


Monday, January 1, 2024

Access the code, data, and analysis at <https://github.com/j-jayes/who-is-who-scraper> and <https://github.com/j-jayes/svensk-industrikalender>

Paper 4: Praise the people or praise the place?*

Upper tail human capital in electrifying Sweden

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ABSTRACT Abstract

Introduction

In the quest to understand the dynamics of economic development and technological advancement, previous research by this author and his supervisors shed light on the transformative impact of early electricity access in Sweden. “Power for progress: The impact of electricity on individual labor market outcomes” (Jayes et al., 2024) revealed how the advent of electricity in certain parishes led to positive economic outcomes: a boost in income levels, reduced inequality, and the maintenance of employment levels despite the advent of labor-saving technology. A particularly striking observation was the tendency of workers in these early electrified parishes to remain in their birthplaces, hinting at a newfound economic vibrancy stemming from the technological spillovers.

Building on these insights, the present paper delves deeper into the human aspect of this technological revolution. It poses a critical question: Who were the key figures driving this change? Were they local talents nurtured by the

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opportunities at hand, or did they represent a wave of skilled individuals drawn from afar, lured by the pioneering spirit of these early electrified areas?

To answer this, the investigation leverages two novel and rich data sources. The first, “Vem är Vem”, is a comprehensive set of biographical dictionaries containing the profiles of 75,000 notable Swedes active between 1945 and 1968. The second, the “Svensk Industrikalender” or Swedish Industrial Calendar of 1947, offers an exhaustive catalogue of industrial firms, detailing their activities, workforce, and financial metrics.

I digitize and structure these sources in order to analyze the changing patterns of the Swedish labour market in the middle of the 20th century in light of electrification. Our findings challenge our prior expectations. Contrary to the belief that local talent pools predominantly fueled the technological boom, I observe a pattern of geographical mobility among the highly educated and skilled professionals in electricity-related fields. These individuals, pivotal to overseeing and advancing the electricity sector, often sought education and opportunities far from their origins. This suggests a bifurcated labor market: local talent predominantly filled the burgeoning middle-skilled roles within the electricity sector, while the top-tier skilled professionals were more transient, moving towards educational and occupational opportunities. This paper explores the implications of this labor market structure for the economic development patterns witnessed during Sweden’s second Industrial Revolution.

These findings, tentative as they are, have real world value. As we seek to understand what drove the dynamism during the age of electrification in Sweden, we are better equipped to shape policy today that seeks to revitalize deindustrializing areas across the developed world and help the developing world harness new technologies for sustainable growth. In addition, the methodologies employed to structure and analyze archival data can provide a template for future research using similar materials. [fix up]

The paper is laid out as follows: the current research question is placed in context, the sources are explained, followed by their digitization and structuring process. I then lay out some descriptive statistics and tentative findings regarding the patterns of movement for the high skilled electricity related workers, compared with other professionals I observe in the biographical dictionaries.

Related Literature

The question of where the high skilled workers in electricity related occupations in Sweden came from is important in order to understand the economic dynamism of that era. As such, it ties into a wealth of research on technological change and the labour market, which I review briefly here.

The historical adaptability of labor markets to technological change is well-documented. In their study of the U.S. labor market’s response to the automation of telephone operation, Feigenbaum and Gross Feigenbaum and Gross (2020) demonstrate how technological displacement in one sector led to increased demand in others, suggesting an inherent resilience in labor markets. This finding is particularly pertinent to our exploration of Sweden’s electrification, as it indicates

a potential for both displacement and opportunity in the face of technological change.

Goldin’s extensive analysis of labor markets in the 20th century provides a comprehensive backdrop to our study (1994, 1998). Her work highlights critical shifts in labor participation, wage structures, and job security, reflecting the complex interplay between societal changes and labor market dynamics. These insights are crucial for understanding how shifts in human capital, like those during Sweden’s electrification period, contribute to broader economic outcomes.

The impact of the Digital Revolution on labor markets, as reviewed in the Oxford Review of Economic Policy, is also salient to our study (Adams, 2018; Goos, 2018). These articles underscore the emergence of job polarization and the crucial role of policy interventions in ensuring equitable benefits from technological advancements. This perspective is instrumental in understanding the differential impacts of electrification in Sweden, especially in terms of job creation and labor market segmentation.

Moretti’s exploration of the geographical clustering of talent and innovation in “The New Geography of Jobs” provides a crucial perspective on the spatial dynamics of economic development (Moretti, 2012). His findings about the importance of local ecosystems in fostering innovation and economic vitality resonate with our investigation of how early electrification in Swedish parishes influenced the distribution and impact of skilled labor. His concern, that gains to productivity are eaten up by increased cost of living (primarily through housing costs) when constraints prevail, is not evidenced in the first half of the 20th century in Sweden. However, his example of Silicon Valley – where high productivity and attractive jobs draw in people with high levels of skill, raising property prices – is becoming more concerning in today’s relatively housing scarce urban centers.

New technologies require new skills. Mokyr’s research provides insights into the importance of both artisans and engineers in the progression of the Industrial Revolution. His studies underscore the synergistic relationship between theoretical knowledge and practical expertise, essential in driving technological innovation and economic progress (Mokyr, 2017b). In his examination of the socio-economic elites of early modern Europe, Mokyr explains how their education and exposure to new ideas and sciences were pivotal in fostering various intellectual and technological advancements. This educated elite, through their changing culture and institutions, played a crucial role in creating an environment conducive to innovation (Mokyr, 2017a).

Not every innovator needs higher education. Mokyr’s perspective is crucial in understanding the dynamics of technological development and economic growth, emphasizing the collaborative efforts between well-educated scientists and highly skilled artisans. This interplay highlights the importance of practical skills, theoretical knowledge, and their combined impact on technological progress. For example, figures like metallurgist Henry Cort, who collaborated with scientists despite lacking formal scientific training, exemplify the productive synergy between different forms of expertise in this era (Mokyr, 2017a).

In this paper, I want to find out where the individuals came from who enabled the technological development that was associated with Sweden becoming richer

and more equal. Did they come from the areas around where the technology was developed / adopted, learning skills on the job? Or did they get formal education at one of Sweden's universities and then bring these skills to the hubs of technology? Should we praise the people, or the place?

Source material

Biographical dictionaries

“Vem är Vem?” is a biographical dictionary, comprising a rich repository of information about notable individuals in Sweden. Published in two regional editions with a total of five volumes each, the first edition spanned from 1945 to 1950, and the second from 1962 to 1968, by the Bokförlaget Vem är Vem publishing house. An additional volume specifically focussed on individuals in industry and business was produced in 1945. This encyclopedia offers an invaluable snapshot of Swedish societal and professional landscapes during these pivotal periods. [fix citation]

The primary intention behind the creation of “Vem är Vem?” was to spotlight individuals who were at the peak of their careers, regardless of their age. This focus extends beyond traditional measures of influence, emphasizing the importance of those in influential positions or notable roles across relatively diverse sectors. As such, it serves as a crucial resource for understanding the professional and personal trajectories of around 75,000 individuals who shaped Swedish society in the mid-20th century.

It is worth noting that the criteria for inclusion was somewhat vague, and individuals could opt in to being included for a nominal fee. As a result, there are some individuals for whom not much information is included beyond biographic information, current location and profession. For others, there is a rich tapestry about their lives including records of career progression, business travel, technical writings and membership of civic organizations. The source does not capture a representative picture of Swedish society at the time, but rather those individuals with some level of social cachet or prestige, and a desire to be recorded in the biographical dictionaries as such.

“Vem är Vem?” is useful to economic historians thanks to its high quality digitization, with nine out of the 11 total volumes being made accessible online by librarians in Uppsala through *Projekt Runeberg*, as shown in Figure 1. This digitization has facilitated research, allowing for a broader exploration of the biographies and career paths of thousands of individuals. The encyclopedia's extensive coverage makes it a goldmine for researchers, historians, and anyone interested in the socio-economic history of Sweden during a period marked by significant change and development.

In the context of economic and historical research, “Vem är Vem?” serves as a unique tool. By providing detailed biographies and career information, it allows for an in-depth analysis of the human capital that contributed to Sweden's economic and social evolution during the mid-20th century.

Number of biographies in Vem är Vem?

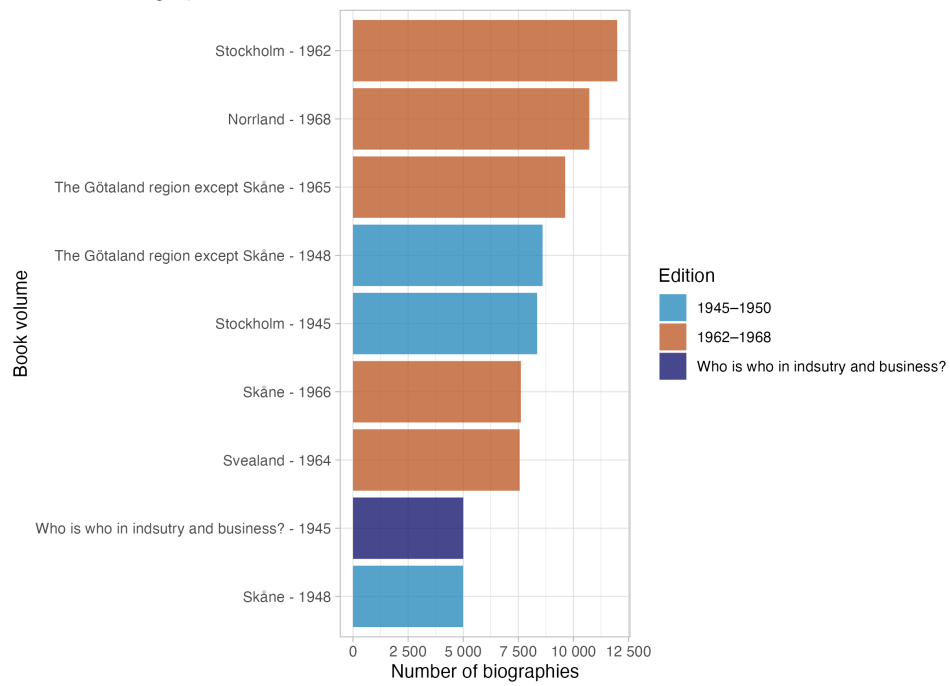


Figure 1: Number of biographies in each volume of 'Vem är Vem?'

The biographic information about the individuals in the dictionaries are exemplified in Figure 2, which highlights the life of chemist and metallurgist Karl Gustaf Lund.

fl. 14-15, i Trollhättan 15-16, Nässjö 21-32, Majornas komm. flicksk. i Gbg sed. 37. I Nässjö bl. a. led av barnavårdsn. 29-32, kyrkofullm. 31-32, samt ordf. i RK-krets 30-32. Sekr. i styr. f. Gbg o. Boh. landstings yrkessk. 36-45, suppl. i hälsovårdsn. i Gbg sed. 40, ordf. i Nässjö hush. fören. 23-32, Smål. hush. förh. 28-32, Gbg hush. fören. 41-45 samt Gbg o. Boh. l. hush. förh. sed. 41, led. av Sv. hush. förh. riksförb. centr. styr. sed. 29. **Lund, Karl Gustaf**, överingenjör, Varberg, f. 22/7/93 i Helle, Gävle, l. av brukstj. m. Ferdinand L. o. Maria Andersson. G. 36 m. Sigrd Johansson. Barn: Ingvar f. 38, Lennart 42. — Ex. v. bergssk. i Filipstad 17, spec. stud. v. KTH (B) 20-22, stud. v. metallogr. inst. o. Sthlms högsk. 21-22. Kemist v. Strömans järnverks A-B, Degerfors, 18-20, metallurg o. kemist v. Westinghouse Electric & Manuf. Co., East Pittsburgh, Pa, USA, 23-26 o. 28-29, chefsmetallurg v. Laclede Steel Co., Alton, Ill., USA, 27, hytt o. stålving. v. A-B Iggesunds Bruk 29-31, platschef v. Gunneby Bruks Nya A-B, Varbergsverket, sed. 31. Led. av drätselkamm. v. ordf. v. ekonom. avd., suppl. i styr. f. elverket, huv. man i Varbergs Sparbank, arb. giv. repr. i länssarb. ndns kretsrad, led. av styr. f. Varbergs luftsk. fören., sek. i Varbergs högerfören., ordf. i järnv. sjukförsäkr. o. Plant. sällsk. Småfågl. Vänner. Res. t. Tyskl. 21, 22, 23, 30 o. 36, Danm., Tjeckoslov. 21, 22, 23, Österr. 21, USA 23-29. Skr.: Some fundamental factors for obtaining sharp thermal curves (Trans. Am. Soc. for Steel Treating, Ills. m. C. Benedicks o. W. H. Dearden 25), Nutida fabrikation av sågblad, sågklingor o. maskinlänvar (Trävaruind. 31). Hobbies: jakt o. fiske. **Lund, Lars Gustaf Viktor** Ferdinand, tandläkare, Göteborg, f. 1/8/96 i Tolg, Kronob. l. av Fredrik L. o. Maria Johansson. G. 27 m. Hildur Nordenström. Barn: Lennart f. 28, Ingemar 29. — Stud. ex. v. Lunds priv. elem. sk. 17, tandl. kand. 20, tandl. 22. Prakt. i Klippan 22-23, i Gbg sed. 24. Skattmäst. i Gbg. tandl. sällsk. 35. **Lundh, Lars Åke**, redaktör, Göteborg, f. 14/9/09 i Gbg av Otto L. o. Maria Malmberg. G. 41 m. Barbro Nordström. Barn: Lars f. 44, Christ-

na 46. — Stud. v. Gbg latinlärov. Medarb. i Gbg-Posten sed. 29. Gjort reportage i Norge, Danm., Lettl., Polen, Tjeckoslov., Tyskl., Frankr., Engl., Ital., Schweiz o. Amer., krigskorresp. i Polen 39. Ordf. i folktopart ungdomsfören. i Gbg 39-43, styr. led. i folktopart. ungdomsförb. m. fl. org. inom part. styr. led. i Flygjournalisternas klubb, Gbg-Postens guldplak. f. journ. bragd. **Lundahl, Carl-Gustaf** Allan, prakt. läkare, Göteborg, f. 13/3/06 i Borås av fabr. Carl L. o. Anna Jacobsson. G. 40 m. Marguerithe Giescke. Barn: Hans f. 41. — Stud. ex. i Borås 25, med. kand. i Upps. 30 o. med. lic. där 37. E. o. aman. v. hygien-bakteriolog inst. i Upps. 32-33, tf. prov. läk. i Kinna o. Värmdö distr. kort. tider 37, bitr. läk. v. Hultafors sanst. 37, prakt. läk. i Gbg sed. 39. **Lundahl, Ernst** Fritiof, stadsfiskal, Vimmerby, f. 13/11/88 i Sönerslöv, Krist. l. — Lansm. ex. 10. Anst. v. landsstaten 06-17, landskont. 17-18, stadsfiskal o. stadsfogde i Vimmerby sed. 18. Ordf. i styr. f. Skand. Bankens avd. kont. i Vimmerby o. i styr. f. Vimmerby Sparbank, köpmannafören. ombud. **Lundahl, Harry** Sigurd, redaktör, Göteborg, f. 16/10/05 i Hålsingborg av Herman o. Agda L. G. 35 m. Britta Linnea Davidson. Barn: Ulf f. 36. — Stud. ex. i Hålsingborg 25, stud. v. handelslymn. där 27-28. Medarb. i Helsingborgs-Posten 28-31, Eskilstuna-Kur. 31-35, Arbetet i Malmö 35-45, Gbg Handelsstidn. sed. 45. På sin tid framgångsrik fotb. spelare, landslags-spelare, medl. av Hålsingborgs IF, IFK Eskilstuna, Malmö FF o. BI, led. av Sv. fotb. förb. uttagn. komm. 37-39 o. 40. Resor t. Schweiz o. Holl. 27, Engl. o. Ung. 28, Engl. 29 o. 39, Tyskl., Ital. o. Monaco 31, Polen o. Rumänien 37. Tjeckoslovakien 38, Engl. 39. Skr.: Fotboll-Jul (28), Engelsk ligakalender (30). Hobby: idrott av skilda slag. Sv. fotb. förb. spelaren. o. dess tekn. komm. diplom o. M. Skånes fotb. förb. fjtjG, Söml. fotb. förb. hedersm. Hålsingborgs IF hedersM o. stora fjtjS. **Lundahl, Hasse**, ingenjör, Eksjö, f. 29/9/99 i Eksjö. — Stud. ex. 20, ing. ex. 23. Chef f. Eksjö stads vatten- o. elverk sed. 31. Medl. av Eksjö fabriks- o. hantv. fören. samt Odd Fellow.

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Figure 2: A representative page of Vem är Vem?, highlighting the biography of Karl Gustaf Lund

The fields include:

- Education:** Lund's education at prestigious institutions such as the Royal Institute of Technology (KTH) indicates he had access to advanced technical knowledge. This level of education is critical for understanding the specialized skills that were necessary for innovation and advancement in electricity-related industries.
- Career Progression:** The text outlines Lund's career progression through various roles in metallurgy and chemical engineering. This trajectory can illustrate how individuals applied their education in practice, contributing to industrial development. Tracking such careers can provide insight into the professional development paths that were common and valued in the sector at the time.

3. **International Experience:** His experiences in the United States reflect the cross-border exchange of knowledge and skills. This can show how international experiences contributed to the domestic industry by importing new ideas and practices, which is a key aspect of human capital development.
4. **Leadership and Management:** Lund's leadership positions, such as chairmanships and advisory roles, imply a combination of technical expertise and managerial acumen. The ability to lead and innovate within companies is a significant aspect of human capital that drives industry growth.
5. **Research and Innovation:** The reference to his translated research work indicates an engagement with cutting-edge technology and knowledge creation. Such contributions are the tangible outputs of human capital in action, pushing the industry forward through innovation.
6. **Professional Networks:** His involvement with societies and associations suggests a networked professional community, which is essential for the diffusion of innovative ideas and practices. These networks are often where knowledge is exchanged, partnerships are formed, and collaborations are initiated.

Industrial Catalogue

The Svensk Industrikalender from 1947, published by Sveriges Industriförbund (Sweden's Industrial Association), is a comprehensive directory of Swedish industrial firms. This calendar was issued annually from 1918 to 2000 and contains information related to Swedish industry. The 1947 edition available on the Project Runeberg website was digitized in April 2012, sourced from the Centrum för Näringslivshistoria. The calendar is believed to be under catalog protection but not copyright.

It includes detailed information such as company names, locations, nature of businesses, products, contact details, share capital, number of employees, production values, establishment years, and key personnel including managing directors and board members. This source is valuable for studying the economic and industrial environment of post-war Sweden, providing insights into corporate structures, industry distribution, and business trends of that period.

A representative page is shown in Figure 3.

The common fields listed for each company entry in the catalogue are as follows:

1. **Company Name:** The name of the company is listed at the beginning of each entry, with an asterisk indicating membership of Sveriges Industriförbundet.
2. **Location/Town:** The town or location of the company, which in this case is Arboga.
3. **Description of Business:** A brief description of the company's main activities or products is provided.

***AB. Arbit, Arboga.**

Elektr. sintringsverk och smältverk. Tillverkar: sintrad hårdmetall (»Vivax» o. »Sintram») samt gjuten hårdmetall (»Pansar» o. »Arbit»); dragverktyg av sintrad hårdmetall för dragning av järn och metall, dragskivor, runda och profilerade, fasta samt ställbara för tråd, stänger och rör, dragdornar för runda och profilerade rör, dragdynor för koppning och hylsdragning, diverse andra dragverktyg; sliddetaljer av gjuten hårdmetall, runda och profilerade sandblåstermunstycken samt diverse verktyg och maskindetaljer utsatta för förslitning.

Telegr.-adr.: Arbit, Arboga. Telefon: 226. Postgiro: 51462. — Akt.-kap.: 100,000 kr. Tillv.-värde pr år: 500,000 kr.

Bolaget grundat 1930. Dess verk och anläggningar arrenderas av Fagersta Bruks AB. Försäljningen av verkets produkter handhaves av Fagersta Bruks AB, Fagersta, och platskontoret i Arboga.

Styrelse: disp. Hj. Aselius (ordf.), dir. Nils Elfström, dir. Zachaus Olson.

Platschef: ing. Rolf Pauly.

***Arboga Boktryckeri AB., Arboga.**

Utför tidnings-, bok- och accidenstryck, affärstryck, kataloger m. m. Bolaget utger »Arboga Tidning».

Telefon: »Arboga tidning». Postgiro: 28543.

Akt.-kap.: 124,000 kr. Antal industriarb.: 15. Tillv.-värde pr år av tidnings-, bok- och accidenstryck: 290,000 kr. — Firman etabl. på 1850-talet, bolag 1911. Bolaget äges av Eskilstuna-Kurirens Tryckeri AB.

Styrelse: kamrer Stig Holm (ordf.), chefred. J. Anton Selander, red. John Wallström.

Verkst. dir.: John Wallström.

***Arboga Bryggeri AB., Arboga.**

Tillverkar malt- och läskedrycker.

Telegr.-adr.: Bryggeribolaget, Arboga. Telefon: 31. Postgiro: 6361. — Akt.-kap.: 400,000 kr. Antal industriarb.: 20. — Bolaget grundat 1899.

Styrelse: tandläk. Ernst Arosenius, grossh. Ivar Levert, dir. Nils Levert.

Verkst. dir.: Nils Levert.

***AB. Arboga Kvarn & Maltfabrik, Arboga.**

Tillverkar vete- och rågmjöl samt pilsnarmalt. Varumärke: »Guldsnö»vetemjöl. Firman driver även engroshandel med kraftfoder och gödningsämnen.

Telegr.-adr.: Kvarnmalt, Arboga. Telefon: 238 o. 237. Postgiro: 10078.

Akt.-kap.: 226,250 kr. Antal industriarb.: 7. Prod.-värde pr år: 900,000 kr. — Firman etabl. 1821, bolag 1919, nuv. bolag 1923.

Styrelse: bankdir. Ivar Fredholm (ordf.), dir. Tage Lindblom, dir. Carl-Hugo Peterson.

Verkst. dir.: C.-H. Peterson.

***AB. Arboga Margarinfabrik, Arboga.**

Tillverkar växtmargarin, animalisk margarin, kokossmör och konstister.

Telegr.-adr.: Margarinfabrik, Arboga. Telefon: 188. Postgiro: 6352.

Försäljningen sker genom Margarinbolaget AB., Stockholm, Vasag. 16. Telefon: 230960.

Akt.-kap.: 2,500,000 kr. Antal industriarb.: 27. Tillv.-värde pr år: 4,500,000 kr. — Firman etabl. 1888, bolag 1928.

Styrelse: herr Johan Biesert, disp. Anders Göransson, dir. Gillis Husberg, fru Ester Husberg, adv. Ivar Morssing, dir. Gustaf Settergren.

Verkst. dir. o. disp.: Gillis Husberg.

Kontorschef: Anders Göransson.

Driftsing.: Holger Omoe.

***AB. Arbogamaskiner, Arboga.**

Mek. verkstad. Tillverkar elektriskt direktdrivna verktygsmaskiner.

Telegr.-adr.: Elektrofabrik, Arboga. Telefon: 20. Postgiro: 77023.

Akt.-kap.: 500,000 kr. Antal industriarb.: 100. Tillv.-värde pr år: 1,800,000 kr. — Bolaget, grundat 1937, har i sig upp-tagit f. d. Elektriska Fabriken Jonsson & Larsson.

Styrelse: disp. H. de la Cour, fabr. Gunnar E. Jonsson, dir. E. Albin Larsson.

Verkst. dir.: E. Albin Larsson.

Försäljn.-chef: H. de la Cour.

Kamrer: T. Brüde.

***AB. Arboga Mekaniska Verkstad, Arboga.**

Mek. verkstad med gjuteri och elektr. vattenkraftstation (Grindberga).

Tillverkar maskiner för järn-, stål- och metallverk samt tråddragerimaskiner, excenterpressar, bockningspressar, friktionsskruvpressar, gradsaxar, kugghjul m. m. Bolaget distribuerar jämväl elektr. energi.

Telegr.-adr. o. telefon: Verkstaden, Arboga. Postgiro: 25175.

Figure 3: A page of the industry catalogue from 1947

4. **Products or Services Offered:** Specific items or services the company provides, such as types of machinery, tools, or materials.
5. **Contact Information:** This typically includes:
 - **Telegraph Address:** Listed as “Telegr.-adr.” indicating the address to which telegraphs are to be sent.
 - **Telephone Number:** Listed as “Telefon” followed by the number.
 - **Postal Code:** Mentioned as “Postgiro” or “Postiro” with corresponding numbers.
 - **Bank Account:** Sometimes a bank account number or similar financial information is included.
6. **Management and Key Personnel:** Names and titles of important figures in the company, such as the director (**Verkst. dir.**), board members, or founders.
7. **Financial Information:** Information about the financial aspect of the company, such as capital invested (**Akt.-kap.**) or turnover (**Tilllv.-värde**).
8. **Establishment Details:** This includes the year of establishment and sometimes the history or lineage of the company’s ownership or major changes.
9. **Address:** The full postal address, which may include a street name or a postbox number, indicated as “Postgiro”.

This type of catalogue was commonly used for business-to-business interactions and could be considered an early form of networking resource, allowing companies to find suppliers, customers, and partners.

Data collection strategy

In order to analyze both the biographical dictionaries and industrial catalogue, we need to bend the text into a machine readable structure. This process is relatively complicated. It involves breaking each component of the source up (e.g. each biography or company record), extracting the pertinent information from each record, storing each value with its associated key, and then saving this information in a way that is easy to analyze and aggregate. The simplified process is laid out in Figure 4.

Prior to the advent of Large Language Models (LLMs), this was a task that required a large number of human hours to complete, either putting the information into an excel sheet by hand, or writing rules to extract the information from the text. The first limits the number of observations a researcher can collect on her own, and the second approach quickly turns into the first. Due to the abbreviations, acronyms and contractions (for example, **Gävleb. 1.** is the contraction of *Gävleborg län* or Gävleborg county), while it might be possible to take a simple rules based approach to replacing these contractions with their






Data Collection Strategy		
For biographical dictionaries and industry catalogue		
Step	Process	
1	Scrape book data from website	
2	Split records on each page of a book	
3	Structure records with LLM	
4	Augment data with coordinates	
5	Store data for analysis	

Figure 4: Data collection process steps

complete Swedish text, and then looking for specific terms relating to each piece of information, the number of rules soon balloons to an unreasonable number. Writing a rule for every case necessitates as much human involvement as would be required to manually structure the information.

However, with the rapid advancements in LLM technology in the previous five years, this manual workload can be avoided to a large extent.

Intuitive explanation of LLMs contextual ‘understanding’

The GPT-3.5-turbo model which I make use of is a LLM which has been trained on all of Wikipedia and Wikidata, among others. These two sources contain the same information, but in a different format, as shown in the adapted extracts below.

Jonas Wenström (4 August 1855 in Hällefors – 22 December 1893 in Västerås) was a Swedish engineer and inventor, who in 1890 received a Swedish patent on the same three-phase system independently developed by Mikhail Dolivo-Dobrovolsky. He studied at Uppsala University.

Wikidata information about Swedish inventor Jonas Wenström

Key	Value
Name	Jonas Wenström

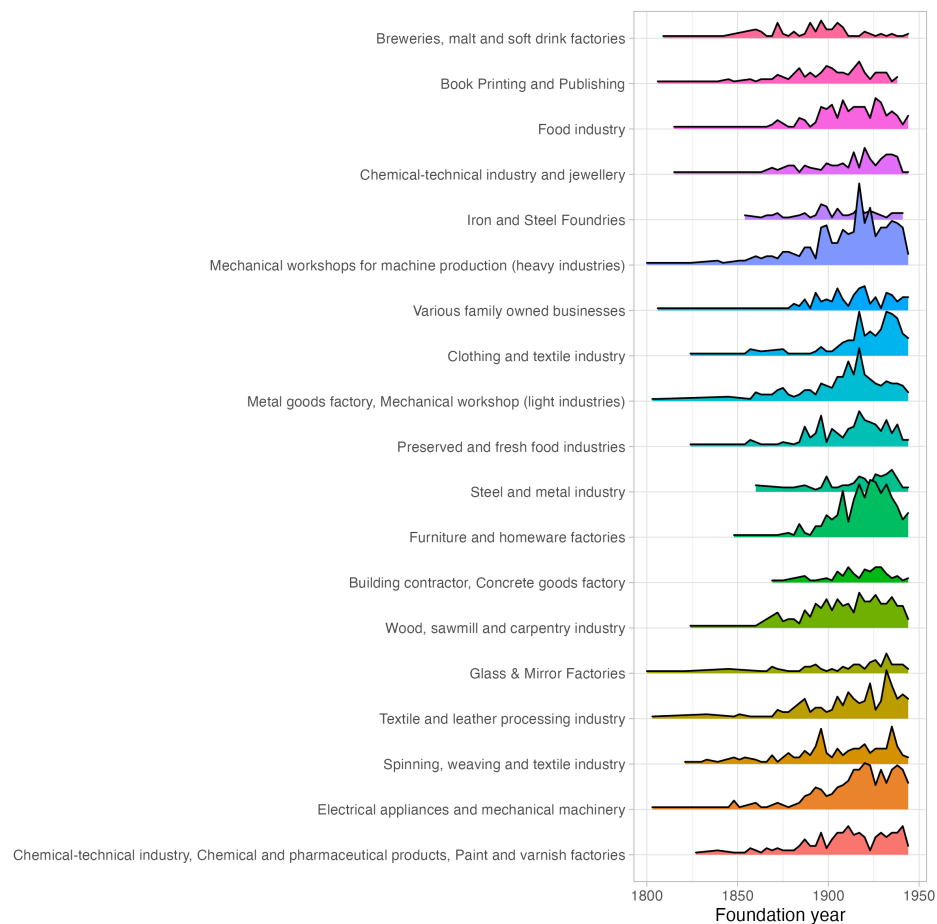
Birth Date	1855-10-04
Death Date	1893-12-21
Occupations	Engineer, Inventor
Education	Uppsala University

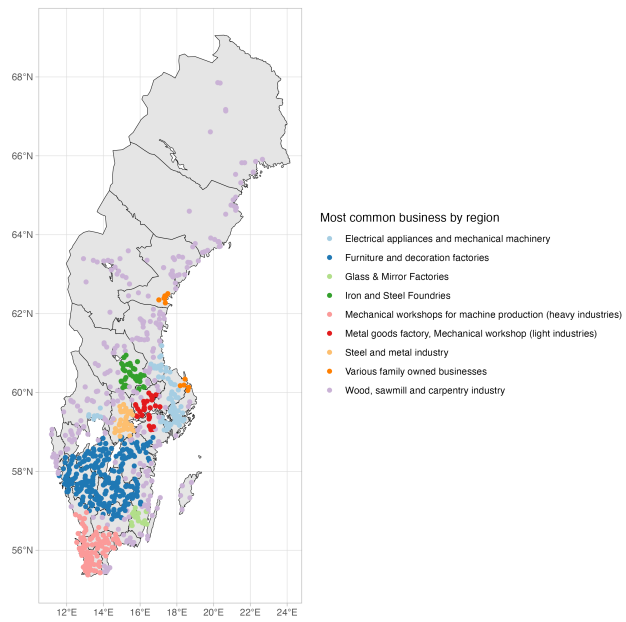
[complete explanation]

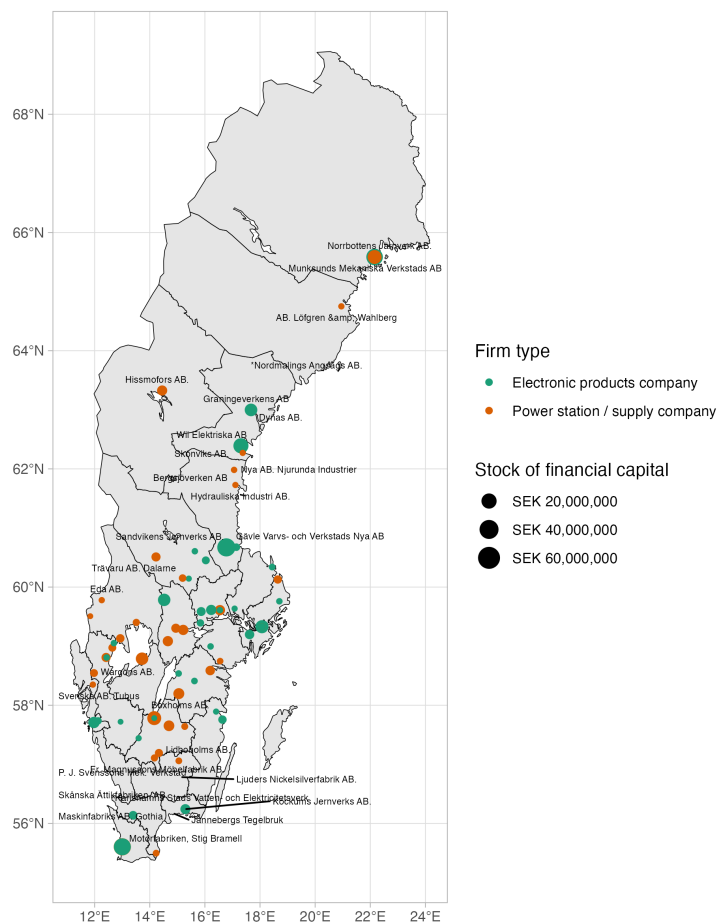
Clustering of firms and classification of occupations

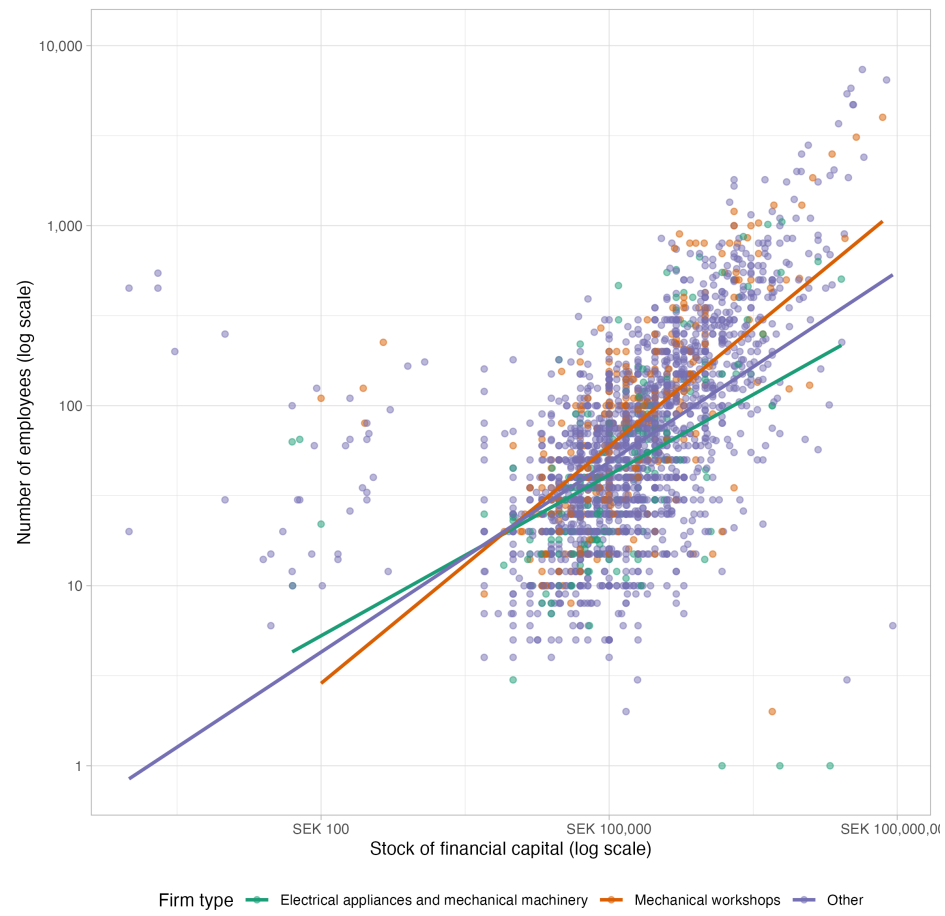
[explain how I cluster firms with text embeddings based on business and products]
[explain how I]

What does the industrial calendar tell us about industrial firms in Sweden in 1947?



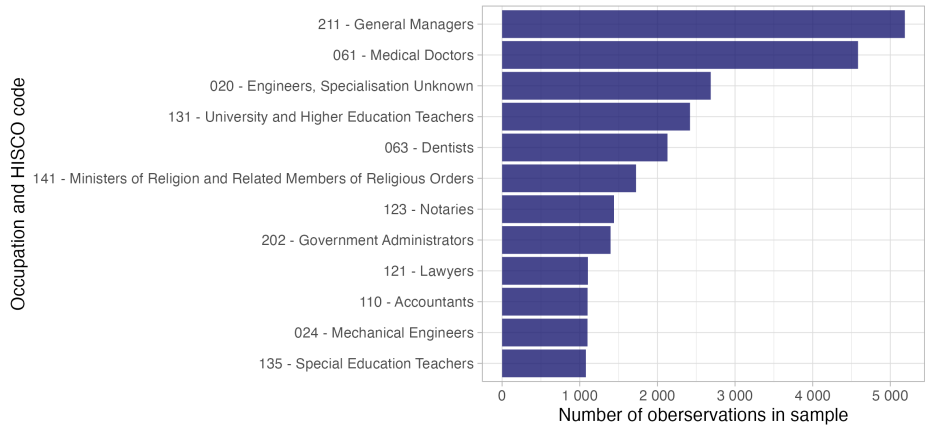






What can we learn from the Who is Who? biographies?

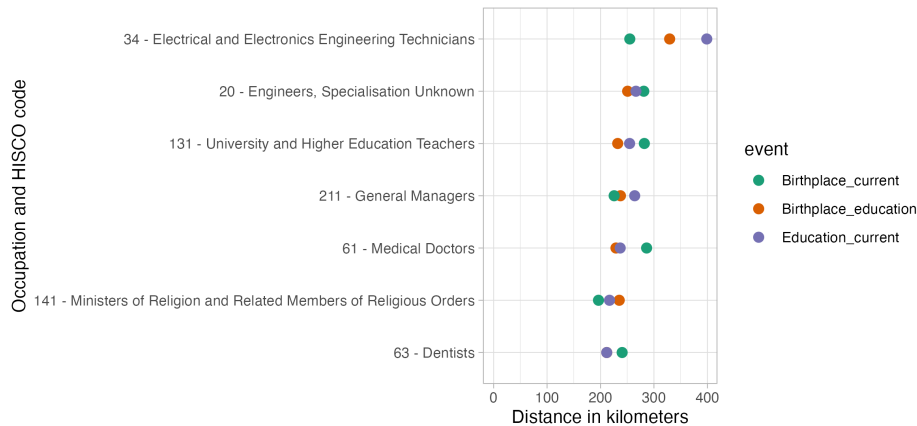
Most common 3 digit HISCO codes in the Who is Who sample



Life paths of selected Electrical and Electronic Engineering Technicians



Distances between life events for selected occupations



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