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Material and methods.

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Wage distribution within the Swedish State Railways, 1877–1951: Material and methods.*

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Abstract: For nine decades, the Swedish State Railways (SJ) produced wage records containing all its permanent employees. SJ employed more people than any private employer in Sweden, and the records contain individual-level information across hundreds of occupations: full name, yearly wage, occupational status, year and date of birth, occupational status, time of employment at SJ, etc.

This paper serves as a background to a project on wage distribution within SJ, with the aim of tracking the development of, on the one hand, occupational or class-based wage inequality and, on the other, gender-based wage inequality. In this paper, we present the source material in detail, discuss its strengths and weaknesses, and describe the methods used to develop and process the wage records into data. Special attention is given to the adoption and application of HISCLASS, the historical, international social class scheme.

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Keywords: Wage distribution, HISCLASS, relative wages, white-collar wages, gender wage gap, the Swedish State Railways, Statens Järnvägar

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1. Introduction

For nine decades, from the 1870s to the early 1950s, the Swedish State Railways (SJ) produced wage records containing all its permanent employees. The records contain individual-level information across hundreds of occupations on wage, length of service, full name and other variables. As such, the records offer ample possibilities to track changes over time, by occupation, class, gender and female/male dominated occupation.

SJ was not just any company. In 1945, the largest private employer in Sweden, ASEA, employed 15,000 people (Jagrén 1988, p. 265). The same year SJ employed 26,000, only counting those in permanent positions (Statens Järnvägar 1945, p. XXVI).

This paper serves as a background to a project on wage distribution within SJ. The project has two overarching aims: to follow the development of, at the one hand, occupational or class-based wage inequality and, on the other, gender wage inequality.

The present paper has the character of an appendix; we present the source material in detail, discuss its strengths and weaknesses given our research aims, and describe the methods used to develop and process the wage records into data.

Given the size of the company, SJ is an interesting object of study in its own right. Whether the study of wage distribution in SJ can inform knowledge about wage development and distribution in the Swedish market in general is an open question, which will be addressed theoretically below and empirically later in the project.

2. Material

From 1872 to 1951, SJ produced wage records as bound ledgers with information on all its permanent employees.¹ The records consist for each individual of full name, year and date of birth, position (occupational status or title), length of employment at SJ, length of employment in current position, length of employment with current wage, geographical and administrative location, yearly wage, and, in some cases, notes. The wage ledgers were subsequently scanned and digitalised into pdf-files by the Swedish Railway Museum, *Järnvägsmuseet*, in Gävle (its stamp is seen on the left-hand page in Figure 1 below). The information is covered by confidentiality and not publicly available until 70 years after initial

¹ The first wage record was published in 1869 but it only covers non-manual employees and it is less detailed also in other respects. On several occasions, primarily in the 1920s and 1930s, no records were published: 1918, 1921, 1923, 1925, 1927, 1929, 1933, 1935, 1937, 1939, 1948 and 1950. In the years 1917–1919 also temporary staff is included in the records.

publication. The last year of the SJ-publication, 1951, is yet to be released. The pdf of the most recent wage record covers almost 400 pages. An example page of the pdf of the wage record from 1877 is shown in Figure 1.

FIGURE 1 *Extracts from the 1877 SJ wage record*

Befattningar och namn.	Arfvode efter år räknaadt. Kronor.	Anstald i ordinarie tjenst vid Statens jernvägstrafik.		
		första gången.	i nu innehafvande befattning.	med nu innehafvande arfvode.
General-Direktör och Chef.				
Troilius, Carl Oscar.....	9 000	9 Mars 60	30 Dec. 62	1 Jan. 69
Tillfällig löneförbättring	1 000			
Byråafdelningen.				
<i>Byrå-Chef:</i>				
Linnell, Carl Abraham	7 000	1 Dec. 56	9 Jan. 63	1 Jan. 75
<i>Inspektör:</i>				
Frih. Sparre, Knut Joh. Ulfson	7 000	1 Aug. 62	28 Jan. 76	1 Febr. 76
a) Vid Styrelsen.				
Kansliet.				
<i>Sekreterare:</i>				
Löfman, Carl	5 000	7 Maj 64	7 Maj 64	1 Jan. 75
<i>Registrator och Aktuarie:</i>				
Ljungström, Patrik Victor.....	4 500	1 Jan. 60	1 Jan. 63	1 Jan. 74
<i>Notarier:</i>				
Åkerman, Fredrik Gustaf	3 500	1 Jan. 60	1 Jan. 63	1 Jan. 74
Norrström, Knut Emil.....	3 500	1 Dec. 60	1 Jan. 63	1 Jan. 74
<i>Kontorsskrifvare:</i>				
Kruhs, Daniel August.....	2 400	1 Jan. 73	1 Jan. 73	1 Jan. 77
Lindgren, Carl Magnus Leonard	2 100	1 Jan. 63	1 Jan. 63	1 Jan. 75

Note: The column headings on the right-hand page read as follows: Position and name; Salary per year (given in Swedish crowns); Accepted for a permanent position at SJ (a) for the first time, (b) in the present position, and (c) with the present salary.

The record starts with director-general Carl Oskar Troilius. He earned 9 000 SEK per year (column two), began his career at SJ in March 1860 (column three) and became director-general in December 1862 (column four).

Figure 2 shows an extract from 1907.

FIGURE 2 *Extracts from the 1907 SJ wage record*

Befattningar och namn.	Arfvode efter år räknadt. Kronor.	Antagen i ordinarie tjänst vid Statens järnvägar			Födelseår och datum.
		första gången.	i nu inne- havande befattning.	med nu inne- havande arfvode.	
<i>Manliga bokhållare:</i>					
Östling, Karl Johan Immanuel.....	3 000	1 Jan. 79	1 Jan. 89	1 Jan. 92	22 Juni 51
Walsten, Carl Gustaf.....	3 000	1 Jan. 78	1 Mars 99	1 Jan. 02	21 Sept. 52
Westrell, Daniel Fredrik Eugène...	3 000	1 Jan. 85	1 April 02	1 Jan. 05	18 Maj 62
Norrman, Sven.....	2 400	1 April 95	1 April 06	1 April 06	5 Sept. 70
<i>Manliga kontorsskrifvare:</i>					
Ehrengranat, Tor Hjalmar.....	2 700	1 Jan. 78	1 Jan. 78	1 Jan. 02	13 Juli 59
Schillander, Gustaf Hugo Leopold	2 700	1 Jan. 82	1 Jan. 82	1 Jan. 02	10 Juni 51
Blomberg, Per David.....	2 700	1 Jan. 89	1 Jan. 89	1 Jan. 04	15 Okt. 67
Nordgren, Josef.....	1 800	1 Dec. 98	1 Dec. 98	1 Jan. 06	30 Sept. 75
Gustafsson, Frans Albert.....	1 800	1 April 03	1 April 03	1 Jan. 06	23 Aug. 59
Byström, Albin Herman Wilhelm.	1 800	1 Jan. 05	1 Jan. 05	1 April 06	6 Mars 82
Egelin, Axel Willy.....	1 500	1 Okt. 03	1 Okt. 03	1 Jan. 07	9 Aug. 77
<i>Kvinnliga kontorsskrifvare:</i>					
Holm, Anna Lovisa Amalia.....	1 080	1 April 03	1 April 03	1 Jan. 07	9 Dec. 78
Ekelund, Elisabet Lovisa Charlotta	1 080	1 Okt. 03	1 Okt. 03	1 Jan. 07	31 Jan. 72
Bovin, Gerda Teresia.....	960	1 April 06	1 April 06	1 April 06	27 Okt. 83

Note: The column headings read as follows: Position and name; Salary per year (given in Swedish crowns); Accepted for a permanent position at SJ (a) for the first time, (b) in the present position, and (c) with the present salary; Year and date of birth.

The first column contains three positions (*befattningar*): male bookkeepers (*manliga bokhållare*), male office clerks (*manliga kontorsskrifvare*) and female office clerks (*kvinnliga kontorsskrifvare*). However, the three positions constitute two occupations, namely bookkeepers and office clerks. Within the latter, the record allows a direct comparison of the earnings of men and women, taking into account differences in age and work experience. As an illustrative example: Mr Axel Egelin, entered into his present position 1 October 1903 (column four),

earning 1 500 SEK per year (column two), while Ms Elisabeth Ekelund started her position at the same time as her male colleague but earned 28 per cent less, 1 080 SEK per year. At a single case level, this may indicate gender-based wage discrimination. In forthcoming analyses in the project, the entire sample of office clerks will be used to determine the level of gender-based pay differences, while controlling for age, length of employment both in the company but also in the specific role. Such analyses would provide a detailed picture of gender-based wage discrimination within SJ over a nine-decade period.

This would contribute to the debate on whether gender pay differences are based on productivity or discrimination. Opinions differ. The lack of consensus depends to large extent on the fact that historical-empirical research encounters methodological difficulties (Persson & Wadensjö, 1997; for a recent overview, see Blau & Kahn 2017). Among other things, we need to check for differences in individual productivity, but measuring this directly requires real-time observation, which is by definition ruled out in historical studies. However, productivity can be captured indirectly, with individual data proxying productivity. Economic historian Maria Stanfors and colleagues (2014: 49) write: ‘The best way to analyse gender-differentiated earnings is to look within firms and compare individuals who do the same job.’ To the best of our knowledge, such a historical analysis of wage distribution within the same company over time has not been undertaken in a Swedish context. The SJ material offers the opportunity to compare wages of female and male office clerks, controlling for age and work experience, thus filling an important gap in the literature concerning wage inequalities.

Pay differentials between men and women have also been explained by value discrimination. As shown in many cross-sectional studies, occupations requiring similar degrees of skills and formal education are paid according to gender distribution (e.g. Boschini, 2017). Jobs that are mainly performed by women tend to be paid less than jobs performed mostly by men, simply because society puts less value on female labour, at least so the argument goes. ‘The dream analysis’, according to economist Anna Thoursie (2004: 54), would be to study the change in an occupation’s relative wage when it switches from being male dominated to female dominated (or vice versa), controlling for relevant background variables. Again, the SJ material allows us to conduct such an analysis. In 1890, the share of female office workers (*kontorsskrivare*) was 11 per cent. By 1920, thirty years later, it had increased to 59 per cent.

This period – 1870–1950 – embraces the breakthrough of the modern industrial society from the 1890s onwards (Schön 2004). The SJ wage records allows us to study changes in relative wages across occupations and in the work force composition, with the Second Industrial Revolution as a background.

Working with a single company is advantageous since the same income concept can be used throughout the study period (see Johansson 2006 for a typical example of problems associated with varying income concepts). In addition, it provides beneficial conditions for comparing like-for-like within job categories, but also between time periods, e.g. any company-specific salary increases should apply consistently across the dataset. Forthcoming analyses will thus also look at absolute and relative wage development for different occupational groups in SJ.

In summary, there are two key strengths to the SJ material: the potential to study gender-based wage discrimination, and to contribute to the historical literature on the development of wages and the income gap more generally.

2.1. Limitations

The material has, however, some limitations. The information on benefits in kind is difficult to translate into quantities, and there is little clarity regarding the length of the working day for different occupations. Whereas these two deficiencies are notorious in historical studies, a third problem is specific for this project: the bureaucratic wage setting at SJ, which may hinder generalisation. We discuss each of these points in turn.

2.1.1. BENEFITS IN KIND

Benefits in kind were a non-negligible part of labour income in Sweden well into the twentieth century. Benefits consisted, among other things, of free potato land and medicine, subsidized food and, most importantly, free housing. Attempts to quantify the value of benefits in kind have been few, and the most famous study – *Wages in Sweden 1860–1930* by the prominent economists Gösta Bagge, Erik Lundberg and Ingvar Svernilson – did it in an ambiguous way (Hamark and Collin 2019, p. 5; cf. Bagge et al. 1933, pp. 33–37, 85–90).

The SJ wage records do contain information on benefits in kind but contain this information mostly in the form of use-value, unsuitable for quantitative calculations. By

making assumptions regarding the money-value of use-values, it may be possible to estimate benefits in kind, but that would require additional digitising for which our current budget does not cover.

2.1.2. LENGTH OF THE WORKING DAY

There is no information on the workload of employees. SJ gave annual wages but no figures regarding the length of vacations, the number of workdays per year or, most importantly, the length of the working day.

From other sources, quite a lot is known about the length of the working day of workers (*arbetare*) in the labour market as a whole, and how it differed across occupations (Arbetareförsäkringskomitén 1888; Kommerskollegium 1911; Arbetstidskomitén 1920; SOU 1925; Tegle 1983). On the other hand, little is known about white-collar workers (*tjänstemän*).

In a paper on working time, Tegle (1983, p. 10) refers to an official investigation stating that around 1900 state employees worked three to four hours a day, noting that the life of playwright and novelist August Strindberg illustrates this point. During the years Strindberg was employed at the Royal Library (1874–1882), he wrote several pieces, including the novel *Röda rummet* (The Red Room), and spent a massive amount of time drinking with his friends at the bar *Röda rummet*. Around that time, workers spent eleven hours a day at work (Arbetareförsäkringskomitén 1888, p. 5).

If the working life of Strindberg or the three to four hours a day remotely resembles the working hours of white-collar, state employees in general, any wage comparison between blue-collar and white-collar workers based on annual, weekly or daily rather than hourly wages, will grossly underestimate the differences.

It may be, however, that other source material produced by SJ will shed light on working hours for different occupations. This will be investigated later on in the project.

2.1.3. WAGE SETTING AT SJ

A third problem is specific for this investigation. It concerns how wages were set. Since SJ was part of the state administration, the Swedish parliament made decisions regarding wages,

pensions, and other benefits for the employees of SJ (SOU 1924, p. 23; Andersson-Skog 1993, p. 36.)²

Given this, how do wages at SJ relate to general labour market wages? Or put another way, could the SJ wages be used to say something about *Swedish* wages and wage inequality in general, or are there systematic biases that invalidate any effort to generalise?

First, parliamentary processes by nature are relatively slow, and hence it seems reasonable that SJ wages lagged behind those in the labour market, especially in times of inflation (SOU 1924, p. 129). This implies that, at any point in time, the wages at SJ were lower than in the labour market generally.

A second and more serious question is whether wages set bureaucratically are fundamentally comparable with those set by market forces. At SJ, wages strictly followed grade and the employees were moved up one grade after a fixed period of time. The wage scales were revised at intervals of 2-3 years. Individual wages did not exist, nor did piecework. This is very different from a neoclassical textbook description of a 'perfect' market. But how different is it from a *real* labour market?

With the rise of the trade union movement in the late 19th century, the spread of collective agreements followed, which clearly are antithetical to a perfect market. Within collective bargaining, large groups of workers had their wages collectively set for a specified period of time. Similarly, the pattern that wages increase with work experience is true for any labour market. Also, there are no 'pure' market wages. Even in a labour market characterized by insignificant trade unions, weak labour law and absence of monopoly companies, wages are not set by the mere interplay of supply and demand. Everywhere, labour productivity and thus wage setting is affected by norms, by what we perceive as fair (Solow 1990; Weil 2014).

Furthermore, given free movement of labour across sectors, basic economic reasoning indicates that the SJ wages could not have deviated much from the rest of the labour market, at least not more than short-term. Moreover, SJ and the parliament were not unfamiliar with market reasoning. Already in 1861, the railway manager Nils Ericson addressed the problem of recruiting – and keeping – competent employees. In order to make the SJ wages competitive, Ericson demanded more money by the parliament, and got it. According to the *Socialiseringsnämnden*, the parliament never established any guiding principles for the SJ wage

² By the end of our study period, some blue-collar occupations had collective agreements, but this fact does not change the overall picture.

setting but asserted nonetheless that the level of labour market wages was ‘a driving factor’ when parliamentarians made up their mind (SOU 1924, pp. 94–95).

In *absolute* levels, there could indeed have been long-term differences. The SJ employees had relatively generous pensions (SOU 1924, pp. 152–158) and probably securer employment than most others. Somewhat lower wage levels at SJ could thus be interpreted as a premium paid for better job security. However, any ‘uncalled for’ differences would have been arbitrated away by changes in the supply of labour. It means, for instance, that the pay gap between unskilled and skilled labour in SJ should have been about the same as in the labour market generally and if so, *relative* wages at SJ may reflect relative wages overall.

Now, these are purely theoretical arguments to which several objections can be made. First, while it seems perfectly safe to assume that outflows (labour moving from SJ to the labour market) met no restrictions, perhaps inflows (labour moving from the labour market to SJ) did? At least one could imagine that SJ as a state employer had special rules regarding employment. Second, the parliament may have used the wage setting to meet political ends, such as rewarding certain occupational categories.

These theoretical arguments, as well as the objections, will be discussed in relation to the empirical analyses later on in the project. Further, we will also compare the absolute and relative wage differences, on the one hand within SJ, and on the other, in comparison to the labour market generally from earlier research.

3. Method

3.1. Data extraction and sample

A source material freely available online is good start. However, even though the vein could be seen from a distance, the gold still needed to be dug. We hired a company, Hi-Tech iSolutions, to do the digging, that is, digitalise the material into Microsoft Excel files.

Given the massive amount of potential wage material and a limited budget for digitalising, we decided to have approximately every tenth year digitalised. Hi-Tech iSolutions delivered files containing four main variables: job title, department, sub-department, and salary (given in Swedish kronor). Some other general identifying information, e.g. Head Office staff, was also necessary for calculating some salaries that were given according to a salary code system. Such information was added by ourselves by hand, as the structure of the wage records made this very easy to do. For the purpose of analysing gender differences, we also included also age and length of employment for a handful of white-collar occupations.

The wage records from the 1930s onwards contained two sub-files. The first contained Head Office employees and the second contained all other employees based in different pay districts (*ortsgrupp* A-G). Salaries for district staff were read off a separate wage table, also reproduced in Excel. Head Office staff had no pay district information attached to them, so we assumed they all belong to district G, the highest paid district to which Stockholm employees belonged. Personal communication with the curator of the Swedish Railway Museum advised that the Head Office staff all worked in Stockholm, only a block away from the (white-collar) staff of the Stockholm district. The datafiles were then cleaned for data errors and merged with a new variable created for year.

All information in the original ledgers was machine-typed, which minimises the chance of mistakes that may arise due to difficult hand-writing styles. We have not found a single mistype – for instance, ‘4 200 SEK’ instead of ‘420 SEK’ – in the original payrolls (although, surely, some must exist given the millions entry points).

The sample for the project is thus pooled time-series data from the following timepoints: 1877, 1887, 1897, 1907, 1917, 1928, 1938 and 1951.³ The initial time point of 1877 was chosen because female employees appeared in the records for the first time, and the last time point because the SJ publication ended in 1951. The sample for each of the eight time points is the entire workforce.

3.2. Occupational classifications

With several hundred different occupations in the SJ wage records, these needed to be categorised in order to analyse wages across occupational groups. Such groups may also be useful to study gender-based wage differences. As noted above, comparing individuals in the same job is a strategy with analytical merit. What exactly constitutes ‘the same job’ may not always be self-evident, though. For instance, one could imagine an employer inventing a new occupational category, preserving it for men only, in order to continue paying men and women differently for essentially the same work tasks. To address such a scenario, a strategy

³ While it may be possible to identify actual individuals in the pdfs and thereby create a panel data set, we judged that the historical span of the dataset i.e. over 90 years would render this unfeasible. Additionally, we opted to extract data at 10-year intervals, due to the expense of data extraction, which again makes a panel set likely to be untenable.

for grouping occupations would need to – as far as possible – group together formally different occupations into a broad groups based on an objective measure of skills needed.

In our approach to this analytical task, we used the twin classification systems HISCO (Historical International Standard Classification of Occupations) and HISCLASS, a historical, international social class scheme. HISCO was developed to facilitate occupational comparisons across countries and over time and is well-used in historical studies. HISCLASS allocates occupations to twelve different levels, based on four dimensions of social class: distinction between manual (blue-collar) and non-manual (white-collar) labour, level of skill, level of supervision and economic sector (for details, see Van Leeuwen and Maas 2011, pp. 47–60). The twelve HISCLASS are shown in Table 1.

TABLE 1 *Classification according to HISCLASS*

Code	Name
1	Higher managers
2	Higher professionals
3	Lower managers
4	Lower professionals, and clerical and sales personnel
5	Lower clerical and sales personel
6	Foremen
7	Medium-skilled workers
8	Farmers and fishermen
9	Lower skilled workers
10	Lower skilled farm workers
11	Unskilled workers
12	Unskilled farm workers

Source: Van Leeuwen and Maas 2011

Every occupation in the SJ data was firstly assigned a job title, according to HISCO scheme (hisconame). In a next step, each HISCO job-title was assigned its HISCO-code, which corresponds to a specific group or class in HISCLASS. The procedure is illustrated in Table 2.

TABLE 2 *Example of extracting SJ occupations to HISCO names and HISCLASS*

Occupation	HISCO		HISCLASS	
	Code	Name	Code	Name
Banvakt (Lineman)	9-98.90	Other Transport Equipment Operators	11	Unskilled workers
Kontorsbiträde (Office assistant)	3-93.10	Office clerk, General	5	Lower clerical and sales personnel
Revisor (Auditor)	1-10.20	Auditor	2	Higher professionals
Stationskarl (Station labourer)	9-99.10	Labourer	11	Unskilled workers
Timmerman (Carpenter)	9-54.10	Carpenter, General	7	Medium-skilled workers

Source: Statens Järnvägar 1877, 1897, 1917, 1938; Van Leeuwen and Maas 2011.

3.3. Analytical approach

There is a growing body of literature making use of HISCLASS, for instance in studies on demographics and social mobility (Öberg 2014; Silvestre et al. 2015; Pérez 2019). For empirical convenience, scholars working with HISCLASS have collapsed the twelve HISCLASSes into a varying number of classes, either because twelve classes are too many to be meaningfully interpreted or because the number of observations get too small with twelve classes. The result has been that researchers end up with two, three, four or five groups of occupations. Also, even with equal number of groups, the new categorisations are not identical. For instance, some scholars group lower skilled workers (HISCLASS 9) with unskilled (11), while others group them with medium-skilled (7). Unfortunately, there is a lack of theoretical justification for the choices.

In this paper, we present two different groupings.

Ownership of the means of production, argues sociologist Eric Olin Wright, is for many purposes too crude a way of analysing class structure. Wright therefore introduces two additional dimensions of class, authority, and skills/expertise. According to Wright, managers and professionals in the upper strata of company hierarchy ‘occupy a privileged appropriation location within exploration relations’ (Wright 1997, pp. 16–20), hence mostly sharing interests with capitalists. Since owners are allocated to HISCLASS 1, alongside higher managers (Van Leeuwen and Maas 2011, pp. 55–57), there seems to be close affinity between HISCLASS 1 and 2 on the one hand, and Wright’s owners plus ‘privileged’ on the other. Theoretically, then, the argument can be made that HISCLASS 1 and 2 can be compared with the rest, i.e. an elite/privileged vs ‘the rest’ distinction.

A second way of grouping occupations that we adopt follows in the long empirical tradition of comparing manual (blue-collar) with non-manual (white-collar) labour. Today's official statistics in Sweden draw such a blue-/white collar distinction based on union confederation bargaining domains (Statistics Sweden 2017, p. 32). Employees within the domain of the LO are defined as manual workers (*arbetare*), and employees within the domain of the TCO and SACO as non-manual workers (*tjänstemän*). At least broadly, this corresponds to HISCLASS 1–5 (non-manual) and HISCLASS 6–12 (manual).

3.3.2. DESCRIPTION OF OCCUPATIONS IN SJ, 1877–1938

Given the central role in the SJ data of occupational classifications, we conclude by presenting some descriptive statistics regarding HISCLASS. What follows is based on four historical timepoints – 1877, 1897, 1917 and 1938 – thus covering the first year when female employees appeared in the records as well as the last interwar year. (As mentioned, the 1951 wage record is yet to be released, and at the time of writing these four time points are the ones we have focused on extracting and analysing.) Our purpose with the following analysis is largely illustrative, i.e. to describe the general features of the dataset in terms of occupational groups. Thus, we present the spread of the HISCLASSES over the four time points, and their absolute and relative development over time. Table 3 shows the numbers of SJ employees in each HISCLASS for the years under study.

TABLE 3 *Number of SJ employees by HISCLASS 1877–1938*

HISCLASS	1877	1897	1917	1938
Higher managers (1)	22	17	58	45
Higher professionals (2)	31	44	200	227
Lower managers (3)	187	234	903	1101
Lower professionals, and clerical and sales personnel (4)	112	471	442	540
Lower clerical and sales personnel (5)	413	755	2398	2445
Foremen (6)	258	476	1023	645
Medium-skilled workers (7)	316	701	2981	3264
Farmers and fishermen (8)	0	0	5	5
Lower skilled workers (9)	337	555	573	575
Unskilled workers (11)	1915	3326	9747	9613
Unassigned	55	40	45	40
Total employees	3591	6579	18330	18460

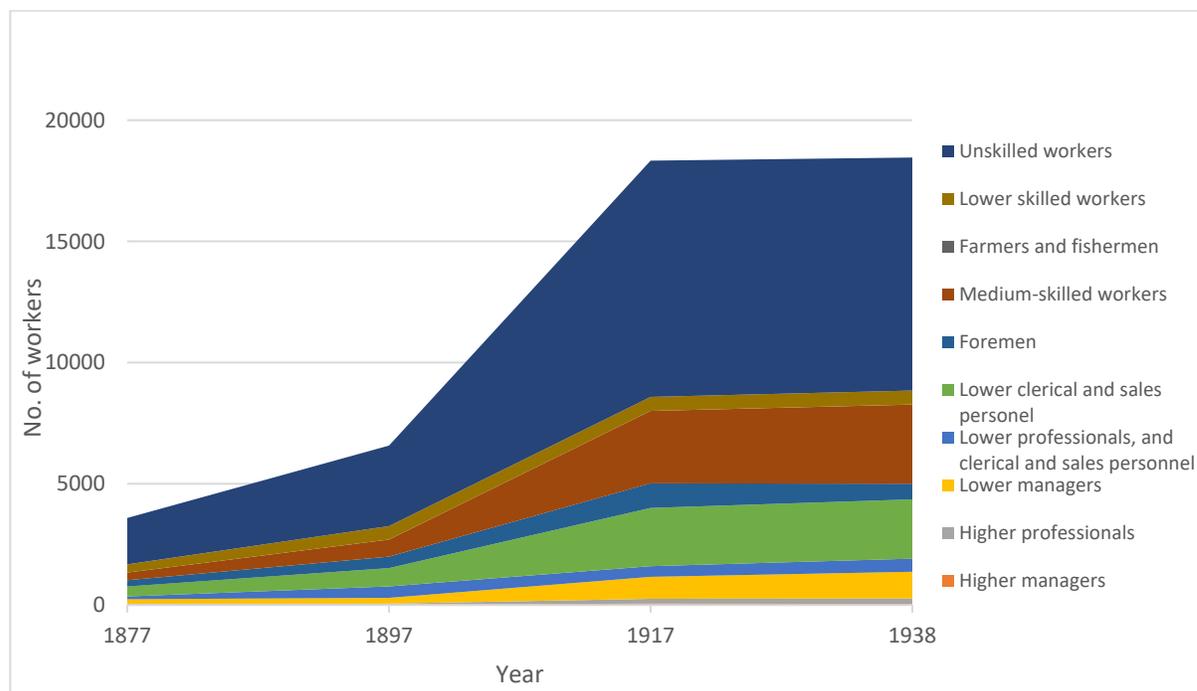
Source: Statens Järnvägar 1877, 1897, 1917, 1938.

The SJ records did not contain any occupations belonging to HISCLASS 10. Furthermore, there were only three observations coded as HICLASS 12, which were incorporated into HISCLASS 11, the other ‘unskilled’ category. Thus, at the outset we arrived at ten HISCLASS categories.

In most cases, the assignment of a HISCLASS to certain occupations was straightforward. In total, 55 occupations have not been found in HISCO, equating to successful matching of occupations in 98% of the records. In some cases, we have simply dropped the observations, but in others, we have nonetheless assigned the occupation a HISCLASS based on approximating the kind of work against the HISCLASS description. As the number of observations that were approximated in this was small, the overall impact on the results is minimal. And while we agree with Van Leeuwen and Maas (2011, p. 12) that it would be far from ideal ‘if every historian were to construct their own version of HISCLASS’, in a few cases we have chosen to depart from the original classifications (notably, we recoded *generaldirektör* (director general) from 3 to 1.)

Figure 3 shows the historical development of the number of SJ employees in each HISCLASS.

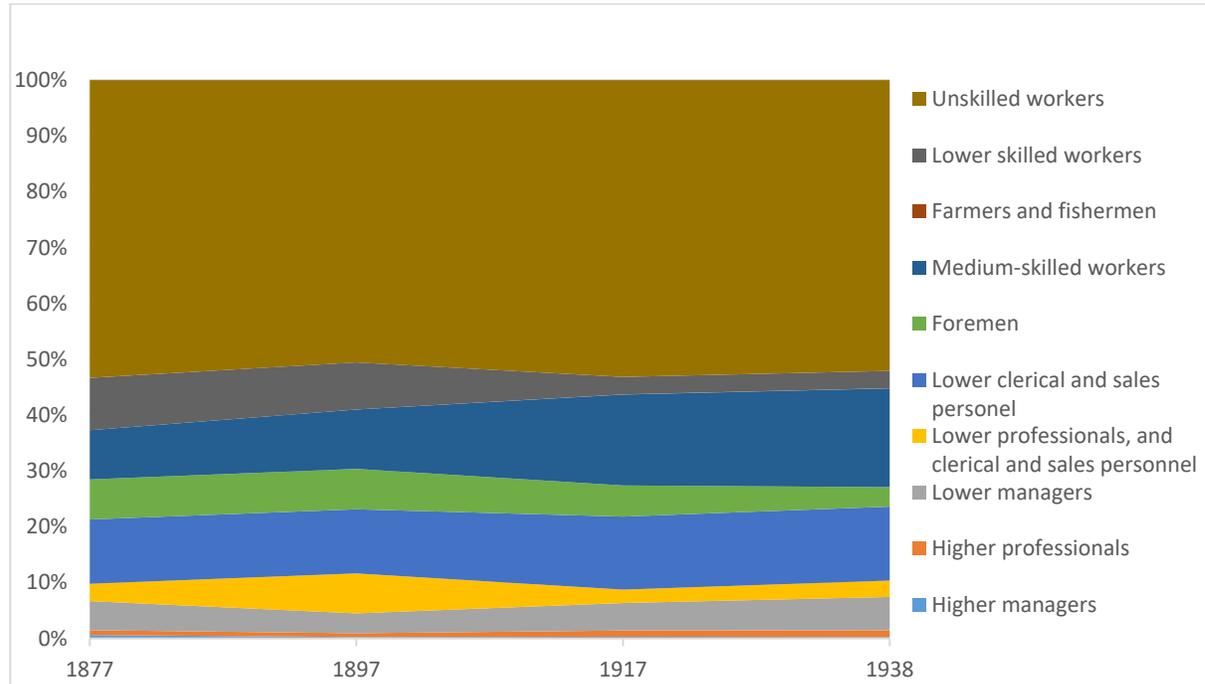
FIGURE 3 *Number of SJ employees by HISCLASS 1877–1938*



Source: See Table 3.

Note that there are low numbers in HISCLASS 1, 2, and 8 and thus these barely show at all in Figure 3. The figure shows that the total workforce doubled from 1877 to 1897. In a similar time period between 1897 and 1917, the total workforce almost tripled in size. In the WWI and post WWI period, the total workforce remained at a similar level. The relative distribution of occupations, according to HISCLASS, however remained stable. This is shown more clearly in Figure 4, which displays the same data but as percentages of the work force.

FIGURE 4 *SJ employees by HISCLASS, as percentage of total workforce 1877–1938*



Source: See Table 3.

There were some small changes in proportional representation of HIS-classes between the time periods sampled. Figure 4 also demonstrates the approximate stability of most of the HIS-classes over the four time points. Exceptions to this pattern of stability are the proportions of medium-skilled workers, which rises in the 20th century, and of foremen and lower-skilled workers, which drops in the 20th century.

Grouping employees by a ‘privileged/the rest’ category resulted in a ‘1% vs 99%’ type of distinction: for all four time periods, the proportion of the workforce in the privileged category ranged between 0.92 and 1.47. There was no clear historical trend in this grouping, other than the lowest percentage occurring in 1897. Grouping employees by blue-/white collar distinction also showed no clear historical trend. The proportion of blue-collar workers was 77.5% in 1877 and 76.2% in 1938.

4. Summary

This paper has provided a background to a project on wage distribution within SJ. The project's two overarching aims were presented: to follow the development of, at the one hand, occupational or class-based wage inequality and, on the other, gender-based wage inequality. The source material was described in detail and its strengths and weaknesses were discussed in relation to the project's research aims. Key strengths were the data's historical span, accuracy, and coverage of an entire workforce. Potential limitations include estimating benefits-in-kind and the role of bureaucratic wage-setting. The methods of data extraction and processing to arrive at an analysable dataset were also outlined, included how we adopt and apply the HISCLASS classification system. The paper also presented some descriptive statistics, as an illustration of the content of the data.

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