize that, although the eventual "settlement" between community colleges and proprietary schools is unknown, proprietary schools contribute a degree of flexibility, responsiveness, and diversity not so evident in public schools and may provide many services more efficiently than other institutions. If we seek to offer meaningful choices in post-secondary education and with consideration for costs, proprietary schools have the potential of being an instrumental component in achieving that efficiency and diversification.

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[1] Computed from enrollment reports by school, 1970 and 1971, State of Illinois, Board of Vocational and Technical Education.

APPENDIX 1

PROGRAMS AND COURSES AT TRITON SIMILAR TO PROGRAMS AND COURSES OFFERED AT FBS

Programs:

accounting
business management
data processing
secretarial with general, legal, medical, pre-court technical, or executive option

Courses:

beginning typing I, II
duplicating and transcribing machines
Gregg shorthand I, II
shorthand refresher I, II
office machines
human relations for executives
bookkeeping I, II
bookkeeping for small business
certified professional secretarial review I, II
business correspondence
clerk-typist re-training
management development
clerk-typist program
key punch I, II
computer programming I, II
data processing

APPENDIX 2

DISTRICT SPECIFICATIONS OF THE ILLINOIS PUBLIC JUNIOR COLLEGE ACT

As we explained earlier a student has the option of attending the community college in his own district or of attending a community college outside his district but at a higher tuition rate. However, because of specific provisions in the Illinois Public Junior College Act we need to distinguish between actual districts and "effective" districts created through the provisions of the Act. The Act states:

> (1) anyone qualified to attend a public community college "and residing outside a junior college district . . . which does not operate a junior college . . . may, . . . attend any recognized public junior college . . . which he chooses, and the board of education of that district shall pay his tuition" less the tuition amount that the college is free to charge any student, and
>
> (2) if "a resident of a junior college district . . . which operates a junior college wishes to attend the junior college maintained by the district of his residence but the program in which the student wishes to enroll is not offered by that junior college, the student may attend any recognized public junior college in some other district . . . and have his tuition," less the amount of tuition charged any student, "paid by the junior college district of his residence."

The net effect in many areas is that, from the student's perspective, the financial barrier does not exist. Only a student residing in a community college district that offers the courses he wants must pay the out-of-district tuition in attending a community college other than the one in his district.

In 1965 when Triton began classes, the only surrounding districts that had public community colleges were districts #508 (Chicago) and #527 (encompassing Cicero, Berwyn, and a few

smaller towns) bordering the east side of Triton's district. Districts lying in other directions from Triton had not then established their own public community colleges, and therefore students were entitled to the "charge back" at Triton. Furthermore, districts 508 and 527 both offered secretarial courses similar to those offered by Triton so that students in these districts seeking secretarial courses were not entitled to the "charge back" agreement and would have to pay the out-of-district tuition rate themselves to attend Triton.

In sum, the students at FBS are either from the Chicago-Berwyn-Cicero areas--the areas from which students wishing to attend Triton have to pay out-of-district tuitions or from areas in which the student need pay only the in-district tuition rate because he is either an in-district resident or an out-of-district resident entitled to the "charge back" provision.

APPENDIX 3

STRUCTURAL EQUATION MODIFICATIONS FOR DEMAND FOR TRAINING

The accuracy of estimating regression coefficients is diminished by multicollinearity, and the correlation matrix below indicates that income (Y) and industrial wages (W_A) are highly collinear (.98) as also are length of course (L) and tuition (.97) and W_A and L (.94). Although multicollinearity does not result in biased estimates it does make it difficult to separate the influences of various independent variables. Sampling variances of estimated coefficients increase sharply as the degree of multicollinearity rises. While there are methods of identifying the presence of collinearity, removing multicollinearity may be difficult. Re-specification of

TABLE 3-1

CORRELATION MATRIX

	M	W_{TV}	W_A	L	T	S	Y
W_{TV}	.39						
W_A	-.66	-.11					
L	-.58	-.15	.94				
T	-.56	-.20	.89	.97			
S	.49	.15	-.69	-.57	-.39		
Y	-.61	-.15	.98	.96	.94	-.58	
W_{TVA}	.75	.67	-.93	-.87	-.82	.64	-.90

structural relationships, such as omitting one of the highly collinear variables, transforming variables, or collecting more data are three methods of eliminating multicollinearity

Transforming or deleting variables are the only options available in this case because no additional data exist, but deleting either Y or L tends to result in autocorrelation of residuals (which introduces large sampling variances and invalidates the t and F tests) without yielding significantly different results (see Tables 3-2 and 3-3).

TABLE 3-2

REGRESSION OF ENROLLMENT ON WAGES, TUITION, AND LENGTH OF TRAINING

	Ordinary Least Squares		2-stage Least Squares	
Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
W_{TV}	69.8	1.82	36.5	0.234
W_A	-95.8	-1.92	-102	-1.74
T	-0.012	-0.142	-0.015	-0.175
L	1.01	0.769	1.07	0.778
R^2 = .58			.56	
Durbin-Watson statistic = 1.58			1.46	

TABLE 3-3

REGRESSION OF ENROLLMENT ON WAGES, TUITION, AND INCOME

	Ordinary Least Squares		2-stage Least Squares	
Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
W_{TV}	70.5	1.98	178	1.05
W_A	-203	-2.38	-185	-1.62
T	-0.061	-0.810	-0.057	-0.588
Y	1.17	1.71	1.14	1.29
R^2 = .64			.40	
Durbin-Watson statistic = 1.84			2.05	

Another possibility is to combine variables (for an explanation of the consequences of re-specifying variables see pp. 110-111 in Chapter V); for instance, the ratio of W_{TV} to W_A can replace the two wage variables. The ratio (W_{TV}/W_A) is less highly correlated with Y than W_A (-.90 versus -.98) and L (-.87 versus .94) but the estimated regression coefficients are less significant than those presented in Tables 3-2 and 3-3. Combining W_A, L, and T into a single cost variable $(W_A \cdot L + T)$ was also tried, but the results, given in Table 3-4, are nearly meaningless.

TABLE 3-4

REGRESSION OF ENROLLMENT ON WAGES, COST, AND INCOME

	Ordinary Least Squares		Two-stage Least Squares	
Variable	Estimated Coefficient	t-statistic	Estimated Coefficient	t-statistic
W_{TV}	6,810	1.63	-16,800	-0.57
$W_A \cdot L + T$	.314	0.19	-1.50	-0.41
Y	-.196	-0.57	.144	0.20
C	-54.8	-0.69	342	0.69
R^2	.44		-.77	
D-W	1.15		.96	

APPENDIX 4

DATA MATRIX OF VARIABLES USED IN REGRESSIONS OF DEMAND FOR TRAINING

Year	M	W_{TV}[a,b]	W_A[a,c]	L	T[a]	S[d]	Y(0)[a,e]	U[f]	CPI[g]
1954	42	1.60	1.65	12	250	21.7	159	5.3	93.6
1955	49	1.70	1.71	13	250	14.7	167	4.2	93.3
1956	29	1.75	1.80	16	250	13.9	174	3.8	94.7
1957	58	1.80	1.89	16	250	10.5	180	4.1	98.0
1958	65	1.95	1.95	16	250	7.2	183	6.8	100.7
1959	55	1.85	2.02	19	250	7.4	191	5.3	101.5
1960	32	1.92	2.09	20	250	5.4	194	5.4	103.1
1961	35	2.00	2.14	20	250	4.7	198	6.4	104.2
1962	16	2.08	2.22	20	300	4.5	207	5.2	105.4
1963	14	1.80	2.28	20	300	4.5	214	5.2	106.7
1964	9	1.83	2.36	26	390	4.6	228	4.6	108.1
1965	12	1.86	2.45	28	415	4.6	244	4.0	109.9
1966	34	2.10	2.56	28	475	5.3	260	3.2	113.1
1967	22	2.15	2.68	28	475	6.3	275	3.1	116.3
1968	25	2.20	2.85	40	635	5.3	295	2.9	121.2
1969	29	2.30	3.04	40	635	6.3	313	2.8	127.7
1970	24	2.40	3.22	40	635	2.7	338	4.4	131.3
1971	16	2.50	3.43	50	890	4.9	360	5.3	141.1
1972	10	2.65	3.65	50	985	4.4	382	4.9	145.7

[a] In the results reported in the text the variable is divided by the consumer price index to express all observations in 1958 values.

SOURCES: b. Company wage schedules of Certified Television Service, Inc., Chicago, Illinois, c. U.S. Bureau of Labor Statistics, Employment and Earnings, 1909-1972, Table 7 and U.S. Department of Commerce, Survey of Current Business, 1973. d. Computed from the Television Fact Book and Electronic Market Data Book (Electronic Industries Association), 1973. e. U.S. Department of Commerce, Survey of Current Business, July 1973, p. 48. f. Bureau of Labor Statistics, Employment and Earnings, February 1973, p. 179. g. U.S. Department of Commerce, Survey of Current Business.

APPENDIX 5

EMPIRICAL DERIVATION OF THE DEMAND FOR COSMETOLOGY TRAINING VARIABLE

Data on entrants is available for only a few years. To lengthen the time series the number of entrants is proxied by the number of cosmetology school graduates sitting for the state licensing examination. Because passing the state examination is required for a practicing license, and because we assume that those who graduate will sit for the examination, and because examinations are given monthly (less frequently in earlier years but still several times each year), the number sitting for the examination in a particular year should nearly completely reflect the number graduating in that same year.

Furthermore, the M variable is expressed in year t+1 so that, while all other variables are given in year t, M approximates the number of existing cosmetology students in year t.

Within the series for graduates there is one adjustment that must be made to correct for an idiosyncracy in the data. In August 1966, the course was lengthened from 1000 hours to 1500 hours, an increased duration of training which results in higher foregone earnings. The impact of the greater training time, which reduced the number of graduates by (1) reducing the number of matriculants, and (2) decreasing the completion rate through higher attrition, on the demand for cosmetology training is correctly reflected in the number of graduates, but completely independent of this decline in demand is a one-time sharp drop in the flow of students out of training immediately following the effective date of the legislation requiring the longer course and lasting until the "slack" in training time is absorbed. This sharp drop in graduates in 1967 incorrectly portrays the demand for cosmetology training. To compensate for the inordinate drop in the number of graduates, the 1967 figure was adjusted upwards, to represent the expected number of graduates if the

"slack" period had not existed, by applying the pre-1967 completion rate to those matriculating before August and applying the post-1967 completion rate to those matriculating after August 1966 and summing the two figures. (See Appendix 6 for the data and computation of completion rates.) The adjusted figure for 1967 is 4723 instead of 2945. Other observations are unaffected. The time period over which data is available is 1950 through 1972. The complete data matrix is given in Appendix 7.

APPENDIX 6

COURSE LENGTH, COMPLETION RATES, AND ARC ELASTICITY OF DEMAND FOR COSMETOLOGY TRAINING

The course length was increased from 1000 to 1500 hours for persons enrolling in cosmetology training beginning on 1 August 1966 or later. While the cost of the 50 percent increase in time invested in training was incorporated into the foregone time and earnings variables, we have data on the number of matriculants and graduates before and after the legislated increase which allow us to see to what extent the longer course is associated with a lower completion rate for those beginning training and to estimate the arc elasticity of demand for training. Taking the ratio of graduates in one year to the number of matriculants in the preceding year as an approximation for the completion ratio (Table 6-1) we find that the average completion rate for those beginning in 1963, 1964, and 1965 is 66.8 percent and 56.7 percent for those beginning in 1967 or later. Although the relationship between course length and completion rate is probably not linear for all values, if we assume that linearity holds over the region specified, a 3 percent change in length leads to a 1 percent change in the completion rate.

Figure 6-1 clearly shows the abrupt drop in completions. The greater course length may be the cause of the smaller number of completions, but the mechanism through which course length affects the number of completions is two-fold. First, as just explained, the longer course increases the drop-out rate. Second, the longer course represents a substantial opportunity cost and may reduce the number of matriculants. The average number of matriculants for the three years before 1966 was 8623, and 7735 for the three years after 1966. With this information we can estimate the arc elasticity of demand.

The net cost to the student of the increased course length is the foregone earnings that she could obtain in the best alternative. Tuition costs may rise some but so will the earnings that she is able to make while in school.

In cosmetology, as in many other areas of vocational training, earnings coming from school work often approximate tuition leaving foregone earnings as an approximate measure of the net cost of training to the student. An increase of 50 percent in training time implies a similar increase in net cost. Computing the arc elasticity

$$(\eta = [(q_o - q_1)/(q_o + q_1)]/[(p_o - p_1)/(p_o + p_1)])$$

from this information gives $\eta = -.271$, indicating an inelastic demand for cosmetology training.

TABLE 6-1

MATRICULANTS AND APPLICANTS FOR THE STATE EXAMINATION

Year (Jan.-Dec.)	Col. (1) Matriculants	Col. (2) Applicants for State Exam	Col. (3) Ratio (of (2)/(1)$_{t-1}$ as a percent)	
1963	8043	5448		
1964	8398	5243	65.2	66.8%
1965	9429	5431	64.7	
1966	7556	6687	70.9	
1967	7436	2945	39.0	56.7%
1968	8102	4108	55.2	
1969	7666	4322	53.3	
1970	7032	4533	59.1	
1971	7307	4310	61.3	
1972	7273	3997	54.7	

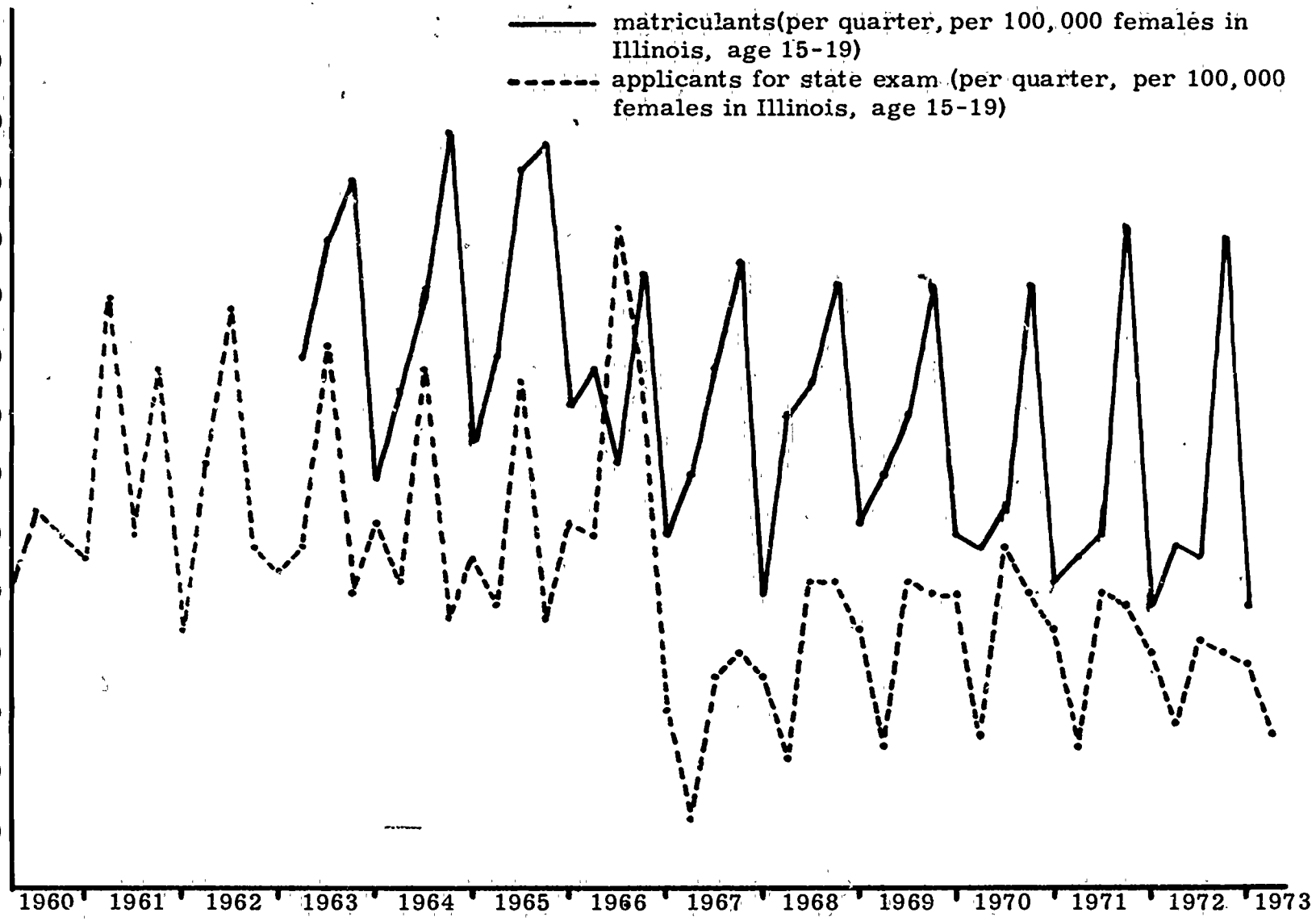

Figure 6-1. Matriculants in and "graduates" of cosmetology schools in Illinois, 1960-1973

APPENDIX 7

DATA MATRIX FOR VARIABLES USED IN DEMAND FOR COSMETOLOGY EQUATIONS

Year	M	P(0000)	U	W	Y(0)	FT	FW($)
1950	1054	212	11.4	76.4	163	1000	.89
1951	1025	213	8.3	80.4	162	1000	.83
1952	1040	214	8.0	84.0	164	1000	.81
1953	1236	215	7.2	87.5	170	1000	.80
1954	1810	216	11.4	89.8	169	1000	.80
1955	1906	217	10.2	91.4	179	1000	.80
1956	2061	218	11.2	93.4	184	1000	1.01
1957	2405	219	10.6	97.1	184	1000	1.02
1958	3363	220	14.3	100.4	182	1000	.99
1959	4159	221	13.5	102.4	188	1000	.99
1960	5554	222	13.9	104.1	188	1000	.97
1961	5623	225	16.3	104.6	190	1000	1.01
1962	5448	228	14.6	106.5	196	1000	1.09
1963	5243	231	17.2	107.9	200	1000	1.11
1964	5431	234	16.6	109.2	211	1000	1.16
1965	6687	238	15.7	109.9	222	1000	1.14
1966	2945(4723)	241	14.1	112.2	230	1208	1.11
1967	4108	244	13.5	115.5	236	1500	1.20
1968	4322	247	14.0	120.3	243	1500	1.30
1969	4533	250	13.3	126.2	245	1500	1.25
1970	4310	253	15.6	128.1	257	1500	1.22
1971	3997	257	17.2	134.9	255	1500	1.13
1972	3803	260	16.7	138.4	262	1500	1.10

APPENDIX 8

ALTERNATIVE SPECIFICATIONS AND ESTIMATING PROCEDURES FOR DEMAND FOR COSMETOLOGY TRAINING

Two modifications, offering a more extreme specification than that presented in the text, are presented here. One is to enter variables in disaggregated form; the other is to condense the information into a minimum of variables. In the first instance the 2SLS technique is used to explain demand in terms of W, FW, FT, U, and Y, each entered as a separate variable. In the second case, M is regressed on the ratio of returns to costs (W/FT·FW), U, and Y, but a 2SLS equation cannot be legitimately specified in this instance because the benefit-cost variable contains FT which is independent of M.

The results are given in Tables 8-1 and 8-2. Again, the results are as one generally might expect, but it is interesting to note that W has no effect on demand. Also FW is unexpectedly positive, but could be the result of high correlation with other variables, a consequence of misspecification through imposing the additive restriction on the variables, or simply measurement error. In Table 8-2 the returns/cost variable has the correct coefficient sign, but it is not significant. U in both equations is positive, and Y, entered as an ability to pay variable, is positive but of little consequence as it is in Equation 3 in Table 8-1. For this reason Y was deleted from the demand for training equation in the text.

TABLE 8-1

	Ordinary Least Squares			
	(1)		(2)	
Variable	Estimated Coefficient	t-value	Estimated Coefficient	t-value
M	d.v.		-.18E-3	0.20
W	54.7	1.23	d.v.	
FW	5,950	2.59		
FT	-6.32	-3.06		
U	149	1.24	1.05	1.75
Y	7.83	0.29	.420	11.7
constant	-4,620	-3.98	5.20	0.87
R^2	.85		.95	
D-W	1.02		.76	

TABLE 8-1--Continued

Two-stage Least Squares			
(3)		(4)	
Estimated Coefficient	t-value	Estimated Coefficient	t-value
d.v.		-.23E-3	-.10
5.36	0.01	d.v.	
5,250	0.89		
-6.15	-2.48		
220	0.39	1.31	1.08
29.5	0.18	.479	4.73
-4,230	-1.32	-8.98	-0.53
.84		.93	
1.09		.69	

TABLE 8-2

Variable	Estimated Coefficient	t-Value
W/FT·FW	17,000	0.71
U	461	4.39
Y	7.65	0.54
constant	-5,590	-1.35
R^2	.71	
D-W	.97	

APPENDIX 9

ANALYSIS OF THE MEASURES OF QUALITY

If we proceed on the assumptions that the Spanish and black area schools serve on the average more economically depressed communities than majority area schools; and that low socio-economic status results in more students dropping out of training for personal reasons (lack of funds, sickness, or family problems), we might expect the completion rate to serve a double function, a proxy for socio-economic welfare of the community, and a measure of a school's quality. The data in Table 46 gives evidence in support of this position. Q3 is significantly lower in black and Spanish area schools[1] than majority area schools, but when Q3 is separated into Q1 and Q2, the difference between the Spanish area schools and majority schools in how well they prepare their students for the state examination is statistically insignificant (although lower), despite a significant difference ($s = .05$) in completion rates of the two groups.

Keeping in mind these two components of measured quality the actual observations of tuition and overall quality are plotted in Figure 9-1, and the simple correlation coefficients for Spanish, black, and majority area schools are given in Table 9-1. Aside from the expected positive relationship between Q1 and Q3, and Q2 and Q3, the relation between tuition and Q3 is the strongest correlation in both the Spanish and black groups, but the coefficient is positive for black area schools and negative for Spanish area schools. In the majority group the relation between tuition and Q3 has no particular importance. We postulated that tuition would increase with quality but the only positive correlation of any strength between tuition and Q3 is in the black area schools. The actual observations (Figure 9-1) do little to supplement information gained from Tables 46 (of the text) and Table 9-1; although in the case of black area schools the importance attached to the correlation between tuition and Q3 is weakened by several extreme outliers. In sum, our data show that the relation between overall quality and tuition for all schools is inconsequential although substantial differences exist <u>among</u> groups.

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[1] It is interesting to note that the greater statistical significance between quality in Spanish area schools and majority area schools (than between black and majority area schools) is due to greater variation in black area schools than in Spanish area schools. In fact, the means for Q1 and Q3 are higher in Spanish area schools than in black area schools.

Tuition

FIGURE 9-1. Plot of tuition against overall quality (Q3). (N= 73)

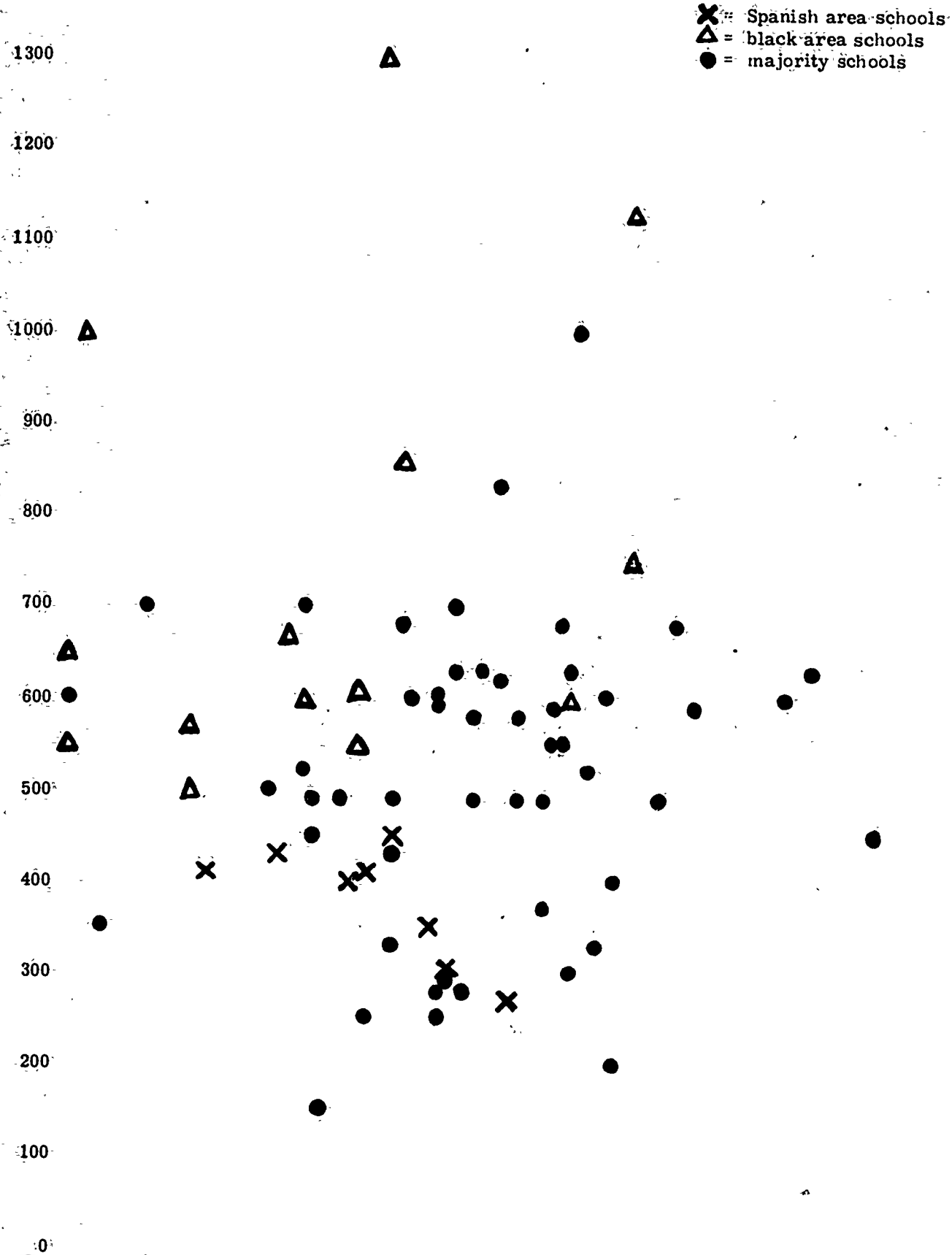

TABLE 9-1

SIMPLE CORRELATION COEFFICIENTS FOR AREA SCHOOLS

	Tuition	Size	Q1	Q2
A. Black				
Size	-0.391 (.104)			
Q1	0.630 (.019)	-0.029 (.467)		
Q2	0.241 (.266)	-0.038 (.461)	0.323 (.199)	
Q3	0.625 (.020)	-0.056 (.436)	0.967 (.001)	0.601 (.043)
B. Spanish				
Size	-0.247 (.278)			
Q1	-0.527 (.090)	-0.026 (.473)		
Q2	-0.583 (.065)	0.309 (.209)	0.588 (.048)	
Q3	-0.709 (.024)	0.138 (.362)	0.881 (.001)	0.885 (.001)
C. Majority				
Size	0.340 (.007)			
Q1	0.147 (.152)	0.107 (.218)		
Q2	-0.043 (.384)	0.097 (.242)	0.325 (.008)	
Q3	0.106 (.230)	0.059 (.334)	0.962 (.001)	0.536 (.001)

Another caveat that should be entered regarding "quality" is that the measurements of overall quality may reflect differences in school policy and goals. On the one hand, a school may serve in part as a screening mechanism, letting graduate only students fully qualified. In a situation of this sort we would expect to find a low completion rate but a high passing rate. On the other hand, a school may allow students to graduate regardless of what they have learned. If this were the case, the school might have a high completion rate and a low passing rate, but the evidence we have shows that Q1 and Q2 generally move together, as shown in the joint distribution of Q1 and Q2, plotted in Figure 9-2.

The Spanish area schools are quite uniform in quality, especially with regard to the completion rate. The worst school graduates 30 percent of its matriculants, the best, 50 percent. The Spanish area schools' variation in percentage passing the examination is not substantially different from the variation in the other two groups. Black area schools show greater dispersion than either of the other two groups for both percentage passing and completing, but their observations fall along the same axis as the other schools. Overall it appears unlikely that a school might advocate a policy that would result in a high Q1 at the expense of Q2, or vice versa.

An alternative approach to evaluating quality differences among schools grouped according to ethnic or racial communities in which the schools are located is to separate the schools first by quality and then to compare characteristics of the schools. If we group observations through visual inspection (Figure 9-2.) we see that the bulk of schools are concentrated around the means of Q1 and Q2. Moving toward either the upper right or lower left corner, small clusters of schools appear separate from the rest of the schools. One cluster consists of the six schools with the lowest Q1 and Q2. All of them are located in Chicago, although not in any particular section of the city. The highest quality schools, the three in the upper right corner of Figure 9-2, are located in suburbs, two in Elgin, a town to the far northwest, and one in Evergreen Park, a near south-side suburb (see Table 9-2.). The geographical distribution of having the best schools in the suburbs and the worst schools in the city again suggests that an important input in determining the quality of a school may be the student.[1]

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[1] Failure to recognize the possibly very important contribution of the student to the "quality" of a school could result in the conclusion that quality of cosmetology training in public community colleges is much higher than in public schools. In 1973 a sample of public vocational

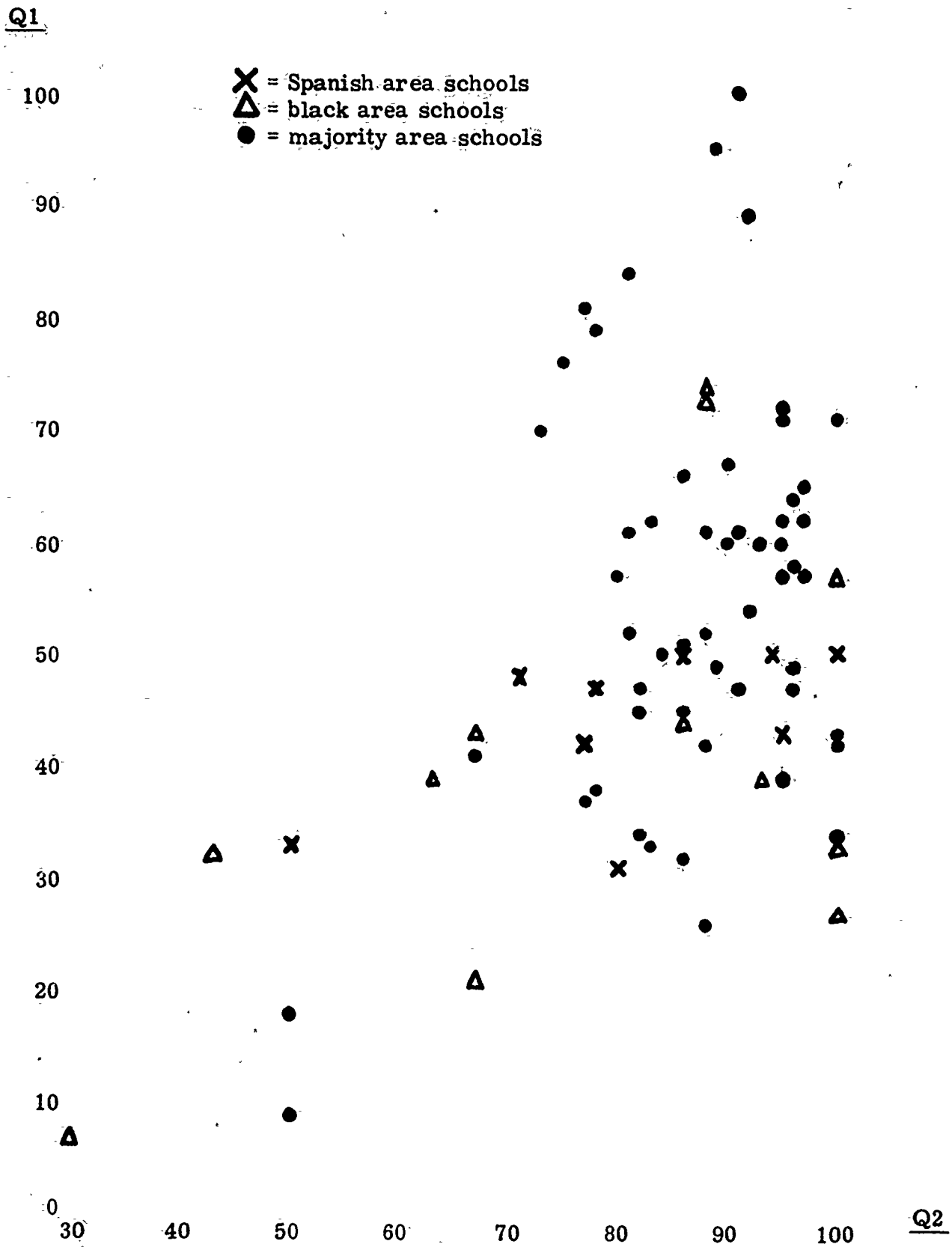

Figure 9-2. Plot of Q1 against Q2

Urban-suburban divisions commonly represent well-known socio-economic and cultural differences among populations. Income and years of education, as measures of SES, show that people living in suburbs have higher socio-economic status than city residents, and the observed disparity in quality between the extremes may be attributable to differences in economic, educational, or ethnic background of students. When the cluster of high quality schools is expanded to include the five schools below and to the left of the three highest schools or all schools with a Q1 equal to or greater than 70, the distinction based on city-suburban location disappears, and in fact the location of the highest and lowest quality schools are intermixed. The worst schools (in terms of quality) are found in the south, west, and northwest; the best, in the south, southwest, west, and northwest. For example, the black southern community contains one of the worst and one of the best schools, as does a community of European-extraction to the northwest; nevertheless, in spite of large variances in quality among schools within all communities, the educational, economic, and ethnic status of students in the two groups of schools is different.

From Table 9-2 we see the following:

1.) The very highest quality schools (3) are located in communities that have above average income and education, and they are located in suburbs with a dominantly white native population.

2.) The lowest quality schools (6) exist in communities of below average income and education, and all of them are located in Chicago. The ethnicity of the communities surrounding the schools are heavily black, Spanish, and European stock, communities that are marked by a high level of ethnic or racial cohesiveness.

3.) An expanded cluster of highest quality schools to include 5 or 10 additional schools still indicates that students come from areas of high income and education, although the superiority is reduced. Also the geographical location of the schools is no longer limited to the suburbs, and ethnicity of the areas surrounding the schools is diversified.

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high schools had a 70.6 percent of their cosmetology graduates pass the state licensing examination. A sample of community colleges had a 95.6 percent pass rate. While the figures could reflect a true difference in school quality, it is probable that the real difference is lessened by differences in student input. The location of the schools and the areas from which the schools presumably draw their students were quite different. The high schools, unlike the community colleges, were all located within the city limits of Chicago.

TABLE 9-2

COMPARISON OF THE SOCIOECONOMIC STATUS OF COMMUNITIES WITH THE HIGHEST AND LOWEST QUALITY SCHOOLS

Number of Schools	Median Family & Unrelated Indiv. Income	% 18-19 yr. Olds Enrolled in High School	Median yrs. of Schooling Completed	Location[1]	Ethnicity[2]
(Highest Quality Schools)					
3	11,300	56.5	12.1	s	a
3 + 5	11,100	53.8	11.7	s+c	a,b
13(Q1≥70)	10,400	56.2	11.4	s+c	a,b,c
(Lowest Quality Schools)					
6	7,800	45.1	10.6	c	b,c,d
(Chicago Population)	7,983	50.8	11.2		

[1] s = suburban; c = city

[2] a = native white, b = European stock (generally Polish, Irish, Italian and German), c = black, d = Spanish.

n.b. Comparison of ethnicity between city and suburb is misleading because of the definition of foreign stock and the pattern of city emigration. Foreign stock are the immigrants themselves and their children; all other generations become "natives of native parentage." Second and higher order descendants of immigrants lose their "foreign stock" designation, and because younger generations are moving out from the city, statistics of foreign stock in the suburbs are underestimates of ethnic concentrations in those areas.

SOURCE: U.S. Bureau of the Census, Census of Population: 1970 Census Tracts PHC(1)-43, Chicago, Illinois, SMSA.

If socio-economic status of the student serves as a proxy for an important quality input, and one for which the school does not pay, then tuition and quality need not be strongly related.

Tuition for either extreme group is nearly the same. The average tuition for the three groups of highest quality schools is $560, $519, and $599; for the lowest quality schools, tuition averages $587--all groups approximately within a quarter standard deviation of the overall mean (see Table 39 of text).

In sum, the success that a school has in getting its students to complete training accompanies the success of the school's graduates in passing the licensing examination. Also, as in other types of schooling, "quality" of a cosmetology school measured by student output variables may depend in large part on the socio-economic background of the student[1] (which often coincides with ethnic categories).

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[1]The implication from Table 9-2 is that rising SES increases probability of success in cosmetology training. While this appears to be true, it is interesting to note that communities of very high income are void of cosmetology schools. Undoubtedly this is the consequence of different expectations that conventionally are associated with socio-economic status. Within the eight suburbs to the north of Chicago with median family income greater than $15,000, only one cosmetology school is located.

APPENDIX 10

CROSSTABULATIONS OF Q2 WITH TUITION AND SIZE

TABLE 10-1

CROSSTABULATION OF Q2 WITH TUITION

	Quintile	TUITION 1	2	3	4	5	Row Total
Q2 Passing	1	3	4	2	0	1	10
	2	1	3	1	4	4	13
	3	0	3	1	0	2	6
	4	1	3	2	3	2	11
	5	5	0	3	2	0	10
Column Total		10	13	9	9	9	50

Chi square = 22.9 with 16 degrees of freedom

Significance = 0.12

TABLE 10-2

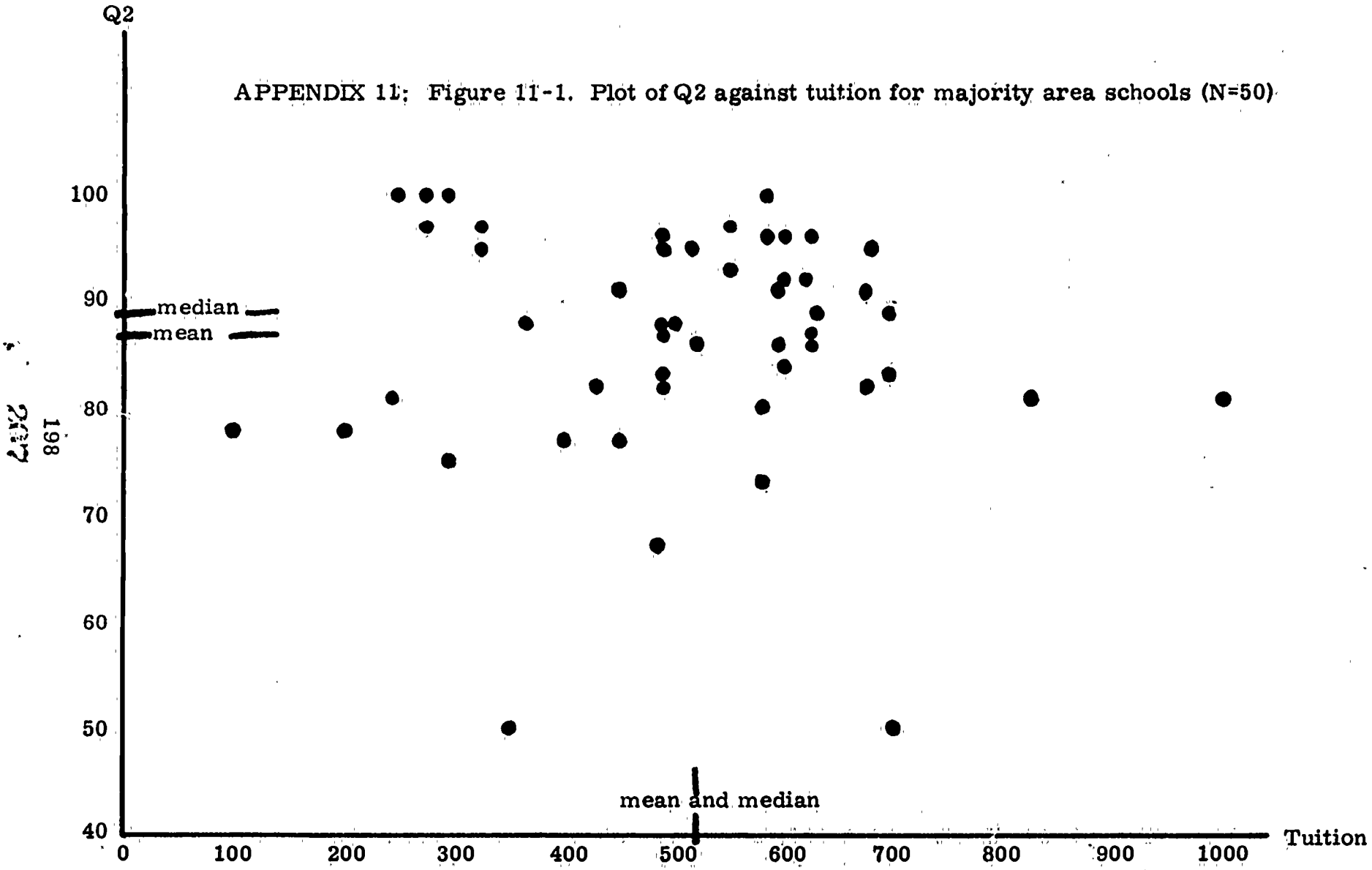
CROSSTABULATION OF Q2 AND SIZE

	Quintile	Q2-Passing 1	2	3	4	5	Row Total
Size	1	3	0	1	2	3	9
	2	4	1	1	5	1	12
	3	2	1	4	1	3	11
	4	0	6	2	3	0	11
	5	1	5	0	1	4	11
Column Total		10	13	8	12	11	54

Chi square = 30.7 with 16 degrees of freedom

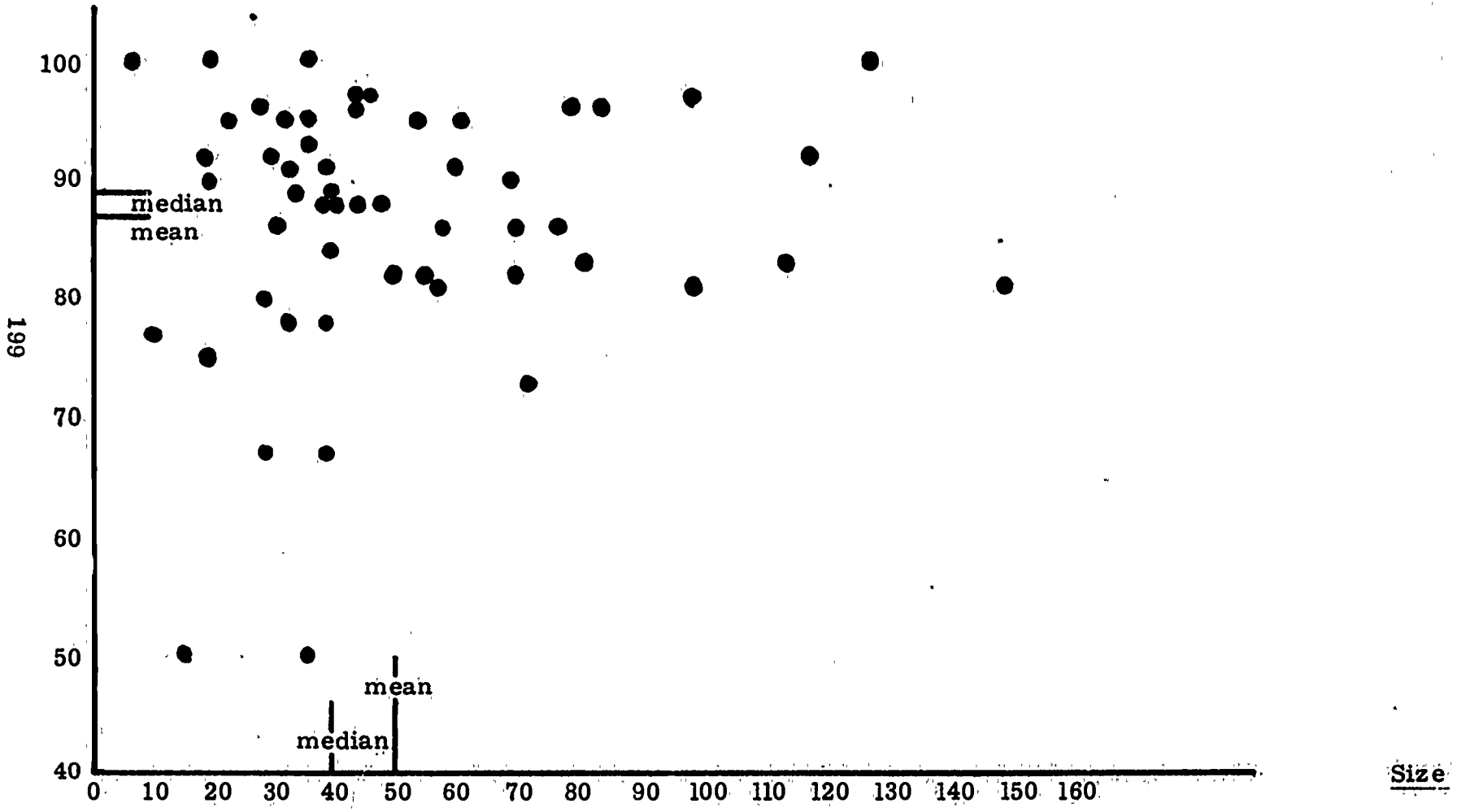
Significance = .01

APPENDIX 11: Figure 11-1. Plot of Q2 against tuition for majority area schools (N=50)



Q2

APPENDIX 11: Figure 11-2. Plot of Q2 against size for majority area schools (N= 54)



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