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Examining the Decline in Bargaining Power in Faculty Labor Unions in the United States: The Effects of Reduced Monopoly Power in Providing Public Higher Education

Lynn A. Smith¹
Robert S. Balough²

Our supply chain strategy has been consistent for many decades. It's to always operate in the lowest cost places that we can. This allows us to use that cost advantage to invest in our brand, invest in innovation, and keep prices low for our consumers.³

Abstract

This study examines the decline in the economic power of faculty labor unions in public higher education in the United States in recent years. The authors assume the labor union is a utility maximizing entity and that income accrues to the “union family.” The union family attempts to maximize this income. By analyzing collective bargaining agreements and hiring practices between the Association of Pennsylvania State College and University Faculties and the Pennsylvania State System of Higher Education, the authors construct bargaining indices. Because this study is focused on the change in bargaining power of labor unions in public higher education over time, each index is constructed by looking at the ratio of the union annual income pay scale from the collective bargaining agreements of the mid-tier public universities in Pennsylvania to the average yearly income for workers in the private nonagricultural industries.

Borrowing from the Harris-Todaro labor migration model, we construct a composite bargaining index where the original bargaining index is discounted by incorporating the proportion of part-time temporary faculty permitted by the collective bargaining agreements at the mid-tier public universities in Pennsylvania from 1972 to 2009. By considering the reduced employment of full-time tenured-tenure track faculty that can result from increased wages and salaries, or the increase in employment that may result from decreased wages and salaries, this composite bargaining index gives a better measure of the benefits accruing to the “union family”

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³ Richard Noll, CEO, Hanesbrands, Inc; Also, Vernon Smith (30) made the point that the history of production and manufacturing has included a search for the lowest cost of production. There is much empirical evidence that administrations in higher education in the United States are adopting this “lowest cost” approach.

as faculty incomes are increasing or decreasing than would be given by our “original bargaining index.”

Beginning with the early 1970s, and continuing until 2009, we find that the bargaining index has essentially flattened over the past ten years, and the composite bargaining index decreased from 1995 to 2009.

Applying an historical perspective approach, the authors conclude that this decline in bargaining power in recent years came from the same sources as the declines in bargaining power in the private sector earlier. Namely, a reduction in monopoly power in the good or service offered to the buyer, substitution in the labor market, and a reduction in regulation of the product market.

Introduction

In the early days of the labor movement in the United States there was no legislation to deal explicitly with the issue of workers’ rights to form labor unions and to collectively bargain with their employer. In the absence of such legislation, the Courts generally ruled in favor of business when disputes between business and labor arose. For example, the Cordwainers Case in Philadelphia in 1806 and *Commonwealth of Massachusetts v Hunt* in 1842 each applied the Conspiracy Doctrine to rule that workers’ joining together for their own benefit was harmful to society. As a result, labor union membership was about six percent of the labor force prior to 1930 (Myer; U.S. BLS).

While the Railway Labor Act of 1926 was the first federal law to cover the collective bargaining process, it was not until the Great Depression of the 1930s that labor unions gained political power across industries nationwide. This power resulted in legislation to cover all workers in the private sector. Notably, the Norris-LaGuardia Act was passed in 1932 and the Wagner Act was passed in 1935. In large part, this legislation led to an increase in union density from six percent of the labor force in 1932 to about thirty-four percent by the mid-1950s. (Meyer; U.S.BLS).

The desire to establish countervailing power in such industries as auto, steel, textiles, mining, and others characterized by high concentration levels of business was often the catalyst for workers to organize. Union membership data since the 1930s show that labor unions often located in industries where market power was the result of government regulatory agencies, e.g., public utilities, airlines, and other transportation industries.

In the years of the American labor movement after the passage of pro-labor legislation, labor unions often developed from the grassroots; John L. Lewis in the coal industry, Walter Reuther in the auto industry, I.W. Abel in steel, and Jimmy Hoffa in transportation are examples of individuals who organized workers in the occupations from which these organizers came.

During the years of the Great Depression in the United States workers sought unions to join. Today, labor union organizers more often seek workers. This change, along with many other changes in society, means that contemporary labor leaders may have incentives that differ from their predecessors. For example, in the early years of the labor movement labor unions were interested in increasing wages and benefits for their members as well as improving conditions in the workplace; today union leaders, while they still have the incentive to increase wages and benefits for their members, may seek to organize workers because of the “profitable potential” of bringing new workers into their organizations.⁴

Also, market conditions and management strategies slowly began to reduce this level of union density and the relatively high level of bargaining power for labor unions that was associated with it.

This apparent change in the behavior of labor union leaders, management strategies, and market conditions forces us to re-examine the assumptions made when modeling labor unions and forces us to search for additional explanations for the decline of union density and union bargaining power in the United States.

Traditional models usually treat a labor union as a family that is attempting to maximize income or to maximize utility. In a departure from this approach, Smith (Smith, L.) models the labor union as a “firm” attempting to maximize net revenue. In this model, the process of organizing workers is treated as production, which is subject to the law of diminishing returns, and consequently the law of increasing costs. Dues of the members represent revenue to the firm. Equilibrium in this model is established by the firm (entrepreneur or union leader) equating marginal cost of organizing with union dues paid per member – marginal revenue.

In the model which is presented in this current study, income accrues to the “union family.” It is noted here that the concept of utility maximization for the faculty labor union is applied differently in this study than in many previous utility maximizing models for the labor union. Traditional models often see the labor union as selecting the optimal combination of wages and employment subject to the constraint of the labor demand curve generated by the employer. This

⁴ In a *New York Times* article - William Serrin (27) points out that union leaders targeted public employees in Columbus, Ohio for organization because these workers represented “profitable potential.”

current study treats the faculty labor union as a family that is attempting to maximize utility subject to the family income constraint.

Data reported in Tables 1 and 2 are consistent with the hypothesis that labor unions in public higher education in the United States have lost bargaining power in recent decades. Also, the trends in the bargaining indexes constructed from this study reported in Table 3 are consistent with this hypothesis. Is this apparent reduction in bargaining power due to behavior of the faculty labor unions, strategies of management (Sweeney), market conditions, or a combination of these factors?

Table 1

The Shifting Face of College Faculty				
Year	Full-Time			% Part-Time
	% Tenured	% Tenure Track	% Non-Tenure	
1975	36.3	20.3	13.0	30.2
1989	33.1	13.7	16.9	36.4
2005	21.8	10.1	20.1	48.0

The percentage of part-time faculty has steadily increased in the past three decades, while the percentages of full-time tenured faculty and full-time tenured track faculty have declined. Above data are for all U.S. degree-granting institutions.

Sources:
 U.S. Department of Education, 1975-2005.
 "Studies Examine Impact of Part-Time College Faculty," USA Today, Dec. 4, 2008.

This paper offers explanations for the difficulty faculty labor unions in public higher education face today in securing increased salary and benefits and, in some cases, maintaining salary and benefit levels for their members. The explanations offered here are in addition to the traditional explanations given for the difficulty public sector labor unions face; for example, public sector unions bargain with the executive branch, while the legislative branch must provide the funding for the benefits negotiated by the executive branch (Davey).

Before offering explanations for the decline in bargaining power among faculty labor unions in public higher education, we first will examine some empirical evidence and use as an example collective bargaining agreements as well as hiring practices in Pennsylvania between the Association of Pennsylvania State College and University Faculties (APSCUF) and the Pennsylvania State System of Higher Education (PASSHE). The APSCUF faculty labor union was established in 1971. At that time public higher education in Pennsylvania was administered

by the Pennsylvania Department of Education. On July 1, 1983 the Pennsylvania State System of Higher Education was established as an entity outside the Pennsylvania Department of Education. According to the APSCUF Website, by 2010, APSCUF represented approximately 6,000 faculty members in the PASSHE, which includes the fourteen state-owned universities: Bloomsburg; California; Cheyney; Clarion; East Stroudsburg; Edinboro; Indiana; Kutztown; Lock Haven; Mansfield; Millersville; Shippensburg; Slippery Rock; and West Chester University of Pennsylvania. For fall semester 2010, PASSHE has reported on its Website that 119,513 full-time and part-time students were enrolled statewide

Table 2

U.S. Public Universities 2009-2010			
Academic Rank	% Non-Tenure	%Tenure Track	% Tenured
Professor	4.0	0.8	95.1
Associate	6.6	7.0	86.5
Assistant	17.3	75.6	7.1
Instructor	87.8	10.0	2.2
Lecturer	95.3	2.5	2.3
No Rank	89.9	2.4	7.6
All Combined	23.1	22.7	54.2
Source: American Association of University Professors (26)			

Evidence of the Decline in Bargaining Power

Because economists have long recognized the importance of cost/benefit analysis in the collective bargaining process between labor unions and management (Pigou; Hicks; Chamberlain), we incorporate this approach in developing the bargaining indices below.

Historically, labor unions have tried to secure relatively high wages and salaries for their members. Because part-time temporary workers are generally paid lower wage and salary rates than established full-time workers, union leaders are averse to management employing part-timers, especially when these workers are substitutes for the established full-time workers. Also, the employment of part-time temporary faculty means less income for the union family;

therefore a lower level of utility is available to the union family than if only full-time tenured, and tenure-track faculty were employed.

We can see this effect, in the aggregate, in Table 1. Employment of part-time faculty in higher education in the United States has been on the rise in recent decades. Table 2 shows for the academic year 2009-2010 a high level of non-tenure track faculty employed at public universities in the United States. In addition to competing with lower paid colleagues for salaries, full-time tenure-track faculty may object to the employment of these part-time colleagues because the quality of education offered by the college or university will likely be reduced (Jaeger; Eagen).⁵

With regard to Pennsylvania we can see from a review of recent collective bargaining agreements between APSCUF and PASSHE that the ceiling for part-time faculty has been increasing. In the early days of these contracts no ceilings were established with regard to part-time temporary faculty (CBA).⁶ The absence of a ceiling on part-time temporary faculty suggests the union was not concerned about this issue in the past.

The first language to address this issue can be found in the agreement that was in effect from July 1, 1990 to June 30, 1993. In each year of this contract, management agrees to employ 5% fewer part-time temporary faculty in the current year than were hired in the previous year. The contract that was in effect from July 1, 1993 to June 30, 1996 is the first time the administration and the union agreed to set a ceiling on the employment of part-time temporary faculty; the ceiling was set at 7% of all faculty measured on a head count basis. Although some exceptions were allowed, the ceiling of 7% was maintained in subsequent agreements through June 30, 2007.

The most recent agreement in effect until June 30, 2011 represents a major concession by APSCUF on this issue. In that agreement the ceiling was raised to 25%, and the measure used was changed to full-time equivalent (FTE) faculty instead of the larger head count of faculty members. In addition, there is a clause in the contract that is open-ended with regard to this ceiling provided the local APSCUF agrees. No data is available, however, to determine if any local exemptions have been utilized under this provision. Table 3 provides a summary of these ceilings on part-time faculty.

Typically, labor unions are interested in maintaining or increasing a wage differential between some base wage, and the union wage. For example, some economists (Williams)

⁵ The authors of this study have shown that students' exposure to part-time faculty significantly reduces the likelihood of these students completing the associate degree.

⁶ We will later construct a bargaining index where we use observed part-time temporary employment of faculty.

maintain that labor unions support the minimum wage and increases in it because these wage floors will give labor unions rationale and power for increasing their own wages. We apply this thinking to this current topic by considering the average yearly income for workers in the private nonagricultural industries as the base income level for comparison by the APSCUF labor union.⁷ In Table 3 we report these incomes along with the yearly incomes for the highest step full professor in the pay scale from the various collective bargaining agreements. The yearly private sector incomes were calculated from government tables, which report average weekly income.

⁷ While there could easily be debate as to which labor market to use as the base, with union density in the private sector holding at a very low level - about 8% according to the BLS - this selection seems reasonable. Ideally, we want to select the best proxy for a market equilibrium wage and then convert it to annual income.

Table 3

Bargaining Indices for APSCUF					
Year	Annual Income ¹ - Y	Professor Salary ² - Y*	Bargaining Index ³	P	Composite Bargaining Index ⁴
1972	\$7,483.32	\$ 21,240.00	2.84	0	2.84
1973	\$7,944.04	\$ 23,420.00	2.95	0	2.95
1981	\$13,618.28	\$ 33,820.20	2.48	0	2.48
1982	\$14,200.68	\$ 35,849.40	2.52	0	2.52
1983	\$14,881.36	\$ 35,849.40	2.41	0	2.41
1984	\$15,496.00	\$ 36,566.40*	2.36	0	2.36
1990	\$18,187.00	\$ 55,997.00	3.08	0	3.08
1991	\$18,642.52	\$ 59,637.20	3.20	0	3.20
1992	\$19,149.00	\$ 62,171.20	3.25	0	3.25
1993	\$19,703.32	\$ 65,279.80*	3.31	0.07	3.08
1994	\$20,343.64	\$ 71,286.00	3.50	0.07	3.26
1995	\$20,803.64	\$ 74,137.20	3.56	0.07	3.31
1999	\$24,083.80	\$ 80,255.40	3.33	0.07	3.10
2000	\$25,012.52	\$ 81,830.00	3.27	0.07	3.04
2001	\$25,677.08	\$ 86,409.60	3.36	0.07	3.12
2002	\$26,351.00	\$ 87,705.80*	3.33	0.07	3.10
2003	\$26,939.12	\$ 89,907.22	3.34	0.07	3.11
2004	\$27,512.68	\$ 89,907.22	3.27	0.07	3.04
2005	\$28,305.16	\$ 92,604.44	3.27	0.07	3.04
2006	\$29,529.24	\$ 95,382.57	3.23	0.07	3.00
2007	\$30,682.08	\$ 97,767.13	3.19	0.25	2.39
2008	\$31,615.48	\$100,700.14	3.19	0.25	2.39
2009	\$32,051.24	\$103,721.14	3.24	0.25	2.43

Definitions:
BI = Bargaining Index – see note 3 below
CBI = Composite Bargaining Index – see note 4 below

Notes: The CBI as defined here is similar in use to the “expected wage” that we find in the labor migration literature and in the field of development economics. Regarding the labor migration model, the potential migrant will discount the wage in the market based on the unemployment rate. Regarding the current analysis, we must discount any measure of bargaining power by the fact that a faculty labor union is allowing a portion of part-time faculty to be employed by management.

1 – Private nonagricultural industries in U.S. – Current \$.
2 – Annual Salary for Highest step for Full Professor – beginning in August except where noted; * Beginning January.
3 – BI = Y*/Y
4 – CBI = BI x (1 – P), where P = proportion of part-time temporary faculty permitted by contract.

From Table 3, we see the Bargaining Index (BI) for APSCUF is the ratio of the annual salary paid to a full professor at the highest step (Y^*) to the average annual income for private nonagricultural industries (Y). Take note that each salary is expressed in money terms. The results in Table 3 illustrate an increase in this index over time, indicating – according to the index – an increase in bargaining power from 1972 to 2009. In more recent times – 1999 to 2009 – this index showed a slight decrease.

Because any reliable index to measure labor union bargaining power must include costs associated with raising the union wage, and because there is much concern within the labor movement in the United States about part-time temporary workers,⁸ we develop a Composite Bargaining Index (CBI) that includes the costs—from the union perspective—of employing these workers. The CBI takes the following form:

$$\text{CBI} = \text{BI} \times (1 - P)$$

Where P is the proportion of part-time faculty permitted in the contract. This proportion is a ceiling. Theoretically, it has the following range:

$$0 \leq P \leq 1$$

Changes in union bargaining power are indicated in part by changes in the variable P . Faculty unions strongly prefer that all faculty members be full-time regular salary employees and these unions resist management hiring of lower paid part-time and temporary workers who are less likely to join and support the union. We expect, therefore, that bargaining power measured by BI varies inversely with P . This analysis assumes that the observed proportion of part-time temporary faculty employed varies directly with P . The empirical evidence does support this assumption.

Under the current collective bargaining agreement between APSCUF and PASSHE—July 1, 2007 to June 30, 2011—this proportion P is equal to 0.25. In the early days of the collective bargaining agreement—prior to July 1, 1993— P was effectively equal to zero.⁹ From the period July 1, 1993 to June 30, 2007, this proportion P was equal to 0.07.

⁸ The Association of Pennsylvania State College and University Faculties has characteristics of both an industrial union and a craft union. Similar to an industrial union, it prefers more members to less; also, APSCUF is interested in expanding the size of the bargaining unit. Similar to a craft union, it prefers to have members who are highly skilled and highly qualified. A highly-skilled membership generally results in higher pay, because of the limited availability of substitute workers.

⁹ We make this point, because APSCUF did not bargain for a ceiling on part-time faculty in the early contracts. Because APSCUF did not bargain over this issue of part-time temporary faculty, we argue that it was effectively zero.

The CBI, as it is defined in this study, is similar in application to the “expected wage” that we find in the labor migration literature and in the field of economic development (Harris-Todaro). In the Harris-Todaro model, the potential migrant will discount the observed wage in the market based on the unemployment rate. Regarding the current analysis, the CBI adjusts the measure of labor union bargaining power to reflect the changing strength of the faculty labor union indicated by the changing maximum proportion of part-time faculty, P , that it has allowed under the various collective bargaining agreements with management. This approach is consistent with the assumptions in the model of maximizing family income and maximizing family utility.

Table 3 presents comparative data for the 1972 to 2009 period. From this table we see that according to the CBI there is a decline in the bargaining power of APSCUF over this period. From 1999 to 2009 the decline is much more pronounced. It is noted here that this study is concerned with the change in bargaining power over time. A cross-sectional analysis of bargaining power at one point in time may call for a different selection for the base income.

Explanations for the Decline in Bargaining Power

We now offer some explanations for the decline in bargaining power as measured by the bargaining indices presented above. First, the decline in union density and union bargaining power in general has contributed to a similar decline in faculty labor union bargaining power. Government has been intervening more and more in areas where labor unions once found it necessary to take an active role. These areas include safety on the job, pay schedules for overtime work, and mandatory minimum wage pay. The Fair Labor Standards Act (1938) and the federal Occupational Safety and Health Act (1970) are examples of government taking roles away from labor unions. The recently passed health care legislation in the United States may result in diminished influence of labor unions nationwide because labor unions historically have bargained for health benefits for their members. Second, attitudes of the population are likely to be a contributing factor causing the decline in labor union bargaining power in general and public sector bargaining power in particular. Studies by Ashenfelter-Pencavel, Smith L., and Lumsden-Petersen, have found evidence that attitudes of the general population influence union density in the United States economy. These studies have concluded that public attitudes can have strong influences over the outcome of labor union negotiations with management.

While general trends in society and in politics can explain a portion of the decline in bargaining power of faculty labor unions in the United States in recent years, we believe that the dismantling of a structured master plan for public higher education in the various states has also contributed significantly to the reduction in bargaining power for these unions.

Today in public higher education in the United States – particularly in community colleges and middle-tier four-year-degree granting institutions – we see similar conditions that existed earlier in the private sector. Competition between and among different tiers of public higher education is occurring today where in a previous period the reins on mission differentiation were held more tightly. While industrial unions in the 1960s and 1970s first saw competition from the international sector, faculty labor unions in public higher education today see competition because of the lack of a well-defined master plan.¹⁰

For the past five decades, a large portion of public higher education in the United States has been characterized by the three-tier system developed by Clark Kerr in California in the 1950s and 1960s. Kerr's ideas were put into place by the California Master Plan for Higher Education in 1960 (Smith, L.). This model was characterized by mission differentiation in each of three tiers. These three tiers were: community colleges offering associate degrees; mid-level universities offering undergraduate education; and research universities offering Ph. D. programs. The central purpose of this model was to provide the opportunity for some form of higher education for anyone who graduated from a high school in California. This model allowed children of parents who were not college graduates to have higher college participation rates than this group previously attained. Also, this model established public universities in California that competed with the most prestigious private universities in the nation. In its obituary of Clark Kerr, the *New York Times* (Hechinger) referred to his model as “an ingenious mixture of elitism and populism.”

Without intention, the three-tier structure of public higher education had characteristics favorable to the location of faculty labor unions. Essentially, the California model is a regulated monopolistically competitive market for public higher education that reduces labor competition. Increased labor competition, however, can reduce this effect and have the same result for members of a faculty labor union as it had for unionized industrial workers employed in the private sector as discussed earlier.

Faculty labor unions in public higher education face increased competition from the non-unionized faculties at private colleges and universities that compete with the public institutions represented by these unions. Also, the increase in intra-tier competition and inter-tier competition

¹⁰ The state of Ohio recently adopted a master plan for public higher education, with the intent of reducing this competition. The Executive Summary of the Strategic Plan reads as follows - The University System of Ohio will end the counter-productive competition among institutions for scarce resources. The historic strengths and traditions of our individual universities will be drawn upon to create distinctive missions for each, leading to the establishment of nationally and internationally-recognized Centers of Excellence that will be drivers of both the regional and state economies and that will complement the comprehensive, quality education available at each institution. Each institution will delineate these Centers of Excellence, together with specific goals and measurements by which the goals can be evaluated (35).

in public higher education in the United States has moved it away from the traditional three-tier structure. In the decades that followed the 1960s, administrators in public higher education in the United States failed to hold the reins on mission differentiation as Kerr had advised. This mission creep led to a proliferation of multi-level academic program offerings at many public higher education institutions, which is now the norm rather than the exception. Today we find community colleges offering four-year programs, traditional undergraduate institutions offering associate degree programs in competition with community colleges, and graduate research universities establishing branch campuses that offer two and four-year degree programs in direct competition with community colleges and traditional four-year institutions.

This increased competition manifests itself in other ways as well. For example, the non-union Pennsylvania State University has 25 branch campuses in Pennsylvania outside its main campus in University Park. Nineteen of these campuses now offer four year degree programs, while the erstwhile mission of these campuses was to serve as feeder campuses to the main campus primarily serving students for their first two years. This changing mission places these nineteen campuses of Penn State University in direct competition with the fourteen institutions of the unionized Pennsylvania State System of Higher Education. Enrollment data from fall 2010 reveal that 33,997 students attend these nineteen campuses. Five of the six remaining Penn State branch campuses are either professional or graduate schools. The sixth is a community-technical college – Pennsylvania College of Technology, in Williamsport – which offers both associate degrees and bachelor degrees.¹¹

While The Pennsylvania State University is eager to announce that it is a top-tier research university and a member of the Big Ten athletic conference, it has at the same time broadened its mission to include associate degree programs in its curriculum offerings.

This proliferation of the diversification of mission of these institutions has increased competition among these institutions. Faculty bargaining power at the traditional four-year institution – where many of the faculty labor unions are located - is eroded by this competition. In contrast to this situation, consider public sector police and fire departments. No similar competition exists and a type of monopoly results in the supply of labor services by unions to police and fire departments. Consequently the unions representing these public service workers may have lost bargaining power for other reasons discussed in this paper but they have faced no erosion of bargaining power because of increased competition from other workers. While competition from the international sector weakened industrial labor unions earlier, the

¹¹ A similar situation has evolved in the Wisconsin system. According to Dr. Petro Roter, Vice Chancellor for Student Affairs at the University of Wisconsin – Oshkosh, some traditional four-year degree campuses in the University of Wisconsin system are now offering Ph.D. programs, and community colleges in this system are now offering baccalaureate degrees.

dismantling of the Kerr model has had a similar effect on faculty labor unions in public higher education today.

In the United States in recent years, more capital-for-labor substitution has occurred in higher education similar to the capital-for-labor substitution in the manufacturing sector in the past several decades. Distance education, such as web-based online courses, interactive television courses, and increased class sizes facilitated by large high-technology classrooms are all examples of this trend toward increased capital intensity. The impact of this increased capital utilization on union strength in higher education is the same as the impact in the industrial sector in prior decades.

The equivalent to service sector outsourcing to reduce labor costs that has occurred in recent years in many service industries is also occurring in higher education. Articulation agreements between four-year degree granting universities, and community colleges results in some “production” being outsourced to low-cost labor in the community colleges because students can take credits with guaranteed transferability to four-year programs from community colleges. We can expect that the impact of this form of outsourcing on faculty union bargaining strength at four-year colleges and universities to be similar to the impact of outsourcing on private sector union strength mentioned above. This type of outsourcing has occurred in other public sector settings as well. Private non-union companies competing for contracts to provide social services, prison guards, and janitorial services to state and local governmental units are examples.

Summary and Conclusions

In summary, this paper has proposed two possible measures of public-sector union bargaining power and provides evidence of a decline in bargaining power for organized faculty in Pennsylvania. An explanation of the existence of this decline in spite of stable union density is offered with several possible causes each with a direct corollary to a contributing factor in the decline in industrial union bargaining power in the United States. First, the increased competition faculty labor unions are now experiencing from the dismantling of the California three-tier model espoused by Clark Kerr is similar to the increased competition U.S. manufacturing faced from the international sector. Second, the increased use of capital intensive teaching techniques including distance education and web-based courses, and increased class sizes facilitated by large high-technology classrooms is similar to capital-for-labor substitution in the manufacturing sector. Third, outsourcing has occurred in both manufacturing and in public higher education. Outsourcing work to non-union companies in the private sector is similar to the effect of articulation agreements in higher education that outsource work to lower-cost educational institutions. Lastly, the increased use of part-time and temporary employees, common in both

manufacturing and public higher education, has moved work from regular union members to lower-cost workers enjoying weaker benefits and job security and has weakened bargaining power of unions in both areas.

While public sector unions have fared far better than their private sector counterparts due primarily to the maintenance of union density, the loss in bargaining power of unions has, nonetheless been widespread and universal and there is no indications that this trend is slowing. It is more likely that the competition faced by public sector unions will increase in the future as governments attempt to control costs and balance budgets.

It is also more likely that capitalization and use of labor-saving technologies will increase in the near future for public sector employment. Just as larger class sizes facilitated by enhanced use of technologies is the most likely scenario for higher education, new technologies are just as likely to reduce or eliminate the demand for highway toll-takers. Increased use of technology and capital-intensive production techniques cut both ways, however. Weakened union bargaining power overall and fewer union workers is often accompanied by increased earnings due to the increased productivity resulting from the use of capital and technology intensive production techniques.

Outsourcing may or may not continue to grow in the future. Private companies can often compete for outsourced public sector jobs because of lower labor cost due to a lower level of benefits offered to their employees, particularly health care coverage and pension benefits. The recent passage of the Affordable Health Care Act in the United States may actually mitigate the practice of outsourcing, at least at the domestic level in the public sector. Outsourcing services overseas is usually not a viable option with public sector service jobs as it often is with private sector service jobs. The advantage private sector competition has over public sector employment regarding pension costs may also be mitigated over time as more state and local governments have taken actions to bring pension costs under control.

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