DataWatch

Hospital Labor Markets In The 1980s

by Gregory C. Pope and Terri Menke

Major changes occurred in the hospital sector in the 1980s. Continued rapid hospital cost inflation intensified cost containment activities by both public and private third-party health insurers. Congress replaced cost reimbursement for inpatient treatment of Medicare beneficiaries with prospectively determined rates set by diagnosis. In addition, peer review organizations (PROs) were established to reduce medically unjustified inpatient admissions. Private health insurers increased use of managed care, bargaining on price with medical providers, and utilization review activities. The result of these efforts and other trends has been fewer, but more severely ill, inpatients, shorter length-of-stay, and increased outpatient activity.

If cost containment efforts are to succeed, they must constrain the rate of increase in hospital labor costs. Labor compensation accounts for over half of total hospital costs and is subject to more immediate restraint than are longer-term expenditures on plant and equipment. Many observers contend that the more difficult inpatient cases hospitals treated in the 1980s have required them to employ a more skilled, and hence costly, mix of workers. This trend has been especially pronounced in the nursing area, where the proportion of registered nurses (RNs) has grown at the expense of licensed practical nurses and ancillary nursing personnel.

Greater hospital demand for RNs that was not matched by an increase in their supply resulted in a nursing "shortage." To ease the shortage, increased Medicare reimbursement to raise nursing salaries and expanded federal subsidies to nursing education have been advocated.[1] The market responded to the RN shortage through above-average wage increases for nurses, which have raised hospital labor costs.

In this DataWatch, we present trends in hospital employment, skill mix, and employee compensation in the 1980s. Trends are analyzed both for all hospital workers and for selected occupations. Data from the 1960s

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and 1970s are juxtaposed where appropriate to put 1980s trends into historical context. In interpreting the trends, we focus on both the effects (or lack of effects) of cost containment activities and the operation of demand and supply factors in hospital labor markets.

Trends In Hospital Employment And Skill Mix

In the 1980s, growth in private hospital employment slowed but continued to outstrip that in the private economy as a whole. Hospital employment grew at triple the rate of all private jobs in the 1960s, double the rate in the 1970s, but only one-half faster in the 1980s (Exhibit 1).[2] Despite slowing growth, private hospitals added 930,000 jobs from 1980 to 1990, about one job in eighteen created by the private economy. The hospital share of total private jobs rose from 2.2 percent in 1960 to

Exhibit 1
Trends In Private Employment, By Industry, Millions Of Employees, 1960-1990

	Total private[b]		Services		Health services		Hospitals[c]	
Year	Employees	Percent change	Employees	Percent change	Employees	Percent change	Employees	Percent change
1960	45.14	-	6.47	-	1.55	-	1.00	-
1970	57.68	-	11.13	-	2.97		1.82	-
1980	73.60	-	17.14	-	5.14	-	2.67	-
1981	73.97	0.5%	17.97	4.8%	5.42	5.6%	2.83	5.9%
1982	73.41	-0.8	18.52	3.1	5.70	5.0	2.97	5.0
1983	71.91	-2.0	18.95	2.3	5.90	3.5	3.03	1.9
1984	75.21	4.6	19.83	4.6	6.06	2.7	3.02	-0.2
1985	78.94	5.0	21.02	6.0	6.20	2.3	2.98	-1.3
1986	81.29	3.0	22.21	5.7	6.40	3.3	3.00	0.5
1987	82.58	1.6	23.27	4.8	6.67	4.1	3.08	2.7
1988	85.59	3.6	24.48	5.2	6.94	4.2	3.21	4.2
1989	88.38	3.3	25.84	5.6	7.38	6.3	3.40	5.8
1990	90.43	2.3	27.06	4.7	7.91	7.2	3.60	6.0
Average annual percent change								
1981-1983		-0.8%		3.4%		4.7%		4.3%
1984-1986		4.2		5.4		2.8		-0.3
1987-1990		2.7		5.1		5.4		4.7
Percent change								
1960-1970		27.8%		72.0%		91.6%		82.0%
1970-1980		27.6		54.0		72.9		46.8
1980-1990		22.9		57.9		54.0		34.7

Source: U.S. Bureau of Labor Statistics. *Employment and Earnings*, Table B-2 (all employees, including supervisory workers).
[a]January of each year.
[b]Excludes agriculture.
[c] Includes general medical/surgical, psychiatric, and specialty hospitals. Excludes federal, state, and local hospitals.

4.0 percent in 1990, but hospitals' share of private health services employment fell from 6.5 percent to 46 percent, and their share of service-sector jobs from 15 percent to 13 percent.

Hospital employment grew rapidly in the early 1980s, despite a recession in the general economy. With the implementation of Medicare's prospective payment system (PPS) in 1983, hospitals expected their revenue growth to be curtailed and responded by reducing employment. Contrary to their expectations, however, hospitals were able to maintain revenue growth well in excess of increases in their input prices.[3] Thus, the effects of PI'S and other cost-control efforts were short-lived: hospital employment growth accelerated toward the end of the 1980s.[4]

Increases in hospital employment that continue to exceed economy-wide job growth are disappointing to policymakers. This is especially true because cost containment efforts have succeeded in reducing hospital inpatient use. From 1980 to 1988, short-term hospital inpatient days fell by 17 percent, as outpatient visits rose 31 percent. [5] The expectation was that treating patients in the less labor-intensive outpatient setting would result in a net reduction in jobs. Such has not been the case.

It is often argued that the increased illness severity of inpatients explains the absence of sustained job reductions in hospitals, in spite of substantial utilization declines. It is true that the average illness severity among inpatients has risen as less sick patients are no longer admitted to the hospital. Although this could account for an increased labor intensity per admission, it fails to explain the absolute increases in hospital employment. A more likely explanation is hospitals' continued ability in the 1980s to generate revenues to support their nonprofit, human service orientation toward providing more services to patients.

In any case, increasing employment combined with declining admissions resulted in a substantial increase in the labor intensity of hospital care in the 1980s. From 1980 to 1987, adjusted for increased outpatient activity, full-time equivalent (FTE) personnel per admission rose 12 percent and per inpatient day rose 26 percent.[6] Total nursing personnel per outpatient-adjusted admission rose 10 percent from 1980 to 1987 in PPS-eligible hospitals and increased 19 percent per adjusted patient day. In spite of concern about a "shortage" of nurses, the average intensity of nursing care in hospitals was greater at the end of the 1980s than at any time previously. These national average figures could, of course, disguise real nursing shortfalls in certain geographic areas or institutions.

Changes in nursing personnel reveal another significant trend in the 1980s: an upgrading of hospital skill mix. There were 28 percent more FTE RNs per adjusted admission in 1987 than in 1980, but 22 percent fewer licensed practical nurses and 12 percent fewer ancillary nursing

personnel. RNs were 56 percent of total nursing personnel in 1980 and 65 percent in 1987 in PPS-eligible hospitals.

This more skilled labor mix was not confined to nursing personnel. Overall, we estimate that the hospital occupation mix was upgraded by 2.9 percent from 1980 to 1987 in PPS-eligible hospitals.[7] Most of this increase (2.6 of the 2.9 percentage points) occurred between 1982 and 1986, coincident with hospitals' adjustment to Medicare PPS. The substitution of RNs for licensed practical nurses and ancillary nursing personnel and the increasing proportion of professional/technical personnel compared to nonprofessionals were the two most important reasons for a more skilled hospital work force. From available data, we are not able to measure greater education, experience, and skills within occupation. For this reason, our estimate of a 2.9 percent more skilled occupation mix in 1987 than in 1980 is a lower bound for total improvement in skill mix.

In part, the upgrading of the hospital work force can be attributed to the demands of new technologies and caring for more severely ill patients in shorter hospital stays. However, other factors have also contributed: competitive pressures to improve the quality of care; and record hospital revenue margins in the mid-1980s that gave hospitals the financial resources to hire more, and more highly skilled, workers. In addition, because of the low wages of some more highly skilled occupations relative to their productivity, hospitals could provide care at lower cost by substituting the occupational categories with higher skills (such as RNs) for those with lower skills (such as licensed practical nurses and aides).

Trends In Hospital Employee Compensation

Following a modest real increase of 5 percent in the 1970s) the earnings of hospital workers advanced dramatically in the 1980s (Exhibit 2). From January 1980 to January 1990, the average hourly earnings of private hospital employees, adjusted for inflation, rose 23 percent, compared to a 6 percent decline for all private-sector employees.[8] In the 1980s) hospital workers' earnings rose by one-quarter relative to the general earnings level, from 10 percent below average to 18 percent above average. Hospital employees' earnings also increased relative to those of service sector and health services employees in the 1980s) widening the slight earnings advantage they held in 1980. The traditional conception of hospital employees as poorly paid workers was no longer true by 1989.

The average earnings of hospital employees will rise if hospitals upgrade the skill mix of their work force as well as if they pay more to the same workers. We estimate that the hospital occupation mix was 2.9 percent more expensive in 1987 than in 1980, which explains only a small

Exhibit 2
Trends In Real Average Hourly Earnings, By Industry, 1970-1990 (January 1980 Dollars)[a]

	All industries[b]		Services		Health services[c]		Hospitals[d]	
Year	Earnings	Percent change	Earnings	Percent change	Earnings	Percent change	Earnings	Percent change
1970	$6.44	-	$5.58	-	$5.85	-	$5.54	-
1980	6.42		5.65	-	5.45		5.79	
1981	6.29	-2.0%	5.56	-1.6%	5.43	-0.3%	5.80	0.2%
1982	6.23	-1.0	5.61	0.8	5.56	2.4	6.04	4.2
1983	6.29	0.9	5.71	1.9	5.77	3.7	6.31	4.4
1984	6.31	0.4	5.78	1.3	5.80	0.5	6.41	1.6
1985	6.27	-0.6	5.78	0.0	5.86	1.0	6.55	2.2
1986	6.19	-1.3	5.77	-0.3	5.84	-0.2	6.54	-0.2
1987	6.23	0.6	5.86	1.6	5.97	2.2	6.74	3.1
1988	6.17	-0.9	5.93	1.1	6.05	1.4	6.87	2.0
1989	6.14	-0.6	5.95	0.5	6.14	1.4	7.00	1.8
1990	6.04	-1.6	5.95	0.0	6.24	1.7	7.10	1.4
Average annual percent change								
1981-1983		-0.7%		0.4%		1.9%		2.9%
1984-1986		-0.5		0.3		0.4		1.2
1987-1990		-0.6		0.8		1.7		2.1
Percent change								
1970-1980		-0.3%		1.3%		-6.8%e		4.6%
1980-1990		-6.0		5.2		14.5		22.6

Sources: U.S. Bureau of Labor Statistics, *Employment and Earnings,* Table C-2; and U.S. Bureau of Labor Statistics, *CPI Detailed Report,* CPI All Urban Consumers, U.S. City Average.
[a] Of nonsupervisory workers on private payrolls, January of each year. Real earnings are actual earnings deflated by cost of living.
[b] Excludes agriculture.
[c] January 1970 data for health services are January 1972 data.
[d] Includes general medical/surgical, psychiatric, and specialty hospitals. Excludes federal, state, and local hospitals.
[e] Percent change 1972-1980.

portion of the 16 percent increase in average hourly earnings over that period. Even if our estimate of skill mix improvement is as little as half of the true value, the majority of hospital wage increases in the 1980s cannot be explained by a more expensive skill mix.[9]

In the 1980s, hospitals increased wages when necessary to attract additional workers. Real earnings rose over 4 percent in both 1982 and 1983, when hospital employment was expanding. In mid-decade, as hospital employment dropped with the implementation of Medicare PPS, wage growth slowed, even turning slightly negative in 1986. However, real earnings growth turned up in the latter third of the decade as employment expanded. The mid-decade slowing of wage increases could also represent an effect of PPS and other cost containment efforts on

hospital wage generosity. However, the higher wage increases in the late 1980s call into question the continuing impact of cost containment.

Hospital wage changes varied enormously by occupation (Exhibit 3).[10] Here we note large real earnings increases from 1981 to 1989 of many higher-skilled medical workers such as RNs, therapists, and pharmacists compared to the flat real earnings of lower-skilled nonprofessional occupations such as admitting clerks, switchboard operators, cleaners, and food service helpers. Also, in the first half of the decade, wage increases were relatively uniform across occupations. In the latter half, the rate of wage growth of some medical occupations accelerated, but in the nonprofessional occupations it was uniformly lower-negative in most cases.

RNs received the highest wage increases of any occupational group, nearly 20 percent adjusted for inflation. Their real earnings rose twice as much from 1985 to 1989 as from 1981 to 1985, as hospitals raised wages

Exhibit 3
Changes In Real Average Hourly Earnings Of Full-Time Workers In Private Hospitals, By Occupation, U.S. City Average, 1981-1989 (1989 Dollars)

	Average hourly earnings			Percent change		
Occupation	1981	1985	1989	1981-85	1985-89	1981-89
Registered nurses						
Head nurses	$15.39	$16.47	$18.58	7.0%	12.8%	20.7%
General-duty nurses	12.66	.	.	5 5	11.0	17.1
Technicians and technologists						
Medical lab technicians	9.62	10.31	10.41	7.2	1.0	8.2
Medical technologists	12.45	12.98	13.22	4.2	1.9	6.2
Radiographers	10.59	10.93	11.39	3.2	4.2	7.6
Therapists and social workers						
Physical therapists	12.69	13.30	14.28	4.8	7.3	12.5
Respiratory therapists	10.22	11.15	11.87	9.1	6.5	16.1
Medical social workers	12.57	13.12	13.31	4.4	1.5	5.9
Other health care occupations						
Licensed practical nurses	9.43	10.08	10.11	6.9	0.2	7.2
Nursing assistants	7.51	7.95	7.66	5.8	-3.7	1.9
Pharmacists	16.98	17.85	18.72	5.1	4.8	10.2
Office clerical						
Clerks, admitting	8.09	8.36	8.15	3.2	-2.4	0.7
Switchboard operators	7.92	8.22	7.83	3.7	-4.7	-1.2
Transcribing-machine typists	9.08	9.46	9.50	4.1	0.5	4.6
Other nonprofessional						
Hospital cleaners	7.24	7.50	7.24	3.7	-3.5	0.0
Food service helpers	7.11	7.32	7.11	2.9	-2.9	-0.1
Laundry workers	7.33	7.66	7.55	4.5	-1.5	3.0

Sources: U.S. Bureau of Labor Statistics, *Industry Wage Survey: Hospitals*, October 1981, August 1985, March/April 1989; and U.S. Bureau of Labor Statistics. *CPI Detailed Report*, *CPI* for All Urban Consumers, U.S. City Average, October 1981, August 1985, April 1989.
[a] The average is for seventeen of the most populous metropolitan areas.

in response to the nursing shortage of the mid-1980s. Also, RN wage gains outstripped those of the less skilled licensed practical nurses and nursing assistants by a wide margin. In 1985, on an hourly basis, licensed practical nurses earned three-quarters as much as general-duty RNs. By 1989, licensed practical nurses earned only two-thirds as much as RNs. Similarly, nurse assistants earned three-fifths as much as RNs in 1985, but only half as much four years later.

The large wage gains enjoyed by RNs seem to be easing the nursing shortage. In some areas, vacancy rates are falling and positions are being eliminated in response to the much higher RN salaries.[11] In the early 1980s, RNs were inexpensive compared to their less skilled counterparts, so hospitals hired many more of them. In addition, their stagnant relative wages precipitated a sharp 27 percent drop in enrollments in basic training programs from 1983 to 1987, constricting supply.[12] By 1989, gains in RN wages, both absolutely and relative to other nursing personnel who can perform some of the same tasks, had begun to lessen hospitals' demand for them. Also, reflecting the salary gains, RN enrollments rose in 1988, promising future increases in their supply. Because of these self-correcting mechanisms in the nurse labor market, policymakers should avoid overreacting to temporary shortages.[13]

The pattern of wage increases by occupation is more consistent with hospitals' response to labor market forces of demand and supply than it is with hospitals' "philanthropy" in setting wages. If hospitals were dissipating excess revenues by granting overly generous wage increases, one would expect wage increases to be more uniform across occupations. However, this is not the case. Especially in the latter half of the decade, hospitals increased wages of skilled medical professionals in short supply but restrained wages of nonprofessionals and other occupations in more abundant supply relative to demand. The large increase in the average hourly earnings of hospital workers in the 1980s could be what hospitals had to pay to satisfy their demand for a larger and more highly skilled labor force. Although the evidence for philanthropic wage setting is not very strong, the possibility of hospital "sharing" of excess revenues with workers warrants continued monitoring of hospital wage setting.

In addition to the demand factors discussed above, shifts in the supply of labor to the hospital industry in the 1980s contributed to wage increases. The hospital labor force is about three-quarters female.[14] In the 1980s, the expansion of opportunities available to women, especially well-educated and highly skilled women, made them less willing to work for hospitals without salary increases.

Hospitals also raised wages in the 1980s to meet increased competition for skilled medical personnel from other providers of medical care.

Hospitals were forced to raise the salaries of skilled personnel to avoid losing them to other health care settings. This greater competition may have reduced hospitals' market power over the wages of medical occupations.[15]

Having lost their captive pool of female labor, hospitals will have to compete more vigorously for workers, especially highly skilled ones. To control their costs, hospitals must economize on the suddenly much more expensive skilled labor. This can be accomplished by assigning skilled workers only tasks for which their greater training is necessary. In addition, substituting capital (for example, computer monitoring systems) for labor can hold down labor expenses.

Sources Of Increase In Hospital Labor Costs

From 1980 to 1988, the total expenses of short-term hospitals grew at an average annual rate of 10.3 percent. Half of the cost increase (5.3 percent) was due to labor expenses, and half (5.0 percent) to nonlabor expenses.[16] The large increases in hospital employee compensation above inflation account for a significant fraction of total hospital cost increases in the 1980s. If real compensation (payroll and benefits) per employee had been constant from 1980 to 1988, total hospital costs would have risen at an annual rate of 8.6 percent instead of 10.3 percent, or 3.8 percent instead of 5.5 percent, inflation-adjusted. Thus, real increases in hospital employee compensation are responsible for one-sixth of hospital cost inflation in the 1980s and one-third of real cost increases.

A decomposition of payroll cost increases from 1980 to 1988 is given in Exhibit 4, together with similar data for the 1960s and 1970s to lend historical perspective. In the 1980s, admissions fell at an average annual rate of 1.7 percent, contributing negatively to growth in payroll labor costs.[17] Of the 10.8 percent increase in payroll cost per admission, about half (4.6 percentage points) was due to general inflation and about one-quarter each to increases in FTE personnel per admission (3.2 percentage points) and in real payroll per FTE employee (2.9 percentage points). Thus, of the 6.2 percent rate of increase in real payroll costs per admission, about half was due to the greater labor intensity of care and half to higher real salary per worker.

The average annual rare of increase in payroll labor costs was lower in the 1980s than in the two previous decades. However, payroll costs per admission increased faster in the 1980s (10.8 percent) than in the preceding decades (10.4 percent in the 1970s and 10.1 percent in the 1960s). Growth in *real* payroll costs per admission was much higher in the 1980s (6.2 percent) than the 1970s (2.6 percent), but lower than in

Exhibit 4
Sources Of Increase In Hospital Labor Costs, By Decade, 1960-1988[a]

	Average annual percent change		
	1960-70	1970-80	1980-88
Total payroll labor costs	12.6%	12.6%	9.1%
Components[b]			
General inflation[c]	2.7	7.8	4.6
Admissions	2.5	2.2	-1.7
Full-time equivalent personnel per admission	3.4	1.9	3.2
Real payroll per full-time equivalent personnel[d]	3.4	0.3	2.9

Sources: American Hospital Association, *Hospital Statistics,* 1989-90 edition, Table 1; and *Statistical Abstract of the U.S.* (for the CPI, All Urban Consumers, U.S. City Average).
[a] Total nonfederal short-term general and other special hospitals.
[b] The components do not add to the total because of interactions among percent changes in individual components that cannot be allocated to only one component. These interactions accounted for 0.6 percent, 0.4 percent, and 0.1 percent of the total rate of growth in payroll costs in the 1960s, 1970s, and 1980s, respectively.
[c] Measured by the consumer price index.
[d] Actual payroll per full-time equivalent deflated by the consumer price index.

the 1960s (7.4 percent).

The rapid rate of increase in real payroll costs per admission in the 1980s is surprising. In this respect, the 1980s are more similar to the expansive 1960s, marked by the introduction of the Medicare and Medicaid programs in mid-decade, than they are to the 1970s. The effects of intensified cost containment efforts on labor expenses are not obvious in these aggregate numbers, except through a reduced demand for labor from fewer admissions. However, increased outpatient activity, the greater illness severity of inpatients, and labor market conditions must be considered when evaluating increases in labor costs in the 1980s.

Implications

Cost containment efforts in the 1980s succeeded in reducing the inpatient utilization of hospitals. Nevertheless, growth in labor costs was only temporarily slowed as hospitals increased the labor intensity of care, the skill mix of their labor force, and salaries. Substituting outpatient for inpatient care has not been enough to bring costs under control. More comprehensive limits on the revenues flowing to hospitals are necessary to curtail job and cost growth.

The rapid increase in the number and salaries of health care workers worries policymakers, who are concerned with the sharp rise in the nation's health care costs.[18] To be sure, this growth is not bad in itself. However, it means that human and financial resources are being diverted

to the health sector at the expense of other pressing national priorities such as education. Increasingly, the health sector is draining away highly skilled individuals capable of major contributions to other fields.

For the most part, hospitals have been able to pay a premium to attract the skilled workers that they increasingly demand. If financial constraints begin to bind more tightly, and hospitals are unable to continue to raise salaries, they may complain of "shortages" of key personnel. Policymakers will then have to decide whether to provide hospitals with the resources to command many of the "best and brightest" workers, or whether other priorities will take precedence.

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NOTES

1. U.S. Department of Health and Human Services, *Secretary's Commission on Nursing: Final Report* (Washington, D.C.: DHHS, Office of the Secretary, 1988).
2. Employment in government-sector hospitals (not shown in Exhibit 1) grew at a less rapid rate than in private hospitals in the 1980s. As a result, total hospital employment (private and government) rose by only 24 percent from 1980 to 1990, from 4.02 million to 4.97 million. This was slightly higher than the 21 percent growth in total (private and government) employment. Data on total hospital employment (government plus private) are from U.S. Bureau of Labor Statistics, Employment and Earnings, Table B-2. The BLS data are based on a sample of establishments (hospitals) and so are subject to sampling error. However, the relative standard errors arc quite small, about 1 percent.
3. Prospective Payment Assessment Commission, *Medicare Prospective Payment and the American Health Care System: Report to the Congress,* June 1990 (Washington, D.C.: ProPAC, 1990).
4. American Hospital Association (AHA) Annual Survey data show that part-time employment is increasing faster than full-time employment. For this reason, the growth in total hospital employment overstates the increase in full-time equivalent (FTE) employment.
5. American Hospital Association, *Hospital Statistics,* 1989-1990 ed. (Chicago: AHA, 1988).
6. This refers to employment in hospitals eligible for Medicare's prospective payment system (PPS); calculated by the authors from AHA's Annual Survey of Hospitals tapes. AHA makes an adjustment for outpatient activity based on the number of outpatient visits and the average revenue per outpatient visit compared to revenue per inpatient admission or day.
7. Our estimate is based on an occupation-mix index formed by weighting proportions of hospital employment in different occupations by the average wage rates of those occupations, then summing. For more details on the index, see G. Pope, "The Occupational Adjustment of the Prospective Payment System Wage Index," *Health Care*

Financing Review (Fall 1989): 49-52; and J. Cromwell and G. Pope, "Trends in Hospital Labor and Total Factor Productivity, 1981-86," *Health Care Financing Review* (Summer 1989): 39-50.

8. All earnings figures from Exhibit 2 refer to nonsupervisory employees only. These employees comprise over 90 percent of all hospital employees. Government hospital employees, who comprise about 30 percent of total hospital employees, are excluded.
9. Victor Fuchs has also studied health care wage changes ["The Health Sector's Share of the Gross National Product," *Science* 247 (2 February 1990): 534-538]. He found that with controls for education, age, sex, and geographic location, rank-and-file health care workers earned 15 percent less: than their counterparts in the rest of the economy in 1949, but 7 percent more in 1985. Increased unionization of the hospital work force in the 1970s could account for some of the 1980s wage gains, although the number of union elections declined dramatically from 1974-1979 to 1980-1985. See E.R. Becker and J.S. Rakich, "Hospital Union Election Activity, 1974-85," *Health Care Financing Review* (Spring 1988): 59-66.
10. The wages refer to private hospitals only and include only straight-time hourly earnings, not premium pay for overtime and shift work. Some hospital occupations (such as nurses) derive a significant portion of total compensation from such premium pay; it is much less important for other categories of workers. To the extent that the rate of change of straight-time and premium pay diverged, or the mix of the two changed, the data in Exhibit 3 could misstate changes in total compensation.
11. "Nursing Shortage Eases as Salaries Rise," *Boston Globe,* 21 October 1989, reporting data from the Massachusetts Hospital Association Annual Wage and Salary Survey.
12. National League for Nursing, *Nursing Data Review,* 1989 (New York: National League for Nursing, 1989), 36.
13. Cyclical reports of nurse shortages have occurred for many years. For the most part, they seem to be the result of slow adjustment of nurse wages and supply to increases in the demand of hospitals and other health care providers for nurses. See C. Newschaffer and J. Schoenman, "Registered Nurse Shortages: Appropriate Public Policy," *Health Affairs* (Spring 1990): 98-106.
14. F. Sloan and B. Steinwald, *Hospital Labor Markets* (Lexington, Mass.: D.C. Heath and Company, 1980), 3.
15. Interestingly, however, hospitals employed a larger share of RNs in 1988 (67.9 percent) than in 1980 (65.7 percent). DHHS, Health Resources and Services Administration, Bureau of Health Professions, Division of Nursing, *The Registered Nurse Population: Findings from the National Sample Survey of Registered Nurses,* 1980, 1984, and 1988 (Springfield, Va.: National Technical Information Service, various years).
16. Labor costs (payroll and benefits) comprised 56.4 percent of total expenses in 1980 and grew at an annual rate of 9.5 percent, thereby contributing 5.3 percent to the growth in total expenses. The remaining 5.0 percent was due to increases in nonlabor costs, which grew at the faster rate of 11.4 percent. All data on hospital expenses and personnel in this section are calculated from AHA, *Hospital Statistics,* 1989-1990 ed., Table 1, nonfederal short-term general and other special hospitals.
17. Adjusting for increased outpatient activity would reduce the rate of decline in admissions and lower the rate of increase in FTEs per admission.
18. "Job Growth in Health Care Soars," *The New York Times,* 5 March 1990, Section D.