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## **The Changing Size Distribution of U.S. Trade Unions and Its Description by Pareto's Distribution**

by John Pencavel

Stanford Institute for Economic Policy Research  
Stanford University  
Stanford, CA 94305  
(650) 725-1874

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ITS DESCRIPTION BY PARETO'S DISTRIBUTION

John Pencavel

Department of Economics and Stanford Institute for Economic Policy Research  
Stanford University  
Stanford, California 94305-6072

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ABSTRACT

The size distribution of trade unions in the United States and changes in this distribution are documented. Because the most profound changes are taking place among very large unions, these are subject to special analysis by invoking Pareto's distribution. This represents a new application of this distribution. Extensions to trade union wealth and to Britain are broached. The role of the public sector in these changes receives particular attention. A simple model helps account both for the logarithmic distribution of union membership and for the contrasting experiences of public and private sector unions since the 1970s.

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# THE CHANGING SIZE DISTRIBUTION OF U.S. TRADE UNIONS AND ITS DESCRIPTION BY PARETO'S DISTRIBUTION

John Pencavel\*

## I. Introduction

In Economics, patterns in the size distribution of certain key variables - including incomes, wealth, firms, cities, and macroeconomic shocks - have long been an area of active research. Decades ago the size distribution of trade unions was among these areas of research. However, in the discussion over the retreat of unionism since the 1970s, the issue of the size distribution of unions has been largely neglected. Yet, over this period, there have been important changes in the structure of unionism, changes that perhaps have been sensed by the political system but that have been somewhat disregarded by scholars. Between 1974 and 2007, there were 101 fewer labor organizations so that, notwithstanding the drop in union membership, the average size of U.S. unions rose: the number of members per union grew from 114 thousand in 1974 to 180 thousand in 2007.<sup>1</sup> The changes in the size distribution are linked to the growth of a few very large unions.

The purpose of this paper is to document these changes in the size distribution of U.S.-based unions and, because of the importance of large unions in these developments, to examine the case for invoking Pareto's distribution as a compact description of the increasing concentration of union membership into a smaller number of very large unions. Pareto's distribution is well-known to scholars of the personal income distribution where its performance in describing the distribution of high incomes has been assessed very favorably.<sup>2</sup> It has also been invoked to depict the distribution

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<sup>1</sup> These numbers cover both employee associations and conventional labor unions. An Appendix provides information on the sources for the data used in this paper. As noted in the Appendix, in each year, there are a few unions whose membership is not listed. These are believed to be small unions. All references to unions in this paper are to the set of unions whose membership is reported.

<sup>2</sup> Thus recently Atkinson, Piketty, and Saez (2011) write "A number of the top income studies conclude that the Pareto approximation works remarkably well today....." even though these authors go on to show that "...Pareto coefficients vary substantially over time and across countries".

of employment among firms and the distribution of population across cities. There is a large literature on the effectiveness of Pareto's distribution in describing the size distribution of high incomes, large firms, and big cities, but Pareto's distribution has not been used before to characterize the size distribution of large labor unions. Hence another goal of this paper is to contribute to the body of research on Pareto's distribution.

This paper first describes the distribution of the number of unions by their membership size and the distribution of union members by the size of unions. Then the changes in these size distributions since the 1970s are reported. Because very large unions figure prominently in these changes, in seeking a concise depiction of developments among the large unions, the performance of Pareto's distribution to characterize these changes is reviewed. Extensions of Pareto's distribution in the study of unionism are broached in Section V which is devoted to the distribution of unions by their net worth and to the distribution of unions by membership in Britain. In Section VI, a simple model is sketched that yields a logarithmic density function of national union membership and that helps to account for the growth of public sector unions and for the contraction of private sector unions.

At the outset, it should be recognized that the focus in this paper is on national unions. This is not the organization that many union members see as their principal link with their union. Their connection is with the union at the local level where workplace grievances are handled and where the shop steward is the face of unionism. However, the national union plays a critical role in the typical union member's work life. Normally, it is the national union that needs to approve any strikes and that provides strike benefits. Although many collective bargaining contracts are decentralized and negotiated between the management at a firm or establishment and the union local or the regional union bodies, the national union often contributes advice and material support.<sup>3</sup> "The principal locus of political and economic power in the American union movement has long been the national unions" (Rees (1988) p. 23). In this paper, "unions" and "labor organizations" refer to employee associations as well as conventional trade unions.

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<sup>3</sup> Some unions' procedures require the national union to approve the negotiated settlement to ensure it conforms to some wider patterns. Many unions also have bodies intermediate (often regional) between the local and the national union that coordinate activities among their locals

## II. The Size Distribution of U.S. Trade Unions in the 1970s

In the 1970s, unionism appeared to be well-entrenched in U.S. labor markets. About 20 million workers were members of unions and they represented almost one-quarter of wage and salary workers. Well over eight thousand union representation elections were conducted each year. Three-quarters of all union members in the 1970s were in the private sector<sup>4</sup> and, as indicated in Table 1, four of the five largest unions drew most of their membership from employees in the private sector. Among the largest unions in 1974, only the National Education Association had a substantial representation among workers in the public sector.

There were many small unions that, in aggregate, represented only a small fraction of all union members and there were a small number of large unions that accounted for a substantial portion of all union members. Thus Table 2 shows that, in 1974, those labor organizations with half-a-million members or more (rows 5 and 6) made up fewer than 6 percent of all unions but 50 percent of all union members belonged to these unions. At the other end of the distribution, in 1974, three-quarters of all U.S. unions consisted of those where each had fewer than 100,000 members (rows 1, 2, and 3 of Table 2), but merely 10 percent of all union members were members of these unions.

A visual impression of these frequency distributions is instructive so Figures 1 and 2 present diagrams of the densities in 1974. Figure 1 pictures the percentage distribution of the number of unions by the size of the unions where each union size class is one hundred thousand members up to the open-ended class of one million members or more. The dominance of small unions in the count of all unions is evident. The percent distribution of union members by union size (using the same size classes as in Figure 1) in Figure 2 is dominated by the bar corresponding to unions with one million or more members. The highest bar in Figure 1 is the smallest size class and the highest bar in Figure 2 is the largest size class.

The size distribution of unions resembled the size distribution of firms or work establishments in that most firms or establishments were small but most workers were employed in

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<sup>4</sup> 1977 was the first year that the Current Population Survey included members of employee associations in its count of members of labor unions. In that year, 74.2 percent of labor union and employee association members were employed in the private sector.

a relatively few large establishments.<sup>5</sup> Some may assume that this resemblance of the size distribution of unions to the size distribution of firms is natural and expected. After all, some may reason, unions deal with and respond to firms so should we not expect the distribution of unions to mirror the distribution of firms or establishments?

Of course, there is a link between union membership and employment, but the reasoning in the previous paragraph ignores the fact that most U.S. workers were and are not covered by collective bargaining contracts. Hence a mapping from the size distribution of firms to the size distribution of unions has to account for an intervening variable, the incidence of unionism across firms of different sizes. In addition, many collective bargaining contracts in the U.S. are decentralized and are negotiated between a firm or establishment and the union local, not the national union. Furthermore, some unions in the United States are organized on an occupational basis with members in different industries while other unions are centered on an industry (or closely related industries) and embrace different types of workers in various occupations. In short, it is not straightforward to move from employment by firm size to membership by size of national union.

A different line of reasoning to account for the resemblance between the size distribution of unions and the size distribution of firms draws upon the fact that, in the sense in which Economics conceives of the firm, a union is a firm. A union employs factors, combines and organizes these factors in a manner that is not knowingly wasteful of resources, and supplies the resulting services to members who pay regular dues and fees. These activities are exactly those that economists ascribe to the firm. Of course, the union is not characterized as maximizing net revenues, but then nor does every conventional firm maximize its net revenues. However, interpreting the size distribution of members of national unions as an evident deduction from the size distribution of employment by firms overlooks the fact that union members are not employees of the national unions. In a real sense, union members are customers of the services provided by the union so that a closer analogy with the size distribution of firms would be provided if firm size were measured by the number of the customers of each firm.

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<sup>5</sup> Seminal contributions to the literature on the size distributions of firms, industries, and establishments include Hart and Prais (1956), Simon and Bonini (1958), and Quandt (1966 b). In this literature, size is measured in different ways including employment, assets, market valuation on a stock exchange, and profit. International comparisons are presented in OECD (1996).

### III. Developments since the 1970s

By the first decade of the twenty-first century, the standing of unions in U.S. labor markets looked more precarious than it appeared three decades earlier. Union membership was three-quarters of its 1970s value and union representation elections in 2006-09 were less than one-quarter of their number in 1976-79. Public sector unionism had become more important: the percent of all union members who were employees in the private sector fell from three-quarters in the late 1970s to one-half in the years 2007-10.<sup>6</sup>

The structure of unionism in the 1970s described above - most unions were small and most union members belonged to a relative handful of very large unions - has become more pronounced. As in Table 3, by 2007, more than 70 percent of all union members belonged to organizations each of whose membership consisted of half-a-million members or more. The five organizations with at least one million members accounted for 45 percent of all members yet they represented less than 5 percent of all unions. Seventy-two percent of unions consisted of organizations where each had less than 100,000 members and yet they had in aggregate only 10 percent of all members.

According to Table 4, between 1974 and 2007, those unions with one million or more members were the only size class (of those listed) recording an increase in the number of members, an increase of 2.6 million members. Figures 3 and 4 presents a visual expression of the changing size distribution. In these figures, for each size class specified on the horizontal axis, there are two columns: the unshaded column on the left of each pair represents the year 1974 and the column (shaded in black) on the right of each pair relates to the year 2007. In Figure 3, the height of each bar represents the number of unions in each size class as a percentage of unions in all size classes. The 2007 bars indicate a slight reduction in the percent of unions in the two smallest size classes and a small increase in the percent of unions in the largest size class, but these changes do not alter the pattern that most unions are small. Figure 4 expresses the percentage of union members in each size class. For every size class below 500,000, the column for 2007 is lower than the column for 1974; for the two size classes at and above 500,000, the columns for 2007 are higher than the columns for 1974: in 2007, a larger fraction of union members belong to unions with memberships of half-a-million or more than in 1974.

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<sup>6</sup> From the membership data collected by the Current Population Surveys, the share of union members who were employed in the private sector was 49.95 percent averaged over 2007-10.

These figures express the percentage distribution of unions and the percentage distribution of union members by size classes that differ by a constant number of members, namely, 100,000. A different organization specifies size classes that differ in membership by a constant proportion as in Figure 5 and 6. Here the lower threshold of membership in each class is twice the lower membership threshold in the previous class.<sup>7</sup> In Figure 5, the percentages of unions in the three largest size classes are greater in 2007 than in 1974 and the percentages of unions in the three smallest size classes are lower in 2007 than in 1974. Figure 6 depicts the percentage distribution of union members by the sizes of unions and the skewed distribution of union membership is more pronounced in 2007 than in 1974. The large increase since 1974 in the percent of union members in the largest size class is conspicuous. In 2007, this frequency distribution's modal class is the largest class with well over a million members.

This increasing concentration of total union membership in the largest of unions is associated with the growing importance of public sector unionism. As shown in Table 1, the four private sector unions listed among the five largest unions in 1974 all experienced declines in their membership to 2007 and the single public sector union among the five largest unions increased its membership, more than doubling in size. Whereas in 1974 four of the five largest unions drew most of their members from the private sector, most members of the three largest unions in 2007 (Table 5) are public sector employees.<sup>8</sup> The public sector unions tend to represent more skilled and highly paid employees than the workers represented by the private sector unions so the growth of public sector unionism implies a growth in the clout of the better paid unionised workers.<sup>9</sup> Among public sector union members, it has been those who are State employees whose relative (and absolute) importance

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<sup>7</sup> The analysis later in this paper that examines differences among unions in the logarithm of membership inspires this organization of cells whose memberships bear the same ratio from one to another.

<sup>8</sup> Many of these unions had some members employed in the private sector and some members in the public sector. The private/public employment distinction in the text concerns what is believed to be the sector where most members are employed. Table 5 may understate the importance of public sector unionism: the sixth largest union in 2007 is the American Federation of Teachers (AFT) with 832,100 members, another union with members principally employed in the public sector.

<sup>9</sup> According to the Current Population Survey, the median weekly earnings of full-time unionised wage and salary workers in the public sector exceeded those of the corresponding unionised earnings in the private sector by 12 percent in 2011. See <http://www.bls.gov/news.release/pdf/union2.pdf>.



has grown.<sup>10</sup>

Indeed, the concentration of union membership associated with the growth of public sector unions has the corollary that union membership has become more concentrated within the public sector. Merging the information in the Directory of Labor Organizations on membership in particular unions with the information from the Current Population Survey on total union membership in the public sector, in 1978, membership in the four largest unions with predominantly public sector employees represented 76.9 percent of the Current Population Survey's report of union members in the public sector. In 2007, the corresponding percentage is 93.2 percent.<sup>11</sup>

How has this greater concentration in union membership in recent decades come about? In some cases, increasing concentration has been the consequence of vigorous organizing campaigns undertaken by some of the larger organizations to build up their membership and representation while smaller unions have tended to have been less active in this regard. In addition, there has been a continual process of amalgamation. Mergers between unions are by no means new and Figure 7 plots the number of union mergers per year (averaged over five year periods) from 1900 to 2007. Merger activity was especially animated in the 1980s.

Often this process of amalgamation has not involved unions of approximately the same size but unions whose memberships were quite different in size. The literature on mergers of unions

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<sup>10</sup> The percent of all public sector union members who are State employees rose from 18.7 percent in 1983 to 25.7 percent in 2007 while the fractions who are Federal and Local government employees fell. Union members who are local government employees represented 62.2 percent of all public sector union members in 2007. This information is taken from <http://unionstats.gsu.edu/> maintained by Barry Hirsch and David MacPherson.

<sup>11</sup> To document changes since the 1970s, values from the CPS for the year 1978 are used because the CPS question on union membership expanded in 1977 to include membership in "...an employee association similar to a union". The four unions are the National Educational Association (NEA), the Service Employees International Union (SEIU), the American Federation of State, County and Municipal Employees (AFSCME), and the American Federation of Teachers (AFT). These were the four largest unions with considerable membership of public sector employees in both 1978 and 2007. The fraction of SEIU's members who are public sector employees may be lower than those of the other three unions. When the SEIU is omitted from the calculation reported in the text, an increase in concentration from 1978 to 2007 within the public sector remains. As noted in the Appendix, not all unions are required to file reports with the Department of Labor and this exclusion is more likely to affect unions with members who are public sector employees.

sometimes draws a distinction between mergers that take the form of amalgamations and those of absorptions though the line distinguishing absorptions from amalgamations is “often faint”.<sup>12</sup> Both because of mergers and because of organizing campaigns, unions that already had large memberships in the 1970s have tended to become larger both absolutely and relatively.<sup>13</sup>

The amalgamations over the past forty years have resulted in the demise of several celebrated unions. For instance, the members of the International Typographical Union, a union that traced its origins to early printing guilds, were absorbed into the Teamsters and the Communications Workers of America in the 1980s. The International Ladies’ Garment Workers Union (ILGWU), a union involved in celebrated strikes a century ago, joined in 1995 with the Amalgamated Clothing and Textile Workers Union to form the Union of Needletrades, Industrial and Textile Employees (UNITE). The Brotherhood of Sleeping Car Porters, a union of predominantly Black workers, merged in 1978 with the Brotherhood of Railway and Airline Clerks which, in turn, merged with other unions in the 1980s to form the Transportation-Communications International Union.

Years ago, the issue of the changing size distribution of labor organizations prompted a number of analyses. For instance, using the fraction of total union membership belonging to the largest unions as measures of concentration, Marten Estey (1966) examined data from 1897 to 1962. He found different trends within the ranks of the ten largest unions though his “major empirical finding” was that concentration in the two largest unions had declined since the beginning of the century. He contrasted this with the British experience of increasing concentration.

Subsequently Windmuller (1981) examined the distribution of union membership in the U.S. and eight other countries from the 1950s to the 1970s and found a tendency toward greater concentration over these two decades.<sup>14</sup> The information in Figures 4 and 6 suggests that Windmuller’s conclusion endures to the present. Using the type of indicators that Estey constructed - the percent of total membership who are members of the largest unions - Table 6 indicates that

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<sup>12</sup> Windmuller (1981), p. 53.

<sup>13</sup> Five unions have been particularly involved in mergers: the Communications Workers of America (CWA), the Service Employees International Union (SEIU), the United Food and Commercial Workers (UFCW), the International Association of Machinists and Aerospace Workers (IAM), and the United Steel Workers (USW).

<sup>14</sup> Note that Windmuller omitted employee associations in his analysis for the U.S.

these reveal a marked increase over recent decades.

Although there has been an evident trend toward concentration in union membership, it must not be thought that small unions no longer exist. Table 7 lists from the 2008 Directory the seven unions with fewer than 500 members in 2007 and all of these unions are listed in the 1975 Directory for 1974. By contrast, all but two of the ten smallest unions in 1974 have been swallowed up by larger organizations or they have disappeared.<sup>15</sup> The endurance of unions of substantially different sizes suggests there are no meaningful economies or diseconomies of scale in supplying services to union members.

#### IV. Pareto's Distribution

The concentration of the union structure and the growth of the largest unions may be taken up in a less impressionistic and more organized fashion if the distribution in the sizes of unions followed a compact systematic pattern. This has led some researchers to draw upon the lognormal distribution to describe the size distribution of unions,<sup>16</sup> but I explore a different method to characterize the size distribution of large labor unions: Pareto's distribution. Its use to depict the pattern of high incomes is well known where it relates the logarithm of the percentage of observations whose income is larger than a given value to the logarithm of that value. It has other applications in Economics including the size distribution of large firms and the size distribution of large cities. I consider the case for the same relationship to describe the membership of large unions.

The issue immediately presents itself of defining "large" unions. In other areas of economics where Pareto's distribution has been applied, the consequences of different thresholds for defining "large" have sometimes been investigated and I consider this here in its application to "large" labor organizations. I begin with an analysis of Pareto's distribution using union membership in 2007.

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<sup>15</sup> The 2007 listing of unions identifies two unions that were among the ten smallest unions in 1974: the National Labor Relations Board Professional Association and the World Umpires Association (known in 1974 as the Major League Umpires Association). We may well underestimate the incidence of small unions in the public sector because the Labor Management Reporting and Disclosure Act does not require organizations exclusively representing local or state public sector workers to file.

<sup>16</sup> For instance, see Hart and Phelps Brown (1957) and Simpson (1972) both of which were examining the structure of British unionism.

### Union Membership in 2007

Suppose the threshold for inclusion in the set of “large” unions in 2007 are those with at least 200,000 members. There are 21 labor organizations in this set. These unions constituted almost a fifth (precisely 18.9 percent) of all the unions and over four-fifths (precisely 83.1 percent) of all the reported membership in the Directory. Let  $M_i$  be the number of members belonging to union  $i$  and suppose  $S_i$  is the percentage of unions with membership greater than union  $i$ 's membership.<sup>17</sup> The values of  $S_i$  constitute the survivor function and it is the complement of the cumulative distribution function of membership.<sup>18</sup> Pareto's Law maintains that, beyond a certain threshold (initially, a level corresponding to membership of 200,000 in 2007 is specified), the survivor function of union membership is  $S(M_i) = e^{-\lambda} (M_i)^{-\alpha}$  or, in logarithms,

$$(1) \quad \ln S_i = \lambda - \alpha \ln M_i \quad ,$$

where  $\lambda > 0$  and  $\alpha > 0$  are parameters.<sup>19</sup>  $\alpha$  is sometimes called Pareto's coefficient. The special case of  $\alpha = 1$  is named Zipf's Law or the “rank-size” rule. In the study of high incomes,  $\alpha$  is often estimated between 1.5 and 2.5; in its application to the size distribution of large firms,  $\alpha$  is estimated between 0.89 and 1.06; and in its application to the distribution of large cities in a country,  $\alpha$  is estimated between 0.729 and 1.963.<sup>20</sup>

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<sup>17</sup> Unions are ordered from the smallest to the largest so, among these 21 unions, the largest union is ranked 21 (RANK = 21). Because we intend to form logarithms of the variables, to avoid trying to take the logarithm of zero (!) and to ensure the largest union is represented in the data, in forming  $S_i$ , we add unity to the number of unions. That is, in the set of the 21 largest unions in 2007,  $S_i$  is defined for union  $i$  as  $[(22 - \text{RANK}_i)/22]100$ . This means  $S_i = [(22 - 21)/22] = 4.545$  for the largest union and  $S_i = [(22 - 1)/22]100 = 95.545$  for the smallest union among this set of 21 unions.

<sup>18</sup> The cumulative function is non-decreasing and the survivor function must be non-increasing.

<sup>19</sup> For values of  $M_i > 200$  thousand, the density function is  $f(M_i) = e^{-\lambda} \alpha (M_i)^{-(1+\alpha)}$ . When plotted on linear axes, the density function looks approximately like an upper case L with a monotonic negative slope. This is how the frequency distribution of unions by membership appears in 2007 for those unions with membership greater than 200,000 members.

<sup>20</sup> The values for high incomes come from Atkinson, Piketty, and Saez (2011) and from Pareto (1965) who reported estimates of  $\alpha$  values ranging from 1.35 in England in 1879-80 to 2.10 in Uri in 1887. The values for large firms are drawn from Axtell (2001) and Fujiwara et al. (2008). The values for city size are reported in Rosen and Resnick (1980) and Soo (2005). For other applications of

$\alpha$  provides an indicator of the degree of concentration of the values of the variable among those observations to which Pareto's distribution is applied: higher values of  $\alpha$  denote less concentration because the larger the value of  $\alpha$ , the steeper the decline of the survivor function and the larger the range of values of the survivor function for a given difference in union membership. Indeed, under certain conditions,  $\alpha$  can be mapped into other indicators of inequality with higher values of  $\alpha$  associated with less inequality.<sup>21</sup> A useful attribute of Pareto's distribution is that, if  $\alpha > 1$ , the average membership of those unions equal to and above a minimum value, say,  $M_N$ , equals  $\alpha (\alpha - 1)^{-1} M_N$ . Or the ratio of the average membership to  $M_N$  is the constant  $\alpha (\alpha - 1)^{-1}$  so that lower values of  $\alpha$  imply a greater ratio of average membership to  $M_N$ .

An impression of the relationship between the variables in equation (1) is provided by the scatter diagram, Figure 8, which plots  $\ln S_i$  against  $\ln M_i$  for the 21 unions with membership no less than 200,000 in 2007. The largest union had 3,167,612 members and the smallest union included in this scatter diagram had 229,248 members.<sup>22</sup> The negative relationship between  $\ln S_i$  and  $\ln M_i$  in Figure 8 does not appear to be exactly linear although the deviations from linearity may be random and inconsequential. To what extent is this relationship satisfactorily described as linear? Is this a good fit by some criterion? Are the deviations from the fitted relationship randomly distributed? These issues will be taken up by estimating the unknown parameters of Pareto's distribution by the method of least-squares. From equation (1), departures from precise log-linearity may be accommodated by adding a stochastic term:

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Pareto's distribution, see Clauset, Shalizi, and Newman (2009), Gabaix (2009), and Steindl (1965).

<sup>21</sup> When comparisons are made among distributions with the same mean, if  $\alpha > 1$  and if  $G$  stands for Gini's coefficient,  $\alpha = (1 + G)(2G)^{-1}$ . Chipman(1974) uses Atkinson's concept of the equally distributed equivalent income to write a social welfare function in terms of  $\alpha$  and  $\lambda$ . Aitchison and Brown (1954) relate values of  $\alpha$  to Lorenz' Curve. If  $\alpha \leq 1$ , the distribution's population moments do not exist though those of the sample observations are well-defined. If  $\lambda$  is set to  $(M_N)^\alpha$  where  $M_N$  is a fixed low level such as the minimum observed level, equation (1) may be written  $\ln S_i = \alpha \ln (M_N / M_i)$  and the size distribution is described by one unknown parameter,  $\alpha$ .

<sup>22</sup> In Figure 8,  $S_i$  is expressed not as a percentage but as a fraction. Therefore,  $S_i$  is 0.04545 and  $\ln(S_i) = -3.091$  for the largest union and  $S_i$  is 0.09545 and  $\ln(S_i) = -0.0465$  for the smallest union in this set. The difference between expressing values of  $S_i$  as a fraction and as a percentage is simply the value of the intercept. The slope of the relationship,  $-\alpha$ , is unaffected.

$$(1.1) \quad \ln S_i = a_0 + b_0 \ln M_i + e_{0i}$$

where  $a_0$  and  $b_0$  are parameters to be estimated with the interpretation that  $a_0 = \lambda$  and  $b_0 = -\alpha$  and where  $e_{0i}$  represents the value of  $i$ 's residual from the fitted line.<sup>23</sup>

The equation above describes the nature of the association between two variables. In terms of Figure 8, there is no necessary reason to minimize the sum of squared residuals in a vertical direction instead of in a horizontal direction. Therefore, rearrange equation (1) as follows:

$$(2) \quad \ln M_i = \lambda \alpha^{-1} - \alpha^{-1} \ln S_i,$$

a stochastic version of which is

$$(2.1) \quad \ln M_i = a_1 + b_1 \ln S_i + e_{1i},$$

where  $a_1 = \lambda / \alpha$ ,  $b_1 = -\alpha^{-1}$ , and  $e_{1i}$  is an additive disturbance.

Equation (1.1) is estimated first to the 21 largest unions in 2007 (the unions with no less than 200,000 members) and the ordinary least-squares estimates are reported in the first row of Table 8. For these unions, Pareto's coefficient is estimated to be 1.13 and 95 percent of the variance in the dependent variable is removed by the single right-hand variable,  $\ln M$ . In Table 8, the rows from 2 to 5 expand the number of unions to which Pareto's coefficient is estimated. As the membership threshold is lowered, so Pareto's coefficient is estimated to be lower. This decline in the implied value of  $\alpha$  as the threshold is lowered for inclusion into the set of unions to which equation (1.1) is estimated is consistent with the notion that the concentration of union members into the largest unions appears more salient as smaller and smaller unions are added to the data. It illustrates the sensitivity of Pareto's coefficient to the set of observations to which it is applied and, in particular, to the threshold value that defines inclusion into the set. When the threshold defining unions included into the estimation set is more than 10,000 members, the estimated value of Pareto's coefficient is 0.62, almost one-half its value when the threshold is at more than 200,000 members.

The ordinary least-squares estimates in Table 9 of the inverse specification (2.1) imply values of  $\alpha$  that are similar to those from estimating equation (1.1) in Table 8. In view of the high values of the  $R^2$  statistics, this is not surprising: the observations lie close to the fitted line.

Reconsider the least-squares estimates of equation (1.1) fitted to the 21 largest unions in 2007 as reported in the first line of Table 8. When the estimated residuals from this regression are

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<sup>23</sup> The use of least-squares is common in applications of Pareto's distribution although other techniques have been proposed. See Gabaix and Ibragimov (2009), Nishiyama and Osada (2004), and Quandt (1966a).

ordered by the size of the union, the null hypothesis that they are random and display no first-order serial correlation is rejected at conventional levels of significance by familiar tests. In the literature on estimating Pareto's distribution, this finding is far from unprecedented. It seemed prudent to determine if different inferences about Pareto's coefficient would follow from applying some procedure that recognizes this pattern in the residuals. For this, the residuals were assumed to follow a first-order autoregressive pattern and the autoregressive parameter was estimated along with  $a_0$  and  $b_0$ . Cochrane and Orcutt's familiar iterative technique was used for this purpose. With the same 21 largest unions in 2007, the consequences for the estimated parameters are shown in Table 10. The estimates of Pareto's coefficient from estimating equation (1.1) are similar - though not identical - to those in Table 8 that do not recognize such serial correlation. In the case of the inverse specification equation (2.1), when allowing for a first-order serial correlation parameter, the estimates of  $\alpha$  in Table 10 differ more from those in Table 9 : the estimated value of  $\alpha$  in Table 10 barely changes as the threshold size of unions is lowered.

As is well known, the finding of autocorrelated residuals in a cross-section regression often signals a functional form specification error. Indeed, in some previous work on estimating Pareto's distribution, equation (1) has been augmented with a second-order term in  $\ln M_i$  and this formulation is investigated here:

$$(3.1) \quad \ln S_i = a_2 + b_2 \ln M_i + c_2 (\ln M_i)^2 + e_{2i} \quad ,$$

where  $e_{2i}$  is an additive disturbance. This represents a departure from Pareto's distribution. The least-squares estimates from fitting equation (3.1) to the 2007 largest unions applying different threshold sizes are reported in Table 11. In all cases, the estimates of  $b_2$  are positive and those of  $c_2$  negative indicating the relationship is concave from below (broadly consistent with the scatter diagram in Figure 8). The addition of the quadratic term often results in a statistically significant improvement in the goodness of fit. This result is sometimes found in applications of Pareto's distribution to firm sizes and to city sizes.<sup>24</sup> Although the second-order term constitutes a strict rejection of log-linearity, a less drastic reaction to this result is to view Pareto's log-linearity as a useful first-order approximation to the relationship and not to discard Pareto's rule unconditionally.

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<sup>24</sup>For example, see Ijiri and Simon (1974) on firm sizes and Soo (2005) on city sizes.

### Union Membership in Other Years

Having estimated Pareto's distribution to the 21 unions with at least 200,000 members in 2007, consider how these estimates contrast with those fitted to a comparable set of unions in other years and consider what these estimates in other years imply. What constitutes a "comparable" set of unions? In the literature on fitting Pareto's distribution to observations on other variables, the "comparable" sets have been defined in different ways. For instance, in the research that estimates Pareto's distribution to large cities in different countries, the sets of cities in these countries are sometimes defined by the same number of cities, sometimes defined by the same minimum city size, and sometimes defined by the same fraction of all cities. By analogy, this would call for estimating Pareto's distribution to large unions in different years by specifying the same number of unions in these years as in 2007 (namely, the 21 largest unions) or by specifying the same minimum threshold level of union members as in 2007 (namely, 200,000 members) or by specifying the same percentage of all unions as in 2007 (namely, the largest 18.9 percent of all unions).

To pursue these different selection criteria, consider data on union membership for a year in the 1970s, a year in the 1960s, and, to provide a longer-term perspective, consider using data on the size distribution of unions in 1939 and in 1920. The implications of these three selection criteria for the set of unions to which the stochastic equations above are estimated are given in Table 12. Evidently, these three selection criteria result in a different number of unions being defined as "large" in a given year.

First, considering the 21 largest unions in all years, the least-squares estimates (with and without allowance for first-order serial correlation of the residuals) of equation (1.1) are listed in Table 13. In all instances, the goodness of fit ( $R^2$ ) statistic exceeds ninety percent. The estimate of Pareto's coefficient tends to increase as the equation is fitted to earlier years implying less concentration among large unions in earlier years. Second, when defining the set of large unions as those unions with 200,000 members or more in each year, as shown in Table 14, the declining value over time of estimates of Pareto's coefficient is less apparent. Third, when selecting the largest 18.9 percent of all unions, as given in Table 15, the estimates of Pareto's coefficient also tends to fall over time. This is clearer in the estimates that allow for first-order serial correlation in the residuals although the pattern can also be read in the other estimates.

A large number of estimates of Pareto's coefficient are reported in Tables 13, 14, and 15. To ease comparisons, Table 16 summarizes the estimates by year and by estimating method.



Although each estimate is not independent of others in the table, the reported values of  $\alpha$  convey a clear impression of  $\alpha$  falling over time with a value of about 1.53 in 1920 and a value of 1.13 in 2007. How may this difference between 1.53 and 1.13 be illustrated? As noted earlier, a property of Pareto's distribution is that, provided  $\alpha > 1$ , for any union with membership  $M^*$ , the average membership of those unions whose membership equals or exceeds  $M^*$  is  $[\alpha (\alpha - 1)^{-1}] M^*$ . This implies that a lower value of  $\alpha$  increases the gap between  $M^*$  and the average-sized union among those unions with membership above  $M^*$ . In this sense, a lower  $\alpha$  signifies greater inequality in membership among the larger unions. Suppose  $M^*$  equals 200,000. Then the average size of unions with membership equal to or greater than 200,000 is 577,359 when  $\alpha = 1.53$  and the average union size is three times this number (precisely, 1,738,462) when  $\alpha = 1.13$ . This difference in  $\alpha$  reflects a considerable difference in inequality among these large unions. Expressed differently, ostensibly "small" differences in  $\alpha$  have "large" implications for concentration.

Thus the decline from 1920 to the present in the value of Pareto's coefficient is consistent with the interpretation that, among the largest unions, the concentration of union membership has tended to increase over time. Even though the concentration ratios in Table 6 are designed to indicate concentration among all unions and not just the largest unions, the increases in the concentration ratios from 1968 to 2007 in Table 6 are consonant with the decline in the estimated values of Pareto's coefficient between these years. Also, all the estimates of Pareto's coefficient in Tables 13, 14, and 15 for the large unions in 1920 and 1939 indicate a relatively higher value of Pareto's coefficient in 1920 than in 1939 suggesting greater disparity among the large unions in 1939 (during the great burst in union activity in the late 1930s) than in 1920.

To this point, Pareto's coefficient has been estimated to unions in different years. Suppose these observations on the membership of large unions in different years are pooled and Pareto's distribution is fitted to the pooled observations. What is the value of Pareto's coefficient when applied to these pooled data when the intercept of the fitted line is permitted to differ by year (that is, permitting  $a_0$  in equation (1.1) to vary by year)? The answer is reported in Table 17 for each of the three sets of "large" unions specified in Table 12. The estimates of Pareto's coefficient range from 1.04 to 1.31 with the coefficient higher in absolute value as the number of observations falls.<sup>25</sup>

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<sup>25</sup>Applying conventional F-distribution tests, the hypothesis that the year-specific intercept terms may be eliminated is rejected for the observation sets consisting of 105 unions and 162 unions, but not for the observation set of 82 unions. In this last case, when fitting Pareto's distribution without these year-specific intercepts, the estimate of Pareto's coefficient is 1.302 with an estimated standard

Again, in describing the distribution of large unions in the U.S., Pareto's coefficient is not an iron constant but it varies within a relatively narrow range over the years. However, as indicated earlier in this section, "small" differences in the coefficient may have "large" consequences. To compare the estimate of  $\alpha = 1.04$  with  $\alpha = 1.31$ , recall that, for any union with membership  $M^*$ , the average membership of unions whose membership equals or exceeds  $M^*$  is  $[\alpha (\alpha - 1)^{-1}] M^*$ . Again, if  $M^*$  equals 200,000, the average size of unions with membership equal to or greater than 200,000 is 5,200,000 when  $\alpha = 1.04$  and the average size of unions with membership equal to or greater than 200,000 is 845,161 when  $\alpha = 1.31$ . The former is six times the value of the latter.

#### V. Two Extensions to the Use of Pareto's Distribution Describing Trade Unions

To this point, Pareto's distribution has been applied to the membership of large U.S. unions. Two questions arise. First, how do the estimates of Pareto's coefficient change if the size of unions is measured by something other than the number of members? Second, because the history and structure of U.S. unionism are singular, how does Pareto's distribution fare as a description of the size distribution of larger unions in other countries?<sup>26</sup> This section is devoted to a treatment of these questions.

##### Assets

There has long been an interest in the degree to which union membership is concentrated in a relatively small number of unions. However, there are other indicators of size and, for purposes such as the ability to finance long protracted disputes and for mounting legislative campaigns, the wealth of unions may be more consequential than the number of members. A convenient documentation of union finances in the United States is Leo Troy and Neil Sheflin's Union

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error of 0.040.

<sup>26</sup> This is a suitable place to recognize that a number of national unions based in the United States describe themselves as 'international' because their contracts with U.S. firms cover these firms' workplaces in Canada or Puerto Rico or the Panama Canal Zone. These members outside the U.S. were once identified in earlier issues of the Directory and in 1978 they constituted seven percent of the membership of all U.S.-based unions. This information is not available in recent issues of the Directory. In the analysis above, these members outside the U.S. have been included with members in the U.S.

Sourcebook compiled in 1985.<sup>27</sup> From this, Table 18 presents the size distribution of net assets of national unions in 1982. It is similar to the size distribution of membership in that most unions have relatively meagre assets but a small number of unions account for a large share of all net assets owned by national unions. Thus more than one-half of all unions have less than one million dollars in net assets and 3.6% of unions have assets greater than one hundred million dollars. These few wealthy unions hold almost three-quarters of all union net assets. Wealthy unions tend also to be unions with large membership. Of the ten unions with the highest net assets in 1982, six are also ranked in the top ten by membership and the remaining four unions are ranked seventeenth or above in membership.

### Britain

For many years, British unionism has been characterized by the dominance of a few “general” unions that draw their membership from many different industries and that account for a large fraction of total union membership.<sup>28</sup> In this respect, the growth of certain very large unions in the United States such as the Service Employees International Union, the Teamsters, and Steel Workers Union<sup>29</sup> follows the pattern set earlier by British unionism. Another similarity between American and British unionism is the decline in the extent of unionism in both countries in recent decades.

At about the same time that Troy and Sheflin (1985) published their Union Sourcebook for the United States, a U.K. Department of Employment Research Paper by Paul Willman and Timothy Morris (1986) reported research into the membership and finances of large unions in Britain.<sup>30</sup>

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<sup>27</sup> Financial information on unions is not available in the published Directory of Labor Organizations.

<sup>28</sup> Hart and Phelps Brown (1957) reported that, in 1954, the six biggest unions accounted for almost one-half of all union members.

<sup>29</sup> The full name of the Steel Workers Union signifies its breadth: the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union.

<sup>30</sup> Similar to the U.S. data used above, the British data are derived from reports that British unions are required by law to file. From the information provided, what the British authors call “net worth” (assets minus liabilities) corresponds to what the U.S. researchers call “net assets”. There will surely be differences in details between the British and the U.S. data if only because the reporting forms are different and there are likely to be different accounting conventions.

Hence an Anglo-American comparison can be made of Pareto's coefficient both for membership and for net assets that applies to the same period.

The British study lists the membership of the 56 largest unions but the net worth of only the 20 largest (wealthiest) unions. As in the United States, unions in Britain with relatively large memberships tend to be unions ranked high in net worth: of the British unions ranked in the top twenty by net worth, eighteen were in the top twenty ranked by membership. All of the British unions ranked in the top twenty by net worth had more than 100,000 members. Nevertheless, the shape of the distribution of British unions by net worth differs from the shape of the distribution of British unions by membership: the coefficient of variation for membership exceeds that for net worth, membership is more skewed than net worth, and the authors report a value of kurtosis for membership that is twice the value for kurtosis for net worth.

Once again, when making comparisons of Pareto's coefficient to different sets of observations, the issue arises of how to define "large" unions. In this case, the issue is more or less "solved" by the fact that information is available on no more than the 20 largest British unions defined by net worth. For Britain, information on the membership of British unions is available for the 56 largest unions but, to facilitate comparison with the U.S. in Table 13, Pareto's distribution is fitted to the membership on the 21 largest British unions.

First, compare the estimates for Pareto's coefficient when applied to U.S. union membership with the estimates when applied to the net assets of U.S. unions. In one case, unions are ordered by their membership and, in the other case, unions are ordered by their net assets. As already mentioned, there is a overlap in the set of large unions by membership and the set of large unions by net assets but this intersection is not complete. Analogous to equations (1.1) and (3.1) above, the following regression equations are specified to observations on these unions ordered by their net assets, where  $K_i$  denotes the net assets of union  $i$  and  $e_{3i}$  and  $e_{4i}$  are stochastic residuals :

$$(1.2) \quad \ln S_i = a_3 + b_3 \ln K_i + e_{3i}$$

$$(3.2) \quad \ln S_i = a_4 + b_4 \ln K_i + c_4 (\ln K_i)^2 + e_{4i}$$

The least-squares estimates of equations (1.2) and (3.2) applied to the 21 largest unions in the 1980s in the United States are given in Table 19. The upper panel of Table 19 reports that

Pareto's coefficient is 0.85 when fitted to the distribution of the assets of the 21 wealthiest U.S. unions. This compares with an estimate of 1.28 for Pareto's coefficient when fitted to the distribution of membership of the 21 largest U.S. unions. The lower value of Pareto's coefficient when fitted to the distribution of net assets in the U.S. than the value of Pareto's coefficient when fitted to the distribution of membership means that a given proportional difference in membership spans a larger fraction of unions than the same proportional difference in net assets. Expressed differently, there is more concentration among the larger unions in their assets than in their membership.

The corresponding least-squares estimates of equations (1.2) and (3.2) for British unions are given in Table 20. For Britain, as for the U.S., Pareto's coefficient has a lower absolute value for net worth than that for membership. In addition, with respect to membership, Pareto's coefficient is lower in absolute value for Britain than its estimate for the U.S. implying greater concentration of membership among the larger unions in Britain than among the larger U.S. unions. The opposite is the case for net worth where Pareto's coefficient for Britain is larger than that for the U.S.

The consequences of estimating a quadratic relationship in membership and net worth is presented in the lower panels of Tables 19 and 20. In all four cases, the signs of the point estimates imply a concave from below relationship. For both countries, the improvement in fit for the membership equation by adding the second-order term is statistically significant. The relevance of the second-order term is also suggested for net worth in Britain. This is not the case for the distribution of assets in the U.S.

This extension of Pareto's distribution shows that it has potential in helping to understand the size distribution of unions along dimensions other than membership and that it may be useful as a summary description of differences in the concentration of unions across countries.

## VI. A Simple Model

The empirical results reported above prompt two questions: first, why have unions grown in the public sector and those in the private sector contracted; second, why does the size distribution of trade unions follow, as a first approximation, a log-linear density function such as Pareto's distribution? Here a simple model is sketched that addresses both questions and that suggests relevant variables. The model is a simple adaptation of a union optimizing an expression for its

welfare. In particular, consider a single union local and suppose its objectives  $U$  over wages  $w$  and employment  $E$  take the following special form:

$$(4) \quad U(w, E) = (w - v) E^\theta$$

where the positive parameter  $\theta$  gauges the weight on wages vis-à-vis employment in the union's welfare and where  $v$  is some comparison or reference wage such that  $w > v$ .

The union local's pursuit of its objectives is constrained by the following semi-logarithmic trade-off between employment and wages:

$$(5) \quad E = \exp(\rho + \eta w + \mu r + \delta p)$$

where  $r$  is the price of physical capital and  $p$  stands for any variable that shifts the employment-wage trade-off rightwards and enhances the union's employment-wage opportunities. Increases in  $p$  raise  $E$  so  $\delta > 0$ . In the private sector,  $p$  may represent the prices of goods that compete in the product market for the good produced by this union local. In the public sector,  $p$  may stand for the government agency's allotted budget.  $\eta$  is negative while  $\mu$  is positive when capital and labor are substitute inputs and  $\mu$  is negative when capital and labor are complementary inputs. The effects of other variables on  $E$  are embodied in  $\rho$ .

In this bilateral monopoly setting, the union local is assumed to act as a monopolist seller of labor and posts a wage that maximizes  $U(w, E)$  in equation (4) subject to management selecting employment according to (5). The optimal wage is a multiple of  $v$  and the resulting implied expression for employment is

$$(6) \quad E = \exp(\rho - \theta^{-1} + \eta v + \mu r + \delta p)$$

Higher values of  $\theta$  (corresponding to a greater relative weight placed on employment in the union's objectives) implies greater employment.

Assume union membership in the union local is proportional to employment. Then an expression for local union membership,  $m$ , is arrived at:

$$(7) \quad m = \exp(\gamma + \eta v + \mu r + \delta p)$$

where  $\gamma$  incorporates  $\rho$ ,  $\theta^{-1}$ , and the factor of proportionality between employment and union membership.

Suppose this is one of  $N$  locals that belong to the national union and suppose each local faces the same constraints and possesses the same objectives. This is certainly a strong assumption, but the differences among the union locals within a given national union are likely to be narrower than the differences in the union locals across different national unions. Then aggregating equation (7) over all the  $N$  union locals yields  $M : \sum_i m_i = M$ , the membership in the national union which is

$$(8) \quad M = N [\exp(\gamma + \eta v + \mu r + \delta p)]$$

Write the logarithm of this national union membership equation for the  $k$  th national union

$$(9) \quad \ln M_k = \ln N_k + (\gamma_k + \eta_k v_k + \mu_k r_k + \delta_k p_k)$$

and, according to equation (9), holding constant the number of union locals in each national union, absolute differences in the values of the right-hand side variables in parentheses are transformed into proportionate differences in national union membership. Because general linear functions of random variables tend toward normality in the limit (even when the components may not be normal),  $\ln M_k$  tends to be distributed as normal and  $M_k$  to be lognormal. A logarithmic distribution for national union membership - as implied by Pareto's distribution - is derived. According to (8), the precise form of the logarithmic distribution is not a constant but will vary as the objectives of the constituent local unions differ and as their employment-wage trade-offs differ.

In addition to providing an explanation for Pareto's distribution, this simple model can also help to understand the different experiences of membership in private and public sector unions since the 1970s. Write equation (9) for a representative national union in sector  $k$  in year 0 and in year  $t$  and then first difference the equations:

$$(10) \quad \Delta \ln M_k = \Delta \ln N_k + \eta_k \Delta v_k + \mu_k \Delta r_k + \delta_k \Delta p_k$$

where  $\Delta \ln M_k = (\ln M_k)_t - (\ln M_k)_0$ ,  $\Delta \ln N_k = (\ln N_k)_t - (\ln N_k)_0$ ,  $\Delta v_k = v_{kt} - v_{k0}$ ,  $\Delta r_k = r_{kt} - r_{k0}$ , and  $\Delta p_k = p_{kt} - p_{k0}$ . In forming this first difference equation, the parameters  $\eta_k$ ,  $\gamma_k$ ,  $\mu_k$ , and  $\delta_k$  have been assumed to be unchanged. Now consider applying equation (10) to a representative public sector national union and to a representative private sector union where year 0 is 1974 and year  $t$  is 2007.

An examination of the large unions in 1974 and 2007 in Tables 1 and 5 suggests that an important difference between the large private sector unions and the large public sector unions is that the typical large private sector union in 1974 was one involved in producing tradeables whereas the typical large public sector union in 1974 and in 2007 does not produce something that is traded across international borders. The contraction of the large private sector unions after 1974 accompanied a large growth in imports of the durable goods made by the workers in these unions, a growth stimulated by a reduction in their effective prices. In other words, for the typical large private sector union after 1974,  $\Delta p_k$  assumed a large negative value: competition from cheaper foreign imports made the product markets for these U.S.-produced goods much more competitive and exacting. By contrast, the members of many public sector unions were employed in delivering services sheltered from rigorous competition. Indeed, at least until recent years, rising state and local government budgets boosted the employment of unionized public sector workers.

In addition, in a number of cases, the typical member of a large public sector union is a skilled or semi-skilled worker while the typical member of the large private sector union in 1974 was a blue-collar worker with easily acquired skills. There is evidence that, in many instances, skilled labor and capital tend to be complementary inputs in production while less skilled workers and capital are often substitute inputs.<sup>31</sup> Given this, the drastic reduction in the real price of computers and peripheral equipment since the 1970s<sup>32</sup> has had the effect of reducing the employment of unskilled workers and increasing the employment of skilled workers. That is, in terms of equation (10),  $\Delta r_k < 0$  and, for the private sector blue-collar unions  $\mu_k$  is positive while for the public sector white-collar unions  $\mu_k$  is negative. The reduction in the price of an important type of capital has

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<sup>31</sup> See, for instance, Berndt and Christensen (1974).

<sup>32</sup> Consider the price index for computers, software, and communication published by the Bureau of Economic Analysis and deflated by the producer price index. Setting the value of this to 100 in the year 2000, its value in 1976 was over 831 and its value in 2007 was 61.3 .



helped the growth of public sector unions and contributed to the contraction of private sector unions of blue-collar workers.

In this way, a simple form of the familiar model of trade union behavior can help understand both the logarithmic distribution function of union membership and the contrasting experiences of the large public and large private sector unions since the 1970s.

## VII. Conclusions

The information in this paper points to an increase in the concentration of membership in national unions in the United States since the 1970s and this concentration has come about as the heart of U.S. unionism has shifted from the private to the public sector. What have been called the “labor conglomerates”(Chitayat (1979)) are situated principally in the public sector.

How important is concentration in national unionism in the U.S.? One way to assess this is to invoke standards from the product market which has accorded special attention to Hirschman-Herfindahl’s index (HHI). In its work in assessing the product market effects of mergers, the U.S. Department of Justice routinely uses values of HHI to classify product markets into unconcentrated markets, moderately concentrated markets, and highly concentrated markets. In 2007, the value for HHI for all the national labor organizations studied in this paper was 570, a value that would categorize these unionized labor markets as “unconcentrated”. However, because the value of HHI for these national unions was 330 in 1978, the change in HHI between 1978 to 2007 was 240 points, an increase that would raise “competitive concerns” if experienced in moderately concentrated or highly concentrated markets.<sup>33</sup>

This paper has drawn on Pareto’s distribution to characterize the size distribution of large trade unions and changes in the size distribution of large trade unions. In providing a summary statement of the distribution and its changes, the performance of Pareto’s distribution has been mixed. Even though goodness of fit statistics are usually well over 90 percent, the description provided by strict log-linearity is sometimes inferior to one that is a concave from below. Moreover, the deviations from log-linearity are often not random.

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<sup>33</sup> See U.S. Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines, issued: August 19, 2010 , especially pages 19-20. The values of HHI in this paragraph are those when market shares (the fraction of total membership in each union) are expressed in percentages.

Even if flawed, Pareto's distribution has provided a useful summary description of the changes in the concentration of unions in the U.S. over time and its further application to trade unions is well worth exploration. It appears to provide a convenient description of the size distribution of unions by their wealth and to have potential for its application to unions in other countries. At the same time, the estimates of Pareto's coefficient are sensitive to the choice of observations to which to fit the equation and the lack of strict criteria to guide the choice implies that there is ample room for the researcher's prior beliefs and, through the publication process, there is ample room for the profession's prior beliefs to influence the selection of estimates that are reported and disseminated.

A model of unionism has been adapted to generate a skew distribution such as Pareto's or the lognormal. Although it makes demanding assumptions, it falls into a class of statistical models in which random shocks asymptotically tend towards a normal distribution.

Does the trend towards greater concentration in U.S. unionism matter? We know that many outcomes are associated with differences in the sizes of firms: there are systematic earnings, fringe benefit, working conditions, and turnover differences by size of firm.<sup>34</sup> Are there differences in the labor market outcomes of union members between those who belong to large unions and those who belong to small unions? This question may be amenable to research by imaginatively combining the files on labor organizations at the Office of Labor-Management Standards with those on employment and compensation in the Census Bureau's Business Dynamics so that the effects of firm size on labor market outcomes may be distinguished from any effects associated with union size.

Windmuller (1981) conjectured that increasing concentration "...tends to diminish direct member participation in union affairs and to produce more representative, and thus more indirect, patterns of union government". Because most negotiated union collective bargaining contracts involve local and regional unions, the implications of greater concentration among national unions may have more consequences for the pressure group activities of unions as they try to influence legislative and executive bodies. Because there is a positive correlation between the membership of unions and their net worth, a union movement concentrated in a smaller number of large unions implies a union movement in which much of its wealth is allocated by a smaller number of decision-makers. Unions representing workers in the public sector now constitute many of the very large

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<sup>34</sup> See, for instance, Brown, Hamilton, and Medoff (1990).

labor organizations. Much has been written on “union voice”, but less on what these voices are saying. Increasingly the union voice heard by government is the voice of white-collar public sector workers and the voice of lower-paid private sector workers has been dulled.

A serious concern is that a more concentrated union movement that is dominated by public sector unions may politicize unionism. That is, the focus of union activity will be less on attending to grievances and to the conditions of union members at their place of work and more on issues that are the province of politics. After all, the managers and supervisors of public sector workers ultimately report to politicians which makes the links between unions of public sector employees and politicians more visible and palpable than those of unions representing private sector employees. Unions have always been involved in politics so this would be a change of degree, not of kind, but it is an important change because, ultimately, more politicized unionism will not help the typical union worker.<sup>35</sup>

This judgment - that a more politicized union movement is an undesirable development - does not hold when people lack the mechanisms to alter their government peacefully. In other countries, unions have contributed significantly in converting autocratic regimes into more decent and civilized societies. But in a democracy, a politicized union movement is another step toward government run by pressure groups in which the great mass of citizens are disempowered and the classic union activities of protecting the interests of employees at their place of work take a backseat to service that is political in nature.

This harks back to Dicey’s classic dilemma expressed a century ago.<sup>36</sup> The principle that

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<sup>35</sup> This view derives from observation of several episodes. One draws upon the experience of Britain in the 1960s and 1970s when a politicized union movement (with unions of public sector workers at the helm) prompted General Elections where the electorate were asked “Who runs the country?” After indecision and wavering, the British electorate plumped for a government that substantially trimmed the sails of unions and especially those of unions of public sector workers. This episode is not singular but it is an example of unions refocusing their energies on a political agenda and using their human and financial resources to prevail upon government. In time, this induces a backlash that leaves unions with substantially less clout and influence.

<sup>36</sup> Writing in 1912, Dicey wrote, “In England, as elsewhere, trade unions and strikes, or federations of employers and lock-outs;...in the United States, the efforts of Mercantile Trusts to create for themselves huge monopolies...[S]ome forms of association force upon public attention the practical difficulty of so regulating the right of association that its exercise may neither trench upon each citizen’s individual freedom nor shake the supreme authority of the State” (Dicey, pp. 331-2 of 2008 edition).

working people should have the freedom to form associations that represent and guard their interests would seem to be an intrinsic feature of a liberal society. But, if these associations exploit this principle to procure entitlements that enhance their interests at the expense of others, a new base of authority and influence is created that, at best, feathers its nest and, at worst, challenges the jurisdiction of the state. A balance is needed between promoting the principle of free association and avoiding the creation of a mischievous organization. In due course, this may become the issue presented by the increasing concentration of members in a smaller number of unions and by the dominance of the union movement by public sector employees. This is not a prediction; it is a concern, a source of apprehension.

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## APPENDIX NOTE ON DATA SOURCES

The household Current Population Survey (CPS) has collected annual information on union membership since 1973. In 1977, the question collecting this information was amended to include employee associations in addition to unions. The CPS information does not identify the union to which the worker belongs.

Membership by labor organization is reported to the Office of Labor-Management Standards at the U.S. Department of Labor by private sector unions (and those covering the U.S. Postal Service) as required by the Labor Management Reporting and Disclosure Act (the Landrum-Griffin Act) of 1959. Organizations representing other Federal workers are required by the Civil Service Reform Act of 1978 to supply similar reports. Organizations exclusively representing local or state public sector workers are not required to file. The information was published every two years by the BLS until September 1980 when BLS Bulletin 2079 reported data for 1978. Public and professional employee associations were first included in the BLS Directory in 1968. The Bureau of National Affairs published their Directory in 1982 and Leo Troy and Neil Sheflin published their Union Sourcebook in 1985.

The values of aggregate union and employee association membership from the CPS usually fall short of the summation of the membership reported by unions to the Office of Labor-Management Standards. This is the case even though some unions are not required to file reports and a few unions are listed without their membership being reported. The common assumption is that unions tend to overstate their membership by not deleting from their records people who have discontinued paying their dues.

In this paper, the 2007 data are from the Directory of U.S. Labor Organizations 2008 Edition, edited by Court Gifford, the Bureau of National Affairs, Arlington, Virginia. The 1983 membership data are from Leo Troy and Neil Sheflin, Union Sourcebook: Membership, Structure, Finance, Directory First Edition 1985, Industrial Relations Data Information Services, West Orange, NJ. The 1978 data are from the Directory of National Unions and Employee Associations, 1979, U.S. Department of Labor Bureau of Labor Statistics, 1980, Bulletin 2079. The 1974 data are from the Directory of National Unions and Employee Associations, 1975, U.S. Department of Labor Bureau of Labor Statistics, 1977, Bulletin 1937. The 1968 data are from the Directory and National and International Unions in the United States 1969, U.S. Department of Labor Bulletin 1665, BLS 1970.

The 1939 data used in this paper are from Leo Troy, Trade Union Membership, 1897-1962, National Bureau of Economic Research, Occasional Paper 92, New York 1965. The 1920 data are from Leo Wolman, Ebb and Flow in Trade Unionism, NBER, New York, 1936.

Table 1  
The Five Largest Unions in 1974

Full Name of Union in 1974	Abbreviation	Membership in Thousands	
		in 1974	in 2007
International Brotherhood of Teamsters, Chauffeurs, Warehousemen & Helpers of America	IBT	1,973.3	1,398.6
International Union of Automobile, Aerospace & Agricultural Implement Workers of America	UAW	1,544.9	538.4
National Education Association	NEA	1,470.2	3,167.6
United Steelworkers of America	USW	1,300.0	730.9
International Brotherhood of Electrical Workers	IBEW	991.2	697.9

Table 2  
The Distribution of Unions by the Number of Their Members in 1974

row	size of union (number of members)	percent of all unions	percent of all members
1	< 1,000	12.7	0.04
2	from 1,000 to 9,999	24.1	0.87
3	from 10,000 to 99,999	38.2	8.21
4	from 100,000 to 499,999	19.3	37.01
5	from 500,000 to 999,999	3.8	23.89
6	≥ 1,000,000	1.9	25.99

Table 3  
The Distribution of Unions by the Number of their Members in 1974 and 2007

size of union (number of members)	1974		2007	
	percent of all unions	percent of all members	percent of all unions	percent of all members
< 1,000	12.7	0.04	9.0	0.02
from 1,000 to 9,999	24.1	0.87	22.5	0.50
from 10,000 to 99,999	38.2	8.21	40.5	9.54
from 100,000 to 499,999	19.3	37.01	16.2	19.45
from 500,000 to 999,999	3.8	23.89	7.2	25.93
≥ 1,000,000	1.9	25.99	4.5	44.58

Table 4

Changes in the Number of Unions and in the Number of Members (in thousands) between 1974 and 2007 by Size Class

size of union in thousands of members	number in 2007 minus number in 1974	
	number of unions	number of members in thousands
< 1	- 17	- 4.8
from 1 to 4.9	- 20	- 64.8
from 5 to 9.9	- 6	- 46.6
from 10 to 24.9	- 13	- 187.0
from 25 to 49.9	- 19	- 577.1
from 50 to 99.9	- 4	- 282.2
from 100 to 199.9	- 13	- 1,949.6
from 200 to 299.9	- 5	- 1,107
from 300 to 399.9	- 1	- 251.4
from 400 to 499.9	- 4	- 1,756.1
from 500 to 999.9	0	- 593.4
≥ 1,000	+ 1	+ 2,627.8
Total	- 101	- 4,195.1

Table 5  
The Five Largest Unions in 2007

Full Name of Union in 2007	Abbreviation	Membership in Thousands	
		in 1974	in 2007
National Education Association	NEA	1,470.2	3,167.6
Service Employees International Union	SEIU	550.0	1,575.5
American Federation of State County, & Municipal Employees	AFSCME	648.2	1,470.1
International Brotherhood of Teamsters	IBT	1,973.3	1,398.6
United Food & Commercial Workers International Union	UFCW	1,175.9*	1,304.1

\*United Food & Commercial Workers International Union did not exist in 1974. It was created in June 1979 through the merger of the Retail Clerks International Association and the Amalgamated Meat Cutters and Butcher Workmen of North America. In 1974, the Retail Clerks reported their membership as 650,876 and the Meat Cutters as 525,000. The entry in the table of 1,175.9 is the sum of these two membership figures in thousands. After 1979, a number of other unions joined with the UFCW.

Table 6  
 Percent of All Union Members Who Are Members of the Ten, Five, and Two Largest Unions,  
 Selected Years 1920 - 2007

<u>year</u>	<u>membership of the ten largest unions as a percent of total union membership</u>	<u>membership of the five largest unions as a percent of total union membership</u>	<u>membership of the two largest unions as a percent of total union membership</u>
1920	43.85	28.70	14.98
1939	36.84	17.88	14.29
1968	43.82	28.79	14.72
1974	45.43	30.09	14.54
1978	47.13	30.46	14.85
1983	48.10	31.60	14.70
2007	62.40	44.58	23.71

Table 7  
Unions with Fewer Than 500 Members in 2007 with their Membership in 1974

<u>name of union in 2007</u>	membership in	
	<u>2007</u>	<u>1974</u>
Atlantic Independent Union	488	3,255
National Basketball Players Association	454	216
Plant Protection Association National Union*	450	320
International Plate Printers, Die Stampers and Engravers Union of North America	200	400
American Radio Association	150	618
The Guild of Italian American Actors ♦	135	75
World Umpires Association #	67	48

\* known in 1974 as the Independent Union of Plant Protection Employees

# known in 1974 as the Major League Umpires Association

♦in 1974 known as the Italian Actors Union (In 2007 and in 1974, this union was an autonomous branch of the Associated Actors and Artistes of America.)



Table 8  
Estimates of Equation (1.1) Fitted to Largest Unions in 2007

$$(1.1) \quad \ln S_i = a_0 + b_0 \ln M_i + e_{0i}$$

row	size of unions	number of unions	estimated $a_0$ (s.e.)	estimated $b_0$ (s.e.)	implied $\alpha$	$R^2$
1	> 200,000	21	10.894 (0.395)	-1.126 (0.061)	1.13	0.947
2	> 100,000	31	8.890 (0.284)	-0.883 (0.047)	0.88	0.923
3	> 50,000	46	7.873 (0.167)	-0.784 (0.030)	0.78	0.938
4	> 25,000	60	7.239 (0.120)	-0.723 (0.023)	0.72	0.943
5	> 10,000	76	6.407 (0.101)	-0.615 (0.021)	0.62	0.919

Table 9  
Estimates of Equation (2.1) Fitted to the Largest Unions in 2007

$$(2.1) \quad \ln M_i = a_1 + b_1 \ln S_i + e_{1i}$$

size of unions	number of unions	estimated $a_1$ (s.e.)	estimated $b_1$ (s.e.)	implied $\alpha$	$R^2$
> 200,000	21	9.503 (0.172)	-0.841 (0.046)	1.19	0.947
> 100,000	31	9.749 (0.211)	-1.045 (0.056)	0.96	0.923
> 50,000	46	9.749 (0.174)	-1.196 (0.046)	0.84	0.938
> 25,000	60	9.731 (0.158)	-1.305 (0.042)	0.77	0.943
> 10,000	76	9.931 (0.193)	-1.490 (0.052)	0.67	0.919

Table 10

Estimates of Equations (1.1) and (2.1) Fitted to the Largest Unions in 2007 After Accounting for First-Order Serial Correlation in the Residuals

$$(1.1) \quad \ln S_i = a_0 + b_0 \ln M_i + e_{0i}$$

size of unions	number of unions	estimated $a_0$ (s.e.)	estimated $b_0$ (s.e.)	implied $\alpha$
> 200,000	21	11.050 (0.659)	-1.149 (0.098)	1.15
> 100,000	31	9.378 (0.594)	-0.967 (0.090)	0.97
> 50,000	46	8.415 (0.433)	-0.890 (0.069)	0.89
> 25,000	60	7.893 (0.327)	-0.852 (0.055)	0.85
> 10,000	76	7.265 (0.324)	-0.795 (0.054)	0.80

$$(2.1) \quad \ln M_i = a_1 + b_1 \ln S_i + e_{1i}$$

size of unions	number of unions	estimated $a_1$ (s.e.)	estimated $b_1$ (s.e.)	implied $\alpha$
> 200,000	21	9.260 (0.250)	-0.761 (0.072)	1.31
> 100,000	31	9.010 (0.325)	-0.761 (0.092)	1.31
> 50,000	46	8.871 (0.388)	-0.760 (0.099)	1.32
> 25,000	60	8.722 (0.382)	-0.765 (0.084)	1.31
> 10,000	76	8.720 (0.407)	-0.760 (0.078)	1.32

Table 11  
 Estimates of Equation (3.1) Fitted to the Largest Unions in 2007

$$(3.1) \quad \ln S_i = a_2 + b_2 \ln M_i + c_2 (\ln M_i)^2 + e_{2i} \quad ,$$

size of unions	number of unions	estimated $a_2$ (s.e.)	estimated $b_2$ (s.e.)	estimated $c_2$ (se)	$R^2$
> 200,000	21	0.331 (2.401)	2.112 (0.732)	-0.245 (0.055)	0.975
> 100,000	31	0.344 (0.862)	1.987 (0.287)	-0.235 (0.023)	0.983
> 50,000	46	2.666 (0.480)	1.117 (0.173)	-0.167 (0.015)	0.984
> 25,000	60	3.744 (0.290)	0.655 (0.112)	-0.128 (0.010)	0.984
> 10,000	76	4.086 (0.125)	0.440 (0.055)	-0.109 (0.006)	0.987

Table 12

## The Number of Unions and their Sizes in Five Years According to Different Selection Criteria

## A. Selecting the 21 Largest Unions in each Year

year	number of unions included	percent of all unions	percent of all members	size of smallest union included	size of largest union included
2007	21	18.9	83.1	229,248	3,167,612
1978	21	10.1	66.6	284,329	1,923,896
1968	21	10.4	61.9	283,155	1,755,025
1939	21	10.2	55.1	78,600	495,000
1920	21	13.5	63.7	73,600	393,600

## B. Selecting all Unions with 200,000 or more Members in each Year

year	number of unions included	percent of all unions	percent of all members	size of smallest union included	size of largest union included
2007	21	18.9	83.1	229,248	3,167,612
1978	27	13.0	73.8	200,000	1,923,896
1968	27	13.4	68.0	200,000	1,755,025
1939	7	3.4	30.9	201,500	495,000
1920	3	1.9	21.5	330,800	393,600

## C. Selecting the Largest 18.9 Percent of all Unions in each Year

year	number of unions included	percent of all unions	percent of all members	size of smallest union included	size of largest union included
2007	21	18.9	83.1	229,248	3,167,612
1978	39	18.9	82.6	154,242	1,923,896
1968	38	18.9	71.1	144,682	1,755,025
1939	39	18.9	70.3	43,500	495,000
1920	25	18.9	68.9	60,400	393,600

Table 13  
 Estimates of Equation (1.1) Fitted to the Twenty-One Largest Unions in Different Years

$$\ln S_i = a_0 + b_0 \ln M_i + e_{0i}$$

		without allowance for serial correlation				after accounting for serial correlation		
		estimates of....		implied $\alpha$	$R^2$	estimates of....		implied $\alpha$
year	% of all unions	$a_0$ (s.e.)	$b_0$ (s.e.)			$a_0$ (s.e.)	$b_0$ (s.e.)	
2007	18.9	10.894 (0.395)	-1.126 (0.061)	1.13	0.947	11.050 (0.659)	-1.149 (0.098)	1.15
1978	10.1	11.990 (0.614)	-1.280 (0.094)	1.28	0.907	13.549 (1.350)	-1.520 (0.199)	1.52
1968	10.4	12.692 (0.435)	-1.429 (0.069)	1.43	0.958	13.006 (0.656)	-1.480 (0.102)	1.48
1939	10.2	10.965 (0.394)	-1.461 (0.079)	1.46	0.948	10.964 (0.588)	-1.462 (0.115)	1.46
1920	13.5	11.258 (0.380)	-1.547 (0.077)	1.55	0.955	11.294 (0.413)	-1.554 (0.083)	1.55

Table 14

Estimates of Equation (1.1) Fitted to Unions with 200,000 Members or More in Different Years

$$\ln S_i = a_0 + b_0 \ln M_i + e_{0i}$$

		without allowance for serial correlation				after accounting for serial correlation		
		estimates of....		implied $\alpha$	$R^2$	estimates of....		implied $\alpha$
year	# of unions	$a_0$ (s.e.)	$b_0$ (s.e.)			$a_0$ (s.e.)	$b_0$ (s.e.)	
2007	21	10.894 (0.395)	-1.126 (0.061)	1.13	0.947	11.050 (0.659)	-1.149 (0.098)	1.15
1978	27	10.898 (0.439)	-1.156 (0.070)	1.16	0.917	12.420 (1.083)	-1.398 (0.164)	1.40
1968	27	11.645 (0.351)	-1.308 (0.057)	1.13	0.954	12.144 (0.596)	-1.389 (0.095)	1.39
1939	7	13.284 (1.564)	-1.703 (0.279)	1.70	0.882	12.951 (1.461)	-1.650 (0.259)	1.65

Table 15

Estimates of Equation (1.1) Fitted to the Largest 18.9 Percent of Unions in Different Years

$$(1.1) \ln S_i = a_0 + b_0 \ln M_i + e_{0i}$$

year	without allowance for serial correlation				after accounting for serial correlation		
	estimates of.....		implied $\alpha$	$R^2$	estimates of.....		implied $\alpha$
	$a_0$ (s.e.)	$b_0$ (s.e.)			$a_0$ (s.e.)	$b_0$ (s.e.)	
2007	10.894 (0.395)	-1.126 (0.061)	1.13	0.947	11.050 (0.659)	-1.149 (0.098)	1.15
1978	10.170 (0.265)	-1.100 (0.044)	1.10	0.944	11.100 (0.685)	-1.264 (0.109)	1.26
1968	10.821 (0.232)	-1.231 (0.039)	1.23	0.964	11.236 (0.416)	-1.304 (0.069)	1.30
1939	9.653 (0.184)	-1.324 (0.040)	1.32	0.967	9.758 (0.301)	-1.349 (0.064)	1.35
1920	10.912 (0.303)	-1.513 (0.063)	1.51	0.962	11.004 (0.331)	-1.531 (0.068)	1.53

Table 16

A Summary of Point Estimates of Pareto's Coefficient in Different Years from Tables 13, 14, and 15

	without allowance for serial correlation				after accounting for serial correlation			
	estimates of $\alpha$ from Table.....			average	estimates of $\alpha$ from Table.....			average
year	..... 13	..... 14	..... 15		..... 13	..... 14	..... 15	
2007	1.13	1.13	1.13	1.13	1.15	1.15	1.15	1.15
1978	1.28	1.16	1.10	1.18	1.52	1.40	1.26	1.39
1968	1.43	1.13	1.23	1.26	1.48	1.39	1.30	1.39
1939	1.46	1.70	1.32	1.49	1.46	1.65	1.35	1.49
1920	1.55		1.51	1.53	1.55		1.53	1.54
average	1.37	1.28	1.26	1.32	1.43	1.40	1.32	1.39

Table 17

Estimating Pareto's Coefficient to the Observations on Unions from 1920 to 2007

Allowing the Intercept to Vary by Year

$$\ln(S_{it}) = \eta_t + \alpha \ln(M_{it}) + u_{it}$$

<u>Each Year's Selection Criterion</u>	<u>total number of observations</u>	<u>estimated <math>\alpha</math></u> (s.e.)	implied $\alpha$	$R^2$
21 Largest Unions	105	-1.123 (0.057)	1.12	0.877
Unions with $\geq 200,000$ Members	82	-1.313 (0.042)	1.31	0.932
Largest 18.9 % of Unions	162	-1.036 (0.035)	1.04	0.904



Table 18  
Distribution of Net Assets of U.S. Trade Unions in 1982

net assets in thousands of \$s	number of national unions	percent of all national unions	percent of all unions' net assets
≤ 10	32	16.8	-0.05
10.001 - 100	27	14.1	0.04
100.001 - 1,000	42	22.0	0.60
1,000.001 - 1,500.0	33	17.3	3.39
1,500.001 - 10,000.0	15	7.9	3.73
10,000.001 - 25,000.0	20	10.5	10.61
25,000.001 - 50,000.0	12	6.3	12.60
50,000.001 - 100,000.0	3	1.6	5.96
100,000.001 - 250,000.0	5	2.6	37.60
> 250,000.0	2	1.0	35.52

Table 19

Estimates of Equations (1.1), (1.2), (3.1), and (3.2) Fitted to the Membership and Net Assets of the 21 Largest U.S. Unions in 1982 (Net Assets) and in 1983 (Membership)

$$(1.1) \quad \ln S_i = a_0 + b_0 \ln M_i + e_{0i}$$

$$(1.2) \quad \ln S_i = a_3 + b_3 \ln K_i + e_{3i}$$

membership equation (1.1)				net assets equation (1.2)			
estimates of.....		implied $\alpha$	$R^2$	estimates of.....		implied $\alpha$	$R^2$
$a_0$ (s.e.)	$b_0$ (s.e.)			$a_3$ (s.e.)	$b_3$ (s.e.)		
11.600 (0.540)	-1.278 (0.087)	1.28	0.920	13.086 (0.387)	-0.848 (0.035)	0.85	0.969

$$(3.1) \quad \ln S_i = a_2 + b_2 \ln M_i + c_2 (\ln M_i)^2 + e_{2i} \quad ,$$

$$(3.2) \quad \ln S_i = a_4 + b_4 \ln K_i + c_4 (\ln K_i)^2 + e_{4i}$$

membership equation (3.1)				net assets equation (3.2)			
estimates of.....			$R^2$	estimates of.....			$R^2$
$a_2$ (s.e.)	$b_2$ (s.e.)	$c_2$ (s.e.)		$a_4$ (s.e.)	$b_4$ (s.e.)	$c_4$ (s.e.)	
-10.356 (3.096)	5.768 (0.990)	-0.560 (0.079)	0.979	5.187 (5.261)	0.532 (0.917)	-0.060 (0.039)	0.973

Table 20

Estimates of Equations (1.1), (1.2), (3.1), and (3.2) Fitted to the 20 Largest British Unions by Net Worth in 1985 and the 21 Largest British Unions by Membership in 1984

$$(1.1) \quad \ln S_i = a_0 + b_0 \ln M_i + e_{0i}$$

$$(1.2) \quad \ln S_i = a_3 + b_3 \ln K_i + e_{3i}$$

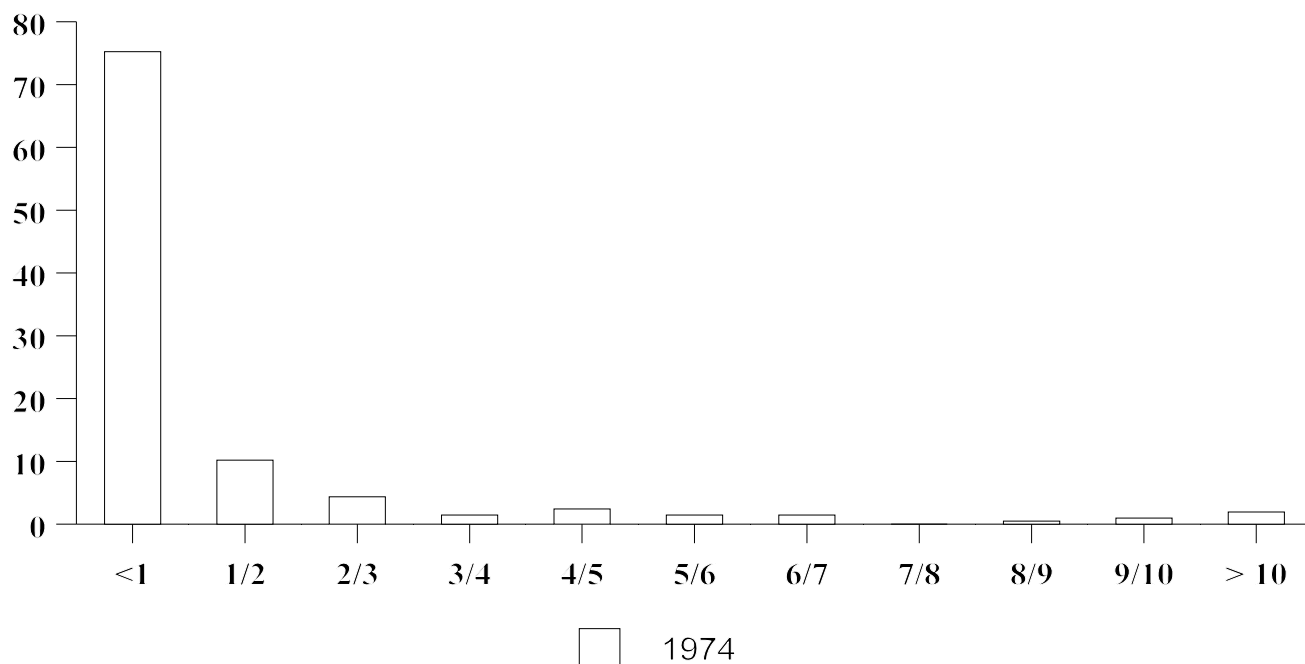
membership equation (1.1)				net worth equation (1.2)			
estimates of.....		implied $\alpha$	$R^2$	estimates of.....		implied $\alpha$	$R^2$
$a_0$ (s.e.)	$b_0$ (s.e.)			$a_3$ (s.e.)	$b_3$ (s.e.)		
10.313 (0.281)	-1.153 (0.048)	1.15	0.968	12.691 (0.747)	-0.955 (0.079)	0.96	0.891

$$(3.1) \quad \ln S_i = a_2 + b_2 \ln M_i + c_2 (\ln M_i)^2 + e_{2i} \quad ,$$

$$(3.2) \quad \ln S_i = a_4 + b_4 \ln K_i + c_4 (\ln K_i)^2 + e_{4i}$$

membership equation (3.1)				net worth equation (3.2)			
estimates of.....			$R^2$	estimates of.....			$R^2$
$a_2$ (s.e.)	$b_2$ (s.e.)	$c_2$ (s.e.)		$a_4$ (s.e.)	$b_4$ (s.e.)	$c_4$ (s.e.)	
3.451 (2.224)	1.162 (0.747)	-0.192 (0.062)	0.979	-15.892 (3.103)	5.125 (0.658)	-0.321 (0.035)	0.982

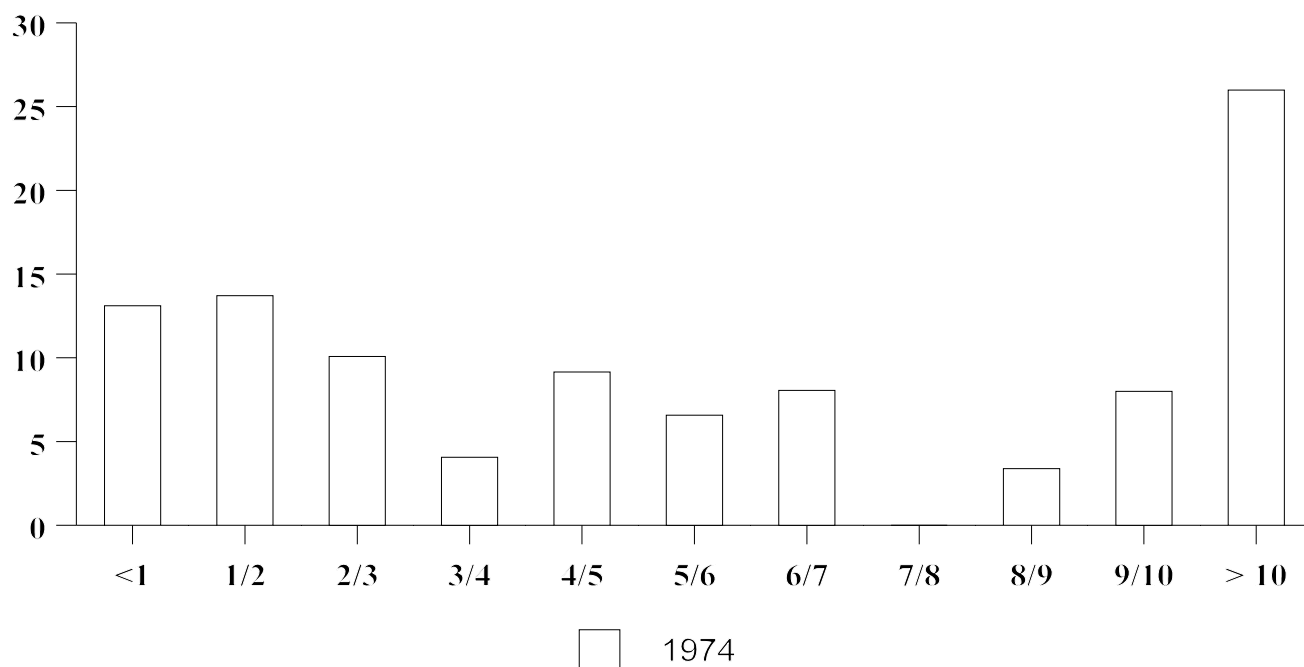
Figure 1  
 Percent Distribution of the Number of Unions by Size of Union in 1974: Size Classes in  
 Intervals of One Hundred Thousand Members



The horizontal axis measures membership in labor organizations by hundred thousand of members. Thus “< 1” means less than 100,000, “1/2” means from 100,000 to 199,999, and so on in 100,000 intervals until the largest class of 1,000,000 or more denoted “> 10”.

The vertical axis measures the total number of unions in the size class as a percentage of the total number of unions in all size classes.

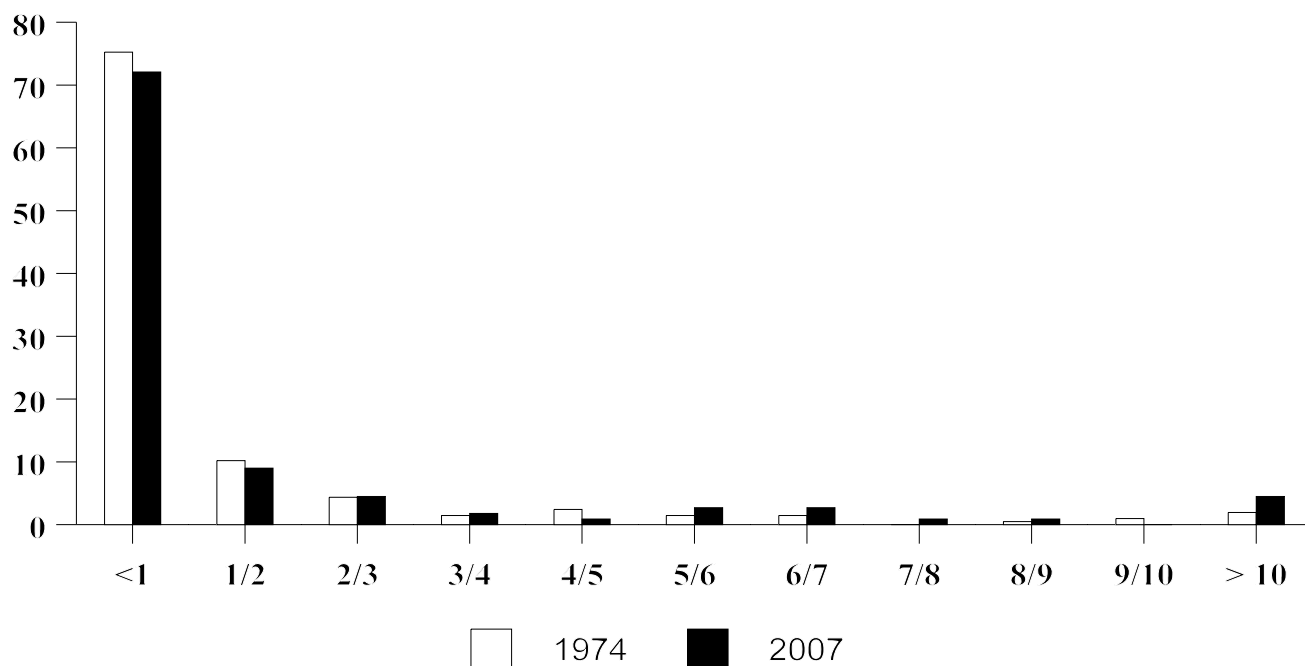
Figure 2  
 Percent Distribution of Union Membership by Size of Union in 1974: Size Classes in  
 Intervals of One Hundred Thousand Members



The horizontal axis measures membership in labor organizations by hundred thousand of members. Thus “ < 1 ” means less than 100,000, “ 1/2 ” means from 100,000 to 199,999, and so on in 100,000 intervals until the largest class of 1,000,000 or more denoted “ > 10 ” .

The vertical axis measures the membership in unions in the size class as a percentage of total union membership in all size classes.

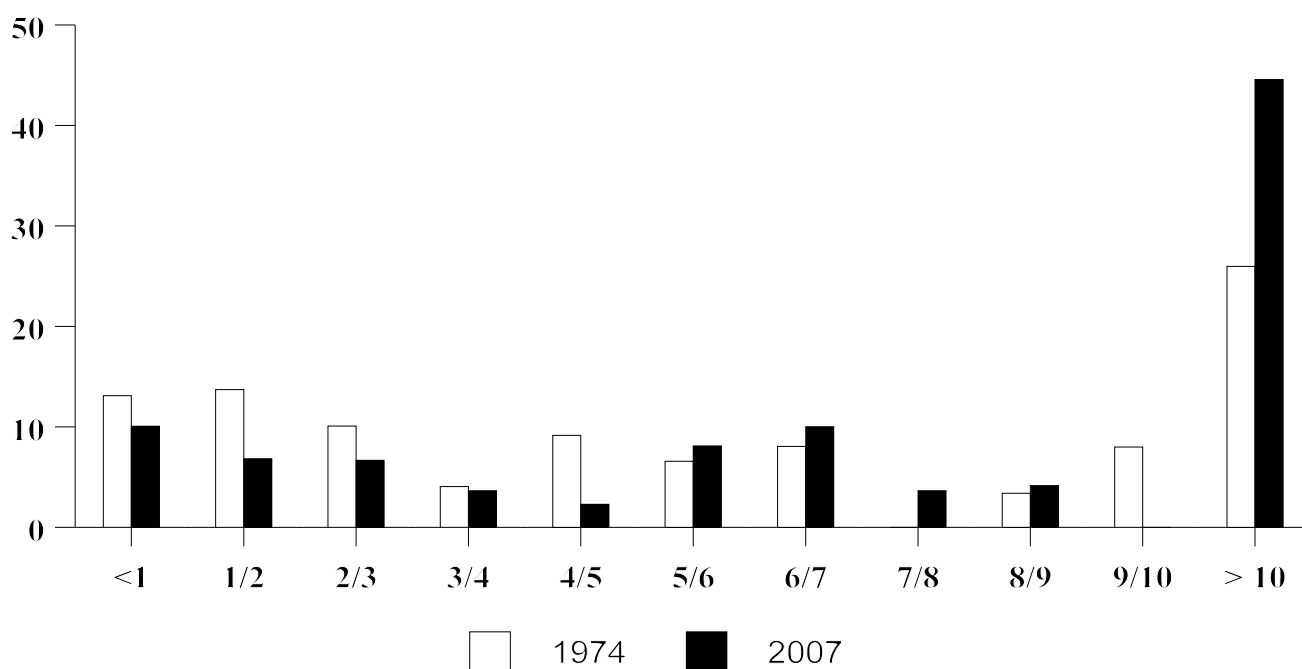
Figure 3  
 Percent Distribution of the Number of Unions by Size of Union in 1974 and 2007 : Size Classes  
 in Intervals of One Hundred Thousand Members



The horizontal axis measures membership in labor organizations by hundred thousand of members. Thus < 1 means less than 100,000, 1/2 means from 100,000 to 199,999, and so on.

The vertical axis measures the total number of unions in the size class as a percentage of the total number of unions in all size classes. The black columns describe the year 2007 and the white columns describe the year 1974.

Figure 4  
 Percent Distribution of Union Membership by Size of Union in 1974 and 2007: Size  
 Classes in Intervals of One Hundred Thousand Members

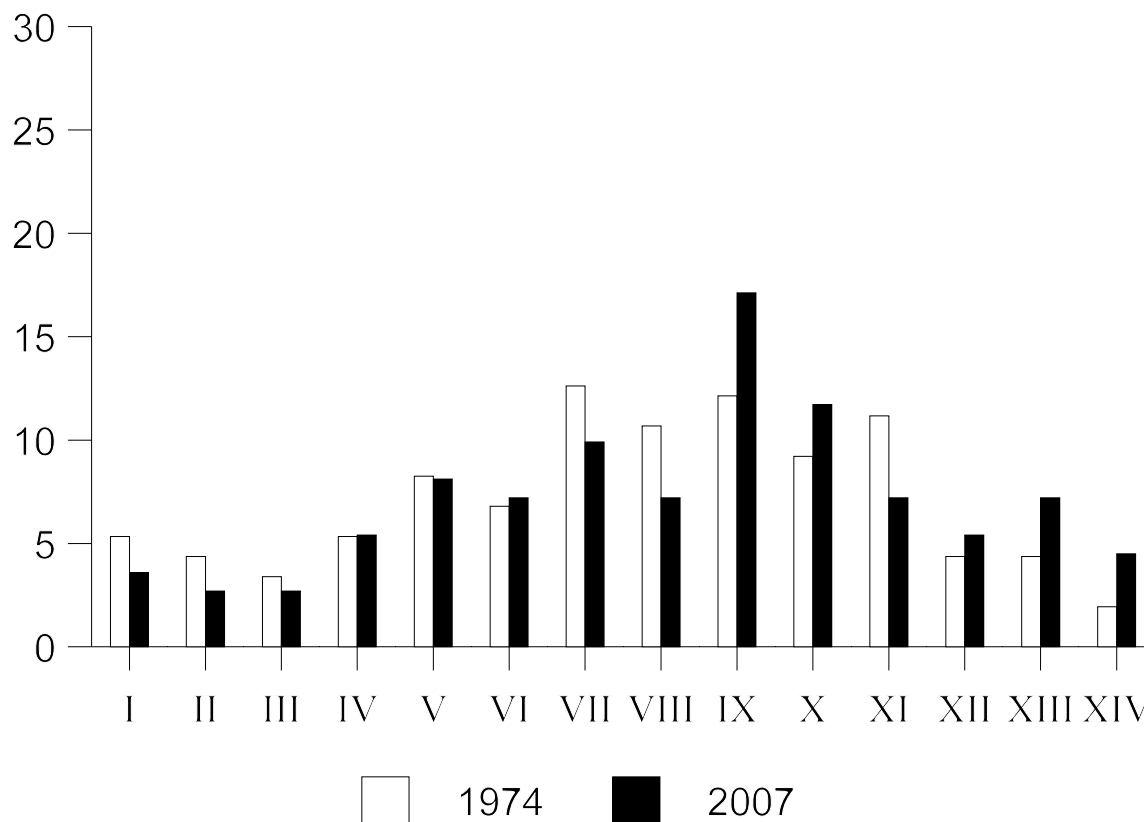


The horizontal axis measures membership in labor organizations by hundred thousand of members. Thus “ < 1 ” means less than 100,000, “ 1/2 ” means from 100,000 to 199,999, and so on in 100,000 intervals until the largest class of 1,000,000 or more denoted “ > 10 ” .

The vertical axis measures the membership in unions in the size class as a percentage of total union membership in all size classes.

The black columns describe the year 2007 and the white columns describe the year 1974.

Figure 5  
Percent Distribution of the Number of Unions by Size of Union in 1974 and 2007: Size Classes in Constant Ratios

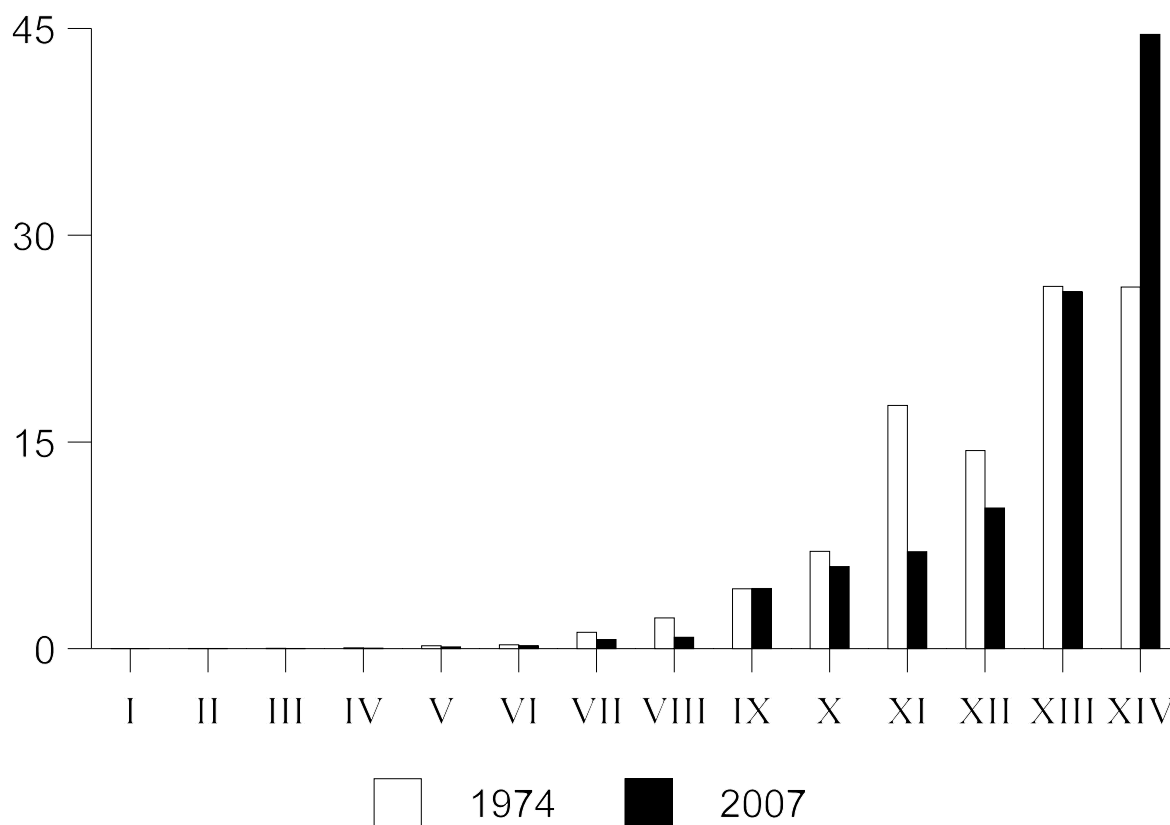


The vertical axis measures the number of unions in the size class as a percentage of the total number of unions in all size classes. The black columns describe the year 2007 and the white columns describe the year 1974. The horizontal axis measures membership in labor organizations where each size class bears a constant ratio from class to adjacent class: class I means < 250 members; class II means 250-499 members; class III means 500-999 members; class IV means 1,000-1,999 members; class V means 2,000-3,999 members; class VI means 4,000-7,999 members; class VII means 8,000-15,999 members; class VIII means 16,000-31,999 members; class IX means 32,000-63,999 members; class X means 64,000-127,999 members; class XI means 128,000-255,999 members; class XII means 256,000-511,999 members; class XIII means 512,000-1,023,999 members; and class XIV means  $\geq 1,024,000$  members.



Figure 6

Percent Distribution of Union Membership by Size of Union in 1974 and 2007: Size Classes in Constant Ratios



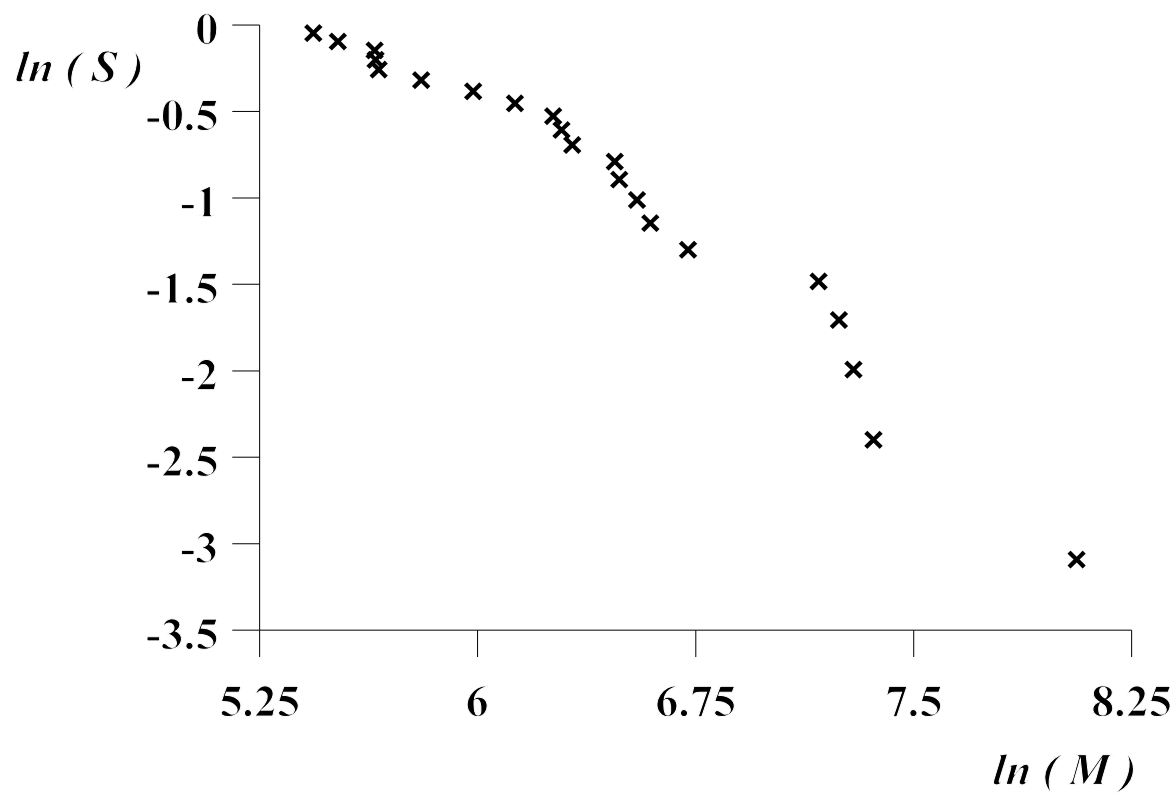
The vertical axis measures the membership in unions in the size class as a percentage of total union membership in all size classes. The black columns describe the year 2007 and the white columns describe the year 1974. The horizontal axis measures membership in labor organizations where each size class bears a constant ratio from class to adjacent class: class I means < 250 members; class II means 250-499 members; class III means 500-999 members; class IV means 1,000-1,999 members; class V means 2,000-3,999 members; class VI means 4,000-7,999 members; class VII means 8,000-15,999 members; class VIII means 16,000-31,999 members; class IX means 32,000-63,999 members; class X means 64,000-127,999 members; class XI means 128,000-255,999 members; class XII means 256,000-511,999 members; class XIII means 512,000-1,023,999 members; and class XIV means  $\geq 1,024,000$  members.

Figure 7  
Average Number of Mergers of Labor Unions per Year, 1900-2007



With the exception of 2007, each year on the horizontal axis denotes the beginning of a five year period so, for instance, 1900 means the average annual number of union mergers during the years 1900-04. The observation for 2007 is the average number of union mergers for 2005-07. Observations from 1900 to 1959 are drawn from Chaison (1980) and observations from 1960 to 2007 are from Ashack (2008).

Figure 8  
Pareto's Law for Labor Organizations with at least 200,000 Members in 2007 ?



Data Appendix to “The Changing Size Distribution of U.S. Trade Unions and Its Description by Pareto’s Distribution”

### UNION MEMBERSHIP IN 2007

The table below lists national unions by membership size class where membership is reported in thousands from the Directory of U.S. Labor Organizations, 2008 Edition.

union	membership in thousands	rank from smallest	percent ile
<b>unions with membership under 1.000 (10 unions in this size class) in 2007</b>			
WUA [World Umpire Assoc]	0.067	1	
GIAA [Guild of Italian-American Actors]	0.135	2	
ARA [American Radio Assoc.]	0.150	3	
PPDSE [International Plate Printers, Die Stampers and Engravers U of N. America]	0.200	4	
PPAN [Plant Protection Assoc National U]	0.450	5	
NBPA [National Basketball Players Assoc]	0.454	6	
AIU [Atlantic Independent U]	0.488	7	
NPWU [National Production Workers U]	0.603	8	
NLRBPA [National Labor Relations Board Professional Assoc.]	0.844	9	
NAAEA [National Assoc of Agricultural Employees]	0.850	10	
<b>unions with membership between 1.000 and 4.999 (17 unions) in 2007</b>			
CLA [Christian Labor Assoc.]	1.092	11	10%
NWSEO [National Weather Service Employees Organization]	1.300	12	
GAG [Graphic Artists Guild]	1.302	13	
ACRE [Assoc of Commuter Rail Employees]	1.519	14	
MLBPA [Major League Baseball Players Assoc]	1.525	15	
AWSE [Assoc of Westinghouse Salaried Employees]	1.625	16	
FPA [Federation of Professional Athletes]	2.150	17	
IBDW [Int Brotherhood of DuPont Workers]	2.475	18	

NFIU [National Federation of Independent Unions] consists of 15 affiliates	2.532	19	
ATDA [American Train Dispatchers Assoc]	2.553	20	
IPA [Independent Pilots Assoc]	2.841	21	
AGVA [American Guild of Variety Artists]	3.100	22	20 %
UPIW [International U of Petroleum & Industrial Workers]	3.126	23	
WGAE [Writers Guild of America, East, Inc.]	3.800	24	
NOITU [National Organization of Industrial Trade Unions]	3.935	25	
NACST [National Assoc of Catholic School Teachers]	4.480	26	
ACT [Assoc of Civilian Technicians]	4.838	27	
<b>unions with membership between 5.000 and 9.999 (8 unions) in 2007</b>			
NSO [National Staff Organization]	5.159	28	25 %
UFW [United Farm Workers of America]	5.504	29	
FEA [Federal Education Assoc]	5.669	30	
MM&P [International Organization of Masters, Mates and Pilots]	6.419	31	
AGMA [American Guild of Musical Artists]	6.478	32	
AWPPW [Assoc of Western Pulp & Paper Workers]	7.416	33	
BRS [Brotherhood of Railroad Signalmen]	9.231	34	
NAPFE [National Alliance of Postal & Federal Employees]	9.573	35	
<b>unions with membership between 10.000 and 24.999 (16 unions) in 2007</b>			
CIR [Committee of Interns & Residents]	10.218	36	
AMFA [Aircraft Mechanics Fraternal Assoc]	10.255	37	
UGSOA [United Government Security Officers of America]	10.586	38	
APA [Airline Pilots Assoc]	10.861	39	
DGA [Directors Guild of America]	13.326	40	
ASFA [American Foreign Service Assoc]	13.700	41	

FLOC [Farm Labor Organizing Committee]	14.232	42	
NATCA [National Air Traffic Controllers Assoc]	14.571	43	
UNAC [United Nurses Assocs of California/Unions of Health Care Professionals]	15.177	44	
APFA [Assoc of Professional Flight Attendants]	17.684	45	40%
NPW [Int U of Allied Novelty & Production Workers]	18.225	46	
WGAW [Writers Guild of America, West, Inc.]	18.519	47	
SPFPA [Int U Security, Police and Fire Professionals of America]	18.666	48	
HFIA [Int Assoc of Heat & Frost Insulators & Asbestos Workers]	20.692	49	
MEBA [Marine Engineers' Beneficial Assoc]	22.471	50	
RWAW [United U of Roofers, Waterproofers and Allied Workers]	23.816	51	
<b>unions with membership between 25.000 and 49.999 (13 unions) in 2007</b>			
IUEC [Int U of Elevator Constructors]	26.357	52	
NAGE [National Assoc of Govt Employees]	33.328	53	
ILWU [Int Longshore & Warehouse U] - SF	34.396	54	
UE [United Electrical, Radio & Machine Workers of America]	35.525	55	
GMP [Glass, Molders, Pottery, Plastics & Allied Workers Int U]	36.607	56	50 %
BMWE [Brotherhood of Maintenance of Way Employees]	36.958	57	
SIU [Seafarers Int U of North America]	37.273	58	
IUPA [Int U of Police Associations]	38.478	59	
AAUP [American Assoc of University Professors]	40.663	60	
AEA [Actors' Equity Association]	41.358	61	
OPCMIA [Operative Plasterers' & Cement Masons' Int Assoc of the US and Canada]	41.431	62	
ILA [Int Longshoremen's Assoc] - NY	43.500	63	
IUJAT [Int U of Journeymen & Allied Trades]	48.027	64	

<b>unions with membership between 50,000 and 99,999 (16 unions) in 2007</b>			
UWUA [Utility Workers U of America]	50.000	65	
BLET [Brotherhood of Locomotive Engineers & Trainmen]	54.384	66	
TCU [Transportation Communications Int U]/IAM	56.847	67	60%
AFTRA [American Federation of Television & Radio Artists]	59.788	68	
ALPA [Air Line Pilots Assoc Int]	61.314	69	
IFPTE [American Federation of Professional & Technical Engineers]	61.767	70	
IBB [Int Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers, & Helpers]	62.529	71	
CNA [California Nurses Assoc/National Nurses Org Committee]	65.874	72	
RWDSU [Retail, Wholesale & Depart. Store U]	73.335	73	
NTEU [National Treasury Employees U]	77.733	74	
UMWA [United Mine Workers of America]	80.060	75	
UTU [United Transportation U]	84.679	76	
AFM [American Fed of Musicians of the U.S. & Canada]	89.860	77	
GCC [Graphic Communications Conference]	93.076	78	
BAC [Int U of Bricklayers & Allied Craftworkers]	94.115	79	
BCTGM [Bakery, Confectionary, Tobacco, etc.]	94.396	80	

**UNIONS WITH MEMBERSHIP GREATER THAN 100,000 THOUSAND IN 2007**

union	M in thousands	rank from smallest	percent ile
<b>unions with membership between 100,000 and 199,999 (10 unions) in 2007</b>			
OPEIU [Office & Professional Employees Int U]	104.596	81	
IATSE [Int Alliance of Theatrical Stage Employ, Moving Picture Technicians, Artists, etc.]	108.386	82	
NRLCA [National Rural Letter Carriers' Assoc]	111.893	83	

TWU [Transport Workers U of America]	115.145	84	75 %
IUPAT [Int U of Painters & Allied Trades]	129.499	85	
BSORIW [Int Assoc of Bridge, Structural, ....., Iron Workers]	134.134	86	
SMWIA [Sheet Metal Workers Assoc]	149.149	87	
UAN [United American Nurses]	157.055	88	
SAG Screen Actors Guild]	176.455	89	
ATU [Amalgamated Transit U]	182.109	90	80%
<b>unions with membership between 200.000 and 299.999 (5 unions) in 2007</b>			
AFGE [American Fed of Govt. Employees]	229.248	91	
NPMHU [National Postal Mail Handlers U]	249.509	92	
APWU [American Postal Workers U]	283.279	93	
IAFF [Int Assoc of Fire Fighters]	283.932	94	
NALC [National Assoc of Letter Carriers]	287.036	95	
<b>unions with membership between 300.000 and 399.999 (2 unions) in 2007</b>			
UA [United Assoc of Journeyman.....Plumbing & Pipe Fitting Industry of the U.S. & Canada]	332.205	96	
IUOE [Int U of Operating Engineers]	397.348	97	
<b>unions with membership between 400.000 and 499.999 (1 union) in 2007</b>			
UNITE [UNITE HERE]	458.901	98	
<b>unions with membership between 500.000 and 999.999 (8 unions) in 2007</b>			
UBC [United Brotherhood of Carpenters etc.]	523.126	99	
UAW [United Automobile, Aerospace and Agricultural Implement Workers of America]	538.448	100	90 %
CWA [Communications Workers of America]	559.083	101	
IAM [Int Assoc of Machinists & Aerospace Workers]	646.933	102	
LIUNA [Laborers' Int U of N. America]	657.197	103	
IBEW [Int Brotherhood of Electrical Workers]	697.863	104	
USW [United Steel, Paper & Forestry, Rubber, Manufacturing, Energy,...,Service Workers Int U]	730.936	105	



AFT [American Federation of Teachers]	832.058	106	
<b>unions with membership equal to or greater than 1,000.000 (5 unions) in 2007</b>			
UFCW [United Food & Commercial Workers....]	1,304.061	107	
IBT [Int Brotherhood of Teamsters]	1,398.573	108	
AFSCME [American Fed of State, County, & Municipal Employees]	1,470.095	109	
SEIU [Service Employees Int U]	1,575.485	110	
NEA [National Educational Assoc]	3,167.612	111	100 %

**UNIONS WHOSE MEMBERSHIP NOT LISTED IN 2007**

Associated Actors & Artistes of America [AAAA]

National Association of Broadcast Employees & Technicians [NABET-CWA]

California School Employees Assoc [CSEA]

CWA Industrial Division/International Union of Electronic, Electrical, etc [IUE-CWA]

National Federation of Federal Employees [NFFE]

Assoc of Flight Attendants [AFA-CWA]

National Football Players Association [NFLPA]

National Hockey League Players Association [NHLPA]

Jockeys' Guild Inc. [JG]

The Newspaper Guild [NG-CWA]

Union of American Physicians & Dentists [UAPD]

Fraternal Order of Police [FOP]

American Federation of School Administrators [AFSA]

National Writers Union [NWU]

## UNION MEMBERSHIP IN 1978

From the Directory of National Unions and Employee Associations, 1979, starting page 20. Membership in the table below is given in thousands.

union	membership in thousands	rank from smallest	percent ile
<b>unions with membership under 1.000 (25 unions in this size class) in 1978</b>			
IAS [Int Assoc of Siderographers]	0.015	1	
PAICC [Prof Assoc of the Interstate Commerce Commission]	0.022	2	
TS [Trademark Society Inc.]	0.033	3	
NLRBA [National Labor Relations Board Prof Assoc]	0.225	4	
NBA [National Basketball Players Assoc]	0.242	5	
LogSIU [Log Scalers Int U]	0.250	6	
NAAE [Nat Assoc of Aeronautical Examiners]	0.260	7	
FPQI [Federal Plant Quarantine Inspectors National Assoc]	0.324	8	
IUPPE [Independent U of Plant Protection Employees]	0.325	9	
AWIU [Allied Workers Int U]	0.350	10	
CLGA [Composers & Lyricists Guild of America]	0.359	11	
NHL [National Hockey League Players Assoc]	0.375	12	
UJH [U of Journeymen Horseshoers of the U.S.]	0.400	13	
IPPDS [Int Plate Printers. Die Stampers & Engravers U of N. America]	0.400	14	
IATC [Int Assoc of Tool Craftsmen]	0.410	15	
NPPA [Nat Plant Protection Assoc]	0.450	16	
NAAPC [Nat Assoc of Aeronautical Production Controllers]	0.453	17	
MAGE [Minnesota Assoc of Govt Employees Independent]	0.500	18	
IUTDMM [Int U of Tool, Die & Mold Makers]	0.500	19	10 %

NIWU [National Industrial Workers U]	0.580	20	
MLB [Major League Baseball Players Assoc]	0.650	21	
AWWU [American Watch Workers U]	0.650	22	
MPEA Machine Printers & Engravers Assoc of the U.S.]	0.669	23	
POPA [Patent Office Professional Assoc]	0.700	24	
NAGI [Nat Assoc of Govt Inspectors & Quality Assurance Personnel]	0.955	25	
<b>unions with membership between 1.000 and 4.999 in 1978 (29 unions) in 1978</b>			
ARA [American Radio Association]	1.000	26	
CIU [Coopers Int U of N. America]	1.056	27	
NAPEP [Nat Assoc of Planners, Estimators & Progressmen]	1.057	28	
FPSP [Fed of Postal Security Police]	1.100	29	
BSAC [Brotherhood of Shoe & Allied Crafts]	1.200	30	
SDSEO [South Dakota State Employees Org]	1.200	31	
NAGE [Nebraska Assoc of Public Employees]	1.300	32	
NLRBU [National Labor Relations Board U]	1.350	33	
NFL [Nat Football League Players Assoc]	1.384	34	
NBPIW [Nat Brotherhood of Packinghouse & Industrial Workers]	1.400	35	
FEIA [Flight Engineers' Int Assoc]	1.720	36	
NDSEA [North Dakota State Employees Assoc]	2.000	37	
ALOA [Amalgamated Lace Operatives of Amer.]	2.100	38	20 %
LW [Leather Workers Int U of America]	2.110	39	
IGUA [Int Guards U of America]	2.216	40	
AIU [Atlantic Independent U]	2.400	41	
WGAE [Writers Guild of America, East]	2.400	42	
WPEA [Washington Public Employees Assoc]	2.515	43	
ATDA [American Train Dispatchers Assoc]	3.300	44	

BUWNE [Brotherhood of Utility Workers of New England]	3.300	45	
ISEA [Indiana State Employees Assoc]	3.400	46	
WPEA [Wyoming Public Employees Assoc]	3.400	47	
SLU [Southern Labor U]	3.500	48	25 %
DieSinkers [Int Die Sinkers' Conference]	3.680	49	
VtState [Vermont State Employees Assoc]	3.800	50	
IndWA [Independent Watchmen's Assoc]	4.000	51	
NevEA [State of Nevada Employees Assoc]	4.300	52	
RailYard [Railroad Yardmasters of America]	4.701	53	
WriteWest [Writers Guild of America, West]	4.780	54	
<b>unions with membership between 5.000 and 9.999 (17 unions) in 1978</b>			
DGA [Directors Guild of America, Inc]	5.000	55	
Security [Int u of Security Officers]	5.001	56	
Idaho [Idaho Public Employees Assoc]	5.300	57	
NHState [New Hampshire State Employees Assoc]	5.301	58	
AssonCT [Assoc of Civilian Technicians]	5.500	59	
Alas [Alaska Public Employees Assoc]	5.900	60	
Stove [Stove, Furnace, & Applied Appliance Workers Int U of N America]	6.400	61	
Montana [Montana Public Employees]	6.700	62	
AmerRail [American Railway & Airway Supervisors Assoc]	7.054	63	
NatAssoc [Nat Assoc of Broadcast Employees 7 Technicians]	7.300	64	
CountyOff [Nat Assoc of ASCS County Office Employees]	7.800	65	
Ariz [Arizona Public Employees Assoc]	8.875	66	
Tile [Tile, Marble, and Terrazzo Finishers and Shopmen Int U]	9.300	67	
Jewelry [Int Jewelry Workers U]	9.500	68	
Maine [Maine State Employees Assoc]	9.529	69	

Pattern Pattern Makers' League of N. America]	9.600	70	
SchoolAd [American Fed of School Administrators]	9.958	71	
<b>unions with membership between 10.000 and 24.999 (28 Unions) in 1978</b>			
Hatters [United Hatters, Cap & Millinery Workers Int U]	10.000	72	
MetalPolis Metal Polishers, Buffers, Platers & Allied Workers Int U]	10.001	73	
West [Fed of Westinghouse Independent Salaried Unions]	10.190	74	
Utah [Utah Public Employees Assoc]	10.500	75	
Alabama {Alabama State Employees Assoc]	11.000	76	
UnitedTel [United Telegraph Workers]	11.466	77	40 %
Phys [Physicians National Housestaff Assoc]	12.000	78	
Ncarolina [North Carolina State Govt Employees Assoc]	12.377	79	
RailSig [Brotherhood of Railroad Signalmen]	12.972	80	
NatMarine [National Marine Engineers' Beneficial Association]	13.490	81	
Colorado [Colorado Assoc of Public Employees]	13.830	82	
Brick [United Brick & Clay Workers of America]	15.000	83	
NJState [New Jersey State Employees Assoc]	15.553	84	
Oregon [Oregon State Employees Assoc]	16.000	85	
IntBroth [Int Brotherhood of Pottery & Allied Workers]	16.938	86	
Laundry [Laundry & Dry Cleaning Int U]	17.365	87	
Elevator [Int U of Elevator Constructors]	17.900	88	
Nurses [National Fed of Licensed Practical Nurses]	18.000	89	
Michigan [Michigan State Employees Assoc]	18.872	90	
Heat&F [Int Assoc of Heat & Frost Insulators & Asbestos Workers]	19.681	91	
Insur [Insurance Workers Int U]	20.000	92	

Postal [National Alliance of Postal & Federal Employees]	20.001	93	
Postmaster [National League of Postmasters of the U.S.]	20.002	94	
Pulp [Assoc of Western Pulp & Paper Workers]	20.190	95	
IPSSU [Int Production, Service, & Sales U]	21.000	96	50 %
Retail [United Retail Workers U]	21.500	97	
ProfTech [Int Fed of Professional & Technical Engineers]	23.000	98	
Ncarolina [North Carolina State Employees Assoc]	24.300	99	
<b>unions with membership between 25.000 and 49.999 (25 unions) in 1978</b>			
UFW [United Farm Workers]	25.000	100	
Marine [Industrial U of Marine & Shipbuilding Workers of America]	25.001	101	
Mechanics [Mechanics Educational Society]	25.002	102	
Guard [United Plant Guard Workers of America Int U]	25.003	103	
Ohio [Ohio Civil Service Employees Assoc. Inc]	25.800	104	
Distillery [Distillery, Wine & Allied Workers' Int U]	26.600	105	
Leather [Int Leather Goods, Plastics & Novelty Workers' U]	27.000	106	
Furniture [United Furniture Workers of America]	27.042	107	
Maryland [Maryland Classified Employees Assoc]	27.250	108	
Aluminum [Aluminum Workers Int U]	29.000	109	
Garment [United Garment Workers of America]	31.000	110	
Roofers [United U of Roofers, Waterproofers & Allied Workers]	31.000	111	
Flint [American Flint Glass Workers' Union of N America]	33.375	112	
Novelty [Int U of Allied Novelty & Production Workers]	33.500	113	
Newspaper [Newspaper Guild]	33.518	114	
Postal [National Assoc of Postal Supervisors]	34.000	115	

Glass [United Glass & Ceramic Workers of N. America]	34.539	116	60 %
Grain [American Fed of Grain Millers]	35.000	117	
Cement [United Cement, Lime, & Gypsum Workers Int U]	36.800	118	
Locomotive [Brotherhood of Locomotive Engineers]	38.680	119	
Pilots [Air Line Pilots Assoc]	39.685	120	
Textile [United Textile Workers of America]	40.000	121	
Barbers [Barbers, Beauticians, & Allied Industries Int Assoc]	40.001	122	
Firemen [Int Brotherhood of Firemen & Oilers]	43.000	123	
Upholsters [Upholsterers' Int U of N America]	48.920	124	
<b>unions with membership between 50.000 and 99.999 (19 unions) in 1978</b>			
Maritime [National Maritime U of America]	50.000	125	
CIU [Congress of Independent Unions]	50.001	126	
Federal [National Fed of Federal Employees]	51.000	127	
Long [Int Longshoremen's & Warehousemen's U]	55.000	128	
Police [Int U of Police Associations]	55.001	129	
Plaster [Operative Plasterers' & Cement Masons' Int Assoc of the U.S. & Canada]	57.010	130	
Letter [National Rural Letter Carriers Assoc]	60.000	131	
Theatrical [Int Alliance of Theatrical Stage Employees and Moving Picture Operators of the U.S. & Canada]	62.000	132	
Chemical [Int Chemical Workers U]	65.800	133	
Molders [Int Molders and Allied Workers U]	66.449	134	
AAUP [American Assoc of Univ Professors]	68.100	135	
ILA [Int Longshoremen's Assoc]	77.119	136	
AAAA [Associated Actors and Artistes of America]	78.000	137	
Seafarers [Seafarers' Int U of N America]	80.250	138	
Glass [Glass Bottle Blowers Assoc of the U.S. & Canada]	82.000	139	
Graphic [Graphic Arts Int U]	88.837	140	
ITU [Int Typographical U]	88.876	141	



IndWork [Int U Allied Industrial Workers of America]	90.686	142	
Carmen [Brotherhood of Railway Carmen of the U.S. & Canada]	93.737	143	

**UNIONS WITH MEMBERSHIP GREATER THAN 100,000 IN 1978**

union	M	rank from smallest	percent ile
<b>unions with membership between 100.000 and 199.999 (21 unions) in 1978</b>			
Office & Professional Employees Int U	105.000	144	75 %
California State Employees Assoc	105.001	145	
Int Woodworkers of America	117.691	146	
Brotherhood of Maintenance of Way Employees	119.203	147	
Int Printing & Graphic Communications U	120.000	148	
Transport Workers U of America	130.000	149	
Fraternal Order of Police	140.000	150	
Int Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers & Helpers	145.500	151	
Amerian Assoc of Classified School Employees	150.000	152	
Amalgamated Transit U	154.242	153	
Sheet Metal Workers Int Assoc	158.528	154	80 %
United Electrical, Radio & Machine Workers of America	166.000	155	
Bakery, Confectionary & Tobacco Workers Int U	166.858	156	
Int Assoc of Bridge, Structural and Ornamental Iron Workers	174.932	157	
United Transportation U	175.500	158	
Int Assoc of Fire Fighters	176.474	159	
Oil, Chemical, & Atomic Workers Int U	180.000	160	
American Nurses Assoc.	187.000	161	
Int Brotherhood of Painters & Allied Trades of the U.S. & Canada	190.000	162	

Retail, Wholesale & Dept Store U	198.000	163	
United Rubber, Cork, Linoleum, & Plastic Workers of America	199.990	164	
<b>unions with membership between 200.000 and 299.999 (7 unions) in 1978</b>			
Nat Assoc of Gov Employees	200.000	165	
Brotherhood of Railway, Airline & Steamship Clerks, Freight Handlers, Express & Station Employees	201.083	166	
Nat Assoc of Letter Carriers	227.005	167	
American Postal Workers U	245.826	168	
Int U of Electrical, Radio & Machine Workers	255.427	169	
American Fed of Gov Employees	265.506	170	
United Paperworkers Int U	284.329	171	
<b>unions with membership between 300.000 and 399.999 (4 unions) in 1978</b>			
United Mine Workers of America	307.944	172	
American Federation of Musicians	330.000	173	90%
United Assoc of Journeymen & Apprentices of the Plumbing & Pipe-fitting Industry of the U.S. & Canada	337.055	174	
Int Ladies Garment Workers U	348.380	175	
<b>unions with membership between 400.000 and 499.999 (2 unions) in 1978</b>			
Hotel & Restaurant Employees & Bartenders Int U	403.890	176	
Int U of Operating Engineers	411.860	177	
<b>unions with membership between 500.000 and 999.999 (7 unions) in 1978</b>			
American Federation of Teachers	500.000	178	
Communication Workers of America	508.063	179	
Amalgamated Clothing & Textile Workers U	526.000	180	
Laborers Int U of N America	610.000	181	
Service Employees Int U	625.000	182	
United Brotherhood of Carpenters and Joiners of America	780.398	183	
Int Assoc of Machinists & Aerospace Workers	920.735	184	

<b>unions with membership equal to or greater than 1,000.000 (7 unions) in 1978</b>			
Int Brotherhood of Electrical Workers	1,011.726	185	
American Federation of State, County, & Municipal Employees	1,020.000	186	
United Food & Commercial Workers Int U	1,235.500	187	
United Steelworkers of America	1,285.740	188	
United Automobile, Aerospace and Agricultural Implement Workers of America	1,534.425	189	
National Educational Association	1,696.469	190	
Int Brotherhood of Teamsters, Chauffeurs, Warehousemen NS Helpers of America	1,923,896	191	

**UNIONS WHOSE MEMBERSHIP NOT LISTED IN 1978**

Independent Bakery Employees Union

Int Union of Bricklayers and Allied Craftsmen

Christian Labor Association of U.S.A.

Illinois State Employees Association

National Organization of Industrial Trade Unions

Newspaper & Mail Deliverers' Union of New York and Vicinity

National Treasury Employees Union

## UNION MEMBERSHIP IN 1974

From the U.S. Department of Labor, BLS Bulletin 1937, Directory of National Unions and Employee Associations, 1975, 1977. Union membership reported in thousands.

UNION	MEMBERS IN THOUSANDS	RANK FROM SMALLEST	PERCENTILE
<b>UNIONS WITH M &lt; 0.250 MEMBERS IN 1974 [ 11 UNIONS]</b>			
Siderographers	18	1	
Licensed Officers' Organization, GtLakes	42	2	
Trademark	48	3	
Umpires Association	48	4	
AirLineDispatchers	90	5	
Operations Analysis	112	6	
National Labor Relations	125	7	
Textile Foremen's Guild	149	8	
West Virginia	180	9	
Allied Workers	200	10	
Basketball	216	11	
<b>UNIONS WITH M BETWEEN 0.250 &amp; 0.499 MEMBERS IN 1974 [ 9 UNIONS]</b>			
Bakery	287	12	
Protection Employees	320	13	
Quarantine Inspectors	362	14	
Horseshoers	370	15	
Hockey	396	16	
Plate Printers	400	17	
Western States Service Station	426	18	
Minnesota	460	19	
Tool Craftsmen	496	20	
<b>UNIONS WITH M BETWEEN 0.500 &amp; 0.999 MEMBERS IN 1974 [ 7 UNIONS]</b>			

Radio Association	618	21	10%
Patent Office	650	22	
Gov Inspectors	703	23	
NatAssocofAeroProdControllers	725	24	
Watch Workers	735	25	
Industrial Workers Union	759	26	
Baseball	950	27	
<b>UNIONS WITH M BETWEEN 1.000 &amp; 1.999 MEMBERS IN 1974 [11 UNIONS]</b>			
Nebraska	1,100	28	
NLRB Union	1,150	29	
Machine Printers	1,150	30	
Planners, Estimators	1,200	31	
Shoe & Allied Craftsmen	1,250	32	
Sleeping Car Porters	1,300	33	
Lace	1,500	34	
Writers Guild of America, East	1,600	35	
Veterinarians	1,690	36	
Coopers	1,700	37	
AirTrafficSpec	1,900	38	

<b>UNIONS WITH M BETWEEN 2.000 &amp; 3.999 MEMBERS IN 1974 [ 17 UNIONS]</b>			
Packinghouse	2,000	39	
Trades and Crafts National Construction	2,000	40	
Southern	2,200	41	20%
Wyoming	2,850	42	
Leather Workers	3,000	43	
Granite Cutters	3,200	44	
Connecticut	3,200	45	
Writers Guild of America West	3,204	46	
Train Dispatchers	3,229	47	
Guards	3,250	48	
Atlantic	3,255	49	
Mailers Union	3,500	50	
Newspaper	3,500	51	
Die Sinkers	3,690	52	25%
Nevada	3,690	53	
Vermont	3,700	54	
Montana	3,800	55	

<b>UNIONS WITH M BETWEEN 4.000 &amp; 7.999 MEMBERS IN 1974 [ 14 UNIONS]</b>			
Washington	4,000	56	
Directors	4,154	57	
New Hampshire	4,177	58	
Idaho	4,200	59	
Flight Engineers	4,291	60	
Utility Workers of New England	4,500	61	
Indiana	4,500	62	
PhysiciansNationalHousestaff	5,000	63	
Railroad Yardmasters	5,121	64	
Industrial	5,142	65	
Kentucky	5,200	66	
Technicians Association; Civilian	5,500	67	
Railway & Airway Supervisors	6,250	68	
Broadcast	6,600	69	
<b>UNIONS WITH M BETWEEN 8.000 AND 15.999 MEMBERS IN 1974[ 26 UNIONS]</b>			
Tile, Marble, & Terrazzo	8,000	70	
School Administrators	8,000	71	
New Jersey	8,000	72	
Alaska	8,500	73	
Maine	8,917	74	
Marine Engineers	9,150	75	
ASCS	9,400	76	
Stove, Furnace,	9,500	77	
North Carolina	9,900	78	
Massachusetts	10,000	79	
Metal Polishers	10,000	80	
Watchmen's Association	10,000	81	
Jewelry	10,000	82	

Utah	10,039	83	40%
Pattern Makers	10,912	84	
Colorado	11,200	85	
Railroad Signalmen	12,000	86	
Arizona	12,000	87	
Farm	12,000	88	
Alabama State	12,500	89	
Illinois	13,000	90	
Telegraph Workers	13,588	91	
Hatters	14,000	92	
Lathers	14,428	93	
Brick	15,000	94	
Oregon	15,337	95	
<b>UNIONS WITH M BETWEEN 16.000 AND 31.999 MEMBERS IN 1974 [ 22 UNIONS]</b>			
Asbestos	18,255	96	
Michigan	18,500	97	
Elevator	18,902	98	
Laundry	19,543	99	
Technical Engineers	19,500	100	
Postal	20,000	101	
Pulp & Paper	20,781	102	
Insurance	21,896	103	
Retail Workers Union	22,000	104	50%
Independent Unions	25,000	105	
Garment	25,000	106	
Mechanics Educational	25,000	107	
North Carolina	25,000	108	
Marine & Shipbuilding	25,000	109	
Licensed Practical Nurses	25,997	110	



Connecticut State	27,400	111	
AirLinePilots	27,707	112	
Roofers, Damp and Waterproof	28,000	113	
Maryland	29,000	114	
Furniture	29,967	115	
Toys, Playthings, Novelties	31,000	116	
Distillery	31,000	117	
<b>UNIONS WITH M BETWEEN 32.000 AND 63.999 MEMBERS IN 1974 [ 25 UNIONS]</b>			
Aluminum	32,000	118	
Newspaper Guild	32,207	119	
Ohio	33,000	120	
Shoe and Boot Workers	33,250	121	
Plant Guard	34,000	122	
Tobacco Workers	34,627	123	
Postal Supervisors	35,000	124	60%
Shoe Workers	35,000	125	
Maritime	35,000	126	
Glass Workers	35,000	127	
Grain Millers	35,000	128	
Cement	37,500	129	
Glass & Ceramic	38,500	130	
Locomotive	39,245	131	
Firemen and Oilers	40,000	132	
Leather Goods	40,000	133	
Barbers	41,000	134	
Textile Workers	47,344	135	
Rural Letter Carriers	49,135	136	
Distributive	50,000	137	
Treasury Employees Union	50,000	138	

Longshoremen's (SF)	55,000	139	
Upholsterers	59,000	140	
Utility Workers Union	60,000	141	
Theatrical Stage Employees	61,471	142	
<b>UNIONS WITH M BETWEEN 64.000 &amp; 127.999 MEMBERS IN 1974 [ 19 UNIONS]</b>			
Telecommunications	65,000	143	
Plasterers and Cement	65,000	144	
University Professors	72,265	145	
Molders	75,000	146	
AAA	76,000	147	
Longshoremen's (NY)	76,579	148	
Seafarers	80,000	149	
Glass Bottle	80,162	150	
Chemical	85,215	151	
Classified School	89,000	152	

Office & Professional	89,468	153	
Railway Carmen	95,954	154	
Industrial Workers	96,817	155	75%
Graphic Arts	100,000	156	
Fed Employees	100,000	157	
California	106,000	158	
Woodworkers	107,966	159	
Typographical Union	111,362	160	
Maintenance	119,184	161	

<b>UNIONS WITH M BETWEEN 128.000 &amp; 255.999 MEMBERS IN 1974 [23 UNIONS]</b>			
Printing and Graphic	128,714	162	
Bakery	134,158	163	
Boilermakers	138,000	164	
Transit Union	140,000	165	
Police	147,000	166	80%
Bricklayers	147,715	167	
Transport Workers Union	150,000	168	
Sheet Metal	160,860	169	
Electrical, Radio (ind)	163,000	170	
Fire Fighters	171,674	171	
Oil, Chemical	177,433	172	
Retail, Wholesale,	180,000	173	
Iron	181,647	174	
Rubber, Cork, Linoleum etc.	190,523	175	

Nurses	196,499	176	
Civil Service	207,000	177	
Painters	211,373	178	
Mine Workers of America	220,000	179	
Plumbing and Pipe Fitting	228,000	180	
Letter Carriers	232,000	181	
Railway, Airline	235,000	182	
Transportation Union	238,000	183	
Postal Workers Union	249,000	184	
<b>UNIONS WITH M BETWEEN 256.000 &amp; 511.999 MEMBERS IN 1974 [9 UNIONS]</b>			
Electrical	298,231	185	
Gov Employees	300,000	186	90 %
Paperworkers	300,684	187	
Musicians	330,000	188	
Ladies Garment	404,737	189	
Operating Engineers	415,395	190	
Teachers; American Federation of	444,000	191	
Hotel & Restaurant	451,989	192	
Communications	498,743	193	

<b>UNIONS WITH M BETWEEN 512.000 &amp; 1,023.999 MEMBERS IN 1974 [9 UNIONS]</b>			
Clothing	517,000	194	
Meat Cutters	525,000	195	
Service Employees Int Union	550,000	196	
State,County&Municipal Employees	648,160	197	
Laborers	650,000	198	
Retail Clerks	650,876	199	
Carpenters	820,000	200	
Machinists and Aerospace	943,280	201	
IBElectricalW	991,228	202	
<b>UNIONS WITH M ≥ 1,024.000 MEMBERS IN 1974 [4 UNIONS IN THIS CLASS]</b>			
Steelworkers	1,300,000	203	
Nat Educational Assoc	1,470,212	204	
Automobile	1,544,859	205	
Teamsters	1,973,272	206	

<b>UNIONS WITH MEMBERSHIP NOT LISTED IN 1974</b>
[5 UNIONS IN THIS CLASS]
Nat Assoc of Aero Examiners
Christian Labor Assoc of the USA
NAT. Football League Players Assoc
Government Employees; National Association of
National League of Postmasters

## 1968

From the Directory of U.S. Labor Organizations 1969 edition. The 57 largest unions are ranked here.

union	M	percentile
1	72.06	
2	73.5	
3	76.2	
4	80.0	
5	85.0	
6	86.0	
7	95.0	
8	95.596	
9	97.754	
10	103.780	
11	113.811	
12	117.386	20 %
13	123.310	
14	125.000	
15	126.000	25 %
16	132.634	
17	134.000	
18	140.000	
19	140.000	
20	144.682	
21	160.000	
22	165.000	
23	166.000	40 %
24	167.000	

25	167.928	
26	173.185	
27	175.000	
28	175.000	
29	182.795	MEDIAN
30	183.000	
31	200.000	
32	203.000	
33	203.909	
34	210.000	
35	232.000	60 %
36	280.000	
37	283.155	
38	294.725	
39	297.023	
40	324.352	
41	350.000	
42	357.000	
43	364.486	
44	386.000	75 %
45	389.000	
46	455.022	80 %
47	459.053	
48	500.000	
49	552.000	
50	553.102	
51	793.000	
52	897.114	
53	903.015	

54	1120.000	
55	1081.660	
56	1472.696	
57	1755.025	



**UNION MEMBERSHIP IN 1939**

The largest 58 unions from Troy (1965).

Rank	M
1	29.0
2	29.2
3	30.0
4	30.1
5	30.3
6	31.8
7	32.1
8	32.1
9	32.8
10	33.0
11	34.5
12	35.0
13	38.8
14	39.4
15	39.5
16	39.6
17	40.0
18	42.0
19	42.0
20	43.5
21	43.7
22	44.0
23	44.0
24	45.0
25	47.5
26	47.8

27	51.0
28	58.2
29	58.6
30	60.2
31	62.3
32	62.9
33	64.6
34	65.0
35	65.4
36	66.3
37	69.2
38	78.6
39	79.7
40	82.5
41	83.3
42	84.2
43	87.8
44	91.0
45	102.5
46	125.1
47	127.3
48	140.7
49	157.5
50	165.3
51	178.0
52	201.5
53	210.9
54	214.8
55	225.0

56	239.7
57	441.6
58	495

**UNION MEMBERSHIP IN 1920**

The largest 54 unions from Leo Wolman (1936).

Rank	Membership in thousands
1	20.7
2	20.8
3	20.9
4	21.1
5	21.8
6	22.1
7	22.4
8	25.0
9	27.5
10	27.7
11	29.0
12	29.6
13	31.5
14	32.0
15	33.0
16	34.1
17	35.0
18	35.2
19	38.5
20	38.8
21	40.0
22	42.0
23	44.2
24	45.9
25	46.7
26	48.3

27	50.1
28	56.0
29	57.3
30	60.4
31	65.3
32	70.0
33	70.5
34	73.6
35	74.0
36	75.0
37	78.0
38	86.9
39	98.7
40	103.0
41	103.1
42	104.9
43	105.4
44	110.8
45	125.9
46	139.2
47	149.8
48	177.0
49	182.1
50	184.6
51	186.0
52	330.8
53	371.9
54	393.6



## UNION MEMBERSHIP IN U.S. IN 1983

The 53 largest unions from Troy and Sheflin(1985) ranked from smallest to largest conditional on membership  $\geq 50,000$ .

Rank from smallest	membership in thousands
1	50.26
2	56.41
3	58.47
4	59.86
5	69.62
6	70.00
7	77.05
8	77.45
9	80.00
10	81.89
11	82.35
12	91.07
13	94.19
14	95.39
15	97.73
16	103
17	113
18	115
19	116
20	122
21	125
22	125
23	133
24	148
25	148

26	149
27	150
28	157
29	161
30	186
31	191
32	203
33	218
34	221
35	226
36	230
37	283
38	291
39	312
40	401
41	406
42	457
43	475
44	497
45	579
46	579
47	589
48	798
49	904
50	955
51	1,068
52	1,444
53	1,523





## NET ASSETS (K) OF U.S. UNIONS IN 1982

These data for the 53 largest unions are from Troy and Sheflin (1985) where K = net assets measured in thousands of \$s.

Rank from smallest	K
1	5,149
2	5,181
3	5,494
4	5,632
5	5,928
6	6,132
7	6,667
8	7,945
9	8,162
10	8,744
11	9,100
12	9,378
13	9,533
14	10,256
15	11,141
16	11,377
17	11,574
18	11,734
19	11,796
20	11,981
21	12,185
22	12,801
23	13,623
24	14,930
25	15,208

26	16,669
27	16,810
28	18,560
29	21,757
30	21,881
31	23,179
32	24,724
33	25,251
34	26,075
35	26,193
36	30,521
37	30,670
38	34,417
39	35,572
40	36,399
41	36,431
42	37,873
43	40,241
44	53,165
45	54,320
46	62,485
47	123,798
48	143,872
49	149,263
50	155,252
51	215,496
52	407,726
53	606,170

## UNION MEMBERSHIP OF BRITISH UNIONS IN 1983

These data are for the 56 largest British unions and the data are from Paul Willman and Timothy Morris (1988).

Rank from smallest	membership in thousands
1	21
2	23
3	23
4	23
5	23
6	24
7	25
8	27
9	27
10	28
11	31
12	32
13	33
14	33
15	34
16	35
17	36
18	38
19	41
20	41
21	42
22	45
23	46
24	52
25	52

26	54
27	57
28	74
29	74
30	77
31	83
32	90
33	91
34	94
35	125
36	132
37	136
38	155
39	164
40	190
41	195
42	210
43	214
44	220
45	245
46	250
47	259
48	290
49	390
50	392
51	394
52	673
53	766
54	847

55	1,001
56	1,491

## NET WORTH OF UNIONS IN BRITAIN IN 1985

These data are from Table 16, page 70, of The Finances of British Trade Unions 1975-1985 by Paul Willman and Timothy Morris, 1988, for the twenty largest unions where net worth is measured in thousands of £ s.

abbreviation	fuller name	net worth in thousands of £ s
BIFU	Banking, Insurance, and Finance Union	2,686
ASTMS	Association of Scientific, Technical & Managerial	4,596
NCU	National Communications Union	4,815
UCATT	Union of Construction, Allied Trades and Technicians	4,881
COHSE	Confederation of Health Service Employees	7,442
TASS	Technical & Supervisory Section	8,128
CPSA	Civil & Public Services Association	8,641
UCW	Union of Communication Workers	8,911
NUT	National Union of Teachers	9,709
USDAW	Union of Shop, Distributive & Allied Workers	10,290
EETPU	Electrical, Electronic, Telecommunic. & Plumbing	13,418
SOGAT	Society of Graphical & Allied Trades	16,441
NUPE	National Union of Public Employees	18,043
NUM	National Union of Mineworkers	18,647
AEU	Amalgamated Engineering Union	20,236
NGA	National Graphical Association	22,236
NUR	National Union of Railwaymen	26,170
GMB	General, Municipal, Boilermakers' & Allied Trade Union	33,632
NALGO	National Assoc. of Local Government Officers	34,422
TGWU	Transport & General Workers' Union	66,470

**UNION MEMBERSHIP OF 55 LARGEST U.S. UNIONS IN 2009**

These data are from the Directory of U.S. Labor Organizations 2010 edition. Membership (M) is measured in thousands.

rank	M
1	0.1
2	0.2
3	2.075
4	2.100
5	3.325
6	3.741
7	7.200
8	9.169
9	10.654
10	12.125
11	13.533
12	14.763
13	18.269
14	18.311
15	20.384
16	25.796
17	31.245
18	36.552
19	39.807
20	40.000
21	42.658
22	44.084
23	44.300
24	46.915
25	53.160



26	55.119
27	61.306
28	63.256
29	65.000
30	73.375
31	75.371
32	76.000
33	76.972
34	84.245
35	92.610
36	93.032
37	93.761
38	95.000
39	104.184
40	109.000
41	122.107
42	129.000
43	207.333
44	210.894
45	219.800
46	233.591
47	248.000
48	280.000
49	299.107
50	427.521
51	484.190
52	576.833
53	618.740
54	1,129.361

55	1,397.879
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TOTAL = 8,343.053 thousands

CONSIDER THE 20 LARGEST LABOR ORGANIZATIONS IN 2007. WHERE WERE THEY IN 1974?

M = membership

		M in 2007	M in 1974
1	National Education Association NEA	3,167,612	1,470,212
2	Service Employees International Union SEIU	1,575,485	550,000
3	AFSCME	1,470,095	648,160
4	Teamsters IBT	1,398,573	1,973,272
5	United Food & Commercial Workers Int Union UFCW	1,304,061	see A below
6	American Federation of Teachers AFT	832,058	444,000
7	Steel, Paper, etc. USW	730,936	
8	Electrical Workers IBEW	697,863	991,228
9	Laborers' LIUNA	657,197	650,000
10	Machinists etc. IAM	646,933	943,280
11	Communications CWA	559,083	498,743
12	Automobile UAW	538,448	1,544,859
13	Carpenters UBC	523,126	820,000
14	UNITE HERE	458,901	
15	Operating Engineers IUOE (see D below)	397,348	415,395
16	Plumbing & Pipes UA	332,205	228,000
17	Letter Carriers NALC	287,036	232,000
18	Fire Fighters IAFF	283,932	171,674
19	Postal Workers APWU	283,279	249,000
20	Postal Mail Handlers NPMHU	249,509	see C below

Footnotes

A

The UFCW was created in June 1979 through the merger of the Amalgamated Meat Cutters union and Retail Clerks International Union. The merger created the largest union affiliated with the AFL-CIO. The UFCW grew by organizing and merging with several smaller unions between 1980 and 1998. These unions included the Barbers, Beauticians and Allied Industries International

Association, the Insurance Workers International Union, the Canadian Brewery Workers Union, the Independent Foodhandlers and Warehouse Employees Union in Rhode Island and Massachusetts, the Leather Goods, Plastics, Handbags and Novelty Workers Union, the International Union of Life Insurance Agents of Ohio, Wisconsin and Minnesota, the Retail, Wholesale and Department Store Union, the United Garment Workers of America, the Textile Workers, and the Distillery Workers, the International Chemical Workers Union, the Canadian Union of Restaurant and Related Employees, the United Representatives Guild, Inc., and the Production Service and Sales District Council. In 2005, after leaving the AFL-CIO, the UFCW joined six other unions — the Teamsters, SEIU, UNITE-HERE, Laborers, United Farm Workers and Carpenters — in creating a new labor federation, the Change to Win Federation.

### C

The National Postal Mail Handlers Union (NPMHU) is a division of the Laborers' International Union of North America, both of which are members of the AFL-CIO federation. The Mail Handlers are also affiliated with the Communications International Union and the Postal Employees Relief Fund.

### D

The International Union of Operating Engineers (IUOE) is a union that represents primarily construction workers who work as heavy equipment operators, mechanics, surveyors, and stationary engineers (also called operating engineers or power engineers) who maintain heating and air conditioning systems in buildings and industrial complexes.

E

The United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union (United Steelworkers or USW) is the largest industrial labor union in North America, with 705,000 members. The United Steelworkers represent workers in a wide range of industries, such as primary and fabricated metals, heavy-duty conveyor belting, tires, transportation, utilities, chemicals, glass, rubber, container industries, pharmaceuticals, call centers and health care.

CONSIDER THE 20 LARGEST LABOR ORGANIZATIONS IN 1974. WHERE WERE THEY IN 2007?

M = membership

		M in 1974	M in 2007
1	Teamsters IBT	1,973,272	1,398,573
2	Automobile UAW	1,544,859	538,448
3	Teachers, NEA	1,470,212	3,167,612
4	Steelworkers USW	1,300,000	730,936
5	Electrical IBEW	991,228	697,863
6	Machinists IAM	943,280	646,933
7	Carpenters UBC	820,000	523,126
8	Retail Clerks RWDSU	650,876	73,335
9	Laborers LIUNA	650,000	657,197
10	Local Gov. AFSCME	648,160	1,470,095
11	Service SEIU	550,000	1,575,485
12	Clothing ACTWU	517,000	A merger
13	Meat Cutters AMCBW	525,000	B merger
14	Communications CWA	498,743	559,083
15	Hotel&Restaurant Employees & Bartenders Inter.Union	451,989	C merger
16	Teachers AFT	444,000	832,058
17	Inter.Union of Operating Engineers IUOE	415,395	397,348
18	International Ladies'Garment Workers' Union ILGWU	404,737	A merger
19	Musicians AFM	330,000	89,860
20	Paperworkers UPIU	300,684	D merger

A merger:

In 1995, Clothing ACTWU merged with ILGWU to form the Union of Needletrades, Industrial & Textile Employees (UNITE)

B merger:

Amalgamated Meat Cutters and Butcher Workmen of North America AMCBW (a craft union) merged in 1979 with the Retail Clerks International Union to form the United Food and Commercial Workers Union (UFCW) which had 1,304,061 members in 2007

C merger:

Hotel&Restaurant Employees & Bartenders Inter.Union merged in 2004 with UNITE to form UNITE HERE

D merger:

United Paperworkers International Union merged in 1999 with the Oil, Chemical, & Atomic Workers International Union to form Paper, Allied-Industrial, Chemical, & Energy Workers International (PACE) which, in turn, merged with the United Steel Workers of America .