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# Solidaristic Wage Bargaining

Unions potentially affect the distribution of wages among workers far more than they alter the functional distribution of income between wages and profits. In countries with decentralized bargaining systems, the main effect of unions is to standardize wages paid to similar workers within the same plant or firm (Freeman and Medoff 1984, Hirsch and Addison 1986). In countries with more centralized bargaining, however, unions may significantly transform the distribution of income from wages and salaries throughout the labor force.

Perhaps the most dramatic instance of union-sponsored wage equalization occurred during the postwar years in the Scandinavian countries of Norway and Sweden. In both Norway and Sweden, an ambitiously egalitarian wage policy was adopted by the central blue-collar confederations in the early 1950s and pursued steadily for three decades. Solidaristic bargaining, as the policy was named, called for the equaliza-

tion of workers' pre-tax income by eliminating or reducing the wage differentials that existed between plants within the same industry, between industries, between regions and ultimately between occupations. "Equal pay for equal work" is a common demand of unions, easily explained by unions' desire to reduce managerial discretion and competition from low-wage employers. The Nordic unions are unique, however, in extending the principle of "equal pay for equal work" from one industry to the entire economy, and then moving beyond the demand for "equal pay for equal work" toward the goal of "equal pay for all work" (Hibbs and Locking 1991:3).

The egalitarian wage policy was remarkably effective. In Sweden between 1970, when comprehensive wage data on individuals began to be collected, and 1983, when the system of centralized bargaining collapsed, the variance of the log of hourly wages among private sector blue-collar workers declined by over 50 per cent (Hibbs and Locking 1991). That dramatic decrease does not include the equally prominent reduction of the wage differential between blue-collar and white-collar workers. Hibbs (1990a,

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1990b) estimates that a similar decline occurred during the 1960s as well, implying that the variance of log hourly wages in 1983 was only one quarter of what it was in 1960. Three decades of solidaristic bargaining in Sweden resulted in one of the most egalitarian wage structures of any industrialized society (Freeman 1988). Similar longitudinal data is not available for Norway but the pattern appears the same. According to survey data reported by Kalleberg and Colbjørnsen (1990: 360), wage inequality in 1980 as measured by the coefficient of variation (standard deviation divided by the mean) of log earnings was even lower in Norway than in Sweden.<sup>1</sup>

Solidaristic bargaining also had important institutional effects. Many of the distinctive institutions and policies that have characterized Scandinavian social democracy in the postwar period cannot be properly understood without reference to the implementation of egalitarian wage policies. The centralization of wage setting at the national level, for example, was endorsed by the union leadership as a necessary prerequisite for the reduction of wage differentials on a national scale. The active labor market policies providing retraining and mobility subsidies to unemployed workers that were adopted in the 1960s (in Sweden) and 1970s (in Norway), to cite another widely studied (and widely admired) innovation, were originally advocated as a response to the plant closings caused by a wage policy that kept wages from falling in inefficient plants (Swenson 1989).

More recently, conflicts over the appropriate degree of wage equality, both among the blue-collar unions and between the blue-collar, white-collar and professional unions have undermined support for centralized bargaining and the associated corporatist arrangements in both countries (Moene

and Wallerstein 1993, Hernes 1991). Blue-collar unions that supported solidaristic bargaining began to lose members to white-collar unions that didn't (Lash 1985). Too much solidaristic bargaining and too little connection between work performed and wages received became a prominent and persistent complaint of Swedish employers (Myrdal 1991). In Sweden, both the centralized bargaining system and solidaristic bargaining goals were abandoned in the early 1980s. Immediately afterwards, wage differentials began to rise. From 1983 to 1990, the variance of the log of hourly earnings among Swedish blue-collar workers increased by 60 per cent (Hibbs and Locking 1991). In Norway, the system of centralized bargaining remains intact, but support for egalitarian wage policies appears increasingly fragile (Hernes 1991, Høgsnes and Hanisch 1988).

In a related paper (Moene and Wallerstein 1995), we examine the impact of solidaristic bargaining on productivity and employment, a question that is at the center of current debates over the economic desirability of centralized bargaining systems. Local wage setting generally results in unequal pay for equal work. One of the effects of industrial unions is to impose equal pay for equal work at the industry level. Centralized bargaining implements equal pay for equal work at the national level. As we discuss below, there are circumstances under which the wage equalization associated with centralized wage setting increases economic efficiency.

The central focus of this paper, however, is the politics of solidaristic bargaining. In particular, we investigate who gained and who lost from three decades of wage equalization in order to better understand how such a policy could be implemented, and why support for greater wage equality

eventually collapsed. While solidaristic bargaining was part of a wider social democratic package that included substantial increases in the coverage and generosity of welfare programs, the most important sources of support for solidaristic bargaining came from groups who benefitted directly. In principal, the same egalitarian goals could have been achieved with steeply progressive taxes and targeted transfer payments instead of wage equalization. In practice, political support for an equivalent redistribution through taxes and welfare would have been more difficult to obtain. As we argue below, solidaristic bargaining was initially supported by important actors who were opposed to redistribution in general. When support for solidaristic bargaining was reduced to those who welcomed its redistributive impact, the policy declined.

The political significance of solidaristic bargaining extends beyond the labor market of the Nordic countries. The implementation of such a comprehensive equalization of pre-tax incomes was a remarkable achievement. Majority support for extensive redistributive policies that benefit the least well-off in society is not a common political occurrence. An investigation into the sources of support for solidaristic bargaining in Sweden and Norway can reveal more general conditions that permit or block egalitarian policies in other, less egalitarian societies.

We begin, in the next section, with a brief discussion of why unions might seek to reduce wage inequalities among their members. In the following section, we describe how decentralized and centralized wage-setting differ in an economy characterized by the continual exit of older, less efficient enterprises and entry of new, more efficient enterprises. This section contains our central results concerning the efficiency and distri-

butional impact of solidaristic bargaining. Why the coalition in favor of solidaristic bargaining collapsed in the 1970s and 1980s is discussed in the fourth section. In the fifth section, we conclude with the implications of our explanation of the rise and decline of solidaristic bargaining for the feasibility of egalitarian policies in general.

### **Union Preference for Wage Equality**

Why unions should support egalitarian wage policies is not obvious. Freeman and Medoff (1984) suggest three reasons why unions might seek greater wage equality out of self-interest. The first reason is that union preferences reflect the interests of the median voter and, Freeman and Medoff argue, in most cases the median wage earner receives a wage below the mean. Yet unions that listen only to the "voice" of the median union member will soon lose members through "exit". Confederal union leaders who wish to follow redistributive policies favored by the median union have to confront the problem of preventing the departure of those workers who are disadvantaged by an egalitarian wage policy. Unlike the Austrian ÖGB, the national union confederations in Scandinavia do not have the authority to prevent affiliates from leaving the centralized negotiations and bargaining separately. Participation in centralized bargaining is voluntary. Moreover, in both Norway and Sweden, blue-collar unions increasingly compete with white-collar unions to retain the membership of highly skilled manual workers as technological progress blurs the division between blue and white collar work (Lash 1985). Unions that ignore the interests of highly paid members will lose those members to rival unions that are less concerned with wage equality.

Freeman and Medoff's (1984) second and third explanations of union sup-

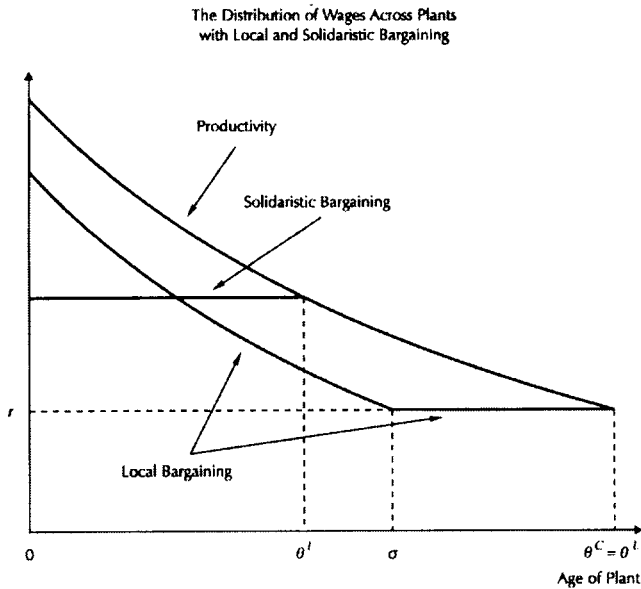
port for wage equality are that single-rate wage agreements reduce managerial discretion and that greater wage equality increases "worker solidarity and organizational unity" (80). However, there is no reason why the elimination of managerial discretion requires a single rate. A wage scale with control over the criteria for promotion would do as well. Finally, the Nordic experience indicates that the reduction of wage differentials can undermine the unity of the union movement, if it is imposed against the wishes of the relatively high paid. Much of the recent industrial conflict in the Nordic countries consists of battles within the labor movement over relative wages.

It is easy to understand why relatively low-paid, public-sector workers support solidaristic bargaining, but why should skilled workers in the private sector support such a policy? Why should the union leadership in Norway and Sweden struggle to limit local bargaining when the traditional core of the union movement are among those with greatest bargaining power at the local level? For many scholars, the difficulty of answering such questions implies that economic analyses based on self-interested behavior must be abandoned in favor of the sociological emphasis on norms (Elster 1989a, 1989b). Swenson (1989), for example, simply considers wage levelling as one of three goals that define "egalitarian unions" (the other two being secure employment and increasing wages at the expense of profits).

The traditional social democratic view, as expressed by Korpi (1978, 1983) among others, goes as follows. The goal of solidaristic bargaining is an expression of a deep ideological commitment of the Scandinavian labor movements to the norm of equality. The rise and fall of the implementation of solidaristic bargaining reflects

the increase and decline of the power of the labor movement vis-a-vis employers. When the labor movement was dominant in the 1950s and 1960s, the unions had the power to impose solidaristic bargaining on employers. In the 1980s, employers gained the upper hand and used their new strength to roll back the unions' gains.

In view of the large body of work that asserts that solidaristic bargaining was a simple reflection of union strength and egalitarian commitments, it is somewhat surprising to return to the original arguments made on behalf of solidaristic bargaining when the policy was first proposed in 1951 by two Swedish union economists, Gøsta Rehn and Rudolf Meidner (LO: 1953). Rehn and Meidner's principal arguments in favor of solidaristic bargaining concerned macroeconomic stability and efficiency, not equality. Rehn and Meidner argued that a policy of "equal pay for equal work" that eliminated wage differentials between plants within industries and between industries would encourage the movement of capital and labor from less productive to more productive uses. Holding down wages in the most productive enterprises would encourage their expansion and provide employment for the labor that would be released as less productive enterprises were forced to close. At the microeconomic level, aggregate efficiency would increase. At the macroeconomic level, the growth of the more productive firms would allow government policy-makers to be less concerned with the survival of marginal enterprises, and freer to pursue price stability without sacrificing employment. That the wage policy was egalitarian in its impact on the distribution of wage incomes was undoubtedly welcomed by Rehn and Meidner, but the egalitarian impact of solidaristic bargaining was of marginal concern



in their arguments.<sup>2</sup> If solidaristic bargaining, in fact, increased efficiency, it may have benefitted groups not usually associated with egalitarian goals. In particular, we demonstrate below that Rehn and Meidner's model implies that the distributional winners from solidaristic bargaining includes employers as well as low-skilled workers. Thus, we suggest that crucial support for solidaristic bargaining came, implicitly, from employers as well as the central union leadership.

### Centralized and Decentralized Wage-Setting

In order to uncover the implications of the arguments put forward by Rehn and Meidner, we focus on a stylized description of centralized and decentralized wage negotiations in a small, open economy with heterogeneous firms. Implicitly, Rehn and Meidner followed Schumpeter (1942) in attributing the dynamic of capitalist economies to what Schumpeter called the "process of creative destruction" in which existing productive units are incessantly being dissolved as new units are inaugurated. Industries expand by

building new plants and contract by scrapping obsolete ones. Entering firms introduce new techniques that drive the least efficient of the existing firms out of the market. When new techniques are embodied in new plant and equipment, technical progress entails continual turnover of plants and firms.

To take the simplest case, consider an industry in which the price of output is fixed in world markets, employment is proportional to the number of plants in operation, and the productivity of each plant is determined by the date it was built.<sup>3</sup> Newer plants are more productive than older ones, but building new plants is costly so older plants are not immediately replaced. The key decisions made by firms, in this context, are when to build new plants and when to scrap older ones.

Once built, investment costs are sunk. Firms will keep plants in operation as long as revenues exceed variable production costs. Thus, the age of the oldest plant in operation is given implicitly by the condition that current profits in the oldest plant in

operation equal zero. For a given wage, the number of firms in operation is determined by the price. At a higher price, more firms earn enough to cover their wage costs and fewer plants are shut down.

Figure 1 illustrates the dispersion of plants according to their productivity in the case in which the rate of productivity growth is constant over time. Plants are arrayed from youngest to oldest, with revenue per plant drawn as a declining exponential curve. If  $r$  is the common wage paid in all plants, the intersection of horizontal line at the level of  $r$  and the revenue curve determines the age at which employers would close a plant. Thus  $\theta^c$  in Figure 1, is the age of the oldest plant in operation.

Plants younger than  $\theta^c$  earn positive profits. Firms will open new plants as long as the expected present value of profits earned over the plant's operating life exceed the initial investment cost. If the supply curve of new plants is rising, the number of new plants that are built each period is determined by the condition that the present value of the future profit stream of the last plant built equal its cost.<sup>4</sup>

### Decentralized Wage-Setting

With decentralized bargaining, workers in each plant bargain separately. In a pure system of local bargaining, wage contracts do not extend beyond the individual firm or plant. Even when local wage bargaining takes place within a frame agreement negotiated at a higher level, the outcome is equivalent to purely local bargaining if local bargainers are free to call strikes or lockouts when pressing their demands (Moene, Wallerstein and Hoel 1993:100-103).

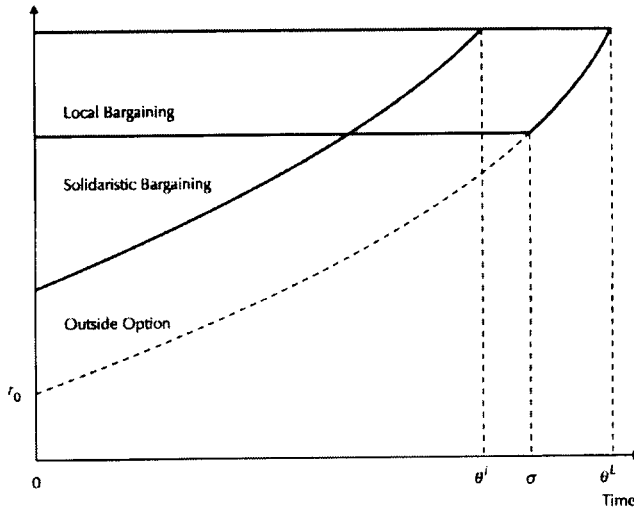
As long as employment at the plant level is determined by the capital equipment installed, union members will want the highest

possible wage subject to the constraint that the plant is not closed. In the event of a strike or lockout, we assume that both sides receive zero income. This assumption is less conventional for workers than for firms. In particular, zero income during conflict implies (a) that workers remain unemployed during labor disputes and (b) that striking workers do not receive strike support from non-striking workers. In other words, workers who receive strike benefits are assumed to be drawing on their own collective savings.

According to standard bargaining theory, the outcome of local negotiations under the specified assumptions is a wage that is a fraction, say  $\alpha$  where  $0 \leq \alpha \leq 1$ , of the plant's revenues per worker, provided the fraction of the plant's revenues exceeds workers' outside option. In any bargaining system, workers must be offered at least as much as they can earn elsewhere or firms will be unable to fill vacancies. Workers' outside option acts as a constraint on the bargaining outcome in that employers cannot offer less and still attract workers. Otherwise, the outside option has no impact on the outcome (Sutton 1986). In Rubinstein's (1982) bargaining model, workers' share,  $\alpha$ , is determined by the relative impatience of the two sides to settle during a conflict.

If the industry is small enough relative to the aggregate labor market such that industry-level employment does not affect workers' outside option, the distribution of wages with decentralized bargaining can be drawn as indicated in Figure 1. Let the value of the outside option be indicated by the wage  $r$ . Then, wages with decentralized bargaining will be a share of the plants' revenues as shown in the figure as long as that share exceeds  $r$ , which occurs in plants that are younger than the age  $\sigma$ . Plants older

Figure 2  
Time Path of Wages with Local Bargaining



than  $\sigma$  but younger than  $\theta^c$  pay workers their outside option. The time path of wages in a single plant with local bargaining is illustrated in Figure 2. The upper horizontal line represents the revenues earned by a plant of a given vintage. If workers' outside option rises with the average level of productivity in the economy, the outside option will be an exponentially rising curve as drawn. As long as the wage exceeds workers' outside option, the wage in each plant is constant over time since the negotiated wage depends on the price, which is constant by assumption, and productivity, which is determined by the date the plant was built. As the plant grows older and the outside option rises, the gap between the union wage and workers' outside option falls. Eventually, at  $\sigma$  in Figure 2, the outside option becomes binding and the wage increases with  $r$ .

Since the wage with local bargaining equals the outside option after the period  $\sigma$ , the exit decision is to scrap the plant when the value added per worker equals the outside option wage. Accordingly, the lifespan of

plants with local bargaining is independent of the unions' share of the plant's revenue. All plants pay a wage equal to workers' outside option once they get sufficiently old, regardless of the bargaining power of the local union. Although decentralized bargaining does not affect firms' exit decision, entry is discouraged. A higher union share reduces the market value of new plants, since the profits earned when the wage is higher than the outside option are lower. A lower value of new plants leads to fewer entrants. As the number of plants that are constructed each period declines, so does the industry's output and employment.

With sunk costs of investment, the union is able to appropriate some of the quasi-rents (the difference between the plant's revenue and workers' outside option) earned by the firm. Anticipation of the union's future bargaining strength causes firms to reduce investment, which lowers aggregate employment.<sup>5</sup> But once a plant is built, both the employer and the local union have a common interest in maximizing the quasi-rents



to be shared over the plant's lifetime. Thus, if the outside option is fixed, the operating life of existing plants remains unchanged whatever the share of the quasi-rents received by workers and average productivity in the industry are unaltered by a change in  $\alpha$ .

### Centralized Wage-Setting

We represent solidaristic bargaining as setting a uniform wage for all plants in the industry. In the Scandinavian context, this assumption exaggerates the impact of solidaristic bargaining, since locals were regularly able to obtain supplements to the centrally-negotiated wage through decentralized bargaining. Unions and firms, however, were forbidden to engage in strikes or lockouts once the central agreement was signed.<sup>6</sup> These restrictions on permissible forms of industrial conflict limit the extent to which local bargainers can obtain increases above the central agreement, and allow central bargainers to anticipate subsequent local wage increases when setting the central wage (Moene, Wallerstein and Hoel 1993:100-103, Hibbs and Locking 1991, Holden 1991). To simplify the presentation, we assume that the control of the central negotiators is absolute.

It is not as obvious that wage maximization is the proper assumption to make regarding the unions' preferences at the industry level. Union members in older plants, in particular, would prefer to accept lower wages if the alternative is losing their jobs. Nevertheless, we maintain the assumption that the union seeks to maximize the wage received by union members in order to isolate the impact of solidaristic bargaining holding union bargaining goals constant. Our argument would only be strengthened if we used the more realistic assumption that central bargainers care about employment as

well as wages.

We maintain our prior assumption, therefore, that the union seeks to maximize the wage received by its members subject to the constraint that the wage is uniform throughout the industry. On the employers' side, we assume that the industry association seeks to maximize the sum of the profits earned in existing plants. As before, both sides receive zero income during an industrial dispute. Again applying standard bargaining theory, the outcome of the labor negotiations with solidaristic bargaining is a wage equal to the share  $\alpha$  of the average revenue per worker in the industry as a whole (rather than the revenues earned in the plant where the worker is employed). As before, the wage paid must be greater than or equal to workers' outside option, or employers will be unable to attract labor.

By assumption, solidaristic bargaining imposes a uniform wage in all plants, as illustrated in Figure 1. As Figure 1 indicates, an increase in the uniform wage forces older plants out of the market, shortening the average life of plants in operation. In addition, a higher wage reduces investment in new plants. Thus, the effect of a wage increase through solidaristic bargaining is to increase average productivity but reduce employment and output.

The time path of the wage with solidaristic bargaining is illustrated in Figure 2. Since the average productivity of the industry increases continually over time, as new plants are opened and old ones are closed, so does the wage with solidaristic bargaining. As Figure 2 illustrates, the industry wage and workers' outside option both grow with the rate of productivity growth. Within our stylized description local bargaining produces a wage in each plant that is constant over time (until the plant becomes so old that workers

receive the outside option), while wages in different plants vary according to the plant's age. With solidaristic bargaining, wages are constant across plants but rising over time at the same rate as productivity growth.

### Decentralized and Solidaristic Bargaining Compared

The effects of the wage profiles implied by the two bargaining systems differ in terms of the threshold wage share at which the union wage exceeds workers' outside option, the exit of old plants, the entry of new plants, industry profits and average industry wages. We discuss each in turn.

#### *The Threshold Wage Share*

In either bargaining system, the union has no impact on wages if the union's share,  $\alpha$ , is so small that the bargaining outcome is less than or equal to the outside option. With local bargaining, wages in all plants remain unaffected by collective bargaining if workers' share of the revenues in the most productive plants is less than the outside option. With solidaristic bargaining, wages remain unaffected if workers' share of the average revenues is less than the outside option. Since the productivity in new plants is higher than the average, the threshold wage share is lower with local bargaining.

#### *Plants' Retirement Age*

It is apparent from either Figure 1 or Figure 2 that solidaristic bargaining shortens the lifespan of plants in the industry. By preventing the wage from falling to  $r$  as productivity declines relative to the industry average, marginal plants are pushed out of the market with solidaristic bargaining. In comparison to decentralized bargaining, solidaristic bargaining generally lowers the average age of plants in operation, thereby increasing the

average productivity of the industry.

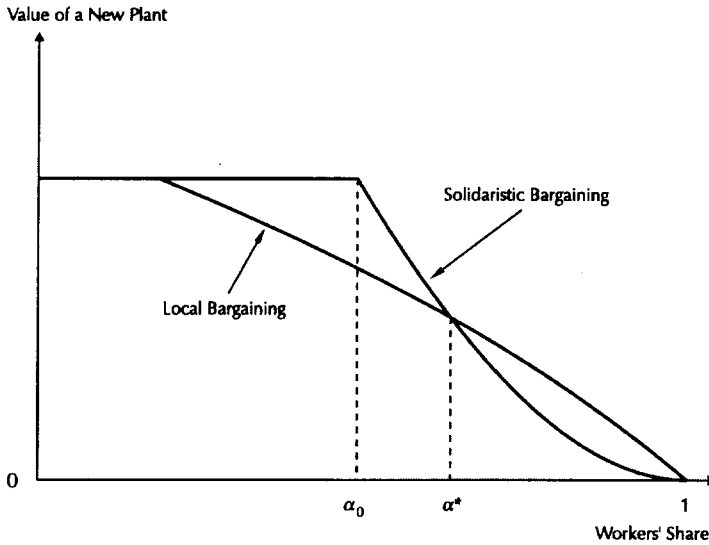
While increasing productivity is an important goal, productivity increases that occur through reductions in employment may signify a reduction in welfare rather than an improvement. Thus, we need to investigate how the different bargaining systems affect the number of new plants that enter each period.

#### *The Number of New Plants Built*

The bargaining system affects firms' decision to build new plants through its effect on the market value of new plants. The higher is the market value of new plants, the greater is the number of new plants that will be built each period. Solidaristic bargaining affects the future discounted earnings of the firm in countervailing ways, relative to decentralized bargaining. On the one hand, solidaristic bargaining holds down wages in plants when they are relatively new, as illustrated in Figure 2. On the other hand, solidaristic bargaining increases the wage relative to local bargaining when plants are older. In addition, solidaristic bargaining shortens the period over which firms can expect to maintain a plant in operation. Thus, it is not evident how entry is affected.

It can be shown (see Moene and Wallerstein 1995) that the impact of the bargaining system on the number of entrants depends on the workers' share of the firms' revenues, as illustrated in Figure 3. In both bargaining systems, the market value of new plants is a declining function of  $\alpha$  when  $\alpha$  is large enough to affect wages. Indeed, the value of new plants goes to zero as  $\alpha$  goes to one with either local or solidaristic bargaining. But because the threshold wage share is lower with decentralized bargaining, there is a range of values of  $\alpha$  where decentralized bargaining depresses the value of new plants

Figure 3



(and thus lowers investment) while solidaristic bargaining has no effect. Thus, if  $\alpha$  is such that the wage with solidaristic bargaining is not much above workers' outside option, solidaristic bargaining raises the market value of new plants relative to local bargaining. Since the number of new plants built is an increasing function of the market value of new plants, entry is greater with solidaristic bargaining when  $\alpha$  is sufficiently low ( $\alpha < \alpha^*$  in Figure 3).

As  $\alpha$  increases, the productivity difference between the most efficient plant and the industry average declines. At high level of  $\alpha$ , wages are close to average productivity and profits are low per period of operation in either bargaining system. The period of time over which plants are kept in operation, however, is much shorter with solidaristic bargaining than with local bargaining when alpha is high. Thus, the value of new plants is higher with local bargaining than with solidaristic bargaining if alpha is sufficiently large.<sup>7</sup>

### *Employment and Output*

Total industry employment displays the same pattern as the number of new plants. If  $\alpha$  is not too large, employment is higher with solidaristic bargaining for the same reasons that entry is higher. When  $\alpha$  is low enough to have a small effect with industry-wide bargaining but sufficiently high to increase the wage in the most productive plants, employment and output is lower with decentralized bargaining than with solidaristic bargaining. The greater entry of new plants under solidaristic bargaining more than compensates for the earlier closing of older plants. When  $\alpha$  is close to one, however, both the age at which plants are closed and the number of new plants that are built is greater with local bargaining. Therefore, employment and output are relatively higher with decentralized bargaining when  $\alpha$  is sufficiently high.

### *Employers' Wealth*

Whatever the bargaining system, firms invest until the value of new plants equals the cost

of construction. But changes in the bargaining system can alter the market value of existing plants, and thereby affect employers' wealth. Whether or not employers would prefer solidaristic bargaining or local bargaining depends, in general, on both the value of  $\alpha$  and the age of the plant. If  $\alpha$  is sufficiently low such that collective bargaining only raises wages with decentralized bargaining, the market value of newer plants is higher with solidaristic bargaining, and the value of older plants is no lower. If, at the other extreme,  $\alpha$  is sufficiently high that even owners of newly built plants prefer local bargaining ( $\alpha > \alpha^*$  in Figure 4), employers are unanimous in preferring decentralized bargaining. When  $\alpha$  is greater than  $\alpha^0$  but less than  $\alpha^*$  in Figure 3, there is some vintage (which depends on  $\alpha$ ) such that owners of newer plants prefer solidaristic bargaining while owners of older plants prefer local bargaining. The closer is  $\alpha$  to  $\alpha^0$ , the larger the proportion of plants whose value would be increased with solidaristic bargaining.

#### *Average Wages*

Wage earners are affected differently by solidaristic bargaining, depending on the age of the plant in which they work. Average wages under the two bargaining systems can be compared, however. With solidaristic bargaining, the wage is a share of average productivity in the industry, and average productivity increases as workers' share increases since only the most efficient plants can survive. With decentralized bargaining, the average wage also approaches a simple share of average productivity as  $\alpha$  increases. In contrast with solidaristic bargaining, however, average productivity remains constant as workers' share increases with local bargaining since the age at which plants are retired remains constant. Thus, the average wage is higher

with local bargaining when  $\alpha$  is sufficiently close to  $\alpha^0$ , but higher with solidaristic bargaining when  $\alpha$  is sufficiently close to one.

#### *Summary of Efficiency and Distributional Effects*

Solidaristic bargaining prevents less efficient firms from paying lower wages than the most efficient firms. As a result, older plants are shut down earlier than they would have been with decentralized bargaining. At the same time, solidaristic bargaining prevents workers in newer, more productive plants, from obtaining higher wages. The result for firms is higher profits during the first period of a plant's life.

Whether or not solidaristic bargaining is more efficient than decentralized bargaining, in the sense of raising productivity, employment and output simultaneously, depends on the value of  $\alpha$ . If  $\alpha$  is close to  $\alpha^0$  the union wage is close to the wage that clears the labor market. In Norway and Sweden, the national wage agreement covered the entire blue-collar labor market. In both countries, unemployment rarely rose above 3 per cent until the very end of the 1980s. It follows that the difference between the union wage and the market-clearing wage was not large. Therefore, the relevant case for Norway and Sweden until very recently is  $\alpha$  close to  $\alpha^0$ , the case in which solidaristic bargaining increases employment, output and productivity. Rehn and Meidner's belief in the relative efficiency of solidaristic bargaining compared to local wage-setting in the Scandinavian context is supported by our model.

The same reasoning on the elimination of wage differences among plants within an industry might be applied to the elimination of wage differentials between industries. With industry-level bargaining, wages will

differ by industry in accordance with industry-level differences in productivity or profitability. Solidaristic bargaining, applied over the national economy, limits the ability of the most efficient industries to pay a wage premium, and prevents the least efficient industries from staying in business by lowering wages. In fact, the elimination of wage differentials between industries can be understood as a subsidy for new industries and a tax on older ones (Agell and Lommerud 1993). The result of nation-wide solidaristic bargaining is to force older industries to shut down while encouraging the growth of new industries. The consequence is a national economy composed of more modern industries than would be the case with industry-level bargaining.

Solidaristic bargaining, whether at the industry level or the national level, has two important distributional effects. The first effect is to increase the wages of low-paid workers relative to highly paid workers. The second effect is to alter the distribution of income between wages and profits. The conditions under which solidaristic bargaining unambiguously improves efficiency are also the conditions under which solidaristic bargaining increases employers' wealth and lowers the average wage. Under the conditions that prevailed in Norway and Sweden, our results indicate that the beneficiaries of the egalitarian wage policy were low-paid wage earners -whose relative wages increased rapidly -and employers, particularly employers with modern plants. The principal losers were the relatively highly paid wage and salary-earners whose incomes were held back in the name of wage equality.

These conclusions fit well with recent historical work on the origins of solidaristic bargaining in Sweden done by Peter Swenson (1989, 1991a). The political coal-

ition that prevailed in the 1950s and established the pattern of centralized and solidaristic bargaining that was to last for 25 years was comprised of the low-wage unions inside the LO and Swedish employers organized in the Swedish Employers' Confederation, the Svenska Arbetsgivareforeningen or SAF. High paid unions were prevented from leaving the centralized negotiations by the threat of lockouts. In 1955, a strike by workers in the Paper Workers Union, a union with rapidly growing productivity and relatively high wages, was met by a threat to lockout a majority of workers in all Swedish industry (Swenson 1989: 54--55). Again in 1957, the SAF had to threaten the unions with a lockout in order to force them to bargain in a centralized manner. It is unlikely that the low-wage unions and the LO leadership would have been able to force the high-wage unions to accept an egalitarian wage policy without the backing of Swedish employers and the threat of lockouts against recalcitrant unions.

Our results also fit with the econometric study of wage inequality and productivity growth in Sweden by Hibbs and Locking (1995). Hibbs and Locking find that the reduction of wage differentials between plants and between industries was associated with above average productivity growth, unlike the effect of the reduction of wage differentials between occupations that came later.

### **The Decline of Solidaristic Bargaining**

In the 1950s and 1960s, we have argued that employers were quiet but critical supporters of solidaristic bargaining. In the 1970s and 1980s, employers were increasingly vocal opponents. In Sweden, employers in the metalworking sector took the initiative to end the system of centralized bargaining in

1983 by making a separate offer to the metalworking union. In 1990, the Swedish employers' confederation closed its bargaining department to render a return to centralized, solidaristic bargaining impossible (Pontusson and Swenson 1995).

What happened? One explanation points to changes in the organization of production that purportedly make centralized pay-determination more difficult if not impossible. In particular, it is argued that the replacement of large-scale production of standardized products by "flexible specialization" or "diversified quality production" has increased employers' need for more discretion in wage-setting (Pontusson and Swenson 1995, Lindbeck and Snower 1995).

A less speculative explanation is that the policy changed. Over time the unions' egalitarian goals increased. As Hibbs and Locking (1991) describe the change, the policy grew from "equal pay for equal work" to "equal pay for all work". In the 1950s and 1960s, solidaristic wage agreements reduced inter-industry and inter-firm wage differentials as we described in the previous section, but left intra-firm wage differentials unregulated. From 1969 forward, however, central agreements in Sweden included provisions for the equalization of wages inside each plant unless the union and the firms agreed otherwise at the industry level (Pontusson and Swenson 1995). In the 1970s, wage compression began to be applied across occupations in both Norway and Sweden, above all in the public sector.

There were a number of reasons why the unions sought to increase the scope of solidaristic bargaining at the end of the 1960s. The unionization of the public sector that occurred in the 1960s changed the composition of the union movement in a manner that increased the relative weight of low-paid

workers. The large increase in female participation in the labor force (most of whom entered the public sector) and the subsequent demands for wage equality between genders pushed in the same direction. The pressure for wage compression within firms came from some of the private sector unions as well, most notably the metalworkers in Sweden, who were not low-paid on average (and thus got little out of wage equalization among industries) but who had a significant number of low-paid members (Pontusson and Swenson 1995).

According to the estimates of Hibbs and Locking (1995), the impact of wage compression between occupations was to reduce productivity growth (in contrast to wage compression between firms and industries). Why the compression of inter-occupational wage differentials should affect productivity and profitability negatively is not clear. Edin and Topel (1995) suggest that lower wages for high-skilled work reduced the supply of skilled workers. It may be difficult to induce workers to work hard when employers have only a limited ability to either reward good workers with higher pay or to punish substandard workers with dismissal. Perhaps the most compelling reason for the negative effects of inter-occupational wage compression is the resentment the policy generated among the higher paid. Bargaining among the unions over relative wages became as conflictual as bargaining between labor and management (Hernes 1991, Moene and Wallerstein 1993). Interunion wage disputes became a common cause of strikes in the 1980s.

The medium-run effect of the expansion of the scope of solidaristic bargaining was to significantly reduce overall wage inequality. The longer-run effect was to undermine the policy's support. The ability

of the union leadership to push the interests of low-paid union members at the expense of high-paid union members was dependent on support from a powerful ally: the national employers' confederation. Low-wage workers were not powerful enough in Norway and Sweden to force the adoption of egalitarian wage policies on their own. The genius of Rehn and Meidner was to harness the self-interest of employers to the egalitarian goals of the social democrats. Once Swedish employers came to see the egalitarian wage policy as an impediment rather than as a support, wage-setting was decentralized and the policy was defeated. In Norway, centralized bargaining survives, in part because Norwegian employers are deeply divided on whether or not their interests would be better served with a Swedish-style decentralization. But the solidaristic component of centralized bargaining has been weakened in Norway as well.

### Conclusion

When solidaristic bargaining does not raise the wage far above the market-clearing level, wage equalization generates an industrial structure with more investment in modern plants and more rapid abandonment of older plants than would otherwise exist. The result is greater output per worker without reductions in employment. The relative wage of low wage workers increases, as does employers' wealth according to our analysis. In this way, the unions' pursuit of greater wage equality found support in employers' pursuit of higher profits. When the scope of wage compression changed in a way that was inimical to higher profits, employers moved into opposition and eventually forced the policy's abandonment.

### Notes

- 1) Cross-national comparisons of wage dispersion based on data on individual wages are rare. Freeman (1988) and Rowthorn (1992) present comparisons of wage differentials among OECD countries using industry-level wage data. Høgsnes and Veiden (1992) and Barth and Zweimüller (1992) compare the distribution of earnings in Norway and Austria. Zweimüller and Barth (1994) compare the wage structure in 6 OECD countries.
- 2) Although Rehn and Meidner's argument was influential among Swedish policy makers in the early post-war period, it has been largely neglected in the recent literature. One exception is Agell and Lommerud (1993) who make an argument similar to ours with regard to the movement from agriculture to industry. See Moene and Wallerstein (1995) for the mathematical model that underlies the discussion and figures of this section.
- 3) The vintage capital model, in which the productivity of a plant depends on its date of construction, was introduced in economics by Johansen (1959) and Salter (1960). Note that our assumption of fixed labor requirements per plant is not critical. Allowing firms to choose among production techniques with different capital-labor ratios does not alter the main argument of the paper.
- 4) In order for an equilibrium to exist, we need to assume at least one of the following: (i) a declining demand curve for the industry's output, (ii) a rising supply curve for new plants, or (iii) a rising supply curve for workers.
- 5) This is sometimes referred to as the Grout effect, after Grout (1983).
- 6) Swedish central agreements dropped this restriction in 1983.
- 7) The cost of building new plants may set an upper bound on  $\alpha$  that is less than one. In particular,  $\alpha$  can only go to one without extinguishing the industry if the costs of new plants go to zero as the number of new plants go to zero.

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