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Foreign-Trained Physicians And Health Care in the United States

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Economics

by

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ABSTRACT OF THE DISSERTATION

Foreign-Trained Physicians and Health Care in the United States

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Professor C. M. Lindsay, Chairman

This dissertation considers the effect on consumer well-being of the free migration of foreign-trained physicians to the United States. It also attempts to explain why U.S. policy makers diverged from their usual policy to allow unrestricted migration from 1965 to 1980.

First, a model of the market for physician services is presented in Chapter 2 that explains the variation in the employment of foreign medical graduates (FMGs) across states as a response to cross-sectional variations in the demand for lower quality physician services. Empirical verification of this model suggests that quality determination costs are not so high as to make FMGs and U.S. Medical Graduates (USMGs) indistinguishable to consumers. It is argued that this implies that physician migration may have a positive effect on aggregate consumer welfare. In particular, the empirical results suggest that, all else constant, the cost of care in hospital and long-term care facilities will be significantly affected by a reduction in the flow of FMGs to the United States.

The discussion of Chapter 3 of this paper also focuses on the role of FMGs and consumer welfare, but from a different point of view. Calculations

of the value of physician migration to consumer welfare in the late 1960s and early 1970s suggest that FMGs were used to alleviate what would have otherwise been a "tight" situation in the market for physician services in the United States. Basically, Chapter 3 is an attempt to substantiate a theory of consumer/physician/government interaction that explains why restrictions on physician migration were dropped in 1965 and reinstated with the Health Professions Educational Assistance Act of 1976.

INTRODUCTION

For many years prior to 1965 a combination of immigration restrictions limited the flow of foreign-trained physicians to the United States. Then, in 1965, at the same time that public and private health care expenditures were growing at an unprecedented rate, virtually all legal restrictions on physician migration to the U.S. were eliminated. The result was a dramatic increase in the flow of foreign medical graduates (FMGs) to the United States. (Physicians educated outside the U.S. and Canada are categorized as "foreign" medical graduates by the American Medical Association.)

By the early 1970's, foreign-trained physicians comprised over one-third of the annual addition to the U.S. stock of licensed physicians. Today, FMGs account for approximately twenty percent of the total U.S. physician stock. (Less than five percent of the foreign-trained physicians are American citizens who have gone abroad to study. (Dublin, 1974)).

Domestic physicians and health professionals have been outspoken in their opposition to physician migration. While some authors (Alexander and Sorkin, for example) deplore the generalizations made about FMGs, the general opinion is that they are of lower quality than U.S. medical graduates (USMGs):

> ...the foreign-trained physician lags behind his American trained colleague in important educational, academic and specialty achievements (Kosa, 1969)

> ...FMGs possess a level of professional knowledge and competence which is significantly below that of graduates of medical schools in the U.S. and Canada. (Margulies, 1968)

> ...there is substantial evidence which indicates that their only contribution is to a deterioration of the quality of care that Americans receive. (U.S. Congress, 1975)

There are others who recognize the value of the services provided by FMGs. Mishan and Needleman (1968) ask:

> Is not the immigrant provision of such services at existing prices preferable to a rise in the price of the services in the absence of immigration?

Even critics of physician migration agree that FMGs have filled a "void" in the U.S. health care delivery system:

> FMGs...fill positions on the staffs of state hospitals that are so desperate for help that they are willing to put almost any warm body into a white coat. (Derbyshire, 1975)

> (FMGs are a) readily available, though temporary means of relieving excessive burdens...on the domestic medical education system. (Coordinating Council on Medical Education, 1976)

On the domestic front, the call for increased government regulation of physician migration can be associated with what certain individuals feel are the particular characteristics of the fact that the market for physician services is unlike most other markets. Fuchs and Kramer (1972) state that restrictions on entry, the absence of price cutting and advertising to promote rivalry, and the difficulty consumers experience in judging quality is one factor that make the market for physician services different from other generally competitive markets. Knowles (1969) questions the ability of market forces to efficiently allocate physicial services. He says:

> Although a free market, free enterprise system is one of the bases of American life, many economists have questioned whether free market forces can balance supply and demand in the health care field when the consumer has no way

to judge quality.

In 1976 the federal government responded to the outcry of those opposed to the large scale employment of FMGs in the United States. The 1976 Health Professions Educational Assistance Act (HPEAA) contains provisions aimed at significantly reducing the employment of FMGs in the United States. The new law specifies that attaining immigrant or exchange visitor status is now contingent on passing the National Board of Medical Examiners' Visa Qualifying Examination (VQE). In addition, exchange visitor status now limits physicians seeking residency training in the U.S. to a two year stay and requires a commitment by the physician to return to his or her own country of origin at the end of that time. Other provisions of the 1976 act will affect the demand side of the market for FMGs by encouraging (subsidizing) the training of domestic substitutes (USMGs, physicial assistants, and other allied health professionals.)

The purpose of this dissertation is to evaluate the role that FMGs have played in the market for physician services in the United States, to assess the impact free migration has had on consumer welfare, and to provide some evidence as to whether or not restrictions on physician migration -- such as those incorporated in the 1976 HPEAA -- are desirable.

Tests of a cross-sectional model of the market for physician services in Chapter 2 of this paper (1) tell us that the role of FMGs in the U.S. has been to meet an effective demand for relatively lower quality physician services, (2) show that ignorance of physicial quality is not widespread, and (3) identify certain subgroups of the population that consume a disproportionate share of FMG services. These findings suggest that physician migration has a positive impact on consumer welfare in general, and particularly on the cost of care to those served by large-

scale or long-term facilities.

The discussion in Chapter 3 of this paper also focuses on the role of FMGs and consumer welfare, but from a different point of view. Calculations of the value of physician migration to consumer welfare in the late 1960s and early 1970s suggest that FMGs were used to alleviate what would have otherwise been a tight situation in the market for physician services in the United States. Basically, Chapter 3 is an attempt to substantiate a theory of consumer/physician/government interaction that explains why restrictions on physician migration were dropped in 1965 and reinstated with the Health Professions Educational Assistance Act of 1976.

In addition to giving us a better understanding of the role FMGs have played in the U.S. market for physician services, the conclusions of Chapters 2 and 3 also shed light on several health care issues that are not primarily related to the presence of foreign-trained physicians on American soil. For example, for years economists have had trouble formulating an appropriate model of physician behavior. Evans and Wolfson (1978) contend that physicians adjust their labor supply to attain some "target" level of income. This idea is not new, others have discussed the idea that physicians can "generate" demand for their services, distorting the normal cross-sectional distribution of physicians and earnings that we would expect to see if this demand generation were not possible. (Fuchs and Kramer (1972), Feldstein (1970)). The case is made in Chapter 3 of this paper that the changes in U.S. immigration policy with regard to FMGs are not inconsistent with a "target" income theory of domestic physician behavior in the short-run.

Another medical issue we discuss is the "need" for the current licensing system. The current system has been justified on the basis that the costs to consumers of determining physician quality are very high. Evidence presented at the end of Chapter 2 is in support of the hypothesis that purchasers of physician services are able to distinguish physicial quality without licensure as a guide.

Other health related issues that are discussed in the light of our observations about the employment of FMGs in the U.S. are increasing government subsidization of U.S. medical schools, and the effect some of the provisions of the 1976 HPEAA will have on the market for physician services in the United States.

CHAPTER 1

Review of the Literature

This chapter includes a review of the literature and statistics on FMG migration, a review of the legislation related to physician migration, and a review of several health manpower issues that will provide the background for our discussion of these issues in Chapter 4.

According to the records of the American Medical Association, there were 75,669 active foreign-trained physicians in the United States at the end of 1976, approximately twenty percent of the total physician stock. Seventy-seven percent were in patient care. (See Table 1.1.) Table 1.2 shows the distribution of FMGs across states.

The trend toward the increased employment of FMGs in the United States is evident in the statistics on newly licensed physicians. Since 1970, almost 40% of all newly licensed physicians have been FMGs. (See Table 1.3.)

The number of FMGs in internship and residency training positions has also increased dramatically. By 1976, there were 15,469 FMGs in residency positions in the United States. (See Table 1.4.) Until 1976, FMGs who desired to enter internships and residencies in the United States were required to pass a two-part exam given by the Educational Commission on Foreign Medical Graduates (ECFMG). FMGs earned the ECFMG Standard Certificate by passing an exam comprised of questions selected from the National Board of Medical Examiners (NBME) fourth year exam and an English language exam.

In addition to the fully-licensed FMGs and ECFMG-Certified FMGs in internships and residencies, other FMGs are issued temporary licenses to

TABLE 1.1

FEDERAL AND NON-FEDERAL FMGs AND USMGs BY ACTIVITY

December 31, 1976

	All Physicians	FMGs	% FMGs
Total Federal and Non-Federal	400,689	82,835	20.7
Non-Federal	373,111	77,982	20.9
Patient Care	294,730	58,435	19.8
Office Based			
General Practice	46,036	6,247	13.5
Medical Specialties	53,919	8,872	16.5
Surgical Specialties	68,473	9,221	13.5
Other Specialties	46,282	8,876	16.5
Hospital Based	80,020	25,219	31.5
Other Activity	26,135	5,222	20.0
Inactive	22,117	2,283	10.3
Not Classified	30,129	12,042	40.0
Federal	27,578	4,853	17.6

Source: Goodman, Louis J., Physician Distribution and Medical Licensure in the U.S., 1976, Center for Health Services Research and Development, American Medical Association, Chicago, c. 1977

TABLE 1.2

NON-FEDERAL USMGs AND FMGs ACROSS STATES

December 31, 1976

Total: 369,791

State	Total Physicians	FMGs	% FMG
Alabama	3951	290	7.3
Alaska	366	23	6.3
Arizona	4221	434	10.3
Arkansas	2253	60	2.7
California	47172	4136	8.8
Colorado	4871	242	5.0
Connecticut	7113	1627	22.9
Delaware	908	317	34.9
Florida	16001	3870	24.2
Georgia	6383	780	12.2
Hawaii	1567	292	18.6
Idaho	874	12	1.4
Illinois	18995	6829	40.0
Indiana	6401	845	13.2
Iowa	3325	434	13.1
Kansas	3221	432	13.4
Kentucky	4320	571	13.2
Louisiana	5266	435	8.3
Maine	1488	229	15.4
Maryland	9351	2869	30.7
Massachusetts	14185	2360	16.6
Michigan	13519	3835	28.4
Minnesota	7015	687	9.8
Mississippi	2248	116	5.2
Missouri	7379	1512	20.5
Montana	915	45	4.9
Nebraska	2135	140	6.6
Nevada	778	54	6.9

Table 1.2 (continued

State	Total Physicians	FMGs	% FMG
New Hampshire	1374	218	15.9
New Jersey	13107	5145	39.3
New Mexico	1586	160	10.1
New York	46614	18820	40.4
North Carolina	7403	533	7.2
North Dakota	725	129	17.8
Ohio	16201	4582	28.3
Oklahoma	3223	278	8.6
Oregon	4134	217	5.2
Pennsylvania	20619	3960	19.2
Rhode Island	1822	558	30.6
South Carolina	3304	213	6.4
South Dakota	631	82	13.0
Tennessee	6108	555	9.1
Texas	17309	2678	15.5
Utah	1971	60	3.0
Vermont	1031	74	7.2
Virginia	7541	1352	17.9
Washington	6163	512	8.3
West Virginia	2389	845	35.4
Wisconsin	6512	968	14.9
Wyoming	423	26	6.1

Source: Goodman, Louis J., Physician Distribution and Medical Licensure in the U.S., 1976, Center for Health Services Research and Development, American Medical Association, Chicago, c. 1977

TABLE 1.3

NEWLY LICENSED PHYSICIANS

Year	Total	FMGs	% FMG
1960	8030	1419	18
1961	8032	1580	20
1962	8005	1357	17
1963	8283	1451	18
1964	7911	1306	17
1965	9147	1528	17
1966	8851	1634	18
1967	9424	2081	22
1968	9766	2185	22
1969	9978	2307	23
1970	11032	3016	27
1971	12257	4314	35
1972	14476	6661	46
1973	16689	7419	44
1974	16706	6613	40
1975	16859	5965	35
1976	17724	6436	36

Source: Goodman, Louis J., Physician Distribution and Medical Licensure in the U.S., 1976, Center for Health Services Research and Development, American Medical Association, Chicago, 1977, p. 586-7

TABLE 1.4

INTERNSHIP AND RESIDENCY PROGRAMS IN THE UNITED STATES

Year	Positions Filled	Positions Filled by FMGs	% FMG	Positions Filled	Positions Filled by FMGs	% FMG
1960-1961	9115	1753	19	28447	8182	29
1961-1962	8173	1273	16	29637	7723	26
1962-1963	8805	1669	19	29239	7062	24
1963-1964	9636	2566	27	29485	7052	24
1964-1965	10097	2821	28	31005	8153	26
1965-1966	9670	2361	24	31898	9133	29
1966-1967	10366	2793	27	32050	9502	30
1967-1968	10419	2913	28	33743	10627	31
1968-1969	10464	3270	31	35047	11231	32
1969-1970	10808	2939	27	37139	12126	33
1970-1971	11552	3339	29	39463	12968	33
1971-1972	12066	3946	33	42512	13543	32
1972-1973	11161	3924	35	45081	14471	32
1973-1974	11031	3425	31	49082	14923	30
1974-1975	9827	2756	28	52685	15373	29
1975-1976	na	na	na	na	na	na
1976-1977	--	--	--	60561	15496	26

Source: American Medical Association, Directory of Accredited Residencies, 1977-78, Liaison Committee on Graduate Medical Education, American Medical Association, Chicago, 1977, p. 14.

work in state-run institutions. Five thousand, six hundred FMGs worked in this capacity in 1976 (Goodman, 1977). Most states require ECFMG Certification, but in a 1971 survey, eleven states were found issuing temporary licenses to FMGs without ECFMG Standard Certificates (Schnibbe, 1971). A survey by Weiss, et. al., on FMGs taking the ECFMG exam in 1971 suggests that, at that time, 13,870 uncertified, unlicensed FMGs were working in the health care field providing some type of patient care.

The history of the legislation governing FMG migration begins with the Surplus Property Act of 1944. This Act allowed for limited educational exchange activities, beginning in 1946. In 1948, the U.S. Information and Educational Exchange Act (the Smith-Mundt Act) created the "exchange visitor" (J visa) status for non-immigrants seeking graduate training in the United States. (See LeRoy, 1977, for a more complete discussion.)

It was not until 1965 that steps were taken to significantly reduce migration restrictions facing foreign-trained physicians. The Immigration Act of 1965 abolished quotas based on national origin and established a more flexible system of hemispheric quotas. Two of the six "preferred" immigration categories that were set forth applied directly to physicians: (1) Third Preference: Members of the professions or persons of exceptional ability in the arts and sciences. (2) Sixth Preference: Skilled or unskilled workers in short supply.[1]

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[1] For a skill to be considered in short supply under the sixth preference category, the Act requires that the Secretary of Labor must find that "there are not sufficient workers in the United States who are willing, qualified, and available at the time of application for a visa and admission to the United States and at the place to which the alien is destined to perform such skilled or unskilled labor" and that "the employment of such aliens will not adversely affect the wages and working conditions of the workers in the United States similarly employed."

Following this, in 1971, Public Law 91-225 eliminated the 1956 amendment to the Smith-Mundt Act which had required individuals with exchange visitor status to spend two years abroad before applying to permanently immigrate to the United States.

The combined effect of these laws was to eliminate all restrictions on the immigration of foreign-trained physicians to the United States. The major effect was on migration from Asia, where large numbers of medical school graduates "flood" the market for physician services (see Myint, 1962; Gish, 1971; Adams, 1968; Bowers, 1971; Joorabchi, 1973). (See Tables 1.5, 1.6 and 1.7.) The peak in immigration rates in the early 1970s is attributed to the fact that many exchange visitors already in the United States were able to "adjust" their status (to immigrant status from exchange visitor status), so that the peak doesn't reflect actual new arrivals (see Table 1.5, Column 3).

Reflecting a turnabout in U.S. policy toward physician migration, the 1976 Health Professions Educational Assistance Act (HPEAA) includes provisions to bring unrestricted physician migration to an end by 1980. Whereas, previously, only FMGs seeking preference visas were required to pass the ECFMG administered exam, the new legislation includes a provision which makes alien physicians seeking immigrant status ineligible for any visa unless they can pass the equivalent of both Parts I and II of the National Board of Medical Examiners' Examination. In accordance with this requirement, the NBME has written a new exam for immigrant physicians -- the Visa Qualifying Examination (VQE). This two-day test was first administered, along with the ECFMG's English language exam, in 1977. (See U.S. Congress, 1976; Goodman, 1977.)

TABLE 1.5

Column 1: Total Physicians & Surgeons Granted "Immigrant Status"

Column 2: Asian Physicians & Surgeons Granted "Immigrant Status"

Column 3: Actual New Arrivals to the U.S.

	Column 1	Column 2	Column 3
1956	1388	139	
1957	1990	155	
1958	1934	316	
1959	1630	207	
1960	1574	244	
1961	1683	269	
1962	1797	265	
1963	2093	260	
1964	2249	204	
1965	2012	205	6014
1966	2549	588	6628
1967	3325	1116	8115
1968	3060	1195	8405
1969	2756	1435	6939
1970	3155	1726	7630
1971	5756	3836	7879
1972	7144	5046	7024
1973	7119	5029	8123
1974	4537	2966	
1975	5361	3279	

Sources:

Column 1: Immigration and Naturalization Service, Annual Report, U.S. Department of Justice, Washington, D.C., yearly.

Column 2: Same as above.

Column 3: Stevens, Rosemary, et. al., "How Many Immigrant Physicians? A Critical Look At Migration Statistics" Mimeo, Feb. 1975

Note: Physicians in columns 1 and 2 may not be new entrants. They may be "exchange visitors" who adjust their status to "immigrant status". Column 3 includes immigrants and exchange visitors.

TABLE 1.6

BENEFICIARIES OF OCCUPATIONAL PREFERENCES AND OTHERS GRANTED IMMIGRANT STATUS -- PHYSICIANS AND SURGEONS

(These figures include new arrivals and those who have adjusted their status from "exchange visitor" status.)

Year	Total	Third Preference (Exceptional Ability)	Sixth Preference (Short Supply)	Other Immigrants
1967	3326	997	20	2309
1968	3128	873	163	2092
1969	2756	887	109	1760
1970	3158	710	130	2318
1971	5756	1121	363	4272
1972	7144	1380	291	5473
1973	7119	1624	105	5390
1974	4537	1424	261	2825
1975	5361	1606	296	3459

TEMPORARY WORKERS ADMITTED UNDER THE IMMIGRATION AND NATIONALITY ACT -- PHYSICIANS AND SURGEONS

Year	Total	Distinguished Merit/ Ability	Other Temp. Workers	Industrial Trainees	Exchange Visitors
1967	5571	63	3	301	5204
1968	5997	61	7	228	5701
1969	4759	62	20	217	4460
1970	5365	83	100	174	5008
1971	5191	178	47	173	4784
1972	4283	231	25	82	3935
1973	5166	350	--	178	4613
1974	5517	578	--	149	4717
1975	3466	426	48	143	2829

Source: Immigration & Naturalization Service, Annual Report, U.S. Department of Justice, Washington, D.C.

TABLE 1.7

IMMIGRANT PHYSICIANS AND SURGEONS GRANTED IMMIGRANT STATUS BY REGION OF LAST PERMANENT RESIDENCE

	1962	1965	1970	1971	1972	1973	1974	1975
Total	1797	2012	3155	5756	7144	7119	4537	5361
Europe	502	568	643	729	826	946	703	958
North & Central America	692	848	412	728	696	505	451	547
South America	298	348	160	269	263	296	200	290
Asia	265	205	1726	3836	5046	5029	2966	3279
Africa	32	31	188	168	222	285	181	247
Other	8	12	26	26	55	68	36	40

(These figures include new arrivals and those who have adjusted their status from "exchange visitor" status.)

Source: 1962, 1965 Scientists, Engineers & Physicians from Abroad, Trends Through Fiscal Year 1970, Surveys of Science Resource Series, National Science Foundation, NSF 72-312, U.S. Government Printing Office, June 1972.

1970-1975 Immigration and Naturalization Service Tables, available from I&NS on request.

The 1976 Act also changed the law with regard to exchange visitor status. The new provisions require that in order for a foreign-trained physician to enter the U.S. on an exchange visitor visa s/he must pass the VQE and the ECFMG's English language exam and must make a commitment to return home upon completion of residency training. (U.S. Congress, 1976). In addition, the new law limits persons coming to the U.S. with exchange visitor status to a two-year stay (eliminating the easy adjustment of status possible under the old law).[2]

The intent of the legislation is unclear. It cannot help but to substantially reduce the employment of FMGs, especially in conjunction with the provisions in the 1976 law for the continuing expansion of U.S. medical schools and domestic training programs for allied health personnel. What follows is a review of the controversy over physician migration that led to the new legislation.

Concern over FMGs providing patient care in the U.S. goes back before the unprecedented increase in physician migration of the last ten years (JAMA, 1959; LeRoy, 1977, p. 2). Opponents of physician migration point out that FMGs do worse on professional exams and are generally less-skilled than USMGs. (See, for example, Williams, 1976; Merchant, 1973; Dublin, August 1974; U.S. Congress, 1974; McDermott, 1974; Lowin, 1975; U.S. Congress, 1975; Crispell, 1974; Dublin, 1972; Kosa, 1969;

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[2]The effect of this new exchange visitor legislation will be somewhat attenuated until December 31, 1980, due to a provision in the law that states that the requirements will not apply until that date to "any alien who seeks to come to the U.S. to participate in an accredited program of graduate medical education or training if there would be a substantial disruption in the health services provided in such a program because such alien was not permitted to...participate..." (U.S. Congress, 1976).

Marguilies, 1968.) Only a few studies have attempted to do more than compare test scores, and their results confirm that the FMG quality distribution is heavily weighted near the low range of professional competence. Halberstam and Dasco (1966), in an attempt to assess the training experiences of FMGs through supervisor's and self-evaluations of 320 foreign and American trained residents in university-affiliated hospitals, found that the overwhelming majority of the respondents gave the U.S.-educated residents higher ratings. (Residents were rated on "knowledge of basic medical sciences", "knowledge of clinical medicine", "amount of supervision required", and were also given an overall rating.) A study by Margulies, Bloch, and Cholko (1968) surveyed the judgments of 271 hospital staff members who taught and supervised interns and residents. Their conclusions were that

> the data show that foreign medical graduates possess a level of professional knowledge and competence which is significantly below that of graduates of the medical schools in the United States and Canada.

Another frequently raised objection is that FMG migration does not contribute to the equilization of physician-population ratios across states. (See, for example, U.S. Congress, 1975; Crispell, 1974; AMA, 1973; Hussey, 1974; Schaffner and Butter, 1972). But, in their defense, it is pointed out that FMGs serve segments of the population that would otherwise have less access to care: the urban poor, Medicare and Medicaid recipients, and those served by state-run mental institutions (LeRoy, 1977; p. 27, 55, 99; Lowin, 1975; Feldstein and Butter, 1975; Studnicki, 1976; Derbyshire, 1975). Also, many feel that physician migration is one way to temporarily relieve a domestic physician

"shortage" (CCME, 1976; Reinhardt, 1975; Mishan and Needleman, 1968, Lave, et. al., 1974; LeRoy, 1977, p. 48, 26).

Since 1967, four major reports on FMGs have been written by groups closely associated to what one might call the American medical "establishment". All four have come out against the employment of lower quality FMGs. The four reports were done by

1) The Coordinating Council on Medical Education (CCME), June, 1976.
2) The Task Force on FMGs of the Association of American Medical Colleges (AAMC), 1974 (Crispell, 1974)
3) The National Board of Medical Examiners' (NBME) Committee on Goals and Priorities, June, 1973
4) The National Advisory Commission on Health Manpower (NACHM), 1967.

The four reports discuss FMG quality and the rising employment of FMGs. On the basis of this information alone, the authors of these reports make recommendations as to what health care delivery "should" be like in the United States.

All four of the reports recommend that the quality standards associated with American medical education should be applied to all physicians seeking employment in the U.S. In other words, only "highly qualified" FMGs should be allowed to work in the U.S. and the U.S. should educate "enough" USMGs to meet the "needs" of the nation. These conclusions obviously influenced the policy-makers responsible for the 1976 health manpower legislation.

Yet, with all the anecdotal evidence and editorial comments pro and con physician migration, the literature on FMGs is not adequate to determine whether or not the United States should encourage physician migration. One recent survey of the research literature on FMGs (Lowin,

1975) put it this way:

> ...we have no idea, at least from the research literature, on the net benefits and losses to patient well-being of increasing or decreasing the supplies of lower quality services that are perhaps provided by less competent FMGs. In brief, even in the simplest sense, there is no basis in the research evidence from which to argue one way or the other as to whether, in the short-run, lesser competent FMGs are better than having altogether fewer physicians....There is no basis in evidence from which to assess the short-term implications of a future change in the supply of FMGs.

Before going on to evaluate physician migration, we take a brief look at four health manpower issues. This will provide us with some background for the further discussion of these topics in the remaining chapters of this paper.

I. Determinants of Physician Distribution Across States

Statistics on FMGs show that they are overrepresented in unaffiliated residencies (AMA, 1977) and that they tend to be hospital-based more than their American counterparts (Goodman, 1977). As mentioned above, they locate in urban areas at least as much as USMGs, a fact often lamented by those who worry about the "maldistribution" of physicians in the United States. In Chicago they supply seventy-five percent of all care received by Medicaid recipients (LeRoy, 1977, p. 56). Finally, although there are no good statistics, it is often mentioned that FMGs staff inner city hospitals and state mental hospitals.

Beyond this casual accumulation of evidence, no one has tried to systematically explain variations in the distribution of FMGs across states. There have, of course, been many attempts to analyze the distribution of all physicians across states. A short review of this

literature seems an appropriate starting point for our attempt at explaining the distribution of FMGs across states in Chapter 2. (For a more complete literature review, see Lave, et. al., 1974; Long, 1975; and U.S. DHEW, July 1974.)

According to Long (1975), there are ten types of variables that have been included in some or all of the numerous cross-sectional studies of physician location. They are community or origin, location of medical education, medical school proximity (medical practice environment), hospital facilities (complements to physician services), population (size, composition -- age and sex, etc., and population growth), urbanization, per capita income, physician income, cultural, social and environmental conditions, and licensure requirements.

Lave, et. al., (1974) look at several models of the medical marketplace and identify supply and demand variables that have been included with varying degrees of success. On the demand side, in addition to population and price, they identify six sets of variables that investigators have used. Age and sex are used to proxy the underlying health status of an area; education is an indication of the level of awareness of the benefits from health care; reported money income is used to represent earned and unearned income; distance to medical facilities is used to measure the time costs of obtaining care; and finally, evidence that suggests that physician-induced demand is a real factor leads to the inclusion of the number of physicians in the demand equation. (See the next section for a further discussion of physician-induced demand.)

On the supply side, Lave, et. al., report that most of the studies that have been done have focused attention on trying to explain physician

"maldistribution" across states. Supply variables most often used include such things as population, income, leisure, per capita income (as a proxy for the "good life"), proximity to medical schools, earnings, hospital beds, and medical facilities (complementarity with physician services are thought to make these last two variables relevant). Although opinion polls may not be a good source of accurate information on tastes and preferences, Lave, et. al., cite polls that show that physicians indicate an interest in case variety, income security, leisure time, colleagues, and urban areas over incremental units of income.

II. Models of Physician Behavior

Several studies have presented empirical evidence for the idea that physicians, by their own actions, are able to shift out the demand curve for physician services. Fuchs and Kramer (1972) found that where physician/population ratios are high, so are per capita expenditures on physician services and utilization rates. In most markets a relative abundance of services would yield greater consumption, but at lower prices. According to Fuchs and Kramers' interpretation of their own results, further increases in the U.S. physician stock would not reduce physician earnings or reduce the so-called "maldistribution" of physicians, but, instead, lead to a substantial increase in utilization in already highly serviced areas. In other words, it seems, to some extent, that physicians locate in areas with desirable living conditions and "create" a demand for their services.

A study of the Canadian medical marketplace makes a convincing case for the conclusion that physicians generate demand to reach or maintain "target" levels of income (Evans and Wolfson, 1978).

Martin Feldstein's 1970 study of the medical marketplace concludes that because there is what he calls "excess demand" in the market for physician services, physicians have discretionary power to vary both the price and quantity of service which they supply. His results show that higher consumer incomes and more complete insurance coverage tend to encourage physicians to increase their prices and reduce the units of service provided. This result is consistent with the "target" income concept of physician behavior -- when fees go up, hours worked fall. This result should not be particularly surprising to labor economists, as empirical estimates of labor supply curves for white males consistently show a backward-bending supply curve above certain wage levels, and physicians are certainly near the top range of the earnings distribution.

III. Licensure

The justification for the current system of medical licensure is to protect consumers from dishonest and incompetent practitioners in a market where quality determination costs are thought to be relatively high. Current discussion of licensure centers around several allegations, as presented in a 1971 Department of Health, Education and Welfare report on licensure and related health personnel credentialing (U.S. Department HEW, June, 1971, p. 5). The authors of the report caution us not to accept the allegations without critical examination. It turns out that the analysis of the market for physician services presented below in Chapter 2 results in one bit of evidence in favor of one of the allegations: "that licensure and certification have outlived their usefulness as quality-control and consumer-protection measures".

Limited licensure has also been a topic of discussion among health professionals. Feldstein and Butter (1975) suggest that limited licensure by task might reduce some of the concern over the possibility of misrepresentation of physician quality by FMGs. While, clearly, the desirability of limited licensure depends on whether quality determination costs are high and whether the situation warrants the expense of limited licensure (quality determination costs are assessed in Chapter 2 of this paper), Feldstein and Butter are implicitly making the point that is stressed in the next chapter, that the justification for concern over FMGs should not lie with the quality of services, but with whether or not consumers can identify quality.

IV. The Supply of USMGs

The Health Professions Educational Assistance Act of 1963 represented a first attempt by the U.S. Congress to provide direct financial assistance to schools that were willing to expand enrollment. Inspired by a 1970 Carnegie Commission report that concluded that the nation suffered from a shortage of physicians, the 1971 Comprehensive Health Manpower Training Act authorized capitation grants -- annual amounts paid to schools to encourage growth in medical school enrollments (LeRoy, 1977, p. 107). By 1975-76, federal funds accounted for thirty-seven percent of medical schools' sources of revenues (JAMA 238(26):2779). The effect of the grant is to encourage the expansion of domestic medical school capacity. Current projections of the supply of USMGs (U.S. DHEW, December 1974, p. 71) show that in nearly every specialty field (except general practice, physical medicine and rehabilitation, and anesthesiology) the 1990 physician-population ratio of USMGs alone will exceed or

equal the ratio for all physicians (including Canadian graduates and FMGs) that prevailed in 1970. Blumberg, in a study of the Carnegie Commission on Higher Education (1971, p. 53), projects to an even greater growth in the domestic physician supply than do the HEW estimates.

Discussing the federal government's role in the development of health manpower, and based on the current projections of the growth of the domestic physician stock, some observers believe that the government should not continue to encourage the expansion of U.S. medical school capacity. (See, for example, U.S. Congress, 1975b; Fields, 1976.) The insights gained by our study of FMGs in the medical marketplace will allow us to comment on this controversy in Chapter 4 below.

CHAPTER 2

Quality Determination

Critics argue that physician migration is not in consumers' best interests because foreign-trained physicians do not, in general, meet the quality standards set for domestic medical school graduates. The argument (that the availability of lower quality physicians is not in consumers' best interests) can be interpreted in one of two ways: Either (1) they are concerned that consumer losses from not being able to distinguish lower quality physicians from higher quality physicians outweigh the gains that accrue from the increased availability of physician services, or (2) they do not think quality determination costs are severe, but they are just trying to constrain consumers of physician services to the kinds of physician services that they think consumers "should" be buying. In this chapter we will evaluate the more substantial first interpretation. But, how does one objectively measure a consumer's loss due to "ignorance of physician quality"?

It would be ideal if we would quantify the gains and losses to domestic consumers from physician migration to determine whether or not physician migration is, in fact, undesirable, but these gains and losses are not easily quantified.

Faced with this measurement problem we have chosen an alternative approach that focuses solely on the quality identification problem. Our approach uses a simultaneous equation model of the market for physician

services. The null hypothesis of the model is that ignorance of physician quality is widespread, i.e., that consumers cannot distinguish between lower and higher quality physician services. In the model, variations in the demand for FMGs (USMGs) are a positive (negative) function of the size of population sub-groups that we would expect to demand lesser-skilled physician services. Empirical verification of this specification is inconsistent with the null hypothesis that consumers cannot distinguish physician quality and weakens the defense of migration restrictions as being in consumers best interests.

Empirical verification of the specification of this model also provides evidence for the debate over the desirability of accreditation and licensure. The justification for accreditation and licensure has always been based on the idea that consumer ignorance of physician quality could cause damage if unscrupulous physicians prevent unsuspecting patients from receiving proper care.

In addition, tests of the model will identify sub-groups of the U.S. population that consume FMG services. These groups of individuals should be affected most strongly by the provisions of the 1976 Health Professions Education Assistance Act which limit migration.

The Model

This cross-sectional model of the market for physician services is based on the assumption that there are differences between USMGs and FMGs, particularly in their levels of training and acquired skills. For this reason, we would expect there to be separate markets for FMG and USMG services and that the market for FMG services could be represented by a simultaneous equation model of this type:

$$(1) \qquad Q^{S}_{FMG} = \alpha + \beta_1 P_{FMG} + \beta_2 X_1 + \beta_3 X_2 + \ldots$$

$$(2) \qquad Q^{D}_{FMG} = \alpha' + \beta'_1 P_{FMG} + \beta'_2 P_{USMG} + \beta'_3 Y_1 + \beta'_4 Y_2 + \ldots$$

$$(3) \qquad Q^{S}_{FMG} = Q^{D}_{FMG} = Q_{FMG}$$

In this model the X's are exogenously determined independent variables in the supply equation, the Y's are exogenously determined independent variables in the demand equation, P_{FMG} is the price or earnings of FMGs, Q^{S}_{FMG} is the quantity of FMGs supplied, and Q^{D}_{FMG} is the quantity demanded. Both price and quantity are endogenous to the model. The equilibrium assumption (equation (3) above) is justified by the fact that there are no restrictions on wages that FMGs can be paid across states.

Although FMGs and USMGs are not perfect substitutes, it is likely that there is some degree of substitutability. The demand for FMGs will be a function of the price of USMGs, as shown in equation (2) above, which, in turn, will depend not only on the supply and demand for USMGs, but also on the price of FMGs. For this reason, the price of USMG services is really an endogenous variable.

Three more equations complete the model:

$$(4) \qquad Q^{S}_{USMG} = a + b_1 P_{USMG} + b_2 M_1 + b_3 M_2 + \ldots$$

$$(5) \qquad Q^{D}_{USMG} = a' + b'_1 P_{USMG} + b'_2 P_{FMG} + b'_3 N_1 + b'_4 N_2 + \ldots$$

$$(6) \qquad A^{S}_{USMG} = Q^{D}_{USMG} = Q_{USMG}$$

The M's are exogenously determined independent variables in the supply equation, the N's are exogenously determined independent variables in the demand equation, P_{USMG} is the price or earnings of USMGs, Q^{D}_{USMG} is the quantity of USMGs demanded and Q^{S}_{USMG} is the quantity of USMGs supplied. Again, both P's and Q_{USMG} are endogenous to the model. While there

might be some problem using equation (4) in a time series model, as it is not clear how well or how quickly the aggregate supply of USMGs responds to market conditions, this is a cross-sectional model. Given the aggregate supply of USMGs, the supply to each state will be a function of the price and other factors.

Three types of variables should be included in the supply equations (equations (1) and (4) above): pecuniary earnings (price), which are endogenous to the model, and two types of exogenous variables, those that measure the non-pecuniary aspects of the work environment in a particular state, and those that measure the non-pecuniary aspects of the living environment. It will be assumed that USMGs and FMGs have different tastes for living environments and similar tastes for the pecuniary and non-pecuniary aspects of the work environment.

It is the role of the demand variables of this model to test the null hypothesis that consumers are not able to distinguish less-skilled foreign medical graduates from graduates of American medical schools. Within the limits of the available data, five population sub-groups have been picked that could be expected to have an effective demand for relatively lower quality physician services. The five groups are:

I. Individuals who receive care in large-scale facilities.

II. Individuals in long-term car facilities.

III. Individuals who obtain health care at governmentally-run health care facilities.

IV. Low income individuals.

V. Individuals whose health care costs are paid through government reimbursement of private medical vendors.

I. Individuals who receive care in large-scale facilities.

Large-scale facilities offer the opportunity for a division of labor between relatively lesser and greater skilled physicians that could result in lower average costs in the production of physician services for these facilities. While no one has studied the role of FMGs in such a division of labor, it has been estimated that "physician assistants", for example, can replace one-half of a full-time physician (Zeckhauser and Eliastam, 1973). (For additional evidence of economies of scale due to division of labor, see Reinhardt, 1972 and Golladay, et. al., 1973.) The acknowledge difference between FMGs' and USMGs' skills suggests that FMGs may be relatively good substitutes for USMGs for simple tasks, but very poor substitutes for sophisticated medical procedures. For this reason, we would expect the employment of FMGs to be proportionally greater in states where the large-scale provision of medical care allows for some division of labor. At this point the objection may be made that the existence of large scale facilities is not really exogenous to our model, as it will depend to some extent on the supply of FMGs. We would expect that the extent of large scale provision of services in any state is determined by the supply of FMGs to that state, which allows the advantage of economies of scale, and by the demand for large scale provision of care, which is a function of factors such as locational differences in population density, types of illnesses, payment mechanisms, and individuals' tastes for private practice care. In order to avoid this simultaneity problem, we assume that the presence of FMGs plays only a relatively small part in the decision as to whether to use large scale facilities (i.e., that population density, types of illnesses, payment mechanisms, tastes, etc., dominate). (Alternatively, we could use the

assumption that at the time our data was gathered, the scale of facilities in any state had not yet adjusted to increases in FMG migration, so that variations in scale across states will only represent cross-sectional differences in demand factors. To justify this assumption, note that the continuing efforts of health professionals to restrict physician migration during the recent period of free migration may have deterred the building of new facilities to more effectively incorporate the use of large numbers of FMGs.)

II. Individuals in long-term care facilities

There are three reasons why individuals in long-term care facilities could be expected to have an effective demand for relatively lower quality care, all else constant. First, many long-term care facilities specialize in providing only "custodial care", yet are required by law to provide a physician's services. (See U.S. Congress, February, 1974.) Here is a situation where sophisticated skills may seldom be required. In a market where quality differences are observable, so that FMGs are cheaper, an FMG may be a relatively good substitute for a USMG.

Second, it is likely that relatives or friends, who place patients in long-term care facilities (mental hospitals, nursing homes, etc.) face high costs of monitoring the quality of care that the patients receive. Relatively high costs of monitoring physician care in these instances implies that less monitoring will be done and, therefore, that other factors will have a relatively greater influence on the decision-makers. As a result of this, there is less of an incentive for owners of long-term care facilities to hire relatively skilled physicians.

Finally, for many individuals in long-term care facilities, the aged and mentally disturbed, for example, returning to a normal life may not be a possibility. In this case, the cost of less than excellent care can only be discomfort or premature death, since the alternative of release is precluded. There is a low present value of future utility prodding these people's relatives to buy them quality care.

III. Individuals who obtain health care at government-run facilities

There are several reasons that we would expect government-run institutions to have an effective demand for relatively lower quality physician services. First, we would expect that the incentive facing legislators to provide quality care is less than it would be if they were seeking physician care for their own consumption, partly due to human nature and partly due to the relatively greater costs of judging the quality of care in a situation where the purchaser is not the one consuming the product. The legislature, in evaluating a program, faces a problem in not being the primary consumer. As a result of this, we would expect them to judge a program based on the most cheaply measureable aspects of the output, such as quantity (units) of services provided, etc., instead of quality, reducing the incentive for hospital managers to expend resources on high quality physician services (see Lindsay, 1976). Finally, the usual incentive in the market to maintain quality is a desire to keep customers coming back. There is no need to do this in public provision -- as consumers cannot express their preferences by changing producers.

IV. Low income individuals

Another variable that should be included in the demand equation is a measure of the number of low income individuals. This is because, at lower income levels, consumers will consume less of all superior goods. While one way to reduce consumption of a good is to buy fewer goods of a particular quality, another way is to buy lower quality goods. (For example, you cannot sit on one-eighth of a high quality couch, so instead you will buy fewer units of couch services from a whole, cheaper couch.) This, along with the indivisibility of physician services, implies that we should observe that lower income individuals consume a relatively greater percentage of their consumption of physician services from FMGs, who are, on the average, less suited to practice in the United States than their American counterparts.

V. Individuals whose health care costs are paid through government reimbursement of private medical vendors

Physicians cite several things about government reimbursement that make it unattractive. (See Goldstone, 1975; MSMS, 1976; Oliver, 1977; and Weikel, 1976.) Briefly, they say that they dislike dealing with the government bureaucracy, the extensive forms, and the possibility of not getting paid on time, or at all. Non-pecuniary factors such as these reduce the units of service of health care that a government dollar will buy, compared to the free market purchase of such services. Also, there are payment limits on many services. We would expect that these factors could effectively constrain individuals whose health care costs are paid for by public expenditures to purchase relatively lower quality physician services.

The identification of these consumer groups provides the basis for empirical tests of the model, and therefore of the null hypothesis. For simplicity, the size of these population sub-groups will be included as variables in both the USMG and FMG demand equations. As we would expect them to have positive coefficients in the FMG demand equation, they should be negatively related to variations in the equilibrium distribution of USMGs across states.

Tests of the Model:

A two-stage-least squares estimation of this simultaneous equation model was done with 1970 data. The results were not satisfactory. They are reported in Appendix 3. (See Appendix 1 for the sources of all data and Appendix 2 for the identification of this simultaneous model.) Estimation of the simultaneous model was severely hampered by two problems. First, physicians' earnings data are not available separately for FMGs and USMGs. The only available cross-sectional data on physicians' earnings are Internal Revenue Service data on median physician earnings (in solo practice) by state. The main disadvantage of using these earnings data is that they are a composite of all physician's earnings. This means that if one group of physicians earns more, on the average, than another, as we would expect to be the case when we consider FMGs and USMGs, then physician earnings for each state will reflect the composition of the physician stock. For this reason, the composite data is not even a good index of earnings across states. In terms of the model presented earlier, using the composite earnings variable would underestimate the coefficients of the earnings variables in the FMG equations and over-estimate the coefficients of the earnings variables in the

USMG equations, biasing all other coefficients.

A second problem with the estimation of the simultaneous model is the difficulty in finding good data to represent the X's and M's -- the exogenous, non-pecuniary determinants of labor supply. Lack of good measures of non-pecuniary aspects of locational choice seems to have obscured the expected positive relationship between earnings and physician supply in the FMG and USMG supply equations.

Two other methods of looking at the data have been attempted, with better results. First, all of the supply and demand variables (except prive) were combined into two reduced-form equations, one with per capita FMGs as the dependent variable and one with per capita USMGs as the dependent variable. The second method also uses ordinary least squares, but with the percentage of all physicians that are FMGs as the dependent variable.

Method 1:

$$\text{Equation 1:}\quad FMGP = C + b_1^f\,MEDSTUP + b_2^f\,FRNBRNP + b_3^f\,HOSPPHYP + b_4^f\,LTBEDSP + b_5^f\,UAPUBEDP + b_6^f\,PUBPAYP + b_7^f\,\begin{matrix}FAMINC\ (1970)\\ \text{or } PCI\ (1976)\end{matrix} + e_f$$

$$\text{Equation 2:}\quad USMGP = C + b_1^u\,MEDSTUP + b_2^u\,FRNBRNP + b_3^u\,HOSPPHYP + b_4^u\,LTBEDSP + b_5^u\,UAPUBEDP + b_6^u\,PUBPAYP + b_7^u\,\begin{matrix}FAMINC\ (1970)\\ \text{or } PCI\ (1976)\end{matrix} + e_u$$

In these equations, all of the variables that are related to the size of the state are measured as a ratio to the total state population. (For example, FMGP is the ratio of FMGs to the total population.) This avoids extreme multicollinearity in the explanatory variables. FMGP and USMGP: The cross-sectional data on FMGs and USMGs are 1970 and 1976 observations by state, taken from the American Medical Association's Masterfile (Haug, 1971; Goodman, 1977). The Masterfile keeps records on all medical school graduates in the United States who are either licensed physicians, interns or residents. (From estimates of the total number of FMGs working in the United States (see Chapter 1), it would appear that twenty percent of the stock is not included in the AMA Masterfile. This twenty percent includes FMGs who work with temporary licenses and FMGs who work in health care, but are not called "physicians", i.e., the "medical underground".) (Canadian medical graduates are not included in the AMA tabulations of foreign medical graduates, as they are considered to be extremely close substitutes for USMGs.)

FRNBRNP: The percentage of the state population that is foreign-born is used as a proxy for the non-pecuniary aspects of locational choice that would appeal to foreign-trained physicians.

MEDSTUP: The percentage of the state population that is in medical school was originally included in the supply equation of the model as a proxy for the non-pecuniary aspects of employment that appeal to physicians. (Hospitals affiliated with medical schools are generally the most modern and prestigious.) Instead, ordinary least squares estimates show that, empirically, MEDSTUP is negatively correlated with the employment of FMGs across states. This may be because the desirable non-pecuniary aspects of working at an "affiliated" hospital make the costs of

attracting domestic physicians relatively low. Also, hospitals associated with medical schools produce a joint product, medical education and patient care, which suggests that they may have an effective demand for relatively higher quality physician services.

HOSPPHYP: The percentage of the state population that is hospital-based physicians is used as a measure of the size of the group of individuals in each state that receive care in large-scale facilities.

LTBEDSP: The number of long-term beds per capita (TB, chronic care, and mental illness) is used as a measure of the size of the group of individuals in long-term care facilities.

UAPUBEDP: The number of beds in public hospitals (not affiliated with medical schools), per capita, is used as a measure of the size of the group of individuals who obtain health care at governmentally-run health care facilities. The calculation is based solely on the beds in hospitals that are not affiliated with medical schools to avoid the effect of confounding the demand for physicians in public facilities with the demand for physicians as instructors in medicine.

FAMINC (1970) or PCI (1976): Median family income or per capita income is used as an indication of the size of the group of low income individuals. (Median family income is a measure that is less influenced by outlying observations, but it is only available for 1970.)

PUBPAYP: Public payments to medical vendors per capita is used as a measure of the size of the group of individuals whose health costs are paid through government reimbursement of medical vendors.

A constant term, C, has been included in all the equations to give the linear approximation of the true equation the greatest amount of flexibility possible in estimating the true coefficients of the variables

in the range in which the observations were recorded.

We expect the coefficients of the demand variables to be positive in the FMG demand equation and negative in the USMG equation. Ordinary Least Squares estimates of the Method 1 equations are presented in Table 2.1.

Method 2:

$$\text{PERFMG} = C + b_1^p \text{ MEDSTUP} + b_2^p \text{ FRNBRNP} + b_3^p \text{ PERPHYHB} + b_4^p \text{ PERLTBED} + b_5^p \text{ PERUAPUB} + b_6^p \text{ PERPUPAY} + b_7^p \begin{matrix}\text{FAMINC (1970)} \\ \text{or PCI (1976)}\end{matrix} + e_p$$

PERFMG is the percentage of all medical school graduates in each state that are foreign-trained.

FRNPRNP, the percentage of the state population that is foreign born, has the same interpretation as in Method 1, a proxy for FMGs tastes for non-pecuniary aspects of locational choice.

MEDSTUP would not have been included here as a supply variable to reflect the non-pecuniary aspects of employment, since we would expect FMGs and USMGs to have similar tastes in this regard so that PERFMG would not be affected, but, since it seems to reflect an effective demand for relatively skilled physicians in our other equations, we include MEDSTUP here also.

The demand variables are included in a new form to be consistent with the dependent variable:

PERPHYHB: Hospital-based physicians as a percent of total physicians represents the percent of individuals that are served by large scale facilities.

PERLTBEDS: Long term beds as a percent of total hospital beds represents

TABLE 2.1

ORDINARY LEAST SQUARES ESTIMATION OF THE METHOD 1 EQUATIONS, 1970 AND 1976

1970

Dependent Variable:	FMGP		USMGP	
Independent Variables	Coef.	t-stat.	Coef.	t-stat.
C	-.00007		.00093	
FAMINC	.00000	.03	.00000	.29
FRNBRNP	.00000	1.86	.0000025	1.45
MEDSTUP	-.36946	-2.90	.32903	1.00
HOSPPHYP	.80231	5.06	1.21518	2.98
LTBEDSP	.03663	2.66	-.09781	-2.76
UAPUBEDP	.02677	1.61	-.02640	-.62
PUBPAYP	-.0000012	-.98	.0000009	.28
	R^2 = .83		R^2 = .60	
	F(7,42): 30.20		F(7,42): 9.17	

1976

Dependent Variable:	FMGP		USMGP	
Independent Variables	Coef.	t-stat.	Coef.	t-stat.
C	-.0002634		.0011519	
PCI	-.00000	1.17	-.00000	-.45
FTNBRNP	.0022731	2.11	.0041045	2.00
MEDSTUP	-.2219923	-1.38	.3349977	1.09
HOSPPHYP	.6684418	3.41	1.0954533	2.94
LTBEDSP	.0776329	2.95	-.1099212	-2.19
UAPUBEDP	-.0031672	-.04	.0166144	.10
PUBPAYP	-.0000003	-.29	-.0000017	-.87
	R^2 = .75		R^2 = .53	
	F(7,41): 17.20		F(7,41): 6.57	

the percent of the individuals in a state that are served by long-term care facilities.

PERUAPUB: Beds in publicly-run facilities not affiliated with medical schools as a percent of total beds in facilities not affiliated with medical schools represents the percent of the individuals in a state that are served by government-run facilities.

PERPUPAY: Public payments to medical vendors as a percent of total health care expenditures represents the percent of the individuals in a state whose health care costs are paid through government reimbursement of medical vendors.

Ordinary Least Squares estimates of the Method 2 equation are presented in Table 2.2.

One problem is that, while 1976 data on FMGs across states is available, similarly updated statistics are not available for all the variables. 1970 data remained the most current available data on the foreign-born population across states and also for public and total health care expenditures. 1974 data on per capita income and 1973 data on hospital beds was the most current data available for those variables. (See Appendix 1 for the sources of all the data.) The updated data produce results almost identical to the 1970 tests. For both years, the empirical results support the hypothesis that quality determination costs are not so high as to keep resources from going to their highest valued use.

For both methods and both sets of data the best results are those for long-term care beds variable which represents consumers served by mental, TB, and chronic care facilities. In Table 2.1, where the dependent variable is per capita FMGs, the number of long-term beds is positively and significantly related to the dependent variable.

TABLE 2.2

ORDINARY LEAST SQUARES ESTIMATION OF THE METHOD 2 EQUATION, 1970 AND 1976

Dependent Variable:	1970 PERFMG	
Independent Variables:	Coef.	t-stat.
C	-.0774246	
FAMINC	-.0000001	-.00
FRNBRNP	.0006561	1.73
MEDSTUP	-308.384	-3.90
PERPHYHB	.8975532	4.93
PERLTBED	.1934076	2.26
PERUAPUB	.0104899	.14
PERPUPAY	.0715962	.54
	R^2 = .72	
	F(7,42):	15.19

Dependent Variable:	1976 PERFMG	
Independent Variables:	Coef.	t-stat.
C	-.1805757	
PCI	.0000346	1.64
FRNBRNP	1.0897950	2.05
MEDSTUP	-171.189	-1.80
PERPHYHB	.8018105	3.49
PERLTBED	.2980641	2.27
PERUAPUB	-.3759764	-1.22
PERPUPAY	-.0564122	-.29
	R^2 = .60	
	F(7,41):	8.92

The negative and significant coefficient of the LTBEDSP variable in the USMG equation assures that long-term care is associated particularly with the employment of FMGs.

The large-scale facilities variable (HOSPPHYP) is also positive and significant where the dependent variable is per capita FMGs, but, its significance in the USMG equation leaves us with some doubt as to whether the large-scale provision of physician services is particularly associated with the demand for FMG services. These doubts are substantially reduced by the power of the large-scale facilities variable (PERPHYHB) in explaining the percent of physicians that are foreign across states (PERFMG). The coefficient of PERPHYHB is positive and significant (see Table 2.2).

The coefficients of the public provision of care variables (UAPUBEDP in Table 2.1 and PERUAPUB in Table 2.2) are insignificant in all of the equations. In spite of this poor performance, if we look at a simple correlation between per capita FMGs and per capita beds in unaffiliated public hospitals, it is .606, while the simple correlation between the same variable and per capita USMGs is .272.

The remaining two variables do not show the expected relationships at all. Per capita public payments to medical vendors (PUBPAYP) is insignificant in the per capita FMG equation (Table 2.1), and, in the equation with the percent of physicians that are foreign as the dependent variable (Table 2.2), public payments to medical vendors as a percent of all health care expenditures (PERPUPAY) is also insignificant. Simple correlations between per capita FMGs and public payments and between per capita USMGs and public payments, using 1970 data, are almost identical for both groups of physicians. Similarly, the median family income

variable (FAMINC) shows insignificant results in all of the tests. The poor performance of these two variables may be due to the level of aggregation of this cross-sectional estimation. If, across states, the states with relatively low income individuals also have relatively high income individuals, then median family income or per capita income will not be good indications of the size of the group of low income individuals in any state. For example, large cities that have an accumulation of wealthy individuals almost always have lower income "ghettos" or "slums". Such a combination would obscure an attempt at identifying the size of the low income populace by means of a measure of median or per capita income.

Similarly, public expenditures on health care may reflect the relative wealth of a state. If the most wealthy states have the best public assistance programs, we may observe high per capita public payments to medical vendors in states where the per capita demand for lower quality physician care is not above average.

On the supply side, the coefficient of the per capita foreign-born population variable (FRNBRNP), a proxy for FMGs' locational preferences, is positive in both the FMGP and USMGP equations. But, in the PERFMG equations it is positive, which tells us that it is associated with variations in the employment of FMGs across states.

Per capita medical students (MEDSTUP), included originally as a proxy for desirable non-pecuniary aspects of employment, does not act as one would expect a supply variable to act; it is negatively associated with the employment of FMGs across states (Table 3.1). As mentioned earlier, this may reflect a demand for relatively comprehensively-trained physicians to work in hospitals affiliated with medical schools. As a supply variable, MEDSTUP would not be included in the PERFMG equations,

since all doctors are likely to have similar preferences for attractive working conditions. (While attractive working conditions would affect the aggregate number of physicians supplied, they should not affect the percentage that are foreign.) Yet, the interpretation of MEDSTUP in the per capita USMG and FMG equations led us to include it in the PERFMG equation where we get the same relationship, MEDSTUP is negatively related to PERFMG.

Perhaps of greatest significance is the fact that, together, all of these variables explain a large amount of the variation in the distribution of FMGs across states. Where the percentage of all physicians that are FMGs is the dependent variable (PERFMG), the 1970 equation has a R^2 of .72 and the 1976 equation, with some of its data from as far back as 1970, has an R^2 of .60.

It seems appropriate at this point to note that other specifications of the simultaneous and reduced form equations were attempted without success. Allied health personnel were included as a measure of the availability of substitutes for physician services, but the results were not as expected. The allied health personnel variable seemed to be picking up some of what was happening with the other demand variables (allied health personnel are likely to work where the demand for FMGs would also be great). Also, several indexes (from Kiu, 1973) were tested as proxies for the non-pecuniary aspects of locational choice without success.

To summarize, the results indicate that a model of the market for physician services which distinguishes the demand for FMGs as a demand for lower quality services is sufficient to explain a substantial amount of the variation in the demand for FMGs across states. In some respects

individuals whom we would expect to demand services of less-skilled physicians are the ones that do so. This evidence is not consistent with the proposition that consumers cannot identify physician quality.

The results suggest that a reduction in the flow of FMGs to the United States would increase the costs of providing physician services in hospital settings, long-term care facilities, and perhaps, in publicly-run facilities. Other facilities will be affected to the extent that their employees are close substitutes for FMGs.

One thing that is important to note is that, as mentioned above, the group of FMGs included in the AMA Masterfile does not include all FMGs working in the U.S. The group of FMGs used in these estimates is the portion of FMGs in the U.S. that are best substitutes of USMGs. Because of this, we would expect these estimates to be biased downward in displaying the significance of the expected relationships, yet we still observe significant differences in the demand for FMG services.

Licensure and Quality Identification

One question remains: Are the results in Tables 2.1 and 2.2 largely due to the fact that relatively skilled physicians are identified by means of physician licensure, or are purchasers of physician services able to identify quality without licensure as a guide? If licensure is not the only guide to quality; then we should observe that variations in the percentage of licensed physicians that are FMGs across states are associated with variations in the demand for relatively lower quality services. On the other hand, if purchasers of physician services can't identify physician quality beyond the guide they get from licensure, then the demand variables that have been identified as being

associated with a demand for relatively lower quality services should not be significantly correlated with the percentage of licensed physicians that are FMGs across states. Table 2.3 presents the results of ordinary least squares regressions similar to those in Table 2.2. except that the dependent variables have been changed. Instead of including all physicians in the United States, interns and residents have been taken out, leaving a measure of only the percentage of licensed physicians that are FMGs across states (PERLFMG). The results show that the percentage of licensed physicians that are FMGs across states can be explained by the size of consumer groups whom we would expect to demand relatively lower quality services. While the R^2 is not as high as in earlier equations, the independent variables still explain much of the variation in the dependent variable across states.

TABLE 2.3

ORDINARY LEAST SQUARES ESTIMATION OF THE METHOD 2 EQUATION, 1970 AND 1976

Dependent Variable:	1970 PERLFMG	
Independent Variables	Coef.	t-stat.
C	-.0516786	
FAMINC	-.0000025	-.43
FRNBRNP	.000695	2.06
MEDSTUP	-247.11	-3.48
PERPHYHB	.6265167	3.86
PERLTBED	.2039485	2.67
PERUAPUB	.0033512	.05
PERPUPAY	.1019602	.87
	R^2 = .67	
	F(7,42): 12.31	

Dependent Variable:	1976 PERLFMG	
Independent Variables	Coef.	t-stat.
C	-.1567420	
PCI	.0000318	1.56
FRNBRNP	1.0884779	2.12
MEDSTUP	-154.511	-1.68
PERPHYHB	.7095938	3.19
PERLTBED	.2962855	2.25
PERUAPUB	-.385	-1.30
PERPUPAY	-.0576288	-.30
	R^2 = .58	
	F(7,41): 8.21	

CHAPTER 3

The Period Of Unrestricted Migration, 1966-72

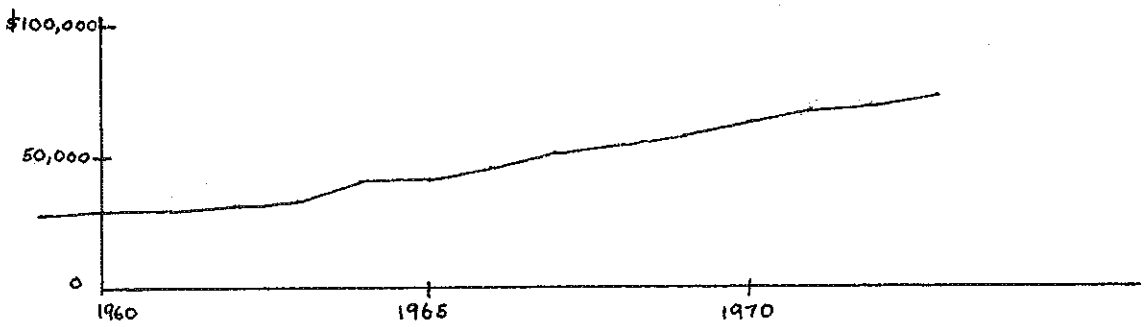
Over the years, free migration has been the exception rather than the rule. Yet, changes in the immigration laws in the late 1960s and early 1970s actually encouraged physician migration. What factors led to the liberalization of immigration restrictions in the late 1960s and what factors led to a reversal of this policy in the late 1970s? These questions form the basis of the discussion in this chapter.

Figure 3.1 shows that real health care expenditures grew at a rapid rate in the late 1960s. Many individuals attribute the unprecedented growth of health care expenditures to increased government health care coverage for the poor and aged (LeRoy, 1977). Whatever the cause, at the same time, government policy-makers opted to allow foreign-physicians free entry. Ten years passed before elected officials were persuaded to once again restrict migration.

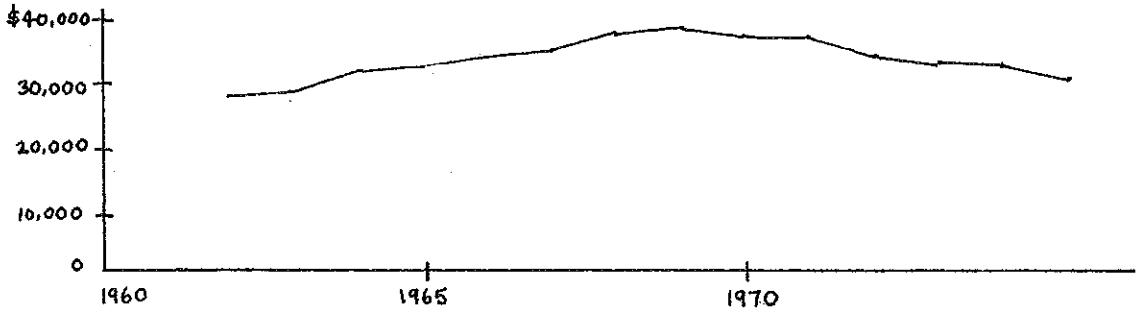
Many have suggested that FMGs were used to relieve what would have otherwise been a domestic physician "shortage" (see Chapter 1). Facing an unexpected, rapid increase in the demand for medical care, the government may have chosen to avoid consumer dissatisfaction over the rising price of physician services by encouraging foreign-trained physicians to work in the United States. As long as voter satisfaction is a function of both the quality and quantity of physician services, an unexpected increase in the demand for medical care would encourage policy-makers to turn to lesser-skilled foreign physicians to maximize voter satisfaction in the short-run while the domestic supply of physicians is relatively fixed.

FIGURE 3.1

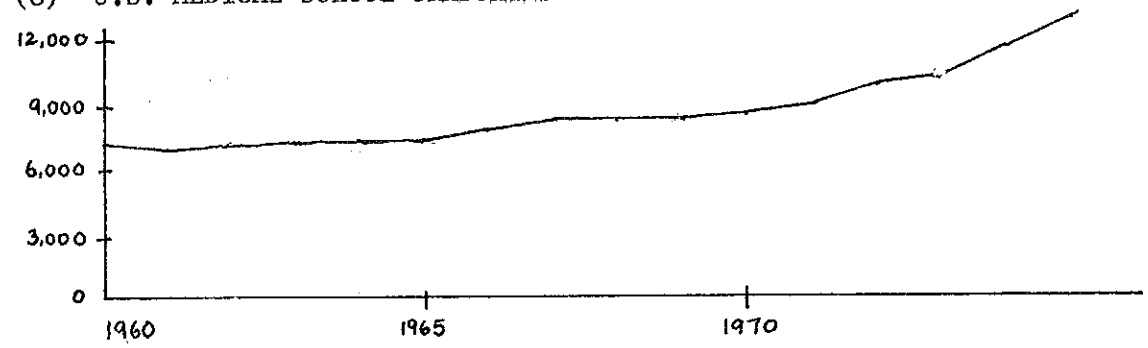
(A) ANNUAL HEALTH CARE EXPENDITURES (IN MILLIONS OF 1967 DOLLARS)



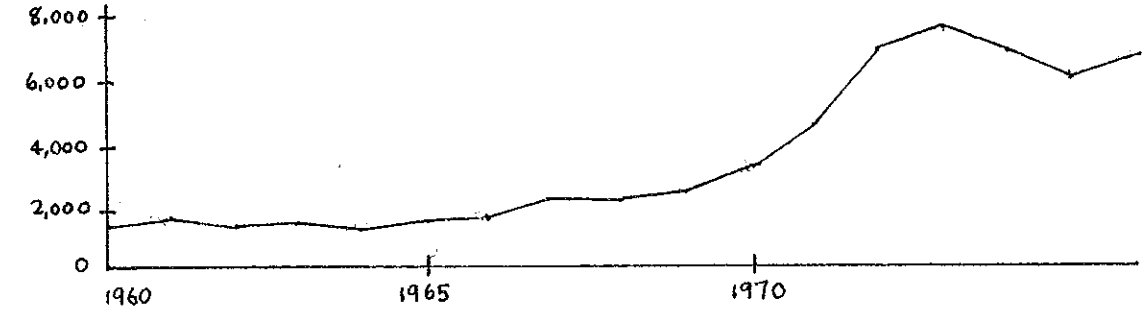
(B) NON-SALARIED PHYSICIANS EARNINGS (IN 1967 DOLLARS)



(C) U.S. MEDICAL SCHOOL GRADUATES



(D) NEWLY LICENSED FOREIGN-TRAINED PHYSICIANS



Sources for Figure 3.1

(A) Health Care Expenditures: U.S. Department of HEW, Social Security Administration, Office of Research and Statistics, Compendium of National Health Expenditures Data, compiled by B.S. Cooper, N.L. Wothington, M.G. McGee, DHEW Pub. #(SSA) 76-11927, January 1976.

Consumer Price Index: U.S. Bureau of the Census, U.S. Statistical Abstract, 1975, Table 687.

(B) Non-Salaried Physician Earnings: U.S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Ed., Part 2, Washington, D.C., 1974 (p. 175).

U.S. Bureau of the Census, U.S. Statistical Abstract, 1977, Washington, D.C., 1978

Consumer Price Index: See (A) above.

(C) U.S. Medical School Graduates: JAMA 238(26):2770 (December 26, 1977)

(D) Newly Licensed Physicians: Goodman, Louis J., Physician Distribution and Medical Licensure in the U.S., 1976, Center for Health Services Research and Development, American Medical Association, Chicago, 1977, p. 586-7.

But, how can we explain the lack of opposition from domestic physicians to the provisions of the Immigration Act of 1965 until some time later? A naive explanation could be that domestic physicians had no idea of the extent to which foreign-trained physicians would choose to migrate to the United States. Alternatively, the changes in U.S. health care expenditures and real physician earnings over time suggest a more sophisticated model of physician behavior may be appropriate -- something along the lines of the "target income" model of physician behavior discussed in Chapter 1.

If physicians are seeking some "target" level of income, we would imagine that, during a period where health care expenditures are increasing, yet the supply of USMGs is relatively inelastic, domestic physicians would not oppose a loosening of migration restrictions, such as those incorporated in the Immigration Act of 1965, as strongly as they otherwise might. As the flow of foreign-trained physicians and USMGs began to dampen real physician earnings, as they did in 1969 (see Figure 3.1), we would expect domestic health professionals to come out in full force in opposition to continued free migration.[4]

It is important to point out that a target income concept of physician behavior should not be thought of as a <u>replacement</u> for utility or profit maximization theories of physician behavior, but instead as a <u>result</u> of utility maximization, subject to a particular set of constraints. To be specific, the major constraint facing domestic physicians

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[4]We can only cautiously attribute the fall in real physician earnings to the increase in FMGs and USMGs in the late 1960s and early 1970s because non-salaried physician earnings may have fallen for a number of other reasons.

is that they must rely, to some extent, on government bodies to the limit the availability of substitutes such as FMGs. The government, for its part, is trying to maximize its popularity with voters. The cost to the government of supporting health professionals in their drive to reduce competition ("maintain quality") is likely to be increased consumer indignance over lack of "sufficient" availability of patient care services. In order for physicians to maximize their long-run earnings, they must avoid actions that would cause consumers to put pressure on the government to repeal some of the legislation that currently protects physicians from competition. In other words, domestic physicians' attempts to maximize their short-run earnings may not be in their long-run best interests if high physician fees reduce their lobbying power with the government.

A more formal way of stating this is that the present value of physicians' earnings can be either increased or decreased by actions that increase their current earnings. An increase in current earnings obviously will increase the present value of an earnings stream, all else constant. But, if the effect of higher current earnings is to increase the supply of substitutes in the long-run, then the net effect may be to reduce the present value of the earnings stream by lowering future earnings.

If we think of physicians as trying to maximize their income subject to some upper constraint (high prices reduce their political power to keep substitutes from entering the market), then we are not far from the idea of a "limit price" (see, for example, Modigliani, 1958), although in this case price is one step removed from discouraging entry -- as price affects consumer attitudes, which affects legislation, which in

turn affects entry. This theory of physician behavior suggests that physicians were not able to successfully oppose free migration in 1965 because, at that time, the conditions in the market for physician services would have led to an unacceptable level of consumer dissatisfaction.

We attempt to substantiate this scenario of government and physician behavior in the remaining portion of this chapter. To do this we must show that consumer dissatisfaction would have been significant, had not migration restrictions been lifted. One way to show this is to calculate just how much worse off consumers would have been without free migration, by estimating the dollar value of the incremental units of FMG services that can be attributed to free migration. Another way is to calculate how high physician earnings would have been without the increased flow of FMGs. We would expect that consumer dissatisfaction would be directly related to the magnitude of either of these two measures. If our calculations produce values that are significantly large, they will lend support to our theory as to why migration restrictions were temporarily lifted in the late 1960s.

Since the supply of U.S. medical graduates is relatively inelastic over any seven year period (it takes four years just to get students through medical school and it must take several years to expand capacity), we can calculate price-that-would-have-been (without free migration) and the value of the incremental services to consumers resulting from free migration from 1966 to 1972 without having to figure on the additional complication that, had FMGs not been allowed free entry, the supply of USMGS would have expanded to meet the increased demand for health care.

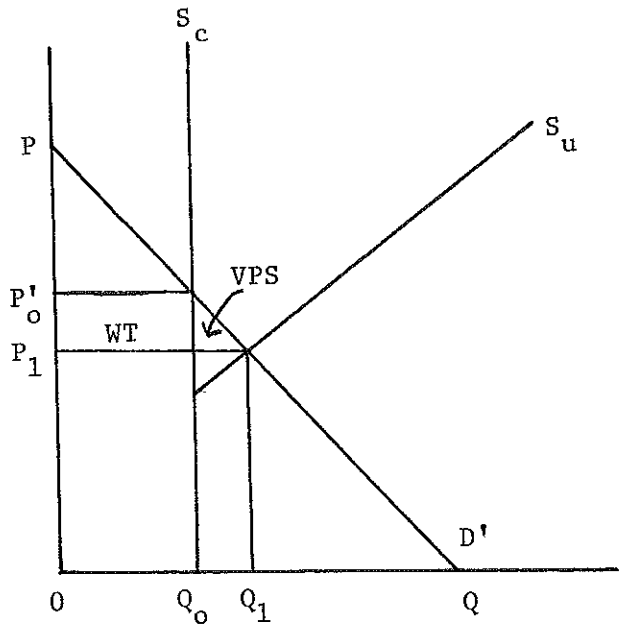
For any group of physicians -- interns, residents, or others -- a diagram such as Figure 3.2 describes the effect of liberalizing the immigration laws (Harburger, 1954). If D' is the demand curve for a particular group of physicians any year after 1965, P is their earnings that year, and Q is the number of physicians, then the gains to consumers from free migration can be represented by comparing two supply curves, one to represent the supply of physicians if the U.S. had continued to limit migration to its pre-1965 level (the inelastic S_c in Figure 3.2), and one to represent the supply of physicians with free migration (S_u in Figure 3.2).

P'_o represents what the price would have been without free migration and P_1 is the price with free migration. Free migration gives us lower prices and a greater number of units of service (Q_1 vs. Q_o). The area of consumer gain can be expressed as

$$CG = (P'_o - P_1)Q_o + \int_{Q_o}^{Q_1} D\,dQ - P_1(Q_1 - Q_o)$$

where part of this, $(P'_o - P_1)Q_o$, is a wealth transfer to consumers from physicians, and $\int_{Q_o}^{Q_1} D\,dQ - P_1(Q_1 - Q_o)$ is the value to consumers of the additional units of physician service that can be attributed to free migration. Our estimates of the consumer gain from free migration assume that there would have been no increase in the flow of FMGs to the U.S. after 1965 without the liberalization of the immigration laws. This enables us to assign the total value of the increased flow of services to the liberalization of the immigration laws. We base this assumption on the fact that Asian migration, which comprised the largest portion of the increased flow, was constrained by the immigration restrictions that existed prior to 1965. (See the statistics on immigration in Chapter 1

FIGURE 3.2



S_C is what the stock of physician services would have been in a particular year if there had been no change in immigration from the 1960-65 level (the c stands for a constant rate of immigration)

S_u is the supply of physician services including the response to the unrestricted immigration policy

WT is the wealth transfer to consumers from domestic (U.S.) physicians when the price of physician services is P_1, due to free migration, instead of P'_o

VPS is the value to consumers of Q_1-Q_o units of physician services, the additional units that can be attributed to free migration

We define the consumer gain from free migration as:

$$CG = WT + VPS$$

of this paper.)

We can easily calculate CG if we make the simplifying assumption that the price elasticity of demand is equal to some constant value over the range (Q_o, Q_1):

$$\frac{dQ}{dP}\frac{P}{Q} = -C.$$

Solving for the appropriate demand function we get $P = K/Q^{1/C}$, where K is also a constant. In this case the consumer gain, CG, is

$$CG = (P_o'-P_1)Q_o + \int_{Q_o}^{Q_1} (K/Q^{1}/C)dQ - P_1(Q_1-Q_o)^3$$

or

$$CG = P_o'Q_o - P_1Q_1 + \{(P_1Q_1-P_o'Q_o)\ (1/(1-(1/C)))\}.$$

To calculate consumer gain (CG) we need an estimate of the price elasticity of demand for physician services (C). It is commonly accepted that the demand for physicians' services is very inelastic because of the lack of close substitutes for the services physicians provide. The extensiveness of third party coverage of medical expenses in the United States also contributes significantly to the inelasticity of demand for physician services. A 1973 article by Rosett and Huang on the effect of health insurance on the demand for medical care estimated a price elasticity of demand for medical care of -.35, for a coinsurance rate of twenty percent of 1960 market prices, to about -1.5, for a coinsurance rate of eighty percent. (A coinsurance rate of twenty percent means that that is the fraction of the market price charged to the consumer under his insurance contract.) It seems likely that the price elasticity of demand

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[3] See Lindsay, D.C., 1978.

for physician services would be even more inelastic than that for the general category of medical care. Based on several attempts at estimating the price elasticity of demand for physician services, Newhouse and Phelps (Rosett, 1976) are of the opinion that it is "at least as high as -.01". Fuchs and Kramer (1972) estimate that the price elasticity of demand for physician services is no greater than -.36, and most likely close to -.19, P. Feldstein's 1964 estimate. For our calculations we will assume that the price elasticity of demand for physician services falls somewhere between -.2 and -.4, with -.2 being the most substantiated estimate.

In order to estimate the consumer gain from increased migration we must calculate Q_o, the number of physicians that would have been available in each year, t, if the immigration laws had not been liberalized in 1965. For interns we use:

$$Q^I_{o_t} = Q^I_{1_t} - (FI_t - AFI)$$

$Q^I_{1_t}$ is the actual number of interns in each year t during the period of free migration, FI_t is the actual number of foreign interns in each year t, and AFI is the average number of foreign interns per year for several years before 1965.

For residents we use:

$$Q^R_{o_t} = Q^R_{1_t} - (FR_t - AFR)$$

$Q^R_{1_t}$ is the actual number of residents in each year t during the period of free migration, FR_t is the actual number of foreign residents in each year t, and AFR is the average number of foreign residents per year for several years before 1965.

The values in parentheses are the increase in foreign services available each year that can be attributed to the liberalization of the immigration laws.

The calculation of the quantity of "other" physician services that would have been available without free migration is more complicated because there is no yearly data on the stock of FMGs and USMGs that can be used like the yearly data on interns and residents. For "other" physicians we will use:

$$Q^P_{o_t} = Q^P_{1_t} - \Sigma^t_{i=1966-67}(F_i - AF)$$

where F_i is the number of newly licensed foreign physicians in year i, AF is the average number of foreign physicians licensed per year for several years before 1965, and F_i-AF is then the addition to the physician stock in year i that can be attributed to the change in the immigration laws. (Here we assume that all newly licensed FMGs since 1965-66 continue to work to the end of the seven year period under consideration.)

The consumer gain from free migration was calculated separately for interns, residents, and other physicians for each of seven years (1966-67 to 1972-73) for two price elasticities (.2 and .4). The figures from the three groups were then aggregated for each year (and for each price elasticity) to give us an estimate of the total yearly consumer gain from free migration. (See Table 3.1.) (The numbers in Table 3.1 -- the consumer gain and wealth transfer -- refer to WT + VPS and VPS, respectively, in Figure 3.2.) Table 3.2 gives the consumer gain as a percent of total expenditures on physician services each year (CG/P_1Q_1). Table 3.3 gives the values of P_1, the actual earnings each year, and P'_o,

TABLE 3.1

ESTIMATES OF CONSUMER GAIN AND WEALTH TRANSFER (In Millions of 1967 Dollars)

CG = Consumer Gain

WT = Wealth Transfer

C = The Absolute Value of the Price Elasticity of Demand for Physician Services

	CG (C=.2)	WT (C=.2)	CG (C=.4)	WT (C=.4)
1966-67	167	165	81	80
1967-68	355	350	171	169
1968-69	595	576	280	275
1969-70	879	865	421	415
1970-71	1517	1487	718	714
1971-72	2688	2617	1249	1216
1972-73	3783	3657	1723	1111

TABLE 3.2

CONSUMER GAIN AS A PERCENTAGE OF TOTAL ACTUAL EXPENDITURES ON PHYSICIAN SERVICES

Price Elasticity:	-.2	-.4
1966-67	1.74	.84
1967-68	3.47	1.67
1968-69	5.58	2.62
1969-70	8.26	3.95
1970-71	14.07	6.66
1971-72	26.22	12.18
1972-73	36.31	16.54

TABLE 3.3

ACTUAL PHYSICIAN EARNINGS (P_1) AND ESTIMATED EARNINGS (P'_o)

Year	Demand Elasticity (Absolute Value)	Interns		Residents		Other Physicians	
		P_1	P'_o	P_1	P'_o	P_1	P'_o
1966-67	.2	4322	5989	4295	5620	34730	35133
	.4		5088		4913		34930
1967-68	.2	4756	6999	4837	7462	36104	36998
	.4		5769		6008		36548
1968-69	.2	5788	10259	5662	9441	36931	38398
	.4		7706		7311		37657
1969-70	.2	6158	9048	5222	9664	35684	38086
	.4		7464		7104		36865
1970-71	.2	6621	11462	6218	12500	35202	39407
	.4		8711		8816		37245
1971-72	.2	7259	16344	6303	12986	32506	40317
	.4		10892		9049		36201
1972-73	.2	7541	18030	8174	18147	31660	42355
	.4		11660		12179		36619

the estimate of what earnings would have been like without the increased flow of FMGs to the United States.

Several points should be made with respect to the validity of these estimates of prices and gains. First, the estimates of consumer gain should not be taken as much more than "ball-park" estimates because we are treating FMGs and USMGs in each of these groups as perfect substitutes, despite the evidence to the contrary presented in Chapter 1 and 2 of this paper. The problem is that there are no separate earnings data for FMGs that would allow us to come up with better estimates. Even so, just by dividing physicians into interns, physicians, and residents, we go a long way toward capturing the true value of the increased migration, as FMGs are far from equally represented in each of these three groups. (See Chapter 1.)

Second, the calculations of the gains to consumers from free migration assume that there is no loss due to ignorance of quality. This assumption is somewhat strict, but is supported by the conclusions of Chapter 1, that ignorance of quality, to the extent that it does occur, is not widespread.

Third, these calculations do not include the value of the services of FMGs that came to the U.S. under the liberalized law and were not able to obtain employment as residents, interns, or other physicians. Many of these individuals found other types of work in the health care field, adding to the consumer gain from free migration.

Fourth, migration was not really as free in the earlier years as it was after 1971. Although immigration restrictions had been liberalized, exchange visitors were still legally constrained to return to their native country for two years before applying for immigrant status in the

U.S. (see Chapter 1's section on immigration regulations.) This constraint was often waived, so it is not clear to what extent free migration was actually hindered before 1971.

Fifth, it is important to point out that the estimated earnings without increased migration that are presented in Table 3.3 assume that prices would have adjusted to reflect supply and demand conditions in the market. It may be that, had we not had any liberalization of the immigration laws, the prices would not have reached the P_o'''s we estimate in this paper. The Federal Government may have been under pressure to use its power to put a ceiling on prices, and queues would have been observed, reflecting the excess demand at the ceiling prices.

Finally, all of the estimated P_o'''s are calculated by approximating the demand curve, which implicitly assumes that the prices of all substitutes remain constant. This is not the case, as all types of physician services have some non-zero degree of substitutability so that any tendency for any of the prices to increase will affect the demand for other types of services and the final set of equilibrium prices will be somewhat different from the set of estimates in Table 3.1.

Despite these considerations, the estimates in Tables 3.2 and 3.3 give us an idea of the magnitude of the effect of migration. The calculations show that, for example, if the price elasticity of demand for physician services were -.2, the consumer gain associated with the increase in migration, measured as a percent of the total expenditures on physician services in each of the years, ranges from near two percent in 1966-67 to over thirty-six percent by 1972-73. Looking at physician earnings (in 1967 dollars) in Table 3.3, if the additional immigration had not been permitted and if prices had been free to adjust to equate

supply and demand, by 1972-73, physician earnings would have been up to one-third higher and intern and resident earnings would have been up to more than double what they actually were.

From these figures we can conclude that conditions in the market for physician services would have led to serious consumer dissatisfaction had physician migration not been encouraged from 1966 to 1972. This evidence supports our theory of interaction between consumers (voters), physicians and legislators, resulting in the temporary loosening of physician migration restrictions in the late 1960s.

CHAPTER 4

Conclusions and Discussion

In conclusion, what can we say about the employment of FMGs in the United States? First, the evidence in Chapter 2 suggests that consumers can identify physician quality -- consumers that we would expect to have an effective demand for relatively lower quality skills do consume a relatively greater portion of services from FMGs. The implication of this finding is that regulations to maintain high quality standards for all physicians may not be in consumers best interests because they force expenditures on high quality services that might better enhance a consumers' satisfaction if spent elsewhere. Whether or not high standards are desirable depends on whether or not one thinks that the government (some individuals) have the right to tell other individuals how to allocate their resources. The results in Chapter 2 suggest that consumers may gain from free migration, but leaves open the question of why free migration has been the exception, rather than the rule. Chapter 3 fills us in on this, providing evidence that FMGs were used to relieve what otherwise would have been a tight situation in the market for physician services. The particular events of the late 1960s, the unprecedented expansion in health care expenditures, may have led to severe queues or price hikes, outweighing for once the pressure to try to maintain very high standards of professional competence for physicians working in the United States.

The results of the tests of the model in Chapter 2 show that, in particular, migration restrictions will increase the price of providing physician services to hospitals, long-term care facilities, and publicly-

run patient care facilities. Although other specific areas of reduced consumption were not identified empirically, it seems likely that this may have been due to the limitations of the data and that there are other areas of care that will be adversely affected by restrictions on FMG migration.

The evidence has obviously been interpreted very subjectively. Because of the problems with the consumer gain calculations, they are really only to be taken as "ball-park" estimates. Also, the regression results cannot assure us that there is no ignorance of quality, but only that widespread ignorance can be ruled out. Also, it has been suggested that the evidence presented here could also substantiate different models of the market for physician services. For example, if racial discrimination by consumers caused FMGs to fare poorly in private practice, they could end up overrepresented in hospitals and long-term care facilities. Basically, I think that such models underrate the value of the points made in this paper, that there are likely to be gains from the division of labor between relatively poor and better skilled physicians in large scale facilities and that much of the care in long-term care facilities is "custodial" and will affect the level of skills demanded. To bolster this argument, the reader may be familiar with the fact that being anti-semetic has not kept large numbers of individuals from seeking aid from Jewish doctors. It does not appear that, in the case of Jews, racial discrimination alone has ever been much of a problem for physicians. If, on the other hand, certain races are associated with lower levels of physician skills, then using racial discrimination as a basis to explain physician distribution just reduces to explaining physician distribution by variations in the demand for greater and lesser skilled physicians.

Still, we have been able to make use of the limited data available, and the results should be considered in any discussion of the merits of physician migration.

The analysis becomes clouded if one allows for the possibility that physician-induced demand is a significant element in the market for physician services, a fact still under much debate. According to this theory, an increase in the availability of FMGs (substitutes for USMGs to some extent) could cause USMGs to increase the services that they provide to the consumers that remain. Consumers of FMG services gain, but consumers of USMG services bear some additional costs. Expenditures on physician services rise as a direct result of physician migration! This means that, even if ignorance of physician quality is low, it may not be desirable. In the language of Chapter 2, the losses to domestic consumers due to physician-induced demand may outweigh the gains from having FMG services available.

The study of FMGs in the U.S. market for physician services is of obvious value to policy-makers who must make decisions about the extent to which physician migration should be encouraged. A more general result of the study of FMGs is a better understanding of certain health care issues that are not particularly associated with the employment of FMGs.

For instance, our study of FMGs shows that there is a market for individuals to provide physician services at skills levels below those of USMGs. This suggests that the U.S. system, by requiring that only licensed physicians provide many patient care services, may be constraining the market from combining resources optimally in the production of patient care.

Also, the age-old justification for physician licensure has been to protect consumers in a market where quality determination costs are high. While our results are certainly not a basis upon which a decision to eliminate licensure can be made, they do provide some evidence of that quality determination costs are not high. FMGs are employed where we would expect the demand for lesser-skilled physicians to be relatively great.

The study of FMGs in the U.S. also sheds some light on what may be an appropriate model to analyze physician behavior. As explained in Chapter 3, the employment of FMGs to relieve a tight domestic market is consistent with a target income theory of physician behavior in the short-run as a means to maximize domestic physicians' earnings in the long-run. We should emphasize the word "consistent", because the evidence could also be consistent with a theory of government decision-making to maximize voter satisfaction in which the domestic physician stock has little or no input. But, based on the fact that much of the testimony heard by the legislature is given by health professionals, it seems hard to believe that physicians' impact on government decision-making is minimal. It would seem that high information costs give the physicians' lobby disproportionate power in influencing health manpower legislation.

Our analysis of the market for physician services also has implications with regard to the projected increase in the domestic physician stock (see Chapter 1). It is relevant to ask whether an increase in expenditures by the federal government to promote the continued expansion of medical school capacity is desirable. The results in Chapter 2 of this paper suggest that the services of greater and lesser skilled physicians can be combined and that such a division of labor can

result in production economies. If this is the case it is not optimal to train enough high quality physicians to provide all patient care services. Even if we decide that we want to provide higher quality care for those individuals served by public hospitals or those individuals in long-term care facilities, perhaps because we suffer knowing that they receive relatively lower quality care (i.e., there are externalities involved), it still will be sub-optimal to have highly trained physicians providing all of their care, as it is for all of anyone's care, if the services of physicians can be combined as suggested by the employment of FMGs. The role of FMGs in the medical marketplace seems to support the idea that training of physician assistants and other allied health personnel is an alternative to continuing the expansion of U.S. medical school capacity.

While the 1976 HPEAA includes provisions to constrain physician migration, it also includes provisions to promote the domestic training of physicians' assistants and to promote the effective utilization and improved methods of credentialing of allied health personnel (U.S. Congress, 1976). This seems to be a compromise. The U.S. medical establishment regains control over the quality of individuals providing patient care services, even though we have shown in this paper that misrepresentation of skills is not a problem so that such controls may not be in consumers' best interests, but takes the lesson from FMG migration that some division of labor is optimal.

APPENDIX 1

Data Sources

Data For Chapter 3

(1970)

FMGs, USMGs

Haug, J.N. and B.C. Martin, Foreign Medical Graduates in the United States, 1970, Dept. of Survey Research, Center for Health Services Research and Development, American Medical Association, Chicago, 1971

Population

U.S. Bureau of the Census, Census of the Population: 1970, Vol. 1, Characteristics of the Population, All States, U.S. Government Printing Office, Washington, D.C., 1973 (Table 45)

Per Capita Income

U.S. Bureau of the Census, Statistical Abstract of the U.S., 1971, (92nd Edition), Washington, D.C., 1971 (Personal Income, Per Capita, 1970)

Unaffiliated Public Beds

American Medical Association, Directory of Accredited Internships and Residencies, 1970, (Calculated from "Consolidated List of Hospitals"

Hospital Beds (General and Long-Term)

U.S. Dept. of Health, Education and Welfare, Hospitals: A County and Metropolitan Area Data Book, 1971, National Center for Health Statistics DHEW Pub # (HRA) 74-1223 (Long-term beds are psychiatric, chronic disease and TB)

Health Care Expenditures (Public and Total)

Cooper, Barbara S., et. al., Personal Health Care Expenditures by State, U.S. Dept. HEW, Soc. Sec. Admin., Office of Research and Statistics, DHEW Pub # (SSA) 75-11906, U.S. Government Printing Office, Washington, D.C., 1975

Physician Income (1972) (NA for North Dakota)

Internal Revenue Service, U.S. Treasury Dept., Statistics of Income, 1972, Business Income Tax Returns, U.S. Government Printing Office, Washington, D.C., 1973. (Net Profit per business for offices of physicians and surgeons, not including osteopaths.)

Foreign Born Population

U.S. Bureau of the Census, Census of the Population, 1970, Vol. 1, Characteristics of the Population, All States, U.S. Government Printing Office, Washington, D.C., 1973

Medical Students

JAMA, "Medical Education in the U.S." 214(8):1488-9 (November 23, 1970)

Hospital-Based Physicians

Haug, J.N., G.A. Roback, and B.C. Martin, Distribution of Physicians in the United States, 1970, Dept. of Survey Research, Center for Health Services Research & Development, American Medical Association, Chicago, 1970

(1976)

FMGs, USMGs, Hospital-Based Physicians

Goodman, Louis J., Physician Distribution & Medical Licensure in the U.S. 1976, Center for Health Services Research & Development, American Medical Association, Chicago, 1977

Unaffiliated Public Beds

AMA, Directory of Accredited Residencies, 1975-76, Chicago, 1976

Medical Students

JAMA 238(26):2779 (December 26, 1977)

Hospital Beds (1973 Data)

U.S. Department of Health, Education and Welfare, Hospitals, A county and Metropolitan Area Data Book, 1973, National Center for Health Statistics, Health Resources Administration, 1975

Population

U.S. Bureau of the Census, Statistical Abstract of the U.S., 1977, (98th Edition), Washington, D.C., 1977

Public Expenditures on Medical Assistance

U.S. Department of Health, Education and Welfare, Medicaid, Social and Rehabilitation Service, 1976

Family Income (1974) and Per Capita Income (1974)

U.S. Bureau of the Census, Statistical Abstract of the U.S., 1977, (98th Edition), Washington, D.C., 1977

Foreign Born Population - no recent data available, see 1970 data

Public and Total Health Care Expenditures - no recent data available, see 1970 data

Data for Chapter 4

TABLE A1

PRICE AND QUANTITY DATA FOR INTERNS

	I	II	III	IV	V
1972-73	7541	11163	3924	1786	9377
1971-72	7259	12066	3946	1808	10258
1970-71	6621	11552	3339	1201	10351
1969-70	6157	10808	2939	801	10007
1968-69	5788	10464	3270	1132	9332
1967-68	4756	10419	2913	775	9644
1966-67	4322	10366	2793	665	9711
1965-66	3906	9670	2361		
1964-65	3734	10097	2821		
1963-64	3687	9636	2566		
1962-63	3314	9905	1669		
1961-62	3086	8173	1273		

I: P_1^I, median intern earnings, deflated (1967=100). See Table A4 for source.

II: Q_1^I, number of interns. Source: JAMA Supplement, vol. 231, p. 49 (January 1975)

III: Foreign interns. Same source as II.

IV: Foreign interns minus the average number of foreign interns per year, 1961-62 to 1965-66. Column IV is supposed to show the number of FMGs in the intern stock each year that can be attributed to the liberalization of immigration restrictions.

V: Q_o^I, Column II - Column IV. Interns without increased migration.

TABLE A2

PRICE AND QUANTITY DATA FOR RESIDENTS

	I	II	III	IV	V
1972-73	8174	45081	14471	6647	38434
1971-72	6306	42512	13543	5719	36793
1970-71	6218	39463	12968	5144	34319
1969-70	5222	37139	12126	4302	32837
1968-69	5662	35047	11231	3407	31640
1967-68	4837	33743	10627	2803	30940
1966-67	4295	32050	9502	1678	30372
1965-66	4044	31898	9133		
1964-65	4221	31005	8153		
1963-64	4346	29485	7052		
1962-63	4017	29239	7062		
1961-62	3642	29637	7723		

I: P_1^R, median resident earnings, deflated (1967=100). See Table A4 for source.

II: Q_1^R, number of residents. Source: JAMA Supplement, V. 231, p. 49 (January 1975).

III: Foreign residents. Same source as II.

IV: Foreign residents minus the average number of foreign residents per year, 1961-62 to 1965-66. Column IV is supposed to show the number of FMGs in the resident stock each year that can be attributed to the liberalization of immigration restrictions.

V: Q_o^I, Column II - Column IV. The number of residents that would have been in the U.S. without the increase in migration.

TABLE A3

PRICE AND QUANTITY DATA FOR OTHER PHYSICIANS

	I	II	III	IV	V	VI
1972-73	31660	314756	7419	5964	17798	296958
1971-72	32506	304422	6661	5206	11834	291588
1970-71	35202	296985	4314	2859	6628	290357
1969-70	35684	291053	3016	1561	3769	287284
1968-69	36931	284489	2307	852	2208	282281
1967-68	36104	277939	2185	730	1356	276482
1966-67	34730	271584	2081	626	626	270958
1965-66	33097	263432	1634			
1964-65	30646	255898	1528			
1963-64	30549	249876	1306			
1962-63	27317	233956	1451			
1961-62	26821	236190	1357			

I: P_1^P, median physician earnings, deflated (1967=100). See Table 4 for source.

II: Q_1^P, number of other physicians. Source: U.S. Bureau of the Census, U.S. Historical Statistics, Colonial Times to 1970, U.S. Statistical Abstract, 1975 (minus interns and residents).

III: Newly licensed foreign physicians. Source: Goodman, Louis J., Physician Distribution and Medical Licensure in the U.S., 1976, p. 587.

IV: New foreign licensees minus the average number of new foreign licensees per year, 1961-62 to 1965-66. This is to show the increase in foreign physicians due to the change in the immigration laws.

V: The cumulative sum of Column IV. The number of FMGs we can attribute to the change in the laws. (This assumes that all FMGs licensed in the U.S. since 1966-67 continue to practice until 1972-73.)

VI: Q_o^P, Column II - Column V. The number of physicians that would have been in the U.S. without the increase in migration.

TABLE A4

P_1^I, P_1^R, P_1^P were calculated using the following data:

	Mean Physician Earnings	Median Resident Earnings	Median Intern Earnings	Consumer Price Index
1972-73	42140	10880	9886	131.1
1971-72	40730	7901	9096	125.3
1970-71	42700	7542	8031	121.3
1969-70	41500	6073	7161	116.3
1968-69	40550	6217	6355	109.8
1967-68	37260	5040	4956	104.2
1966-67	34730	4295	4322	100
1965-66	32170	3931	3797	97.2
1964-65	28960	3989	3529	94.5
1963-64	29380	4037	3425	92.9
1962-63	25050	3684	3039	91.7
1961-62	24300	3300	2796	90.6

Sources: Physician Earnings: U.S. Bureau of the Census, Historical Statistics, Colonial Times to 1970, U.S. Statistical Abstract, 1977. Intern and Resident Earnings: JAMA "Medical Education in the U.S." Yearly.

CPI: U.S. Bureau of the Census, U.S. Statistical Abstract, 1975, Table 687

APPENDIX 2

Identification of the Model

Identification of the Model

(Using the Variables Included or Proxied in the Empirical Estimation)

Equations:

(1) $$q_F = \alpha + \beta_1 P_F + \beta_2 M + \beta_3 F + \varepsilon^S$$

(2) $$q_F = \alpha' + \beta_1' P_F + \beta_2' P_u + \beta_3' I + \beta_4' H + \beta_5' L + \beta_6 U + \beta_7' C + \varepsilon^D$$

(3) $$q_U = a + b_1 P_u + b_2 M + e^S$$

(4) $$q_U = a' + b_1' P_u + b_2' P_F + b_3' I + b_4' H + b_5' L + b_6' U + b_7' C + e^D$$

q_F = FMGs/population

q_U = USMGs/population

P_F = FMG earnings

P_U = USMG earnings

M = Medical Students/population

F = Foreign-born population/population

I = Family Income

H = Hospital Based physicians/population

L = Long-term beds/population

U = Public hospital beds in hospitals not affiliated with medical schools/population

C = Public Health Care Expenditures/population

Structural Form:

$$(q_F \; q_U \; p_F \; p_U)\begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \\ -\beta_1 & -\beta_1' & 0 & -b_2' \\ 0 & -\beta_2' & -b_1 & -b_1' \end{bmatrix}$$

$$+ (\text{MFIHLUC1})\begin{bmatrix} -\beta_2 & 0 & -b_2 & 0 \\ -\beta_3 & 0 & 0 & 0 \\ 0 & -\beta_3' & 0 & -b_3' \\ 0 & -\beta_4' & 0 & -b_4' \\ 0 & -\beta_5' & 0 & -b_5' \\ 0 & -\beta_6' & 0 & -b_6' \\ 0 & -\beta_7' & 0 & -b_7' \\ -\alpha & -\alpha' & -a & -a' \end{bmatrix}$$

$$= (\varepsilon^S \; \varepsilon^D \; e^S \; e^D)$$

IDENTIFICATION:† Order Condition: The total number of independent variables in the system, k, minus the number of these included in any particular equation, k_1, must be greater than or equal to the number of exogenous variables included in the equation, g_1, minus 1.

$$k - k_1 \geq g_1 - 1$$

Equation (1): 8-3 > 2-1 (Overidentified)

Equation (2): 8-6 = 3-1 (Just Identified)

Equation (3): 8-2 > 2-1 (Overidentified)

Equation (4): 8-6 = 3-1 (Just Identified)

Rank Condition:† For the equations and the system to be identified, the rank of the following matrices must be one less than the number of endogenous variables in the system: (4-1=3).

Equation (1): Equation (2): Equation (3): Equation (4):

$$P\begin{vmatrix} 0 & 1 & 1 \\ \beta_2' & b_1 & b_1' \\ \beta_3' & 0 & b_3' \\ \beta_4' & 0 & b_4' \\ \beta_5' & 0 & b_5' \\ \beta_6' & 0 & b_6' \\ \beta_7' & 0 & b_1' \end{vmatrix} \quad P\begin{vmatrix} 0 & 1 & 1 \\ \beta_2 & b_2 & 0 \\ \beta_3 & 0 & 0 \end{vmatrix} \quad P\begin{vmatrix} 1 & 1 & 0 \\ \beta_1 & \beta_1' & b_2 \\ \beta_3 & 0 & 0 \\ 0 & \beta_3' & b_3' \\ 0 & \beta_4' & b' \\ 0 & \beta_5' & b_5' \\ 0 & \beta_6' & b_6' \\ 0 & \beta_7' & b_7' \end{vmatrix} \quad P\begin{vmatrix} 1 & 1 & 0 \\ \beta_2 & 0 & b_2 \\ \beta_3 & 0 & 0 \end{vmatrix}$$

Since we can take a 3x3 matrix with a non-vanishing determinant from any of the above matrices, the rank condition is satisfied.

†For a proof of these conditions, see "Identification by zero restrictions in the nonstochastic case" in Intriligator, Michael D., Econometric Models, Techniques and Applications, Prentice-Hall, Inc., Englewood Cliffs, N.J., p. 346-352.

APPENDIX 3

Two-Stage-Least-Squares Estimation Of The Simultaneous Equation Model Presented In Chapter 2

The results of the two-stage-least-squares estimation of the simultaneous equation model presented in Chapter 2 are given in Table A3. Most of the variables are defined in Chapter 2.

In addition to FMGP and USMGP, physician earnings are endogenous to the model. Since separate earnings data are not available, the simultaneous equations were estimated using 1972 IRS data on physician earnings as a proxy for both P_{FMG} and P_{USMG} in equations (1) and (2) and (3) and (4) respectively. Also, instead of using P_{USMG} in equation (2) and P_{FMG} in equation (4) as measures of the availability of substitutes for FMGs and USMGs, respectively, the absolute quantities, FMGP and USMGP, were used as proxies.

All data sources are in Appendix 1.

As explained in Chapter 2, the problems with the earnings data and identification of supply variables handicapped this analysis. None of the variables in the FMG equation are significant. The negative coefficients of physician earnings (PHYINC72) in both supply equations indicates that we are not holding everything else constant, i.e., we are missing some supply variables. (Note: attempts at using state-by-state indexes of living conditions calculated for general living conditions, facilities, and social and environmental conditions by Liu (1973) as additional variables were also unsuccessful.) In addition to this, a separate run of the first stage of the two-stage process showed that the earnings variables generated in the first stage were not estimated very well.

TABLE A5

SIMULTANEOUS EQUATION RESULTS

Dependent Variables:

Demand Equations

Independent Variables:	coef.	t-stat	coef.	t-stat
C	.011	.21	.0024	1.52
PHYINC72	-.00000019	-.22	-.000000040	-1.00
FMGP	--	--	-.22	-.21
USMGP	-4.56	-.21	--	--
FAMINC70	.000000037	.20	.000000008	.19
HOSPPHYP	3.44	.22	.75	.75
LTBEDSP	-.17	-.15	-.037	-.39
UAPUBEDP	-.16	-.16	-.036	-.47
PUBHCE9P	.0000038	.19	.00000084	.34

Supply Equations

Independent Variables:				
C	.0013	1.23	.0031	5.47
PHYINC72	-.00000003	-1.22	-.00000006	-3.52
MEDSTUP	-.28	-.24	.14	.30
FRNBRNP	.00076	.24	--	--

Observations: 49 states (earnings data not available for North Dakota)

Obviously, the results of this two-stage-least-squares estimation are not satisfactory.

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