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1. Introduction

In many European countries, unemployment remains high and reforms of the labour market to improve real and nominal wage flexibility remain an important policy issue. Among the reform proposals, the recommendation to decentralize wage bargaining down to the plant/firm level is most prominent. Such a move, which has been recommended by the OECD (1997B, 1999, 2001) for Austria, would better link wages to the skill level and productivity of individual workers and the productivity of plants. Decentralisation of wage bargaining would also, it is claimed, ensure wage increases in line with the goal of high employment, price stability and the maintenance of international competitiveness.

Another venue towards achieving these macroeconomic goals is a system of centralised or co-ordinated wage bargaining (*Calmfors – Driffill, 1988*), which allows negative externalities associated with high wage demands to be internalised by wage setters (*Calmfors, 1993*). Such a wage system is also likely to produce a high degree of wage equality, as peak trade union organisations tend to pursue a solidaristic wage policy.

Much of the theoretical and empirical literature, based as it is on neoclassical thinking, views wage differentials as arising from productivity differences of workers in a competitive goods and labour market. A compression of wage differentials would therefore, it is argued, create strong productivity-diminishing distortions of microeconomic incentives and thus reduce output. In this vein, then, some economists tend to argue for a widening of pay differentials, on the presumption that in general differentials are too small and need to be enlarged, as this change would increase productive capacity.

Whether Austria's wage bargaining system should be decentralised or more centralised and whether Austria's wage differentials are too small or too large and whether the wage differentials point in the right direction clearly depends how Austria's status quo along these dimensions can be classified.

How can Austria's wage bargaining institutions be categorised? Is Austria like Sweden of the early eighties, where a strongly solidaristic wage policy has, as some would argue, compressed wage differentials too far, and where a widening of wage differentials is called

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for (Hibbs – Locking, 2000)? Such a move might be also appropriate for Austria if indeed Austria's wage setting system is highly centralised or co-ordinated as claimed by some studies (OECD, 2004) and if inter-industry wage differentials are as small or even smaller than in the Scandinavian countries (Hofer, 1992, OECD, 1997B).

Or should Austria's labour market institutions be modelled after the US economy, where wage bargaining proceeds on a decentralised basis and where wage dispersion is high? If so, are wage differentials high but not high enough for an allocative optimum¹?

Or is the Austrian wage setting system, far from being highly centralised or co-ordinated as claimed by several authors (Calmfors – Driffill, 1988, OECD, 1997A, 2004) located in the middle range of the centralisation/co-ordination ranking? This is suggested by a recent review of the literature (Pollan, 2004). According to the Calmfors – Driffill (1988) view, this intermediary position is synonymous with poor economic performance, basically because bargaining units use the power that comes with bargaining for a small part of the work force without having to worry about the macroeconomic impact of high wage increases. Such a regime of opportunistic bargaining produces high unemployment as well as high wage dispersion. Indeed, preliminary results on the size of wage differentials in Austria confirm the evaluation that Austria's wage setting system is far along the decentralisation dimension (Pollan, 2000). How big are wage differentials in Austria? This issue, which is at the core of this study, has to be resolved before an answer can be given to the question concerning the direction in which wage differentials should evolve.

There are two opposing views regarding the size of wage differentials: One view, which is based primarily on pay statistics involving the manufacturing sector, claims that pay inequality in Austria is large in an international comparison; in the other view, which is based on data derived from the Mikrozensus, the extent of pay disparities is small compared to such countries as the United States and Canada; and Austria is close to the egalitarian Scandinavian countries, where pay inequality is low. Another body of data available for investigating whether Austria falls into the group with high or low pay inequality are the statistics on minimum wage and salary rates, that are derived from collective contracts. These data will be analysed in section 2. Section 3 reports on studies relying on data from the manufacturing sector. Studies using data from the Mikrozensus household survey are critically evaluated in section 4. The final section contains a summary and conclusion.

¹ This argument seems to disregard the finding of large inter-industry wage differentials that are not related to differences in productivity but signal the existence of rent seeking in the US economy, an anomaly for the theory of the competitive labour market (Thaler, 1989).

2. The evidence from collective bargaining

Large differentials in contractual wage rates²

Detailed information on contractual wage differentials is available from data collected by Statistics Austria. The selection covers white-collar as well as blue-collar workers in mining and manufacturing, the crafts sector (small-scale industry), distribution, and utilities. To compare contractual wage rates across industries, the wage rates of unskilled workers at the entry level were selected. This choice avoids the question of comparability attending wage rates of more highly skilled workers in various occupations. At the same time it provides information on the minimum wage prevailing in a specific sector covered by a collective agreement.

Austria does not have minimum wage legislation that provides for a minimum wage for the whole economy. Rather the contractual wage rate (negotiated between the union and the employers' association) for the least skilled group of workers constitutes the *de facto* minimum wage for the industry covered by the collective wage contract. In both manufacturing (including mining) and in small-scale industry, there is a great number of collective agreements and great variation in the wage rates of unskilled workers.

Even at the level of unskilled workers, wage differentials are very high. The ratio between the highest and the lowest wage rate for unskilled blue-collar workers in manufacturing (including mining) is 1.93; this figure is 2.03³ in small-scale industry.

While there are several unions negotiating collective bargaining agreements for blue-collar workers, there is just one union, the Union of Salaried Workers, negotiating collective bargaining agreements for white-collar workers in the private sector. Nonetheless, there is about the same degree of variation in minimum monthly salary rates in manufacturing (including mining) as for wage rates of blue-collar workers. The ratio of the highest and the lowest salary rates across all white-collar bargaining groups contained in the sample is 1.70. The huge differentials in salary rates negotiated by one union suggests that the Union of Salaried Workers, for many years now the largest union in Austria, acts more like a union confederation, with each branch union negotiating its own collective agreement independently.

² Contractual wage rates (*Kollektivvertragslöhne* or *Tariflöhne*), arrived at in settlements between the unions and the employers, are also sometimes referred to as negotiated or basic wage rates.

³ Workers in printing shops command exceptionally high wages in many countries; the second highest wage rate (89.50 schilling for mill workers in the food industry) yields a wage ratio of 1.88.

Table 1: Contractual wage rates for unskilled blue-collar workers in selected industries at the end of 2003

	Collective agreement	Hourly wage rate in €
GEWERBE		
Baugewerbe		8.22
Bauneben- und Bauhilfsgewerbe	Maler, Anstreicher, Lackierer usw.	7.03
Chemisches Gewerbe		5.70
Papierverarbeitendes Gewerbe	Buchbinder	6.03
Druck	Druckvorbereich und Druck	9.44
Holzverarbeitendes Gewerbe	Tapezierer	6.81
Nahrungsmittelgewerbe	Konditoren	6.03 ¹
	Müller	8.35 ²
Lederverarbeitendes Gewerbe	Schuhmacher	5.12
Textil- und Bekleidungsgewerbe	Mieder- und Wäschewarenherzeuger	5.17
Gesamte Eisen- und metallverarbeitende Gewerbe		7.26
Chemischreiniger, Wäscher und Färber		5.02
Sonstige Dienstleistungsgewerbe	Blumenbinder und -händler	4.92
INDUSTRIE UND BERGWERKE		
Bergwerke und Eisenerzeugende Industrie	Bergbau	7.43
Erdölindustrie		9.31
Bauindustrie		8.22
Stein- und keramische Industrie	Ziegel- und -fertigteilindustrie	7.88
Glasindustrie	Gablonzer Betriebe	5.01
Chemische Industrie		7.76
Papierindustrie		8.45
Papier- und pappeverarbeitende Industrie	Papierkonfektion	6.81
Holzverarbeitende Industrie		7.26
Nahrungs- und Genussmittelindustrie	Brauereien über 12.000 hl	10.08 ²
	Brotindustrie	6.48 ¹
	Tabakindustrie	7.99
Ledererzeugende Industrie		5.33
Lederverarbeitende Industrie	Lederwarenindustrie u. a.	5.19
Bekleidungsindustrie ohne Vorarlberg		5.20
Textilindustrie ohne Tirol und Vorarlberg		5.83
Eisen- und Metallindustrie insgesamt		7.43
ELEKTRIZITÄTSWERKE		7.92
HANDEL		
Allgemeiner Groß- und Kleinhandel		6.33
Warenhäuser		7.05

¹ Collective agreement with the lowest contractual wage rate in the sector listed in the first column. – ² Collective agreement with the highest contractual wage rate in the sector.

Table 2: Contractual salary rates for unskilled white-collar workers in selected industries at the end of 2003

	Collective agreement	Monthly salary rates in €
GEWERBE		
Baugewerbe		1,208.00
Allgemeines Gewerbe		962.29
Druck	Graphische Gewerbe, kfm. Angestellte	1,258.77 ¹
	Graphisches Gewerbe, techn. Angestellte	2,213.29 ²
Bäcker		811.02
Fleischer		864.50
Molkereien und Käsereien		1,041.01
INDUSTRIE UND BERGWERKE		
Bergwerke und Eisenerzeugende Industrie		1,355.09
Erdölindustrie		1,452.61
Bauindustrie		1,208.00
Stein- und keramische Industrie		1,248.25
Glasindustrie		1,225.72
Chemische Industrie		1,288.81
Papierindustrie		1,264.62
Papier- und pappeverarbeitende Industrie		1,171.76
Holzverarbeitende Industrie		1,091.81
Nahrungs- und Genussmittelindustrie	Brauindustrie	1,353.20
	Brotindustrie	962.20 ¹
	Tabakindustrie	1,512.00 ²
Schuhindustrie		977.00
Bekleidungsindustrie ohne Vorarlberg		911.26
Textilindustrie ohne Vorarlberg		1,048.81
Eisen- und Metallindustrie insgesamt		1,302.61
ELEKTRIZITÄTSWERKE		1,376.06
HANDEL		
Allgemeiner Groß- und Kleinhandel		1,053.00
Warenhäuser		1,177.00
Tabaktrafiken		1,053.00

¹ Collective agreement with the lowest contractual salary rate in the sector. – ² Collective agreement with the highest contractual salary rate in the sector.

From contractual wage rates to wage rates actually paid

Collective agreements that cover a wide range of economic activity may not be appropriate for individual enterprises which may want to raise wages to attract additional labour, or for plant-level organisations which may want to exploit a plant's above-average profitability. Bargaining over additional wage increases follows easily from talks between management and the works council over how to implement the wage settlement negotiated by the union. As *Windmueller* (1987, p. 34) notes, works councils, even if excluded by law or custom from negotiating collective agreements, have frequently engaged in wage bargaining. Austria is a good example of this practice.

Negotiated wages and salaries are minimum rates which set a floor for the wage and salary rates that are actually paid (*effective wages and salaries*). They also provide a reference point for time rates and for fringe benefits. Many employees are remunerated above the minimum wage and salary rates negotiated by the unions for the industry in question. The size of pay supplements varies greatly from one sector and plant to another.

Negotiated increases in effective wages

With effective wages exceeding negotiated wages by up to 60 percent for some skill levels in some branches, an increase in negotiated wages would benefit only the lower echelons and narrow wage differentials; efforts to raise the pay level for all employees and to re-establish the customary wage hierarchy would then be credited entirely to the efforts of the works councils at the expense of the reputation of the trade union. To maintain their control over the development of wages, some unions have managed to insert into collective agreements a clause which also boosts the level of effective wages (*Ist-Lohnklausel*). As a rule, the increase in negotiated effective wages is somewhat smaller than for minimum wages¹. The practice of bargaining for increases in effective wages has in the past been restricted to unions covering blue-collar workers in manufacturing and some branches of the small business sector and the sections of the Union of Salaried Workers operating in manufacturing. Thus, less than one third of private-sector employees benefit from this arrangement.

Union contracts in other sectors, such as in construction and wholesale and retail trade, though not providing for an explicit increase in effective wages, include a general clause (in some years only in the form of a recommendation) which stipulates that the margin (either in relative or in absolute terms) between minimum wages and effective wages is to be maintained.

¹ For example, in contracts negotiated by the Metal Workers' Union, increases in effective wages were about 50 to 70 percent of the increases in minimum wages. In recent years, however, increases in effective wages were just as high as increases in minimum wages.

In the manufacturing sector, for which detailed data are available, the excess of effective wages over minimum wages for blue-collar workers was around 34 percent in the early eighties. It ranged from 50 percent on average in the steel industry to 11 percent in the food and beverage industry (where contracts are tailored to the various segments of this branch). For white-collar workers in manufacturing, effective salaries exceeded negotiated rates by 27 percent on average in 1981. Since then the wage gap has steadily decreased, with wage drift⁴ being more negative for blue-collar workers than for white-collar workers⁵.

In many firms, particularly large ones, the works councils open negotiations with management over further wage increases, subsequent to the conclusion of collective

⁴ Wage drift is defined as the percentage increase in the effective wage rate minus the percentage increase in the negotiated wage rate; with this definition, wage drift may also be negative.

⁵ For more details on the development in the eighties and nineties, see Pollan (2000, 2001).

agreements, even though works councils are legally barred from negotiating over the level of wages and salaries. Plant level negotiations usually aim at raising the level of effective wages by at least the same percentage as that negotiated for minimum wages. In good business years this standard was exceeded, in bad years increases in effective wages fell short of increases in contractual rates.

Large inter-industry wage differentials: a persistent feature

Large wage differentials at the level of collectively bargained wages and salaries are not a temporary phenomenon but a persistent feature of Austria's wage structure. A comparison of the wage and salary levels of the year 1996 with those of the year 2003 shows that those sectors with low pay levels in 1996 were the same sectors exhibiting low pay in 2003.

Figure 1: Selected hourly wage rates for blue-collar workers in 1996 and 2003 in €

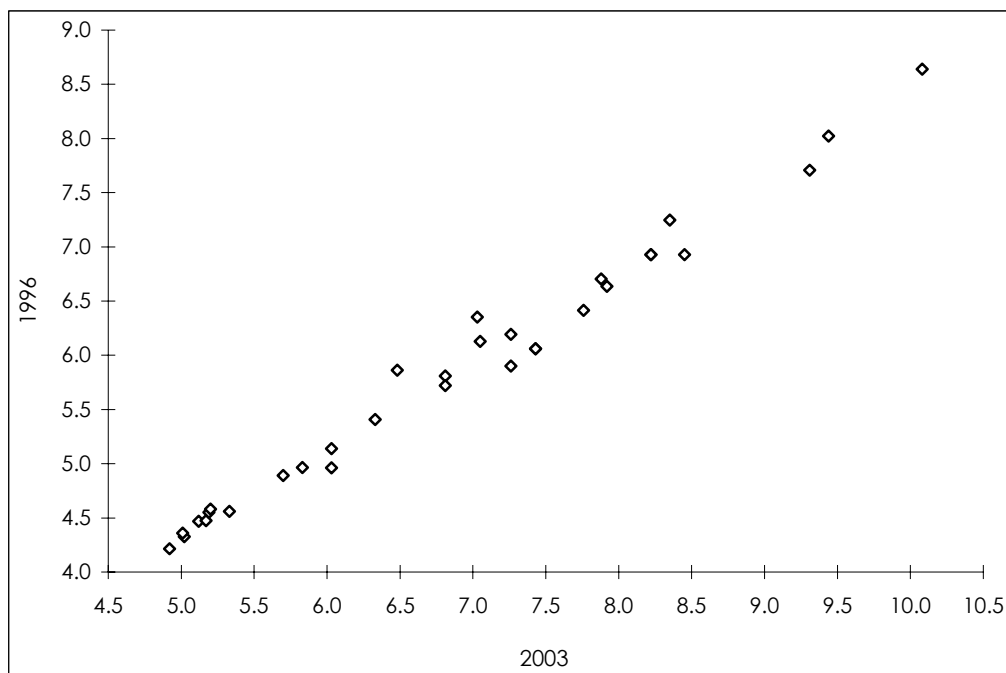
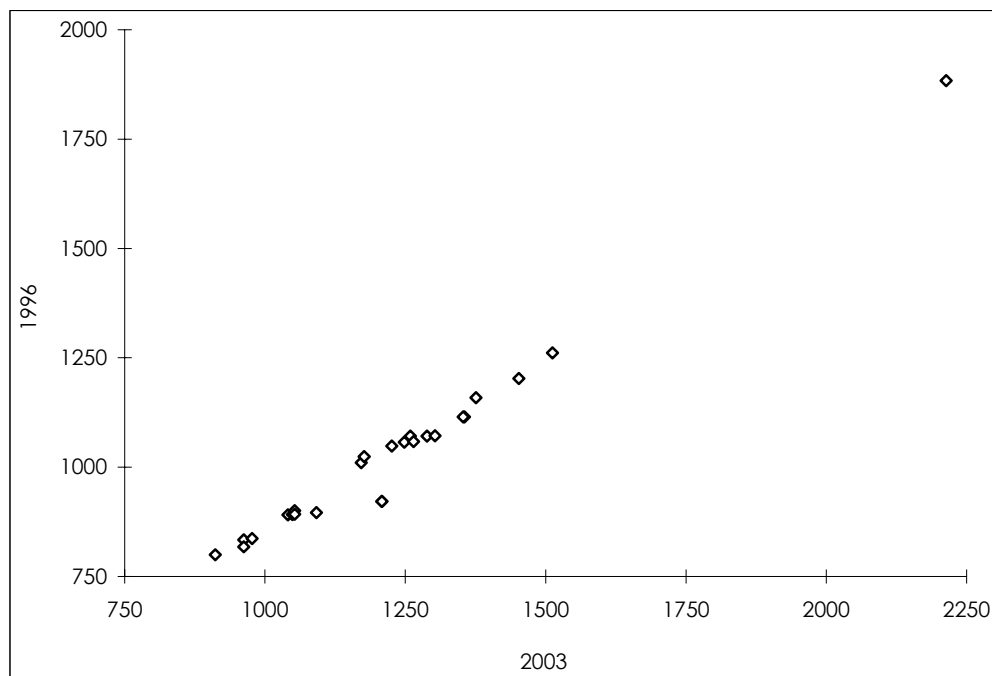


Figure 2: Selected monthly salary rates for white-collar workers in 1996 and 2003 in €



Fringe benefits and non-pecuniary attributes of jobs

Collectively bargained rates are only minimum rates, which refer to pecuniary aspects of a job. There are two questions which need to be addressed in this context: non-pecuniary aspects of employment and the size of wage differentials if the total pay package pertaining to a job is considered.

Compensating wage differentials

Pay rates are only one element of the whole array of working conditions which will draw employees to a certain sector. It may be the case that non-pecuniary effects outweigh the pecuniary differentials. While this hypothesis cannot be tested directly for lack of data on working conditions along the classification used for contractual pay rates, the traditional grouping of employees into white-collar workers (Angestellte) and blue-collar workers (Arbeiter) can be used to throw light on this issue.

Figure 3: Relation between wage and salary rates in 2003

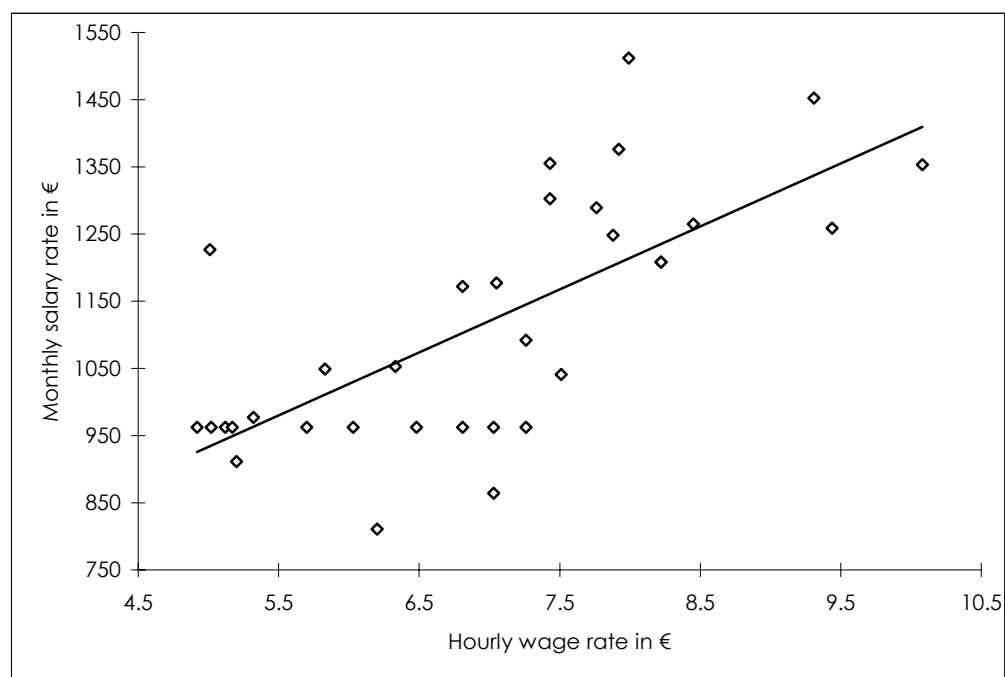


Figure 3 shows that pay rates of blue-collar workers and white-collar workers are strongly related. If it is adverse working conditions such as the physical work environment and the risk of injury that drive the wage differentials for blue-collar workers, then there is no reason why the pay of white-collar workers should be affected in the same way. This correlation between wage and salary rates across industries makes it difficult to attribute inter-industry pay differences to differences in working conditions. There must then be other factors that drive pay differentials between industries⁶.

Wage differentials according to the total compensation package

Contractual pay rates are minimum rates that are exceeded in many industries; furthermore, fringe benefits are an important component of compensation in some industries. Thus, total compensation may substantially differ from earnings according to contractual pay rates.

Data on the manufacturing sector allow us to investigate the question of whether pay differentials are smaller or larger when total labour costs are taken into consideration. For this purpose total labour costs can be divided into pay for time worked (including work-related

⁶ On this question see *Hofer* (1992: pp. 16-19) who finds minimal effects of non-pecuniary working conditions. If there are any effects, the results show that workers with good working conditions also receive higher wages.

premia) and fringe benefits (including statutory and non-obligatory social security expenditures).

For the Austrian manufacturing industries, the verdict is clear: industries with high pay rates for time worked also pay high fringe benefits. This is true both for blue-collar and white-collar workers⁷.

Thus, consideration of fringe benefits widens rather than narrows inter-industry pay differentials. For example, the wages for blue-collar workers in the clothing industry amount to 69 percent of the manufacturing mean when measured by collective pay rates, but only to 58.5 percent when measured by total labour costs; by contrast, the differential for blue-collar workers in the chemical manufacturing industry rises from 6.1 percent to 9.7 percent.

2. The evidence based on data from manufacturing

Pay data from the manufacturing and construction sector have been collected for a long time and are considered the most reliable data on earnings by industries. These data form the basis for several studies concerned with measuring pay dispersion⁸.

International comparisons

One of the earliest studies to include Austria in an international comparison is that by *Hedström – Swedberg* (1985). Their study is based on data on average hourly wages for workers in various manufacturing industries in OECD countries collected by the Swedish Employers' Confederation (SAF).

In 1957, Austria had the lowest inter-industrial wage dispersion. But this changed very rapidly: 'The dispersion level increased rapidly in Austria during the 1960s and the 1970s, and in 1979 Austria was the European country with the highest level of inter-industrial wage dispersion' (*Hedström – Swedberg*, 1985)⁹.

Later studies also found a high degree of wage inequality in an international comparison; the size of wage differentials in manufacturing in Austria (as measured by the variation coefficient of total hourly wage costs) in the late eighties and early nineties was exceeded only by that in the United States and Japan (*Guger*, 1987A, 1991, *Pollan*, 1997A).

⁷ For details see *Pollan* (2000, pp. 51-57).

⁸ Administrative data collected by the Social Security Administration that cover the whole economy have also been used to estimate industry income averages; these data will not be considered in this study, but see *Guger – Marterbauer* (2004).

⁹ A rising trend in wage dispersion in manufacturing in Austria was also found in studies of the cyclical behaviour of the wage structure; the increase in wage inequality was only interrupted in periods of cyclical peaks and at times when the share of foreign workers in Austria's employment dropped sharply (*Pollan*, 1980, 1984, 2004).

A comparison with West German manufacturing, which is classified along similar lines, can help to further elucidate the characteristics of the Austrian wage structure in manufacturing. In 1988 average hourly wage costs in manufacturing in West Germany exceeded those in Austria by about 30 percent. Yet in the food and beverage industry, the pulp, paper and paper products industry, and the petroleum industry (extraction and refining), wage costs in Austria were higher than in West Germany; in the stone, ceramics and glass industry and the iron and steel industry wage costs were only marginally below those in West Germany (Guger, 1991); on the other hand, wage costs in the clothing and textile industry were far below those in West Germany. The picture is similar for 1984 and for 1993 (Guger, 1987A, Pollan, 1997A).

Some of these differences can be traced to the type of ownership, profit situation and location (agricultural or industrialised regions). An analysis of compensation of public limited companies shows that companies in nationalised industries, companies held by the (nationalised) banks as well as multinational companies pay the highest wages and salaries (Walterskirchen, 1987, Pollan, 1997B).

The studies by Freeman and Rowthorn

The finding of large wage differentials in Austria for the manufacturing sector is supported by other studies. Freeman (1988), investigating the link between the extent of centralisation of wage setting, unionism and labour market flexibility and employment performance focuses on cross-industry wage dispersion as one indicator of differences in labour market institutions. An analysis of earnings data mostly drawn from the manufacturing sector puts Austria in the group of countries with *high* and *increasing* earnings dispersion, together with Japan, Canada and the USA. By contrast, the level of dispersion is very small in the Scandinavian countries.

These results are confirmed by Rowthorn (1992). In Denmark and Sweden, wage dispersion is considerably below the European average, while the extent of wage dispersion in North America and Japan is much higher. Austria again stands out from all other countries:

Perhaps the most surprising feature (...) is the extremely high level of wage dispersion in Austria. No matter which indicator we look at and no matter which data source we use, Austria has a wage dispersion similar to that observed in Canada or the United States. It is exceeded significantly only by Japan. The example of Austria illustrates that centralised wage bargaining is not synonymous with egalitarianism. In the Nordic countries, centralised wage bargaining has been accompanied by a policy of deliberately squeezing differentials. This has not been the case in Austria, where there has been no systematic attempt to reduce differentials which remain as high as they were in the 1960s, and sometimes even higher.

Wage differentials and the composition of the work force by skill

The international comparison of sectoral pay levels and then of wage inequality measures is based on the notion that production functions by sector are similar in all countries and that therefore the composition of the work force by skill level follows the same pattern in all countries included in the comparison; if this is the case, then wage differentials can be interpreted largely as reflecting differences in labour market institutions and not as results of differences in the skill composition of the labour forces and of differences in the way that human capital characteristics are valued in the labour market¹⁰.

This question can be examined in more depth for the manufacturing sector in Austria¹¹. Detailed data on skill categories allow us to quantify to what extent differences in the composition of the work force by skill account for intersectoral wage differentials. This question will be first answered for the metal and engineering industries, which account for about half of employment in the manufacturing sector and then for one high-wage and one low-wage industry.

The metal and engineering industries

Blue-collar workers in the metal and engineering industries are covered by the same collective agreement and have identical contractual wage rates. The same is true for white-collar workers in these industries. Thus, the average collective wage rate in one industry will differ from that of another industry only if the composition of the work force differs by skill level. Industries with a larger share of highly skilled workers than other industries will exhibit a higher average collective wage rate. Thus, the difference between the average collective wage for industry i and, say, the average collective wage rate of the whole metal and engineering sector, can then be interpreted as resulting from compositional differences, while the remainder is accounted for by other factors.

The semi-annual survey of wages and salaries in the manufacturing industries provides data on effective hourly wage rates (by skill level) as well as on average collective wage rates (average over all skill levels) by industry.

A comparison of average contractual wage rates by industry in the metal and engineering industries reveals only small differentials. The largest positive deviation is recorded for the nonelectric machinery industry; the largest negative deviation for the foundry industry and the electric equipment industry.

¹⁰ For these distinctions, that are drawn from the literature on the decomposition of wage differentials, see *Juhn et al.* (1991) or *Blau – Kahn* (1996A, B).

¹¹ In what follows, the designation of manufacturing industries refers to the large-scale manufacturing industries and not to the small-scale manufacturing industries (the crafts sector). For more on this distinction in the traditional Austrian classification system, see the section 'The level of industry aggregation'.

This decomposition can be applied, for example, to the wage differential between the industry with the highest hourly effective wage, the transport equipment industry, and the industry with the lowest hourly effective wage, the foundries. Hourly pay in the transport equipment industry is 1,182 times the pay in the foundry industry. 6.7 percentage points of the percentage difference of 18.2 can be attributed to compositional effects, the remainder to other factors. Thus, in the metal and engineering sector, wage differentials for blue-collar workers which are due to compositional effects are rather small. For white-collar workers, however, compositional effects account for a much larger share of pay differentials.

Table 3: Contractual wage and salary rates by skill level 1996

	Blue-collar workers		White-collar workers	
	Average contractual wage rate ¹	Hourly wages	Average contractual salary rate ²	Monthly salaries
Metal and engineering Industry	98.05	120.45	29,205	35,171
Foundries	94.25	110.86	29,598	33,756
Nonferrous basic metals	100.18	124.57	31,086	35,265
Nonelectric machinery	101.29	124.06	28,262	34,322
Transport equipment	100.55	131.05	30,483	35,142
Metal products	94.79	111.64	26,547	31,878
Electric equipment	96.52	119.52	30,30	37,002

¹ Wirtschaftskammer Österreich, Lohnstatistik der Industrie, 1996 April and September. – ² Wirtschaftskammer Österreich, Monatsbezüge der Angestellten in der Industrie Österreichs, 1996 January.

The chemical and clothing industries

A more direct procedure is used to estimate compositional effects for the chemical and clothing industry. For all manufacturing industries for which data are available from the semi-annual survey of the Federal Economic Chamber, skill levels are categorised into 6 comparable levels; this allows us to measure the compositional effect also for other industries. If we take as our benchmark the skill composition in the whole metal and engineering sector, we can apply the pattern found there (employment shares by skill level) to the (effective) wage rates by skill of industry *i*; then the difference between the average wage rate for industry *i* weighted with the employment shares of the metal and engineering sector and the average wage rate weighted with the actual employment shares by skill of industry *i* is a measure of the compositional effects.

Calculations for the chemical industry (a high-wage industry) and the clothing industry (a low-wage industry) show the following results: applying the employment shares of the reference industry to the clothing industry raises the average (effective) wage of the clothing industry, from ATS 79.34 to 85.28, so that the ratio of wages in the clothing industry to wages in the reference industry rises from 65.9 percent to 70.7 percent; thus, part of the wage differential between the clothing industry and the metal and engineering industry is due to

compositional effects (a higher share of skilled workers in the reference industry than in the clothing industry), though the major part of the wage gap is due to other factors.

For the chemical industry, however, the compositional effect works in the opposite direction. If the skill pattern found in the metal and engineering industry is applied to the chemical industry, the wage gap between the chemical industry and the reference industry widens from 13.2 percent to 21.2 percent.

This way of estimating the compositional effect is likely to overstate the size of this effect¹². The classification of workers into the various skill levels is, to some extent, arbitrary and an important element of the reward system within a firm. Workers with the same attributes may be classified into a higher skill category in firms that for some reasons (high profits, strong works councils) pay higher wages than in firms that face different conditions (more competition, weak works councils, etc.). Thus, the extent of wage differentials that are due to compositional effects is likely to be exaggerated.

3. Studies based on data from household surveys

While the studies of *Hedström – Swedberg* (1985), *Freeman* (1988), *Rowthorn* (1992), *Guger* (1987A, 1991), and *Pollan* (1997A, 2000) rely on industry averages, mostly from the manufacturing sector, surveys which collect data on wages and individual characteristics as well as on occupational and industry affiliation of individuals are in principle better suited to investigate the question of industry-specific wage differentials.

In Austria, several studies are based on the Mikrozensus collected for 1983 and later years¹³. According to *Barth – Zweimüller* (1992) and *Zweimüller – Barth* (1994) (unadjusted) industry wage differentials in Austria (obtained from a wage regression without controlling for human capital variables and other variables such as gender and occupations) are closer to the values for the USA and Canada than to Norway or Sweden. When, however, in addition to industry dummy variables other variants are included in the wage regression, wage dispersion (as measured by the standard deviation of the industry coefficients) is considerably smaller, much smaller than the corresponding value for the U.S., and even smaller than for Norway. Similar results are obtained by *Hofer* (1992).

¹² This holds if the average skill level in the industry under consideration is below that of the reference industry, as is the case for the clothing industry.

¹³ Another data set which has been used to estimate inter-industry wage differentials and gender wage gaps derives from the International Social Survey Programme (ISSP) (*Blau – Kahn*, 1996B, *Kahn*, 2000, *Wagner*, 1990). This data set suffers from the small number of observations and perhaps also from the deficiencies noted for the Mikrozensus (see later sections), and studies based on these data will not be considered in what follows.

How can the results from micro data be reconciled with the results from studies of wage differentials in the manufacturing sector and with the existence of large wage disparities at the level of contractual wages?

A close look at the Mikrozensus reveals three sets of problems: First, the Mikrozensus is not representative, as far as income data are concerned; second, the Mikrozensus is not suitable for international comparisons: the data on pay refer to *net* wages and salaries (i.e., net of social security contributions and net of income taxes) while data from other countries refer to gross income data; third, information on respondents are classified according to a classification scheme that is inappropriate for estimating inter-industry wage differentials.

Income data from the Mikrozensus are not representative

The Mikrozensus survey collected data on income of employed persons at an interval of about 2 years during the period from 1981 to 1999. In addition to income data, the Mikrozensus also collected information on the number of hours worked and on various socio-economic characteristics of the individuals taking part in this survey. Thus, in principle, wages could be related to a number of socio-economic characteristics of individuals and characteristics of jobs. The main drawback of this data set, however, is deficiencies in the quality of income data collected. These problems have long been recognised in the literature on surveys in general, and on the Mikrozensus in particular. The shortcomings of the income data have repeatedly been pointed out by Statistics Austria¹⁴ (Wolf – Wolf, 1991, Kronsteiner – Wolf, 1994)¹⁵. Even though the income question is answered by some 70 percent of the respondents, only half of the persons surveyed with the highest income are willing to reveal their income. Moreover, among those who do answer the income question, respondents tend to adjust downwards high incomes and to adjust upwards low incomes. This, too, has the effect that the extent of income dispersion is underreported in the Mikrozensus.

There is an additional problem: certain income components, such as bonuses and compensation for overtime are not reported at all or underreported. Again, this results in a downward bias in income dispersion in income data collected by the Mikrozensus (Kronsteiner – Wolf, 1994).

Data from the Mikrozensus have been incorporated into various secondary data sets, such as the World Income Inequality Database of the United Nations and the World Development Indicators of the World Bank. In addition to the studies cited earlier, the papers by Martins – Pereira (2000), Förster – Pearson (2002) and Milanovic (2002) use the Mikrozensus as a source for income data.

¹⁴ Formerly Österreichisches Statistisches Zentralamt.

¹⁵ See also Zweimüller (1992).

Atkinson – Brandolini (2001) emphasise the problems involved in the compilation and use of secondary data sets: In some studies, some data sets are not documented in sufficient detail; in others, researchers just mechanically use the data sets and don't take the trouble of inquiring about the peculiarities of national data sources. Thus, it seems worthwhile to further examine the suitability of income data from the Mikrozensus for studies of income disparities.

A comparison of income data from two sources

For such an assessment, a comparison of income data from the Mikrozensus and from the Business Statistics Survey (SBS; Leistungs- und Strukturhebung) has been carried out (Pollan – Leoni, 2003). The Business Statistics Survey yields data on yearly incomes according to the Austrian NACE classification. These data can be compared with income data from the Mikrozensus. This comparison has to be restricted, however, to the producing sector plus the construction sector, because only for these sectors wage and salary data are available for employees on a full-time equivalent basis. This restricts the comparison largely to the medium income level; thus, the lower end of the income distribution (tourism, wholesale and retail trade, personal services) as well as the higher end (the financial sector, some government services) are excluded from this comparison.

Income data from the Mikrozensus household survey are on a net income basis, i.e., after the deduction of social security payments and income taxes. For the purpose of this comparison, the income data from the SBS survey, which are on a gross basis, had to be converted to a net basis. For details see Pollan – Leoni (2003).

A comparison of industry pay averages from the Mikrozensus and from the SBS reveals that in both years for which the comparison was carried out (1997, 1999) most industry averages according to the Mikrozensus are considerably below those computed from the SBS. Moreover, the extent of pay disparities in the SBS survey is considerably higher than the corresponding values according to the Mikrozensus. The following dispersion measures (weighted with employment shares) were computed for the year 1999¹⁶.

	Mikrozensus	SBS survey
Standard deviation	2,007.4	3,411.2
Coefficient of variation	0.116	0.176

These figures clearly show that dispersion measures based on the Mikrozensus strongly underestimate inter-industry wage differentials.

¹⁶ The following ÖNACE sectors were included in this calculation: 10, 14, 15, 17-29, 31-37, 40, 41, 45.

Gross versus net income data

As mentioned above, income data from the Mikrozensus household survey are net income data. If net income data from one country are compared to gross income data from another country, dispersion measures based on net income data will be downward biased if there is some degree of progressivity in the tax and social security system. Barth – Zweimüller (1992: 195) do note that their results for Austria, in contrast to those of other countries, are based on net rather than gross earnings and that this may produce a downward bias, but then assert that "it seems hard to believe that differences in average tax rates across industries are so high that they would fundamentally change the picture". It may be true that the progressivity in the tax and social security system, when applied to *industry averages* is not pronounced, but progressivity in conjunction with the underreporting of high (and low) incomes may well result in a pronounced bias.

To gauge the importance of the progressivity of the tax and social security system for the extent of pay dispersion, the distribution of net earnings from the Mikrozensus can be compared to the distribution of gross earnings. Data which allow such a comparison are available from two studies, which link net income data to gross income data.

The income study of 1996

One such link has been performed in a study concerned with the redistributive effects of the government sector (Guger, 1996). Net incomes from the Mikrozensus are translated into gross incomes through a synthetic link on the basis of income tax statistics for dependent employment. For the first decile of gross incomes the ratio of net to gross incomes 84.3 percent, for the tenth decile the ratio is 69.2 percent.

Thus, there is a certain degree of progressivity in the tax and social security system. Note that this comparison is based on net incomes drawn from the Mikrozensus household survey, which suffer from the deficiencies as pointed out earlier. As a result, the range of gross incomes (which are synthetically linked to net incomes) is also restricted. Add to this the fact, that the distribution of gross incomes is only available in deciles; this further reduces the range of incomes of individuals, which is the focus of such cross-country comparisons. As high incomes, where the degree of progressivity is strongest, are excluded from this comparison, the difference in pay dispersion between gross and net incomes will be underestimated.

Nonetheless, net incomes yield considerably lower dispersion statistics than gross incomes: the standard deviation for gross incomes is ATS 12,832, ATS 8,500 for net incomes. The coefficient of variation is 0.541 for gross incomes, 0.482 for net incomes.

A different perspective is provided by the proportional difference between the first and the tenth decile: for gross incomes, average incomes in the tenth decile are 7.5 times incomes in the first decile; for net incomes, this multiple is 6.2.

The income study of 1987

Another comparison of net and gross incomes is contained in *Guger* (1987B). This comparison is based on the Mikrozensus 1983¹⁷ and links net incomes to gross incomes by way of the tax and social security schedules. The distribution of dependent employment across the income brackets is based on the Mikrozensus. Note that all the caveats mentioned with regard to the first comparison apply here too. Again, pay dispersion is considerable less for net pay than for gross pay.

The income brackets range from gross incomes up to ATS 5,000 (with an employment share of 7.5 percent) to ATS 60,000 and more (with an employment share of 0.2 percent). Gross income in the highest bracket is 22.5 times the income in the lowest bracket; the corresponding multiple for net incomes is 16.2. The (weighted) standard deviation is 7,655 for gross incomes, 5,048 for net incomes. The coefficients of variation are 0.554 and 0.492.

The level of industry aggregation

Studies investigating the extent of inter-industry wage differentials include industry dummy variables in addition to human capital characteristics and other control variables in the estimation equations (*Barth – Zweimüller*, 1992, *Dickens – Katz*, 1987, *Hofer*, 1992, *Katz – Summers*, 1989, *Krueger – Summers*, 1988, *Zweimüller – Barth*, 1994). Thus, the level of aggregation by industry has a potentially important effect on the size of the estimated industry coefficients, which represent the extent of inter-industry differentials.

The level of aggregation at the industry level varies considerably from study to study. While *Krueger* and *Summers* present results on the size of industry effects at the level of three-digit industries, the study by *Barth – Zweimüller* (1992) contains a breakdown of the economy into only 22 sectors, and concludes that in Austria industry affiliation does not seem to be very important, as only between 1 and 11 percent of the total variance is attributable to the industry dummies (*Barth – Zweimüller*, 1992: 191). Statistical procedures using this high level of industry aggregation may seriously underestimate the importance industry effects.

In Austria, wage bargaining is decentralised (*Pollan*, 2004). Each year more than 400 collective agreements are negotiated, with pay rates differing from one bargaining unit to the next. Therefore, if the industry classification used in the estimation of inter-industry wage differentials is not fine enough, the wage equation is seriously misspecified.

A sample of the diversity in contractual pay rates is presented in table 1 and table 2. Note that this information refers only to pay schedules and not to fringe benefits and working conditions as specified in collective agreements, which may contribute to widen the differentiation between the working conditions for various bargaining units. Also note that in

¹⁷ This data source was used in the studies by *Barth – Zweimüller* (1992) and by *Zweimüller – Barth* (1994) for their analysis of pay disparities.

many sectors effective pay rates considerably exceed contractual pay rates. As noted earlier, all available evidence points to the conclusion that differences in *contractual* pay rates are not compensated by *effective* pay rates and *fringe benefits*, rather these components of total compensation reinforce pay inequality.

The manufacturing industry in Austria: a heterogeneous sector

One representation of this general problem needs special mention. This concerns the manufacturing sector. In Austria, the manufacturing sector consists of two legally differentiated sectors: large-scale manufacturing (*Industrie*) and small-scale manufacturing (*Gewerbe*)¹⁸. What is important here is that subdivisions of the two sectors conclude their own collective agreements, with contractual wage and salary rates in the small-scale industry smaller or at most equal to the contractual rates valid for the large-scale manufacturing¹⁹. Hence the flight from collective agreements applicable to the *Industrie* to those for the *Gewerbe* (as noted in *Österreichischer Gewerkschaftsbund*, 1999). These differences may be exacerbated by differences in payments in excess of contractual pay rates.

Some idea of the wage differentials between *Industrie* and *Gewerbe* may be gleaned from a look at table 1. For example, contractual wage rates for unskilled workers in the *Industrie* section of the chemical industry is 7.76, while the corresponding rates in the *Gewerbe* section of the chemical industry is 5.70, which yields a wage differential of 36 percent in favour of workers in the *Industrie*²⁰.

If the *Industrie* section (with high wage rates) and the *Gewerbe* section (with considerably lower rates) are bunched together in one sector, as is the case in the regular statistical classifications (which are comparable with international statistical classifications), then the high and low pay rates are averaged out and are representative neither of the *Industrie* nor the *Gewerbe* section. As a result, the coefficient of the industry dummy may be small and statistically insignificant. But the misspecification of the industry dummies will show up as bias somewhere else.

¹⁸ A similar problem arises for the construction industry: the *large-scale* construction industry and the *small-scale* construction industry have the same contractual pay rates but different effective pay rates, while the *auxiliary* construction industry is covered by a great number of collective agreements providing for different contractual pay rates.

¹⁹ The iron and engineering sector is covered by one labour union, the Metal Workers Union; nonetheless, there are separate collective agreements for the *Industrie* section and the *Gewerbe* section. For many years, contractual wage rates for the *Industrie* section were higher than for the *Gewerbe* section; this was true in the mid-eighties, years which are covered by the 1983 and the 1987 Mikrozensus. Later on, contractual wage rates were equalised, though presumable large differentials still exist as far as effective wage rates are concerned.

²⁰ In 1996, the excess of the actual wage rate over the contractual wage rate was 16.5 percent in the *Industrie* section. If we assume that this percentage has fallen to 10 percent in the year 2003, and if we further assume that unskilled workers in the *Gewerbe* section were just paid the contractual rates, the wage differential rises to 50 percent.

Suppose that characteristics of females are exactly the same as those of males on average, and further that wages of females are the same as wages of males on average, but that the share of males in the employment of each sector rises with the size of industry wage premia; i.e., the share of *females* is low in high-wage industries, high in low-wage industries. If industry dummies are properly assigned, industry dummies will pick up the inter-industry wage dispersion and the gender gap (gap between male and female wage rates) will be correctly estimated as zero, if it is estimated by a female/male dummy. If, however, an improper industry classification is used, where, say, a high-wage industry (with a small share of female employees) is put together with a low-wage industry (with a large share of female employees), the gender wage gap will be estimated to be positive, as this approach picks up the correlation between the share of females and the level of wages.

Part of the misspecification problems concerning the improper industry classification may be alleviated by introducing dummy variables for the firm size, as in general businesses in the *Industrie* section are larger than businesses in the *Gewerbe* section. But this is not always the case: some businesses in the food industry, though classified as *Gewerbe* (with lower wage rates), are larger than businesses classified as *Industrie*.

4. Summary and conclusion

Income inequality is an important social problem; if severe, it can threaten the social cohesion of a country. The importance of this issue was recognised in the sixties, when in the formulation of the magic 'pentagon' a fair income distribution was put on the same footing as price stability, full employment, external stability and economic growth as goals of economic policy. Later decades have stressed the allocative role of wages in production, where wages serve as price signals in a market economy. With this perspective, the OECD Jobs Study (1994A) recommended policies to increase wage flexibility and to decentralise wage bargaining. A lot of research has been devoted into establishing the links between the performance of the labour market and the functioning of wage setting institutions²¹. Over the years, the focus has changed, however. While in earlier years the emphasis was on the institutional features that promote wage moderation, allocative aspects have been pushed to the fore in recent years.

Economic research dealing with these topics relies on cross-country comparisons, where two features characterising the countries included in the comparisons are of fundamental importance: the degree of centralisation/co-ordination of wage setting and the extent of wage dispersion. Austria's position in the centralisation/co-ordination rankings has been misspecified in various studies, but can now be established as a medium position between the two extremes (Pollan, 2004).

²¹ For a recent survey, see Calmfors et al. (2001), OECD (2004).

The extent of wage inequality, the other feature of such international comparisons, has also been surrounded by controversy: According to one view, which relies on aggregate industry data, the extent of wage dispersion is large in an international comparison; the other view is derived from the analysis of income data collected in the course of household surveys and asserts that income inequality in Austria is as small as or even smaller than in the Scandinavian countries.

This latter view is consistent with the evaluation of Austria's wage setting system as highly centralised, while the finding that the size of inter-industrial wage differentials is large is consistent with the view that Austria's wage setting system is located in the medium range along the centralisation/co-ordination dimension.

This study starts out by looking at contractual wage rates²², which form the basis of Austria's wage structure, and represents a source of information that so far has been mostly neglected in studies of the Austrian labour market. Contractual wages are rates that are set in collective agreements between the labour unions and employers' organisations. Each year about 400 collective agreements are signed. An analysis of contractual wage rates for selected industries (manufacturing industries, covering both large-scale and small-scale industries; wholesale and retail trade, construction, electricity sector) reveals huge wage differentials: in some industries the wage rates for the same type of labour (unskilled blue-collar workers and unskilled white-collar workers) are as much as twice as high as in other industries.

Contractual wage rates are minimum rates that are exceeded in some industries (effective wage rates). The gap between effective wage rates and contractual wages rates does not compensate for the differences in contractual wage rates, but on the contrary reinforce the size of the wage differentials (even if differences in the composition of the workforce by skill is taken into account). This can be established for the manufacturing sector (large-scale industry). Moreover, fringe benefits (as well as working conditions) contribute further to enlarging wage inequality between the sectors.

Another view of the extent of intra-industry wage differentials is provided by studies relying on data from the Mikrozensus: wage dispersion is as low or even lower than in some of the Scandinavian countries. However, the quality of these data can be faulted on three counts. First, income data from individuals with high (and low) incomes are underrepresented. Second, income data from the Mikrozensus refer to net income and should not be compared to gross income data for other countries. Third, the classification of economic sectors is inappropriate for the question at hand, as this classification lumps high-wage and low-wage sectors together, with the resulting grouping exhibiting incomes that are closer to the economy-mean than are the constituent high-wage and low-wage sectors separately. All three deficiencies result in a serious downward bias in the calculation of inter-industry wage

²² In what follows, the term contractual wage rates also covers contractual salary rates. The same is true for effective wage rates.

differentials. Estimates on wage dispersion from studies based on the Mikrozensus cannot provide a basis for cross-country comparisons.

The effects of the wage distribution on allocative efficiency has been a controversial topic. Swedish trade union economists have long maintained that a wage policy aimed at compressing wage differentials between industries and plants would help to speed up the movement of labour and capital from low to high productivity branches and thus enhance productive efficiency²³. Workers in less productive activities would be forced out of employment and be available for employment in expanding industries. If, as postulated by the productivity-gearred wage policy, wage increases should be the same in all sectors of the economy, such policies would work best if supported by active labour market policies which enhance the mobility of workers and lower workers' attachment to specific enterprises.

But those who favour local bargaining as opposed to centralised bargaining argue that centralised bargaining tends to suppress occupational and plant-specific wage differentials, differentials that are necessary to bring wages in line with productivity differentials. Thus, the argument goes, a move to a more decentralised wage setting system would allow enterprises to better match workers' abilities and jobs by being able to attract workers away from other industries.

This seems to be the stance taken by the OECD when it recommends that Austria move to a more decentralised wage setting system. This position seems to be informed by the notion that the wage setting system in Austria is highly centralised/co-ordinated and as a result the wage distribution is too much compressed. These positions are not tenable, however. They are based on a superficial view of Austria's bargaining system and a view on the extent of wage differentials that is faulty.

Austria is not Sweden of the early eighties and any conclusions drawn from the Swedish model and applied to Austria are likely to be in error.

Austria's wage setting system, at the level of collective bargaining as well as at the level of within-plants bargaining, has produced large wage differentials for workers of the same qualification. Inter-industry wage differentials, a legacy of past industrial policies, are much too large. Thus, any recommendation that suggests increasing wage differentials would make matters worse, from the perspective of allocative efficiency and of fairness.

Achievement of the goal of income equality is often seen in the form of a trade-off to economic efficiency; in other words, a loss in efficiency is viewed as the price to be paid for achieving a fair distribution of income. For Austria, this trade-off does not present itself. Both goals, an increase in productive efficiency and an increase in income equality can be achieved at the same time, though perhaps at the expense of social disturbances as those groups that in the past have been able to achieve wage premia will be loath to give them up.

²³ See Flanagan (1987), Hibbs – Locking (2000) and Moene – Wallerstein (1997).

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