CLASS, OCCUPATION, WAGES, AND SKILLS: THE IRON LAW OF LABOR MARKET INEQUALITY

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ABSTRACT

Economic inequality in contemporary advanced societies is strongly tied to the variation in wages across occupations. We examine the extent to which this variation is captured by social class and occupational prestige and ask how the associations between class, prestige, and wages can be explained. On the basis of data from 11 countries in the European Social Survey (ESS) 2004, we find (a) that class and prestige account for a very large proportion of the occupational variation in wages; (b) that the tight links between class, prestige, and wages are strongly associated with the skill requirements of jobs but only weakly tied to other positional traits, including authority, autonomy, and scarcity; and (c) that these findings are highly similar in all countries examined. We conclude that the rank order of positions in the labor market is a social constant driven by efficiency requirements of work organizations rather than by the exercise of power. This iron law of labor market inequality clearly contradicts major class theoretical models, including Wright's and Goldthorpe's. In addition to empirically refuting contemporary class theory, we offer a number of more conceptual arguments to the same effect. At a macro

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level, however, power relations arguably affect the rate of economic inequality by determining the reward distance between positions in the constant rank order, as indicated by the large cross-national variation in wage dispersion.

Keywords: Class; skill; power; efficiency

INTRODUCTION

For the centennial of the *Communist Manifesto* in 1948, Joseph Schumpeter, then president of the American Economic Association, initiated a symposium at the association's annual meeting. The contributions to the symposium, under the title "The sociology and economics of class conflict," were published in the *American Economic Review* in the following year. Talcott Parsons was invited to represent sociology. In his remarks, he claimed that Marx' perspective on classes had become outdated due to its focus on the distinction between capitalists and workers. Instead, a more general differentiation among occupations had grown in importance as industrialization and modernization had progressed. This is an early formulation of the "middle class issue" that a few decades later would come to dominate the theoretical discussion of class. In the differentiation between occupations, Parsons distinguished two aspects of the organization of work that he saw as especially important drivers of social and economic stratification. One is the division of skill requirements that is inherent in functional role specialization. The skill dimension in part concerns innate ability, and in part competences that are costly and difficult to acquire. The other important aspect of work organization is the increasing centralization and differentiation of leadership and authority in large establishments, whereby individuals who are responsible for coordinating the actions of others necessarily acquire another status in crucial respects than those who mainly carry out tasks designed by others (Parsons, 1949, pp. 17–20).

Parsons' functionalist perspective, developed since the 1930s, was an important influence for his students Davis and Moore (1945) in the *American Sociological Review* on the causes of social stratification is one of the discipline's most controversial texts. The perspective eventually culminated in Donald Treiman's book *Occupational Prestige in Comparative Perspective*, published 1977, at a time point when theoretical work on the

sociology of inequality had already been redirected to issues of power and control rather than efficiency. Although Treiman ties his theoretical model to the concept of power, it is evident that he sees efficiency requirements as the ultimate cause of inequality: ''Analysis of the universally shared occupational prestige hierarchy suggests that high prestige is allocated to those occupations which require a high degree of skill or which entail authority over other individuals or control over capital. … These are the fundamental aspects of power. … But the more powerful an occupation, the more important it is that it be performed well/and thus/the greater the incentive to attract competent personnel to it. /Hence,/the most powerful positions will also be the most highly rewarded.'' (Treiman, 1976, pp. 287–288).

This functionalist perspective on inequality came to be heavily criticized in the wake of the social and political turbulence in the late 1960s. By the mid-1970s, the earlier emphasis on efficiency and social equilibrium had given way to a focus on power, exploitation, and conflict. Two main intellectual figures in the research on social class that was established during this period are Erik Olin Wright and John Goldthorpe, initially labeled as followers of Marx and Weber, respectively, but eventually converging toward a common stance on many (but not all) issues. Wright's work has been highly influential concerning analyses of the class position of the middle class. He sees class-related inequality within the category of employees as determined by two factors: (a) authority within production processes and (b) skills and expert knowledge. Authority is a class dimension because managers and supervisors make use of delegated class power. Skill is a class dimension because professionals and other experts (as well as managers) receive ''loyalty rents,'' that is, they are offered privileged locations within exploitation relations. There are two causes of such rents. First, qualifications and expertise are often scarce, not only due to natural supply limitations but also – and primarily – due to strategically created and reproduced obstacles to supply increases. Second, the performance of qualified tasks is difficult for the employer to monitor, who therefore has to rely on the motivation and loyalty of employees rather than on external control in order to maintain high levels of effort. In sum, the employer buys commitment from selected categories of employees by giving them a high level of rewards (Wright, 1997, pp. 19–22).[1]

The other central figure in class research during recent decades is John Goldthorpe. He originally developed a continuous occupational scale measuring prestige (or ''social standing''; see Hope & Goldthorpe, 1974). In the course of the 1970s, he abandoned this scale for a class model with

distinct categories for the purpose of studying social mobility across generations. In the class schema – which, however, builds on and correlates strongly with the original prestige scale (see Goldthorpe & Llewellyn, 1977) – occupations were grouped according to their typical "market and work situations." The most important source of inspiration here was Lockwood (1958) doctoral dissertation *The Blackcoated Worker* (1958), in turn based on Weber's discussion of how classes should be defined and distinguished. Goldthorpe divided employees into classes by "combining occupational categories whose members would appear … to be typically comparable, on the one hand, in terms of their sources and levels of income, their degree of economic security and chances of advancement [market situation]; and, on the other, in their location within systems of authority and control governing the process of production in which they are engaged, and hence their degree of autonomy in performing their work-tasks and roles [work situation]" (Goldthorpe, 1980, p. 39).

On the basis of this definition, skills may be seen as tied to the "market situation" and authority as tied to the "work situation." But the class model in this guise is close to being completely descriptive – a more elaborate analysis of the mechanisms involved in the connections between class and inequality is missing in these early formulations. With the paper on the "service class" Goldthorpe (1982) embarks on the theoretical journey that ends with the article (2000) on dependence and control as the bases of inequality between groups of employees. In essence, class differences in reward levels (among employees) are explained by arguing that members of the privileged class (the "salariat") (a) are difficult for the employer to replace and (b) carry out work tasks that are difficult for the employer to monitor. The employer solves these two problems by creating a specific structure of incentives (the "service relation") with the purpose of fostering loyalty, commitment, and work effort. Goldthorpe's theory has thereby largely coincided with Wright's. Meanwhile, Wright – in his corner – has modified his operational class definition such that it essentially has coincided with Goldthorpe's (see, e.g., Wright, 1997, p. 37). This synthesis may have pleased many class analysts, since it apparently combines the best of two worlds: theoretical clarity and empirical predictive validity.

The literature survey above shows that skills and authority, on both sides of the theoretical chasm between power and efficiency, are seen as the main operational criteria of class. But the two theoretical perspectives suggest fundamentally different mechanisms for why skills and authority are important for inequality. According to the "efficiency" perspective, the driving mechanism is productivity, while the "power" model seeks to avoid

workers' productive resources as a central mechanism. In the power perspective, the distribution of labor market rewards is a *zero-sum game*, with one party's gain being another party's loss. Rewards tied to skill and authority are thus seen as acquired *at the expense of* other workers' rewards. In the efficiency perspective, by contrast, wage premia for skill and authority reflect high productivity assumed to contribute positively to the value of the entire work organization; that is, inequality is driven by *growth* rather than exploitation.

This division between power and efficiency is the topic of the present paper. We attempt to assess which of the two theoretical perspectives that best explains the empirically observed hierarchical order among employees in the labor markets of modern capitalism. Our conclusions are primarily based on empirical analyses, in which we use data from 11 countries in the European Social Survey (ESS) 2004 (see further below). In addition, we outline some arguments of a more conceptual kind that – independent of our empirical results – point rather clearly in one direction.

The paper is organized as follows. We begin by formulating in more detail the two theoretical perspectives that we see as the main contenders for explaining labor market inequality. We then discuss a few questions of principle with regard to the validity of the power-based model. After describing the data and methods we use, we turn to the empirical analyses and report results in two steps. In a first step, analyses of variance are carried out where we show how wages differ between classes, between occupations within classes, and between individuals within occupations, in the 11 different countries. In a second step, on the basis of factor analysis, we examine how four different determinants of inequality (skills, authority, autonomy, and scarcity) are related to the hierarchical structure of labor market rewards (class, occupational prestige, and wages) among employees. We conclude with a summary and discussion of our main findings.

TWO THEORETICAL PERSPECTIVES ON LABOR MARKET INEQUALITY

Skills and authority are the two central dimensions of the hierarchical structure of labor market rewards among employees. But what are the underlying explanatory mechanisms? According to one model, workers are rewarded in proportion to their productivity. In economic theory, productivity is typically seen as residing in individuals. In human capital

theory (Becker, 1962), for example, individuals increase their productivity by spending resources (time and money) on education and training of various kinds, in school, on the job, or elsewhere (in the family, in civil society, at the gym, etc.). But productivity can also be seen as tied to positions, that is, jobs (as in Thurow, 1975). Different jobs have different skill requirements, which not only means that individuals with varying amounts and types of abilities and qualifications are selected into them but also that individual skills develop more in some jobs than in others (see, e.g., Farkas, 2003; Kohn & Schooler, 1983). Further, differences in technology or work tasks across jobs give different structural opportunities for realizing the productive potential of any given individual. Both individuals and jobs thus differ in productivity-related skill levels, and both sides of this coin need to be taken into account, including the degree of match between them (see, e.g., Duncan & Hoffman, 1981). The connection between authority and rewards can also, in principle, be explained within the framework of the efficiency model. The performances of managerial or supervisory tasks are obviously tied to certain skills, on both the individual and job side. The link between these skills and productivity may thus – fully or partly – explain the correlation between authority and rewards.

According to an alternative theoretical model, the importance of skills and authority for labor market rewards is explained by factors related to power and control. In this line of reasoning, workers in some positions are harder to replace than others (either because their tasks are especially important for the firm's activity or require scarce competence) and are more difficult to control than others (because their work tasks cannot be monitored or directed in any simple way). The main agent in this explanation is the employer who must find a way of generating loyalty and work effort among employees who are difficult to replace or to control. One strategy to achieve this is to offer prospective rewards, that is, opportunities for promotion and wage growth that materialize as a reward for appropriate behavior. This type of solution is particularly emphasized by Goldthorpe (2000). Another solution is to offer bonuses or other kinds of performance pay to managers and experts. In this case, the reward level of the worker is tied to the firm's profit level (or some similar criterion), a scheme that provides incentives for employees to internalize the goals of the employer. This strategy need not involve long tenure or prospective rewards as in well-developed firm–internal labor markets. On the contrary, a highly skilled employee or high-level manager who fails to deliver can be fired on short notice (like the coach of a football team). Hence, employer choices of how to deal with problems of control can vary significantly over time and space.

CONCEPTUAL CRITIQUE OF THE POWER MODEL

The power model, both in Wright's and Goldthorpe's version, is thus based on two main mechanisms for explaining why workers with skilled or managerial tasks are more highly rewarded than others: (a) that these employees are difficult for the employer to replace and (b) that they are difficult for the employer to control. In our opinion, both these explanatory mechanisms are theoretically weak.

Concerning replaceability, we disregard cyclical scarcity, that is, temporal deficits of labor supply of any given category, which by definition cannot contribute significantly to class inequality and other kinds of structural differentiation. Structural scarcity, that is, permanent or long-term labor supply deficits, are of two main types. The first type concerns assets – or skills – that are specific to the firm. This is the kind of scarcity that Goldthorpe bases his theoretical model on. In our view, strong arguments indicate that this particular type is not well suited as an element in class theory. To begin with, if workers' skills are firm specific, not only does the employer face difficulties in replacing the worker but the worker has difficulties finding alternative jobs and employers. Hence, both parties are dependent on each other. This kind of reciprocal dependence (Goldthorpe uses the term "bilateral") is analyzed formally by Becker (1962), when examining the distinction between general and firm-specific on-the-job training. It is also an important theme in Williamson's (1975) model for explaining the choice between the firm and the market for minimizing transaction costs, where "firm" (or "hierarchy") is the equivalent of Goldthorpe's notion of "service relation" and "market" is the counterpart of the "labor contract." The reciprocal nature of the dependence involved means that firm-specific skills are highly equivocal as power resources of employees and, therefore, unlikely to explain much of service class privileges.

There is a further theoretical reason that asset specificity with respect to firms is unlikely to be an important mechanism in the class context. Consider the skill formation of professionals and skilled manual workers, respectively. The former type of skill is typically school based, while the latter is often firm based. In schools, the skills learnt tend to be significantly more general and standardized than in the case of skills developed on the job. Therefore, the skills of manual workers should be much more firm specific than the skills of professionals, so skilled workers should be more difficult for the employer to replace than are professionals. To the extent that this argument is valid, it is a further reason to strongly doubt

that firm-specific skills are a useful mechanism to explain service class privilege, since the service class largely consists of professionals.

The second form of structural scarcity of labor supply is skill specificity with respect to occupation rather than to the firm. This type of scarcity is structural on the basis of power, for example, of the kind that Weber calls closure, and thus reflects asymmetrical rather than reciprocal dependence. The argument, which has a prominent place in Wright's theoretical model, is that the supply of skills of a certain kind is artificially restricted based on strategically maintained limits on entry into certain occupations.[2] Many of these strategies are based on occupational licensing and limits on educational admission (see Weeden, 2002, for a large-scale empirical analysis of the U.S. labor market from this perspective). Since most (though not all) such strategies create shortages of labor supply in professional rather than working class occupations, the closure mechanism is in principle a promising feature of an explanation of class inequality. Still, there are strong arguments against the view that occupational closure is a major causal factor in this regard.

One important argument is that explicit closure (or similar strategies) is far from pervasive, and in many cases actually reversed. Labor supply of professional skills, that is, the fraction of the population with a degree from tertiary education, has been larger than labor demand for these skills for extended periods of time in several countries. Thus, rates of over-education are high in most OECD countries and have been rising in several cases during recent decades (see, e.g., Büchel et al., 2003; Korpi & Tåhlin, 2009). In fact, governments in many countries, especially in the European Union, have had strong educational expansion high on their agenda for a long time. These policies have, to a large extent, been successful, in the sense that a large expansion has in fact occurred, and have met little resistance from the interest organizations of professionals. Further, to the extent that explicit closure strategies are adopted, the variation in their implementation and degree of success is very large, across occupational categories as well as across countries and over time. For example, rules of admission to higher education are very different from one country to the other; significantly, to the extent that commonality exists, the most frequent rule seems to be free (unlimited) admission, hardly a sign of closure. The combination of widespread open admission and large variation in closure where it exists makes it unlikely, we think, that closure could be a major driver of class inequality. After all, the basic structure of class-reward gradients is close to being a social constant (as shown below), and should therefore be explained by highly pervasive and invariant features of

stratification. Closure does not appear to be a phenomenon that meets those requirements.

There is a further important argument against strategic closure as a major driver of inequality. Even if the extent of closure were large and stable, it needs to be shown that a major part of it is due to simple self-interest on the part of privileged educational and occupational groups rather than motivated by the common interest of citizens in having access to reliable high-quality services. Medical services are the clearest example. Are professional licenses in this field required mainly because of strategic power resources held and used by doctors, nurses, and other medical occupational groups? Or is the major motive for medical licensing that the general population typically desires public control over medical practice to minimize risks of maltreatment? We believe that the latter, rather than the former, is most often the case. It would be absurd to argue that medical skills are a mere façade or social construction, without any basis in real competence. Of course, this is not to say that medical professional associations never act on the basis of simple and strategic self-interest. It seems clear, for example, that the highly restricted access to medical education in most countries can at least in part be explained by strategic insider action. But such strategies would hardly succeed if medical skills had no real basis. Power in this case (and in many others of the same kind) would appear to be endogenous to the possession of socially valuable resources – such as skills – rather than an exogenous force.

Note that these remarks concern closure as a strategy, that is, the intentional raising of formal barriers to entry into educational tracks and occupational positions. Obviously, there are countless examples of implicit, unintended closure, in the sense of cultural and motivational hurdles, jointly raised by members of all classes, which reduce access to privileged places in the educational and occupational structure. Such implicit borders are what most of the vast literature on intergenerational social mobility is about, and given the strong reproduction of classes across generations, it is clear that this kind of mechanism operates forcefully in all societies. But as explanations of inequality, closure as a strategy with formal rules as an instrument and closure as an unintended consequence of everyday life are very different. Certainly, Wright, for one, draws a sharp dividing line between them, and claims that class theory would hardly be identifiable as a distinct perspective on inequality if implicit, nonstrategic closure was all there is to the picture (see, e.g., Wright, 2009). Class would in that case, according to Wright, not add anything of theoretical significance to a general and rather uncontroversial perspective focusing on individuals' command over resources and human capital.

That concludes our conceptual discussion of skill scarcity in the class context. With regard to the second main mechanism of class models – employers' problems of labor control as a source of structural inequality – the theoretical weakness is of a different, more formal kind. Assume that the productivity (P) of a certain individual in a certain job[3] is the product of effort (E) and capacity (C), that is,

$$P = E \times C$$

and, further, that the employer is rational and aims at maximizing the rate of employment contract profitability (R), expressed as the difference between productivity (P) and the wage (W), that is,

$$R = P - W$$

The employer's maximization function can then be expressed as

$$R = (E \times C) - W$$

The hypothesis of class theory (in both Wright's and Goldthorpe's version) is that the worker's reward (W) is set relatively high in jobs that are difficult to monitor as an incentive for the worker to supply a high level of effort in the absence of external control (such as direct supervision or machine pacing). The effort level is thus high by definition in easily monitored jobs, but needs to be upheld by internal control, that is, incentive-based motivation, in jobs that are difficult to monitor. But in that case, the effort level of the high-reward category will, at most (if the employer's incentive strategy works optimally), be *equal* to the effort level of the low-reward group. Assume that the supply of effort can vary from zero to one, where workers in easily monitored jobs by definition (through external control) reach the maximum value, and, further, that the control system is optimally designed so that the effort supply of workers in jobs that are difficult to monitor is also maximized. The employer's maximization function can then be reduced to

$$R = C - W$$

since $E = 1$.

In order to explain the higher wage level of the group with jobs that are difficult to monitor, that is, to explain how R (the employer's rate of profitability) can be maintained despite paying high wages to the workers, the only remaining part of the productivity equation is capacity (C).

The conclusion is that monitoring difficulties at most can explain why the wage level for workers in jobs that are hard to control is *not lower* than for

workers in easily controlled jobs. To explain why their wages are not merely equal to, but significantly *higher*, than other workers' wages, the capacity component of productivity rather than the effort component is of decisive importance. Since the effort level in jobs that are difficult to monitor cannot (by definition) exceed the effort level in easily controlled jobs, the entire advantage in productivity – that in turn motivates the employer to pay a higher wage – must (by definition) come from capacity rather than effort. The whole idea that wage inequality is driven by the variation in employers' control problems rather than the variation in workers' productive capacities (or skills) thus fails.

In sum, strong theoretical arguments speak against the view that factors related to power and control rather than to productive resources explain labor market inequality at the micro level. But while conceptual considerations of this kind are important, they cannot, by themselves, settle the issue. A careful empirical analysis is also needed, to which we now turn.

ANALYTIC STRATEGY

Inequality in modern societies tends to be shaped by three processes (see, e.g., Weeden, 2002, p. 55). First, the division of labor in society produces a set of jobs or positions (such as occupations); second, these positions are differentially rewarded; and third, individuals are allocated to these differentially rewarded positions. Our main purpose here is to analyze the second of these processes. We thus take an existing set of positions – as well as the allocation of individuals to them – for granted, and direct our attention to the question why rewards across these positions are unequal. The hierarchical structure of working life can be described in many ways, of which we here distinguish three: class, occupational prestige, and economic rewards (wages). We begin our analysis by showing how these three are empirically related to each other. Previous research has documented strong correlations between them (see, e.g., Ganzeboom et al., 1992), but we give a contribution here by analyzing them within a common framework and with comparable data from 11 countries in Europe. We show that class, prestige, and wages form a single, common dimension that expresses the hierarchical order in the social structure of positions among employees. The relations between this dimension and four distinct, theoretically determined criteria of class (skills, authority, autonomy, and scarcity) are then examined in order to assess which of these factors "explain" (i.e., are most strongly correlated with) the hierarchical structure of rewards.

The first section of empirical analyses shows the extent to which the variation in wages across individuals can be accounted for by the occupations of employees, and the degree to which the variation in wages across occupations, in turn, can be accounted for by the class position of employees, that is, by occupations aggregated into classes. We use Goldthorpe's class schema, which nowadays is operationally very similar to Wright's class model (see, e.g., Wright, 1997, p. 37; Chan & Goldthorpe, 2007, p. 513) as well as to other class schemas, such as the Swedish SEI classification (see Tåhlin, 2007) and the new European socioeconomic classification (Rose & Harrison, 2007). A first conclusion is that the economic rank order (wages) between occupations and classes is very similar in all the countries we study, that is, the *character* of inequality appears to be internationally constant. The other conclusion is that the size of the wage differentials differs markedly across countries; that is, the *degree* of inequality is internationally highly variable.

In a second empirical section, the different explanations of the hierarchical structure of positions in the labor market are evaluated. We conclude that the major alternative to the efficiency model is thoroughly falsified by our data, with a high degree of concordance across countries. Until a reasonable theoretical alternative has been presented, we thus assume that the model based on efficiency as the driving mechanism is the most accurate explanation of labor market inequality.

DATA AND VARIABLE CONSTRUCTIONS

The empirical analyses are based on data from the ESS 2004, with representative samples of the adult population in 21 countries. In the analyses presented below, employees in the following 11 countries are included: Austria, Denmark, Finland, France, Germany, Great Britain, the Netherlands, Norway, Spain, Sweden, and Switzerland. For the remaining 10 countries, the wage data are of insufficient quality for our purposes (e.g., with very high internal nonresponse rates).

In order to facilitate inferences to the population of adult employees in each country, we have combined (by multiplication) two weights. The first is the design weight (DWEIGHT), included as a variable in the ESS data file with the purpose of correcting for differential sample selection probability. The second weight corrects for female over- or underrepresentation for the subsample we use: employed persons with available information on

all included variables. The latter weight has been constructed by dividing the proportion of women in each of our country samples with the proportion employed women in each country according to OECD statistics. As Birkelund (1992) and others have shown, the variation in job characteristics across classes differs significantly by gender. We would have preferred to estimate and report results separately for women and men, but given the very limited number of cases in our data, such a separation is not feasible. Gender–class interactions are an important issue for future research.

Below we give an overview of our variable constructions. A more detailed description of operationalizations is provided in Appendix A. Appendix B contains descriptive and supplementary statistics, with means and standard deviations of all variables used reported in Table B.1.

Wage is estimated as hourly earnings before tax. The variable is measured with three questions. First, ''What is your usual gross pay before deductions for tax and insurance?'' Second, ''How long a period does that pay cover?'' Third, ''Regardless of your basic or contracted hours, how many hours do you normally work a week (in your main job), including any paid or unpaid overtime.'' We have devoted substantial effort to improve the reliability of the variable. For example, a number of respondents replied that they received pay per hour, and then stated the pay they received per month. Obviously, however, some undetected measurement errors remain. Another problem with the wage measure is a high rate of internal non-response for certain countries, which may result in unstable estimates. Still, we believe that the quality of the cleaned wage data is reasonably high and certainly sufficient for the analyses we present below. According to established practice, hourly wage has been transformed into logarithmic units; that is, wage differentials can be interpreted as proportional rather than absolute (Table B.2).

Occupation is operationalized as ISCO-88, and *social class* consists of five occupational categories – service class I (high level white collar), service class II (middle level white collar), class IIIa (routine nonmanual), class VI (skilled manual workers), and class VII/IIIb (unskilled manual and service workers) – according to the EGP class schema (Erikson & Goldthorpe, 1992).[4] We also use a continuous version of the class variable (see subsection ''Determinants of the hierarchical structure of working life''), constructed on the basis of a regression (specific for each country) with wage (in percentile form) as outcome and four class category dummies (for classes I, II, IIIa, and VI, with class VII/IIIb as the reference category) as predictors. The B coefficients from these regressions are then used as values on the class scale.

Skill is measured by five variables: (a) *The respondent's education* (number of years above compulsory school); (b) *Educational requirements for the job* (number of years above compulsory school); (c) *The work experience of the respondent* (number of years of labor force participation); (d) *Initial on-the-job training* (number of months, after being employed, before being able to do the job reasonably well); (e) *Continuing on-the-job training* (opportunities to learn new things in daily work). These five indicators of various dimensions of skill are combined into an index by including them as predictors in a regression analysis (OLS) with log hourly wage as the dependent variable:

$$\log(\text{wage}) = a + bx_1 + bx_2 + bx_3 + bx_4 + bx_5 + bx_6 + bx_7 + r, \qquad (1)$$

where x_1 is the worker's work experience, x_2 is the experience squared, x_3 is the excess educational job requirements, x_4 is the matched educational job requirements, x_5 is the excess schooling, x_6 is the initial on-the-job training, x_7 is the continuing on-the-job training, a is the intercept, r is the residual error term, and b is the regression coefficients. The quadratic experience term captures the curve-linear association between experience and wage (Mincer, 1974). The terms x_3, x_4, and x_5 are based on combined information on the worker's schooling and the educational requirements of the job such that

$$R = S + XR - XS, \qquad (2)$$

where S is the worker's schooling, R is the educational job requirements, XR is the excess job requirements, and XS is the excess schooling. Thus, $x_3 = XR$, $x_4 = S–XS = R–XR$, and $x_5 = XS$. This matching equation is based on the so-called ORU model (Over, Required, Under) developed by Duncan and Hoffman (1981), which is a highly robust specification for estimating the associations between schooling, educational job requirements, and job rewards (such as earnings); see Rubb (2003) for an overview of a large number of empirical studies.

We have performed separate regression analyses based on Eq. (1) for each of the 11 countries. The index values are the predicted values from these wage regressions. Hence, the relative weights of the five components are determined by their respective regression coefficients (i.e., b in Eq. (1)). The wage variable is consequently used in order to provide weights for the five variables that form the skill index, but wage is not a part of the index. Further analyses show that it is of no substantial importance which stratification variable that is used as the outcome for this weighting procedure; if, for example, occupational prestige is used instead of wage, the index values become very similar. Finally, the index values are rescaled

into wage rank (percentile) units by an additional regression (wage rank regressed on skill).

Authority is measured with an indicator of the number of persons who the respondent is supervising. Logarithmic units are used for this variable (with a constant of 1 added) so that workers with no subordinates have zero value, and individuals with supervisory responsibility are distinguished with regard to their relative (proportional rather than absolute) number of subordinates. Several different specifications of this variable have been tried, for instance, by distinguishing individuals with no subordinates as a separate category (a dummy variable), but the results across specifications are almost identical. The logged supervision variable has been rescaled to similar units as the skill variable by entering it as a predictor of wage rank (percentiles), and using the predicted values as the scale of authority.

Autonomy is measured with two indicators: (a) the degree of supervision that the respondent is subjected to and (b) the degree of freedom to decide how one's own daily work is organized. In this case as well, the variables need to be weighted in order to be combined into an index. As with skill, this has been accomplished with regression analyses, separate for each country, with (log) wage as the dependent variable and the two autonomy indicators as independent variables. The predicted values from these regressions make up the index values.

Scarcity is measured with an indicator of how difficult it would be for the employer to replace the respondent if s/he left. (For a validation of this kind of indicator, see Tåhlin, 2007.) As in the cases of skill, authority, and autonomy, the scarcity variable has been scaled by using the original scale (see Appendix A) as a predictor in a regression with wage rank (percentiles) as outcome, and using the predicted values from this regression as scale values.

In the analyses presented below, the four class criteria are used both in what is called a *gross* version based on zero-order correlations, that is, using the observed values of the variables disregarding the covariation between the criteria, and in a *net* version based on partial correlations. In the net version, the covariation among the four criteria has been empirically removed for each variable via the following four regression analyses:

$$\text{Skill} = \text{authority} + \text{autonomy} + \text{scarcity} + r_1$$
$$\text{Authority} = \text{skill} + \text{autonomy} + \text{scarcity} + r_2$$
$$\text{Autonomy} = \text{skill} + \text{authority} + \text{scarcity} + r_3$$
$$\text{Scarcity} = \text{skill} + \text{authority} + \text{autonomy} + r_4$$

where r_1, r_2, r_3, and r_4 are residuals, used as net indicators for each criterion.[5]

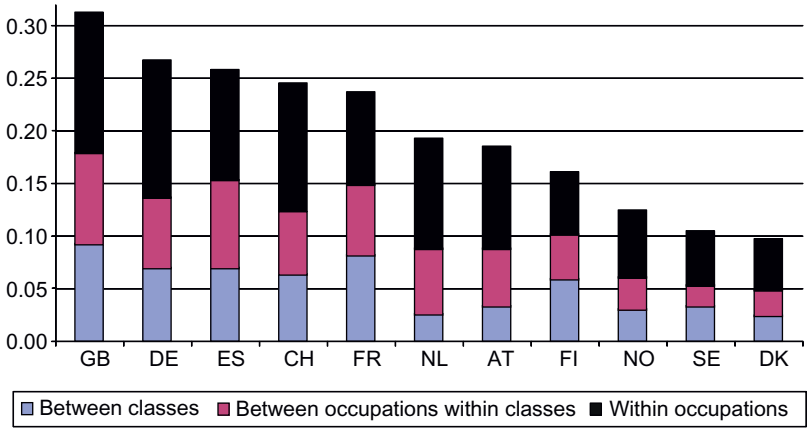
The test of which model – power or efficiency – that is the most valid explanation for inequality is based on the distinction between gross and net in the above sense. According to the power model, the association between skill and rewards is fully explained by the correlations between skill and the other three criteria. In this view, skilled jobs are not better paid because they require higher capacity, that is, are positively related to productivity, but because they are difficult to control and/or because the supply of appropriate labor is scarce. The same kind of argument goes for authority, but in this case with a difference between Wright and Goldthorpe. Wright explicitly claims that authority has a direct effect on rewards because of relations of domination within the firm, whereas Goldthorpe at least implicitly explains the connection between authority and rewards with factors related to control (monitoring difficulties) and scarcity (asset specificity).

It is important to emphasize that the empirical examination of the two models – power and control versus efficiency – is asymmetrical. We cannot directly measure efficiency or productivity but only the mechanisms that are assumed to lie behind the power and control model. Hence, the test has an indirect element: To the extent that the power and control model receives support, the efficiency model can be rejected. If, however, the power and control model is rejected, due to lack of empirical support, we cannot interpret the outcome as unequivocally supporting the efficiency model. In the latter case, the outcome is consistent with the efficiency model but without direct indicators of efficiency we cannot reach any further.

EMPIRICAL RESULTS

The Impact of Social Class and Occupation on Workers' Earnings

Figs. 1 and 2 show the results of an analysis of variance of (log) hourly wage with class and occupation dummies as independent variables. Since class for employed persons has been operationalized as categories of occupations, occupation has been specified as "nested within" the class. The total wage dispersion is divided into three components. First, wage differentials between class categories; second, wage differentials between occupations within the same class; and third, the remaining wage differentials, that is, between employees working in the same occupation. Fig. 1 shows wage differentials measured as the variance of (log) hourly wage in the



N (resp):	561	624	337	652	606	526	343	776	887	910	632
N (occ):	82	90	63	94	83	78	62	84	96	86	81

Fig. 1. Total Wage Differentials (Variance of Log Hourly Wage) Divided into Differentials between Classes, between Occupations within Classes and within Occupations among Employees in 11 European Countries.

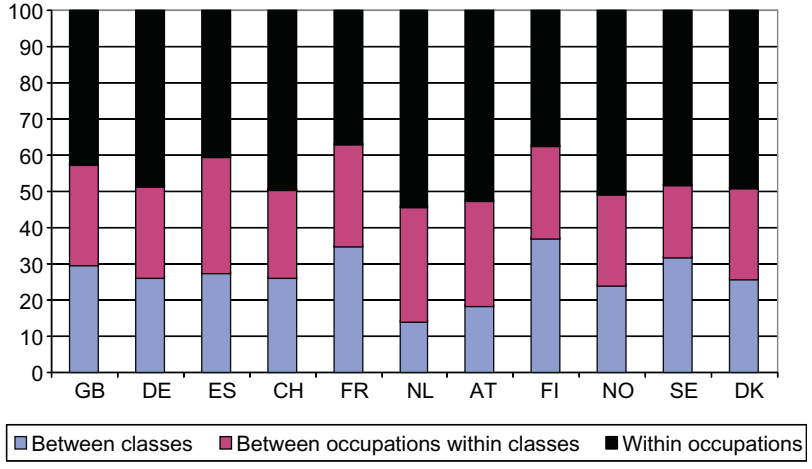


Fig. 2. Proportion Variance Explained (Percent) of Log of Hourly Wage Divided into Differentials between Classes, between Occupations Within Classes and Within Occupations Among Employees in 11 European Countries.

11 countries and Fig. 2 shows the shares of total wage inequality accounted for by the three components.

From Fig. 1, it can be seen that the total wage dispersion as measured by the variance of (log) hourly earnings differs strongly across these 11 European countries – from around 0.10 in Denmark and Sweden to more than 0.30, around three times more, in Great Britain. It is worth noticing that wage inequality between persons with the same occupation is larger in Great Britain than the total wage inequality among all workers in Denmark and Sweden. Wage inequality is also relatively large in Germany, Switzerland, Spain, and France, ranging from 0.24 to 0.27. Between these extreme groups are Norway, Finland, the Netherlands, and Austria with a more moderate wage dispersion ranging from 0.13 to 0.19.

Fig. 2 shows that class and occupation taken together explain a very large part of the total wage dispersion in most of the countries. R^2 – the proportion of variance explained by class position and occupation – varies from 46 percent in the Netherlands to 63 percent in Finland and France. Class alone (see the lower part of the bars) explains between 24 and 29 percent of the wage differentials in most of the countries. Exceptions to this are, on one side, the Netherlands and Austria with only 14 and 18 percent, respectively, and, on the other side, Finland, France, and Sweden where class explains between 32 and 37 percent of the total wage variance. We have no explanation for the low explanatory power of class in the Netherlands and Austria other than perhaps measurement errors in the class variable.

The occupation of the employee explains a considerable share of wage inequality, in addition to wage differences across classes. In most countries, wage differentials between occupations within classes explain between 24 and 29 percent of the total wage inequality. Exceptions are Sweden with only around 20 percent, and, on the other side, the Netherlands and Spain with about 32 percent.

The third and last component in the variance analysis is the wage differences that cannot be explained by class and occupation, that is, wage differentials among employees active in the same occupation. According to our results, these wage differences constitute around half of the total wage dispersion. Finland and France are exceptions, where this type of wage inequality is relatively small – about 37 percent. These conclusions must, however, be taken with caution, since it is reasonable to believe that there are measurement errors in both the dependent and the independent variables that vary among countries. The implication is that the within-occupational wage inequality in reality is smaller and the inequality between classes and occupations is larger than what these results show.

To sum up the results so far, Figs. 1 and 2 show that the 11 European countries differ strongly in terms of the size of the wage differentials between classes and occupations. These country differences are largely due to the fact that the size of the *total* wage dispersion is very different among countries. By contrast, in regard to the *relative* class and occupational differences (i.e., the proportion that class and occupation explain of the total variation in wages), the patterns are quite similar across countries. If we were to make the intellectual experiment that all countries had the same total wage dispersion, then we would find that the differences between countries regarding wage inequality by class and occupation are relatively small.

These conclusions are visualized in linear form in Figs. 3 and 4. Fig. 3 shows the large differences across countries in absolute wage dispersion, both in total variance (the solid line) and in variance between classes (the dashed line). There is a very strong, in fact almost perfect, correlation between these two lines: class variance in wages is thus a strictly increasing function of total wage variance (or *vice versa*). In sharp contrast, Fig. 4 shows the relation between cross-national differences in total wage variance (the same line as in Fig. 3) and the proportion of this variance that is explained by class (i.e., the squared correlation between class and wages). These two lines are almost perfectly *un*correlated. The reason is that the correlation between class and wages is essentially an international constant. In other words, while the unstandardized class-wage association closely follows the amount of total wage dispersion, the standardized class-wage

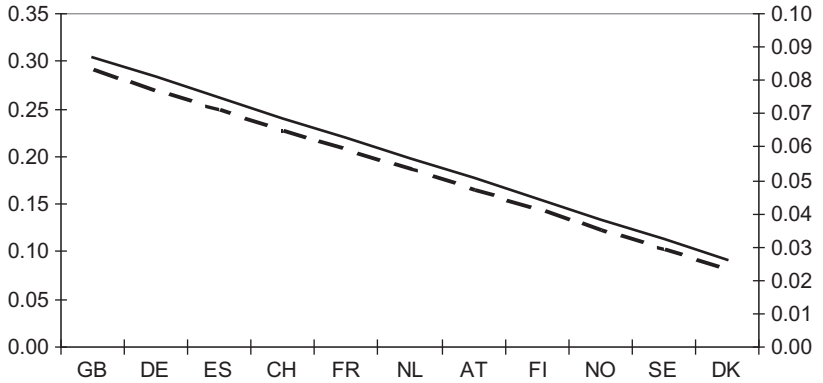


Fig. 3. Variance of Log Hourly Wage (Linear Version of Fig. 1). Total Variance (Solid Line, Left Scale) and Class Variance (Dashed Line, Right Scale), by Country.

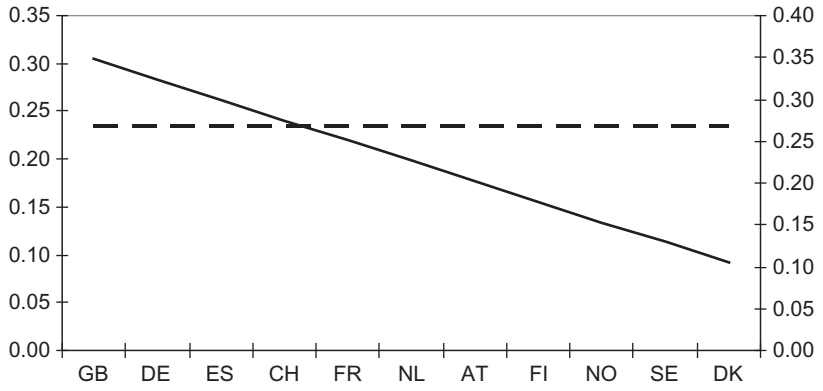


Fig. 4. Variance of Log Hourly Wage (Linear Version of Fig. 2). Total Variance (Solid Line, Left Scale) and Proportion Variance Explained (R^2) by Class (Dashed Line, Right Scale), by Country.

association is close to being completely unrelated to the amount of total wage dispersion. We interpret this clear pattern of empirical regularities as strongly indicating that macro-level factors – such as institutions, which differ greatly across countries – are powerful determinants of the *degree* of class inequality, but that micro-level factors – such as occupational variations in work tasks and requirements, which differ very little across countries – decisively shape the *character* of class inequality. It is to explain the latter that we turn in the next section, leaving explanations of the former to future work (but see, e.g., Pontusson et al., 2002, for a useful macro-level analysis).

Before then, in Figs. 5 and 6, we repeat the same type of analyses as in Figs. 1 and 2, but now with continuous occupational prestige instead of class and occupation categories as the indicator of the hierarchical order in the labor market. Fig. 5 shows wage differentials (in logarithmic units) when occupational prestige goes from low to high values in 11 eleven countries. For the sake of clarity, the prestige scale has been transformed to mean = zero for each country. Fig. 6 also shows wage differentials by occupational prestige, but now with standardized values (mean is zero and standard deviation is one) for both variables. Thus, the difference between Figs. 5 and 6 is that the former shows the observed wage differentials by prestige, whereas the latter shows the country differences that remain when wage and prestige are measured with the same units (standard deviations) in all countries. In other words, Fig. 6 indicates how large the international

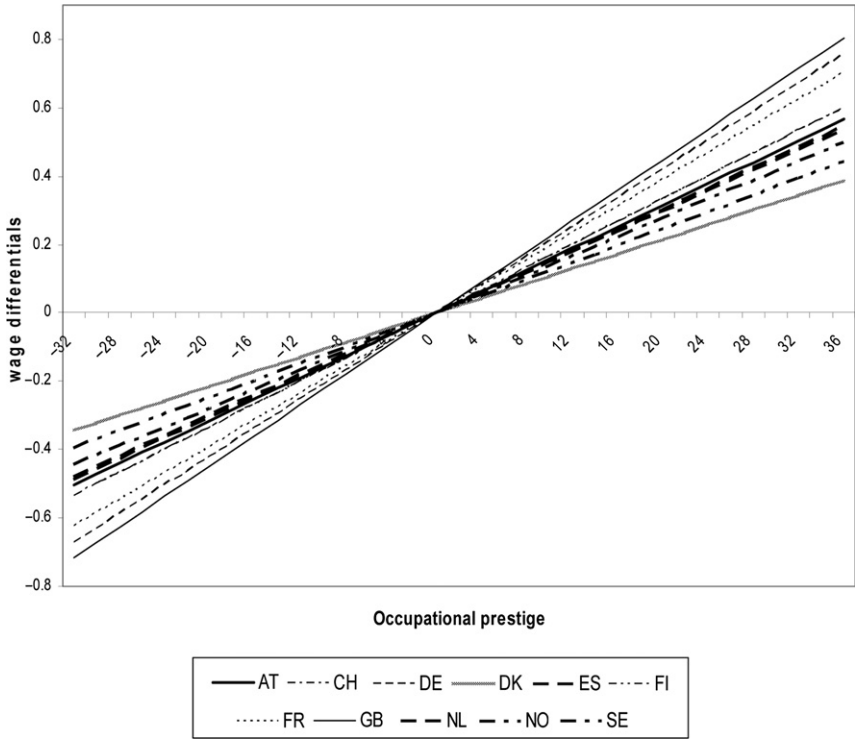


Fig. 5. Wage Differentials by Occupational Prestige in 11 European Countries. Log Hourly Wage, Mean = 0.

variation in wage inequality by prestige would be if the distribution of wages and prestige were the same in all countries.

As expected, the "fan" is more spread out in Fig. 5 than in Fig. 6; in other words, the country variation is much smaller in the standardized case (Fig. 6). In addition, it is likely that the remaining (poststandardization) country variance is even smaller than indicated here, since measurement errors (especially in the wage variable) ought to result in larger country differences than would be the case if the variables were measured more precisely.

To sum up, there are two main results of the analyses in this section. First, the hierarchical order among occupations and classes with regard to earnings is very similar in the countries we examine. This result supports the well-known finding of Treiman (1977) that prestige ratings of occupations show very little international variability, and indicates that the basic

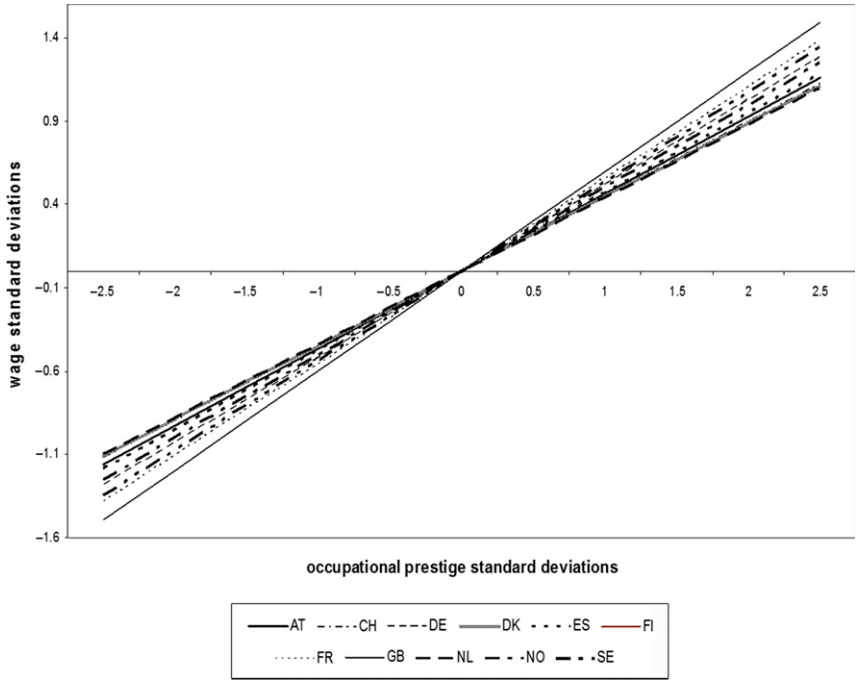


Fig. 6. Wage Differentials by Occupational Prestige in 11 European Countries: Standardized Values (Mean = 0, Standard Deviation = 1).

principles of the division of labor are the same in all modern industrialized countries with common mechanisms accounting for reward differences across positions. Second, given the invariant rank order of positions, the economic distance between ranks differs greatly across countries. As pointed out above, a plausible explanation for these international differences is cross-national variation in institutional traits, such as the prevalence and scope of collective bargaining, labor market legislation, and so on. However, further analysis of this macro-level issue is beyond the scope of the present paper.

Determinants of the Hierarchical Structure of Working Life

We now proceed to analyzing the covariation between the hierarchical structure of working life and the job characteristics that can be assumed to

be tied to this hierarchy. On the basis of the earlier discussion, the analysis contains three hierarchical indicators – class, prestige, and wages – and four hierarchical criteria – skill, authority, autonomy, and scarcity. The causal order between these seven variables is complex; a full model of their interrelations appears difficult to specify. However, it seems reasonable to view skill, authority, autonomy, and scarcity on the one hand and class, prestige, and wages on the other as two causally ordered categories of variables, with the former category as determinants and the latter as outcomes. A possible method in this case – in which we thus want to analyze several outcomes and determinants simultaneously – is to simply estimate correlations between the seven variables, a procedure which makes it easier than in a regression framework to treat the variables group-wise. We have chosen to follow this route by using factor analysis, in order to examine whether the pattern of correlations can be reduced to a smaller number of underlying dimensions. It should be stressed, however, that the main results presented below do not depend on the particular method used. Conventional regression analyses show the same overall picture, but in a less compact and visually accessible way.

In the following overview of empirical results, we consistently report combined analyses for the 11 countries rather than separate analyses by country. The reason is that the results are almost identical across countries, which is a significant finding in itself. This contributes to motivating the title of the paper: the iron law of labor market inequality. It also further corroborates an important conclusion of the wage variance analyses above: that the micro-level processes related to the occupational division of labor are strongly similar across countries, which in turn leads to an internationally invariable character of class inequality.

Fig. 7 shows the first factor (principal component) in the analysis, that is, the factor that best summarizes the pattern of correlations between the seven variables (three outcomes and four determinants). Four variants of this factor are shown in the figure where we gradually (from variant 1 to 4) purify the associations between class, prestige, and wages on the one hand and skill, authority, autonomy, and scarcity on the other. (For detailed numbers and country-specific results, see Appendix B, Table B.3.) The first variant (the left-most group of bars) is based on the gross version of the four determinants; that is, they overlap each other so that the correlation between authority and wages, for example, partly reflects that both authority and wages are associated with skill, and so on. Further, this variant is based on the unrotated factor solution, that is, the raw (unadjusted) outcome of the analysis.[6] This first variant is thus the simplest, least polished solution.

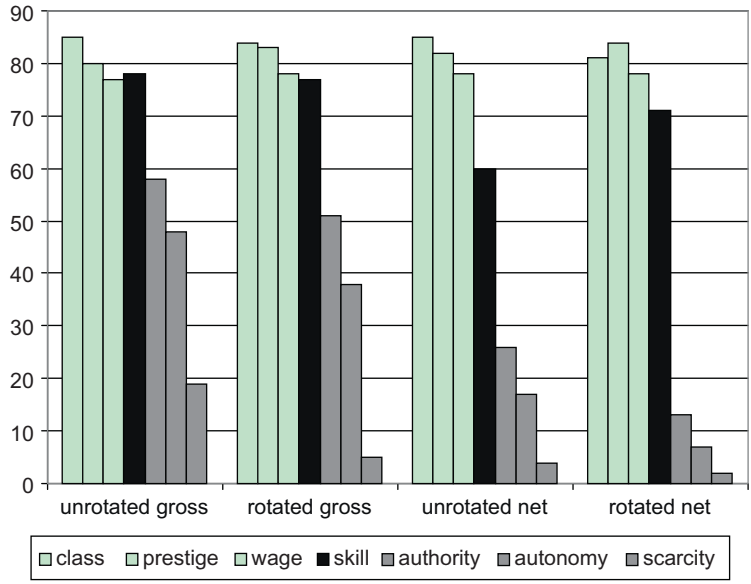


Fig. 7. Factor Analyses of Three Hierarchical Outcomes and Four Hierarchical Determinants among Employees in 11 European Countries. Factor Loadings × 100. *Notes*: All factors are extracted as principal components, rotated by varimax, and common for all 11 countries. Loadings are unweighted averages across countries.

It is evident, first, that class, prestige, and wages are closely connected to each other in a common dimension of rewards. Second, three of the determinants – skill, authority, and autonomy – are relatively strongly tied to the primary reward factor, while the fourth determinant – scarcity – appears to be out of place. Third, skill is apparently the determinant that is most closely connected to the primary factor, but the difference relative to authority and autonomy is rather moderate in size.

The second variant (the second group of bars from the left) shows the first factor in a rotated solution, but still based on the gross version (zero-order correlations) of the four determinants. The difference in outcome relative to the first (unrotated) variant is small, but indicates that the relative importance of skill (compared to the other determinants) grows when the pattern of correlations is purified.

The third variant (the third group of bars from the left) implies a larger change. Here, we show an unrotated solution based on the *net* version of the four determinants; that is, the empirical overlap (covariation) between skill,

authority, autonomy, and scarcity has been eliminated from the analysis by estimating partial correlations. As expected, the loadings of all four determinants are thereby somewhat reduced, since none of them can free-ride on the others. But this loss in loading is clearly smaller for skill than for authority and autonomy (while the loading of scarcity was already low). The interpretation of this result is obvious: the correlation between skill and the three hierarchical outcomes (class, prestige, and wages) to a relatively *small* extent reflects that both skill and rewards covary with authority and autonomy, while the correlation between authority (or autonomy) and the three outcomes to a relatively *large* extent reflects that both authority (or autonomy) and rewards covary with skill. In other words, authority and autonomy appear to be secondary hierarchical determinants, while skill seems to be the primary determinant. This result is the opposite from what would be expected on the basis of Goldthorpe's as well as Wright's class theories, but is clearly compatible with theoretical models based on efficiency and productive capacity (rather than power and control) as mediating mechanism between skills and rewards.

In the fourth variant (the right-most group of bars in Fig. 7), the rotated solution of the analysis based on the net version (partial correlations) of the four hierarchical determinants is shown. The previous conclusion is reinforced: when the analysis is purified, the relative weights of the four determinants are polarized, so that the large importance of skill for work life rewards, and the relatively limited importance of authority, autonomy, and scarcity becomes even more evident.

Fig. 8 shows a four-factor solution of the last (right-most) analysis in Fig. 7, that is, the rotated factors based on net (partial) associations among the determinants. (For detailed numbers and country-specific results, see Appendix B, Table B.4.) The four factors in Fig. 8 are dominated by one hierarchical determinant each – skill, authority, autonomy, and scarcity, respectively – and the bars in the figure indicate the loadings of class, prestige, and wages on these four factors. In other words, each determinant loads strongly on one factor but only weakly on the three others. (These loadings are not shown in the figure; see Table B.4 for full results.) The group of three bars to the left (skill) is identical to the first three bars in the right-most group in Fig. 7, and shows (to repeat) that skill is closely connected to all three hierarchical outcomes (class, prestige, and wages). These bars are shown here again in order to give a reference point for the three other groups of bars in Fig. 8. From the second group of three bars, it is evident that class and authority are associated to some, but clearly limited, extent. Aside from this, association, authority, as well as autonomy and

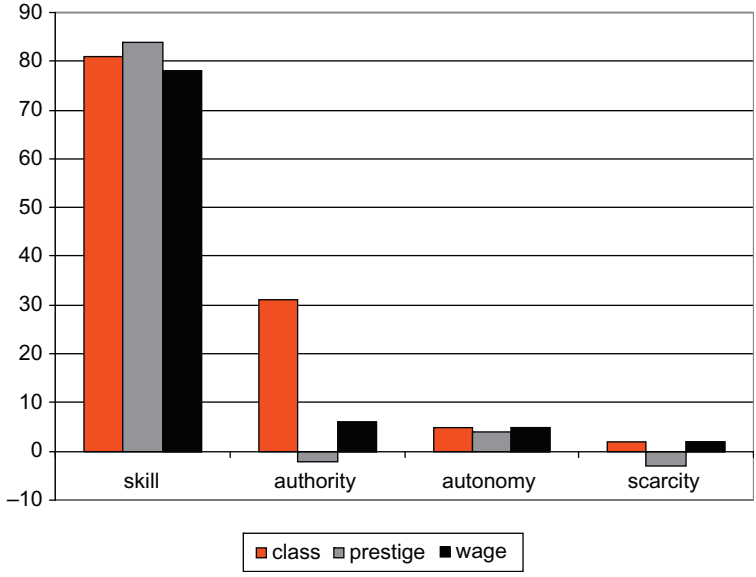


Fig. 8. Factor Analysis of Three Hierarchical Outcomes (Class, Prestige, and Wages) and Four Hierarchical Determinants among Employees in 11 European Countries. Factor Loadings × 100. *Notes*: All Factors Are Extracted as Principal Components, Rotated by Varimax, and Common for All 11 Countries. Loadings Are Unweighted Averages Across Countries.

scarcity (see the third and fourth group of bars) are – in their net versions – almost completely disconnected from the hierarchical structure of the labor market. In other words, while class, prestige, and wages all load strongly on the skill factor, they hardly load at all on the three factors associated with authority, autonomy, and scarcity, respectively. The associations between the three latter determinants and the three hierarchical outcomes are apparently spurious, driven by their correlations with skill. Holding skill constant in the analysis (by estimating partial correlations) essentially breaks the links between authority, autonomy, and scarcity on the one hand and class, prestige, and wages on the other. Once the skill story is told, there is not much more to say about labor market inequality.

In Fig. 9, we give a more detailed picture of how class is tied to the four determinants by dissolving the continuous form of the class variable into five class categories. (For detailed numbers and country-specific results, see Appendix B, Table B.5). The four factors reported are in all other respects

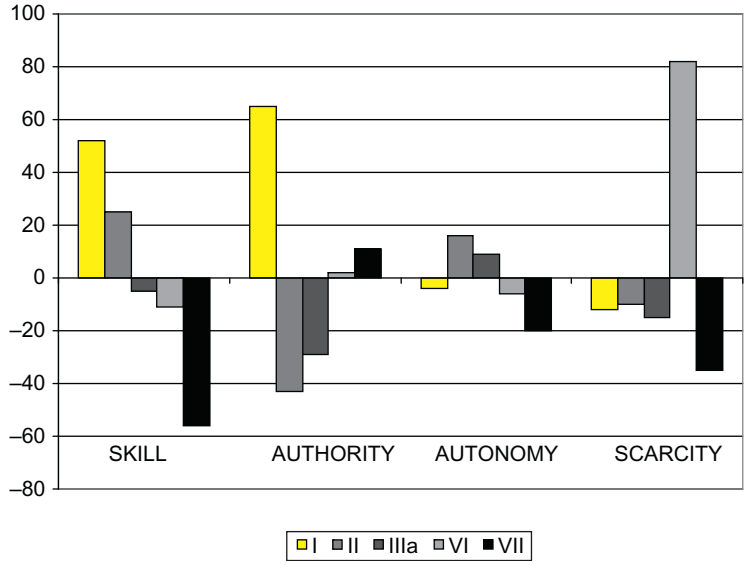


Fig. 9. Factor Analysis of the Relation between Five Class Categories and Four Hierarchical Determinants among Employees in 11 European countries. Factor Loadings × 100. *Notes*: All factors are extracted as principal components and rotated by varimax. Factor 1 (skill) and Factor 2 (authority) are common for all 11 countries, Factor 3 (autonomy) is common for 10 countries (Spain is excluded), and Factor 4 (scarcity) is common for 6 countries (Germany, France, Great Britain, Finland, Norway, and Sweden) with 5 countries excluded (Austria, Switzerland, Denmark, Spain, and the Netherlands). Loadings are unweighted averages across all included countries.

the same as in Fig. 8. We can see that skill is the only determinant that has a clearly hierarchical relation to class, that is, that service class I has the highest value (loading) on the factor and that unskilled workers have the lowest value, while the three other categories are placed in between. Authority identifies the top class (service class I) but aside from this tends to be inversely hierarchical (net of the skill factor). Autonomy is conspicuously weakly tied to class, but has – with the important exception of service class I – a weak hierarchical form across class categories. Scarcity, finally, has a completely deviant shape, with skilled manual workers in a clear top position and unskilled workers at the other end, with all three white-collar categories below zero, that is, with a negative association to the factor.[7]

An important reason for the high position of skilled workers on the scarcity factor is, we believe, that their skills to a relatively large extent are developed on the job rather than in school, which is the converse situation relative to high-level white-collar employees. (Due to lack of space, we do not show these results in detail here.) It is therefore reasonable to assume that skilled workers are comparatively difficult for the employer to replace, more difficult than service class employees. We think the reason is that school-based education is typically more standardized, that is, creates skills of a more general kind, and is therefore more replaceable than work-based training is. This is a completely different picture than the one expected from Goldthorpe's or Wright's class theories, according to which high-level white-collar employees are the most difficult to replace for the employer, either because they have a large amount of firm-specific skills (Goldthorpe's favored mechanism) or a large amount of permanently scarce occupational skills (Wright's favored mechanism).

CONCLUSIONS

The *Communist Manifesto* appeared in a time of social and political upheaval across Europe. Similarly, the class models examined above, which still dominate sociological thinking on inequality, were conceived in a politically and culturally turbulent period. During this time – the late 1960s and early 1970s – functionalist perspectives in the Parsonsian vein gave way to theoretical models with an emphasis on power, control, and conflict rather than on efficiency and social equilibrium.[8] We think that a crucial mistake made by the class theorists of that era, which through path dependency still heavily affects research on inequality, was to use factors related to macro-level social conflict as explanatory mechanisms in the analysis of micro-level stratification processes.

Power-related factors, important as they obviously are at the macro level, do not explain the structure of micro-level labor market inequality. This is true whether we measure inequality by class, occupational prestige, or wage differentials. Instead, efficiency-related factors are the fundamental driving forces behind the hierarchical order of positions in the labor market, at least in modern capitalist societies. Employers' efficiency requirements and workers' productive resources – not employers' control strategies and workers' closure strategies – determine the rank order of positions in working life. This is the picture painted by our findings, a picture that is remarkably similar in all the European countries we have examined despite

the considerable institutional variation between them. The strength of the associations involved and their low degree of international variability justify the label "the iron law of labor market inequality." Hernes and Knudsen (1991) use the expression "the iron law of inequality" to describe the similarity in stratification patterns between socialist Lithuania and capitalist Norway. More generally, our results echo the strong stability in prestige ratings by occupation across time and space (Treiman, 1977). Our contribution here is to expand Treiman's generalization by (a) bringing class and wages into the analysis and (b) testing the theoretical mechanisms involved.

However, we are not claiming that power relations in the labor market are nonexistent or unimportant. First, as our results have shown, there are large international differences in the degree of earnings inequality across positions in the otherwise invariant hierarchical order. If non-European countries were included in our comparison, these cross-country differences in inequality would surely be even more apparent. Such macro-level effects can, in our view, be explained by collective action in distributional struggles over (temporarily) finite resources and rewards. But such macro-level mechanisms need to be analytically distinguished from the division and performance of labor that bring those resources about. Power is a crucial aspect of the former kind of process, but not – according to our results – of the latter.

Second, our aim has been to explain why positions are differentially rewarded, that is, to understand the nature of the hierarchical order of positions within the division of labor in society. Thus, our analyses do not concern the allocation of individuals to these positions. While skilled workers are typically allocated to skilled jobs, the matching process is far from perfect. A large amount of empirical research testifies to the importance of ethnic, gender, and racial discrimination – as well as of factors like class background, social capital, and homo-social reproduction – in the allocation of workers with equal productive characteristics to unequal positions in the educational system and in the labor market. Moreover, inequality of opportunity in early phases of school and work careers – due to discrimination, social capital, homo-social reproduction, and so on – will have long-term effects. There are vicious and virtuous circles in regard to skill formation: skills beget skills. Children of well-educated parents attain relatively high levels of schooling; in turn, this increases their chances of acquiring jobs with relatively large opportunities for on-the-job training. Such processes of cumulative advantage pull the skill distribution apart, with far-reaching consequences for social inequality, but have not been of concern to us here.

Within the scope of our chosen task – explaining the variation in rewards between positions held by employees in the labor market – a number of objections may, of course, be raised against our analyses and findings. To begin with, the methods we use (analysis of variance and factor analysis) are useful instruments for analyzing the total amount of inequality among employees, but not for examining the large reward gaps that may obtain between numerically small categories and the large majority of workers. If, for example, a small group of top-level managers receive very large economic rewards, and have very large amounts of power and authority, compared to other employees, this will only have a marginal impact on inequality estimates based on analyses of variance precisely because the elite category contains such a small share of all individuals. We realize that this objection may be warranted, but our goal here has been to explain the general structure of inequality among all employees rather than the reward gaps at extreme points of the distribution.

A possible objection to the results of the factor analyses is that the measures of autonomy and scarcity, and to some degree authority, are weaker than the measure of skill, and that this difference in measurement quality across indicators may bias the results in favor of finding relatively strong skill effects. We have several answers to this kind of argument: (a) If skill is easier to measure accurately than autonomy and scarcity are, one important reason may be that skill is in fact a more salient and fundamental aspect of work content and work situation than are the others. (b) Even if measurement error should weaken the observed impact of authority, autonomy, and scarcity, relative to the impact of skill, why should the *shape* of the impact be affected? In other words, the hierarchical class *order* should still come through, despite the attenuated *magnitude*; however, all dimensions except skill conspicuously fail to meet the rank-order test. (c) The results are highly similar across all 11 countries, despite probable cross-national differences in the degree of measurement error. (d) A result not shown here (available upon request) is that a strongly simplified skill measure (years of education required in the job) is sufficient to reach results that are very similar to those found when using the more elaborate skill measure; in this sense (as in many others), our findings are robust. (e) Finally, a good theory must be falsifiable; if all negative empirical results are rejected with reference to measurement error, the theory does not fulfill the falsifiability condition (at least not in practice).

An additional objection concerns the type of explanation used. The sociological version of the efficiency model typically assumes that social hierarchies emerge out of functional necessity. Such explanatory accounts

are obviously very problematic if feedback mechanisms, based on individuals' actions, are not specified. In this regard, sociological functionalism is often vague and hence theoretically weak. Functional explanation in sociology is therefore nowadays seen as flawed, almost by definition. In contrast, functional explanation in economics is much clearer when it comes to specifying how labor market inequality emerges and is maintained. The point of departure is the neoclassical axiom of perfect competition in markets under capitalism, that is, that firms and other organizations exposed to competition are forced to seek and adopt efficient ways of carrying out their tasks in order to survive. Competition is the mechanism that explains why most work organizations operate efficiently: those who do not have been killed (or marginalized) by the market success of those who do. In this way, we can understand why a certain division of labor is created and reinforced, and why "more productive" workers receive larger rewards than the "less productive." While employers are obviously not always completely rational profit maximizers, it is reasonable to assume that markets in capitalist societies provide enough economic incentives for most work organizations to achieve at least moderate levels of efficiency. Even such a weak assumption of market efficiency would, in our view, appear sufficient to justify our theoretical interpretation of the empirical findings above.

Class is a crucial concept in research on inequality, and will continue to illuminate efforts at explaining the distribution of labor market rewards, as well as other important social outcomes. Our findings strongly support the view that class – as conventionally operationalized – plays a central role in accounting for social and economic inequality. But the mechanisms involved at the micro level seem to be very different from the ones emphasized in current theoretical models. The main conclusion of the present article is that efficiency mechanisms are much more important than power mechanisms in determining the rank order of positions in the labor market. This conclusion is well corroborated, we believe, both conceptually and empirically.

Our findings are devastating for currently dominant sociological perspectives on inequality. The negative empirical results for standard class theory cannot be brushed aside as minor anomalies, since they go straight to the heart of the whole class theoretical enterprise. The major postulated mechanisms assumed to explain class inequality are apparently very weak, if at all operative. Consequently, research on class and stratification needs to be fundamentally reoriented in the years ahead. Employers' efficiency requirements and workers' productive skills must be placed at center stage theoretically, rather than pushed to the sidelines of explanatory accounts.

Sociologists tend to dislike concepts like efficiency and productivity, partly because explanations based on them are seen as legitimating inequality, but such ideological concerns should not stand in the way of analytical progress. Avoiding serious theoretical and empirical consideration of potentially central causes of inequality does little service to anyone, least of all to the disadvantaged groups of society that supposedly are the ultimate beneficiaries of sound research on class and stratification. Theory, policy, and social change are closely connected: If we do not understand how the world works, how can we contribute effectively to improving it?

ACKNOWLEDGMENTS

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NOTES

1. In his early work on class and income determination, Wright (1979) grants that efficiency is an important mechanism for income determination *within the working class*. His argument is close to that of human capital theory. "Skills cost something to produce and maintain and unless the wages of skilled workers more or less cover these costs, the skill will cease to be produced" (*ibid.*: 81–83). However, income differences *between* classes (including "classes" of employees) are seen as power driven.

2. In recent formulations, Wright (see, e.g., Wright, 2009) calls this kind of mechanism opportunity hoarding with reference to Tilly (1999).

3. Productivity is neither a pure individual trait nor a pure job trait, but depends on the match between individuals and jobs. For example, the productive utility of education (an individual trait) depends on the complexity of to-be-carried-out tasks (a job trait), and vice versa. The link between productivity and matching is reflected in our measure of skill; see below.

4. It is sometimes believed that occupation and skill are necessarily linked, since occupations are partly defined with reference to required education and/or training. For example, the ISCO classification at the one-digit level is explicitly (though not entirely) based on considerations of occupational skill requirements. But

occupational categories reflect a wide range of different characteristics inherent in the job tasks, working conditions, employment relations, and other properties of the positions concerned. Class schemas, even when operationally based on occupational categories, typically avoid – indeed resist – class definitions with reference to skill, in preference of other criteria.

5. In addition, we distinguish a fifth variable on the basis of this set of regressions: a measure of the common (overlapping) variance among the four class criteria. This variable, labeled "common" in Appendix B (Tables B.1, B.3, B.4, and B.5), is included in the analyses below wherever we use the net indicators.

6. In factor analysis, unrotated factors are estimated in a first step, with the goal of maximizing the proportion explained variance in the underlying data (the input variables). In order to ease interpretation of the factor pattern, the initial factors can then be moved ("rotated") in the data space according to some criterion. The most common rotation criterion ("varimax"), which is also the one we use here, is to maximize the variance in loadings (factor-variable associations) within factors, subject to the constraint that the factors be uncorrelated with each other.

7. The reported loadings for the third factor (autonomy) are based on results for all countries except Spain, which shows a slightly deviant pattern. The fourth factor (scarcity) is relatively heterogeneous across countries. The reported loadings in this case are based on the results for six countries. In addition to Spain (as in the third factor), Austria, Switzerland, Denmark, and the Netherlands are excluded from the reported averages here. However, none of the deviant country cases provides any support for the hypotheses derived from either Goldthorpe's or Wright's class theory. (See Appendix B, Table B.5, for country-specific detailed results.)

8. An illustrative case in point is Goldthorpe's transformation of his scale of social standing (Hope & Goldthorpe, 1974) to the first version of his class schema (Goldthorpe & Llewellyn, 1977). One crucial factor involved in this conceptual shift appears to have been Goldthorpe's perception of worker strikes, economic recession, and other macro-level events at the time (Marshall, 1990, p. 56).

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APPENDIX A: VARIABLE OPERATIONALIZATIONS

(Variable numbers from ESS 2004, code book)

Wage is measured with three questions: G91 ''What is your usual gross pay before deductions for tax and insurance?'' [To be recorded in country's own currency and later converted into Euros.] G93 ''How long a period does that pay cover?'' The variable categories are one hour, one day, one week, two weeks, four weeks, calendar month, and year. F21 ''Regardless of your basic or contracted hours, how many hours do you normally work a week (in your main job), including any paid or unpaid overtime.''

Occupation is operationalized as ISCO-88.

Class (employees only) consists of five occupational categories – service class I, service class II, routine nonmanual workers (IIIa), skilled manual workers (VI), and unskilled manual and service workers (VII, IIIb) – according to the EGP class scheme (Erikson & Goldthorpe, 1992). A continuous version of the class variable (see subsection ''Determinants of the hierarchical structure of working life'') is constructed on the basis of a regression (specific for each country) with wage (in percentile form) as outcome and four class category dummies (for classes I, II, IIIa, and VI, with class VII/IIIb as the reference category) as predictors. The *B* coefficients from these regressions are then used as values on the class scale.

Education (number of years above compulsory school). F7 ''How many years of full-time education have you completed?'' The length of compulsory school is subtracted from this number of years, separately for each country and year of birth, in order to calculate the number of years of schooling beyond compulsory school.

Educational requirements for the job (number of years above compulsory school). G61 ''If someone was applying nowadays for the job you do now, would they need any education or vocational schooling beyond compulsory education?'' If yes: G62 ''About how many years of education or vocational schooling beyond compulsory education would they need?'' The answers are grouped into eight categories, from 1 (less than 1 year) to 8 (10 years or more).

Work experience (number of years): G118 ''In total, how many years have you been in paid work?''

Initial on-the-job training (number of months in current job before being able to do the job reasonably well). G63 ''If somebody with the right education and qualifications replaced you in your job, how long would it take for them to learn to do the job reasonably well?'' The answers are

grouped into eight categories, from 1 (one day or less) to 8 (more than five years).

Continuing on-the-job training (opportunities to learn new things in daily work). ''Please tell me how true the following statement is about your current job: My job requires that I keep learning new things,'' measured with a scale ranging from 1 (''Not at all true'') to 4 (''Very true'').

Authority is measured with an indicator of the number of persons who the respondent is supervising. F16 ''In your main job, do you have any responsibility for supervising the work of other employees?'' If yes: F17 ''How many people are you responsible for?'' Logarithmic units of the number of subordinates +1 are used for this variable.

The degree of supervision that the respondent is subjected to: G78 ''My work is closely supervised,'' inversely coded to reflect freedom from control; the answers range from 1 (''Strongly agree'') to 5 (''Strongly disagree'').

The degree of freedom to decide how one's own daily work is organized. F18 ''Please say how much the management at your work allows you to decide how your own daily work is organized''; the answers range from 0 (''I have no influence'') to 10 (''I have complete control'').

Scarcity. G80 ''In your opinion, how difficult or easy would it be for your employer to replace you if you left?'' The answers range from 0 (''Extremely difficult'') to 10 (''Extremely easy'').

APPENDIX B: DESCRIPTIVE AND SUPPLEMENTARY STATISTICS

Tables B.1–B.5.

Table B.1. Means (Upper Row) and Standard Deviations (Lower Row) of All Variables Used, by Country (*N* Based on List-Wise Deletion of Cases with Missing Data).

	AT	CH	DE	DK	ES	FI	FR	GB	NL	NO	SE	AVG	SD
Class	49.4	50.4	52.3	50.9	49.3	50.4	50.1	50.4	48.4	49.9	50.2	50.2	1.0
	12.7	16.2	15.4	14.7	15.0	17.0	18.2	15.8	10.7	15.4	16.6	15.3	2.1
Prestige	42.6	45.4	43.9	46.0	40.8	43.7	43.6	42.7	47.5	43.2	43.0	43.9	1.8
	12.6	12.3	12.5	12.8	15.8	14.2	13.5	14.8	12.0	12.8	14.2	13.4	1.2
Wage (log)	2.48	3.05	2.58	3.06	2.01	2.58	2.40	2.59	2.73	2.98	2.69	2.65	0.31
	0.42	0.46	0.51	0.31	0.51	0.40	0.48	0.55	0.42	0.35	0.32	0.43	0.08
Wage (percentile)	49.3	50.5	50.6	50.5	48.4	50.2	50.4	50.3	50.3	50.4	50.8	50.1	0.7
	28.8	28.7	28.9	28.8	28.6	28.9	28.6	29.0	28.8	28.9	28.7	28.8	0.1
Skill	49.4	50.1	52.8	51.0	49.1	50.9	50.0	51.0	49.2	50.3	50.4	50.4	1.0
	16.1	17.4	17.9	15.7	18.3	17.5	18.6	19.5	16.4	17.0	17.1	17.4	1.1
Authority	49.4	50.0	52.2	50.5	49.1	50.5	50.1	50.5	48.5	49.8	50.0	50.0	0.9
	9.4	10.4	11.5	8.2	10.2	11.4	11.4	11.7	8.8	9.7	9.2	10.2	1.2
Autonomy	49.6	50.1	51.4	50.7	50.1	50.8	50.2	50.6	48.2	50.0	50.0	50.2	0.8
	10.1	9.3	11.2	6.6	7.9	7.1	8.1	9.8	6.7	6.4	7.3	8.2	1.6
Scarcity	49.3	50.1	52.1	50.8	50.3	50.8	50.1	50.4	48.4	50.0	50.1	50.2	0.9
	2.1	2.6	3.9	1.0	0.5	1.7	0.2	4.9	1.8	4.4	5.0	2.6	1.8
Skill net	0.7	−0.3	0.6	0.1	−0.1	0.0	−0.3	0.3	0.6	0.0	−0.1	0.1	0.4
	14.8	16.1	15.6	14.3	16.8	15.8	16.7	17.6	15.5	15.7	16.1	15.9	0.9
Authority net	0.1	0.1	0.1	−0.1	−0.3	−0.2	0.0	0.0	0.0	−0.1	0.1	0.0	0.1
	8.6	9.9	10.4	7.7	9.5	10.7	10.4	10.7	8.3	9.0	8.9	9.5	1.0
Autonomy net	0.0	0.2	−0.7	0.0	0.1	0.0	0.1	0.1	−0.1	0.0	0.0	0.0	0.2
	9.3	8.8	9.9	6.1	7.5	6.6	7.7	9.3	6.4	6.1	7.0	7.7	1.4

Scarcity net	0.0	−0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	2.0	2.5	3.8	1.0	0.5	1.6	0.2	4.8	1.8	4.4	4.9	2.5	1.7
Common	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Class I	0.13	0.18	0.17	0.22	0.17	0.20	0.19	0.22	0.28	0.20	0.19	0.20	0.04
Class II	0.31	0.35	0.28	0.33	0.25	0.23	0.32	0.27	0.37	0.28	0.28	0.30	0.04
Class IIIa	0.32	0.19	0.20	0.11	0.14	0.19	0.18	0.18	0.13	0.19	0.14	0.18	0.05
Class VI	0.11	0.16	0.22	0.11	0.11	0.13	0.12	0.11	0.10	0.14	0.13	0.13	0.03
Class VII/IIIb	0.13	0.12	0.14	0.23	0.32	0.25	0.18	0.21	0.11	0.20	0.25	0.19	0.07
N	284	625	588	590	287	749	579	532	502	868	861	588	193

Class I, high-level white-collar employees; class II, middle-level white-collar employees; class IIIa, routine nonmanual employees; class VI, skilled manual workers; class VII/IIIb, unskilled manual and service workers.

Table B.2. Wages (Log and Percentile) and Prestige by Class, by Country.

Wage (log)	AT	CH	DE	DK	ES	FI	FR	GB	NL	NO	SE	AVG	SD
Class I	76	101	108	56	96	89	110	117	57	62	62	85	23
Class II	46	56	63	24	49	35	51	59	29	35	30	43	13
Class IIIa	12	18	15	7	−7	0	−3	1	−1	6	0	4	8
Class VI	3	19	14	11	27	17	18	19	15	15	9	15	6
Class VII/IIIb (ref.)	0	0	0	0	0	0	0	0	0	0	0		
Wage (percentile)	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AVG**	**SD**
Class I	72	76	78	73	75	79	78	73	61	73	76	74	5
Class II	59	58	62	55	58	58	60	59	51	59	60	58	3
Class IIIa	41	36	41	38	32	35	31	34	32	37	33	35	4
Class VI	36	40	43	45	50	47	43	43	42	46	44	44	4
Class VII/IIIb	35	27	32	33	37	34	29	34	32	30	33	32	3
Prestige	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AVG**	**SD**
Class I	56	59	60	58	63	61	59	60	56	56	60	59	2
Class II	49	49	50	51	50	52	49	48	52	48	50	50	1
Class IIIa	40	43	40	43	34	37	38	37	38	41	38	39	3
Class VI	38	38	38	37	36	37	37	35	38	36	37	37	1
Class VII/IIIb	26	28	26	31	26	30	27	27	29	30	28	28	2

Class I, high-level white-collar employees; class II, middle-level white-collar employees; class IIIa, routine nonmanual employees; class VI, skilled manual workers; class VII/IIIb, unskilled manual and service workers.

Table B.3. Factor Analyses Summarized in Fig. 7, by Country (Factor Loadings × 100).

F1 gross unrot.	AT	CH	DE	DK	ES	FI	FR	GB	NL	NO	SE	AVG	SD
Class	81	83	86	86	84	87	88	87	82	85	86	85	2
Prestige	69	78	83	79	79	86	83	85	79	79	84	80	5
Wage	76	77	77	73	78	79	81	80	72	77	79	77	3
Skill	74	73	79	80	79	81	82	78	73	81	80	78	3
Authority	57	55	64	57	55	60	61	67	56	59	44	58	6
Autonomy	54	51	59	42	45	48	48	48	45	40	44	48	5
Scarcity	32	29	30	25	3	12	19	29	−15	20	28	19	14
F1 gross rot.	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AVG**	**SD**
Class	78	82	86	88	86	86	86	87	78	85	86	84	3
Prestige	84	81	87	83	82	85	84	85	81	79	84	83	2
Wage	74	79	77	75	75	80	83	80	76	77	79	78	3
Skill	69	72	80	75	79	80	83	78	75	81	80	77	4
Authority	26	45	56	52	51	61	52	67	44	59	44	51	11
Autonomy	34	38	46	21	37	43	40	48	28	40	44	38	8
Scarcity	−7	−4	−1	0	−13	−3	−5	29	14	20	28	5	15
F1 net unrot.	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AVG**	**SD**
Class	82	83	88	85	83	86	89	86	82	84	85	85	2
Prestige	72	79	86	82	81	87	84	86	79	81	85	82	4
Wage	77	78	78	75	78	80	81	82	72	78	79	78	3
Skill	54	51	52	68	65	64	57	59	50	67	71	60	8
Authority	30	30	32	22	15	22	27	29	31	25	19	26	6
Autonomy	23	23	14	5	19	16	18	14	29	13	17	17	6
Scarcity	4	5	4	0	4	5	6	2	−6	8	7	4	4
Common	79	83	83	78	81	83	84	89	80	85	84	83	3
F1 net rot.	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AVG**	**SD**
Class	72	80	85	83	83	84	85	87	74	76	83	81	5
Prestige	79	80	87	83	82	88	86	86	81	86	87	84	3
Wage	76	79	80	74	78	80	83	82	76	77	78	78	3
Skill	76	62	61	76	74	71	69	58	74	81	80	71	8
Authority	−3	20	21	13	8	16	14	32	6	6	10	13	9
Autonomy	8	17	12	−3	4	8	10	12	1	3	5	7	6
Scarcity	−3	2	2	−3	−1	6	2	3	2	3	3	1	3
Common	53	79	79	73	71	79	76	89	55	74	78	73	11

Table B.4. Factor Analyses Summarized in Fig. 8, by Country (Factor Loadings × 100).

F1 net rot.	AT	CH	DE	DK	ES	FI	FR	GB	NL	NO	SE	AVG	SD
Class	72	80	85	83	83	84	85	85	74	76	83	81	5
Prestige	79	80	87	83	82	88	86	86	81	86	87	84	3
Wage	76	79	80	74	78	81	83	82	76	77	78	79	3
Skill	76	62	61	76	74	72	69	63	74	81	80	72	7
Authority	−3	20	21	13	8	19	14	25	6	6	10	13	8
Autonomy	8	17	12	−3	4	2	10	11	1	3	5	6	6
Scarcity	−3	2	2	−3	−1	2	2	3	2	3	3	1	2
Common	53	79	79	73	71	76	76	89	55	74	78	73	10
F2 net rot.	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AVG**	**SD**
Class	42	30	28	33	15	27	28	32	42	42	22	31	9
Prestige	−4	−4	3	−2	−12	0	−9	11	9	−7	−9	−2	7
Wage	17	0	−5	8	14	8	1	−7	0	11	16	6	8
Skill	−24	−52	−50	−47	−41	−54	−54	−65	−44	−40	−32	−46	11
Authority	97	95	95	96	99	95	97	92	96	98	98	96	2
Autonomy	−5	−7	−9	−6	−8	−5	−3	−5	−6	−7	−6	−6	2
Scarcity	−9	−6	−7	0	0	1	−7	5	1	−2	−2	−2	4
Common	59	17	18	11	33	4	43	−3	36	40	17	25	19
F3 net rot.	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AVG**	**SD**
Class	8	4	−2	−4	7	7	4	0	11	9	8	5	5
Prestige	11	8	−6	−3	11	5	5	−1	11	−2	4	4	6
Wage	14	0	5	9	−1	−2	4	6	8	5	3	5	5
Skill	−33	−46	−51	−22	−30	−30	−31	−31	−21	−21	−29	−31	10
Authority	−11	−8	−8	−7	−8	−9	−9	−13	−3	−9	−5	−8	3
Autonomy	99	97	98	99	99	99	99	99	99	100	99	99	1
Scarcity	0	−5	−11	−6	−2	−5	−2	−2	5	−3	−4	−3	4
Common	29	20	38	50	45	53	26	16	59	36	40	37	14
F4 net rot.	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AVG**	**SD**
Class	4	3	1	4	−16	7	5	−2	−2	4	0	1	6
Prestige	−3	−3	−6	0	−14	0	1	−6	5	−4	−2	−3	5
Wage	−1	−9	−2	−10	16	−1	−7	2	2	9	6	0	8
Skill	1	−12	−4	−9	15	−5	−1	−21	−12	−9	−16	−7	10
Authority	−17	−8	−8	0	1	0	−9	0	0	−4	−2	−4	6
Autonomy	1	−6	−15	−9	−4	−6	−3	−2	11	−3	−6	−4	6
Scarcity	98	99	99	99	95	100	99	100	98	100	100	99	1
Common	38	30	24	27	20	7	18	13	−29	11	23	17	18

Table B.5. Factor Analyses Summarized in Fig. 9, by Country (Factor Loadings × 100).

F1 net rot.	AT	CH	DE	DK	ES	FI	FR	GB	NL	NO	SE	AVG	SD
Class I	35	56	56	51	71	63	51	56	26	51	57	52	12
Class II	25	16	36	32	23	23	32	31	−1	22	35	25	11
Class IIIa	8	−11	−14	−2	16	−3	−7	−15	−18	4	−8	−5	10
Class VI	0	−14	−22	−10	−4	−10	−21	−7	−6	−11	−12	−11	7
Class VII/IIIb	−80	−61	−66	−77	−64	−70	−65	−71	−12	−70	−72	−64	18
Prestige	83	80	88	83	85	85	87	86	43	85	89	81	13
Wage	56	75	75	67	73	73	73	77	76	71	72	72	6
Skill	58	67	54	78	74	77	79	69	89	80	79	73	10
Authority	−16	9	16	0	2	4	−11	13	−24	−4	4	−1	12
Autonomy	13	16	17	−5	5	4	4	8	−5	0	3	5	8
Scarcity	−2	2	6	−5	3	6	13	1	2	7	5	3	5
F2 net rot.	AT	CH	DE	DK	ES	FI	FR	GB	NL	NO	SE	AVG	SD
Class I	80	48	69	76	9	64	76	74	85	64	70	65	21
Class II	−25	−5	−65	−73	−6	−37	−53	−67	−60	−12	−72	−43	27
Class IIIa	−40	−71	−10	−10	−13	−47	−24	−7	−20	−67	−6	−29	24
Class VI	1	9	8	2	25	−16	5	−7	−6	0	0	2	10
Class VII/IIIb	8	25	10	13	−9	31	7	9	−2	16	15	11	11
Prestige	15	0	7	5	−12	14	11	20	21	7	2	8	10
Wage	29	18	5	23	23	26	22	5	20	26	17	19	8
Skill	−6	−27	−26	−16	−32	−27	−24	−39	−15	−18	−17	−22	9
Authority	85	83	80	73	93	77	84	70	80	84	67	80	7
Autonomy	−1	0	−16	−9	−2	−1	4	−8	2	−1	−5	−3	6
Scarcity	−8	−5	−13	2	23	14	−8	4	−7	5	1	1	11

Table B.5. (*Continued*)

F3 net rot.	AT	CH	DE	DK	ES	FI	FR	GB	NL	NO	SE	AAVG	SD
Class I	−15	−4	−18	−3	12	−1	−9	4	5	0	−1	−4	8
Class II	19	12	23	8	13	10	30	27	−1	12	22	16	10
Class IIIa	19	−1	7	5	4	9	11	7	−4	2	6	6	6
Class VI	−8	−1	−1	−4	−25	11	3	−61	7	7	−15	−6	21
Class VII/IIIb	−30	−43	−17	−7	−8	−26	−42	5	−8	−22	−15	−21	15
Prestige	0	14	−8	0	17	4	13	11	10	−2	5	5	7
Wage	2	−4	−4	11	−8	−3	4	7	14	3	6	4	6
Skill	−50	−59	−65	−24	−36	−38	−39	−35	−17	−24	−34	−39	16
Authority	5	13	18	2	−2	4	10	4	−5	−2	10	6	7
Autonomy	89	83	87	97	94	95	86	80	95	96	94	90	6
Scarcity	1	−6	−37	−6	−24	−15	−9	7	42	−15	7	−3	20
F4 net rot.	**AT**	**CH**	**DE**	**DK**	**ES**	**FI**	**FR**	**GB**	**NL**	**NO**	**SE**	**AAVG**	**SD**
Class I	2	1	−16	2	9	−2	−8	−12	19	−19	−12	−12	6
Class II	−1	5	−17	13	6	−22	−16	10	29	−5	−10	−10	11
Class IIIa	1	−2	−16	1	14	−26	−12	−6	9	−19	−12	−15	7
Class VI	2	2	89	−4	−80	89	86	56	−90	88	84	82	13
Class VII/IIIb	−4	−9	−49	−14	30	−24	−33	−35	6	−33	−34	−35	8
Prestige	−3	1	−8	4	−4	−8	−5	−4	34	−17	−7	−8	5
Wage	2	−10	−12	−14	5	4	−4	−7	4	5	−2	−3	7
Skill	7	−14	−16	−17	8	−11	−5	−39	4	−10	−18	−17	12
Authority	−21	−6	1	9	−5	1	−5	20	−2	2	3	4	8
Autonomy	4	−10	−10	−11	2	−8	−10	12	−4	−7	−6	−5	8
Scarcity	97	99	42	97	72	55	57	76	42	53	61	57	11