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# Labour market concentration since the British industrial revolution

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# Labour Market Concentration Since the British Industrial Revolution*

Kirill Kushnarev†

**Abstract**

This paper highlights an economic history perspective on the labour share and market concentration starting from the British Industrial Revolution. I address two questions: 1) Does market concentration follow labour share? 2) If so, what are the sources of these co-fluctuations and deviations following the rise and the decline of the labour share? Using linked individual-level data on business entities from 1850 onward, I document business dynamism as a key driver of labour share fluctuations. Moreover, market concentration rises alongside the labour share and increasing business dynamism. However, the decline in the labour share is associated with a larger rise in market concentration and a more pronounced decline in business dynamism. Such an approach sheds new light on the sources and the deviations of growth from the GDP hockey stick pattern starting in the 18th century.

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# 1 Introduction

Since the mid-18th century, the labour share of national income has steadily increased (Clark 2014; Allen 2009), a lesser-known fact compared to recent labour share decline (Autor et al. 2020; Barkai 2020; Karabarbounis and Neiman 2013). Between 1750 and 2016, compensation for labour in total value added in Great Britain increased by over 0.25 points, reaching a level of 0.75, where 1 is all value added by both capital and labour.

The recently observed decline in the labour share has been linked to multiple explanations. These include the expansion of capital-intensive superstar firms and the rise of their market power (Autor et al. 2020; De Loecker, Eeckhout, and Unger 2020; Andrews, Criscuolo, and Gal 2016). Other theories emphasise automation and bias in technological change (Acemoglu 2002; Card and DiNardo 2002; Reichardt 2024) as key sources of labour being increasingly substituted by capital. Yet, there remains a gap in explaining why the labour share increased over the long run, even after the British Industrial Revolution, despite significant large-scale capital deepening.

In this paper, I analyse how the long-run rise in the labour share since the 1750s relates to its recent decline. My argument is that both the decline and the rise of the labour share increase concentration via different channels. The booms lead to excessive entry and the expansion of less capital-intensive enterprises, which strengthens market concentration in the long run.[1] In

1. There is no right way to use the term firms for 18th-century data, so I use the terms workforce, entrepreneurs, and firms as synonyms unless otherwise explicitly stated.

particular, the new entrants spur incumbents' capital growth. The busts are driven by a redistribution: new entrants are more likely to exit, while incumbents expand their capital, absorb the labour of exited firms, and increase the fixed costs.

First, to motivate the theory, I summarise aggregate trends in labour share, market concentration, and business dynamism in Great Britain.[2] I construct the labour share from Humphries and Weisdorf 2019 and Feinstein 1976, and proxy market concentration to labour market concentration, relating to common practice in the absence of capital data (Azar, Marinescu, and Steinbaum 2022).

The labour share increased over time, with limited evidence of rising capital-labour substitution or capital deepening sufficient to offset this trend. Instead, there has been a clear trend of increasing labour share over the past three centuries, although the trend became more volatile in the middle of the 19th century. I use such increasing deviations from the trend to identify how labour share co-moves with market concentration between 1851 and 1881.

As a result, market concentration follows labour share between 1851 and 1881 as current literature predicts (Autor et al. 2020; Karabarbounis and Neiman 2013): a decline in labour share leads to a rise in market concentration and vice versa. However, this reflects a distributional effect measured at the level of local industries, meaning that aggregate market concentra-

2. I use Great Britain and United Kingdom interchangeably where appropriate. When the data are limited to England only, I state this explicitly.

tion across Great Britain does not decline alongside the rise in the labour share. In the context of U.S. corporations, support for a similar hypothesis is discussed in Kwon, Ma, and Zimmermann 2024.

Second, to what extent does business dynamism contribute to trends in the labour share and market concentration? I calculate key statistics, including firm entry and exit rates for 1750-1911, job creation and destruction, firm size distributions and Zipf's law, and labour market tightness for 1851-1911. As a result, the deviation of labour share is associated with a short-term increase in exits and job destruction. However, the rise of labour share is not associated with an increasing number of entrants or job creation, although it coincides with an increase in firm size and a convergence to Zipf's law. The rates of business dynamism are proportional to those reported for the U.S. starting from the 1980s in Haltiwanger 2012.

**Related literature.** This paper aims to bridge growth theories such as those by Acemoglu (2002) and Blanchard, Nordhaus, and Phelps (1997) with individual-level historical data.

First, the paper contributes to the literature on the labour share and market concentration (Covarrubias, Gutiérrez, and Philippon 2020; Gutiérrez and Philippon 2019; Syverson 2019; De Loecker, Eeckhout, and Mongey 2021; Hopenhayn, Neira, and Singhania 2022; Azar, Marinescu, and Steinbaum 2022; Barkai 2020; Karabarbounis and Neiman 2013). The paper engages with these debates by using historical data to explain the disconnect between

the recent decline in the labour share and its long-run upward trend. The paper then formulates a coherent view of the dynamics of the labour share and market concentration, using deviations from the long-run labour share trend similar to an idea of hysteresis by Blanchard and Summers 1986.

Second, the paper aggregates stylised facts on business dynamism back to the 18th and 19th centuries, similar to Haltiwanger (2012). In addition, it introduces new labour market tightness data for 1851-1911, similar to that discussed in Mortensen and Pissarides (1994) and search models in general. To some extent, it also quantifies links to business dynamism, such as those proposed by economic historians Crafts (1995a) and Mokyr (2018), by presenting individual-level data that shed light on long-circulated ideas.

Third, the paper proposes a model of how changes in output, typically associated with the British Industrial Revolution in economic history, relate to market structure, market concentration, and firm dynamics. The model builds on Baqaee and Farhi (2020) and Hopenhayn (2014), using the output decomposition framework from the former and the entry and exit decision structure from the latter.

Several authors, such as Schneider and Vipond 2023; Korn and Lacroix 2024; Kastis and Vipond 2024, have already worked with the 1851–1911 data, linking it to automation and technological change. Moreover, Robert Bennett adapted the data for studying entrepreneurs in Bennett et al. 2020a; Bennett et al. 2019; Bennett. et al. 2020b. Yet, this paper introduces a longer time

series, beginning in 1750, and uses the data to understand changes in output and labour share. Lastly, while business historians, notably Hannah and Kay 1977; Payne 1967, have extensively published data on market concentration among large firms in Great Britain, this paper examines all source-recorded firms independent of their size.

Fourth, the paper contributes in part to the literature on agglomeration and market concentration, including Glaeser, Kerr, and Kerr 2015; Hanlon and Miscio 2017; Heblich et al. 2025; Berbée, Braun, and Franke 2025.

**Outline.** The remainder of the paper is organised as follows. Section 2 presents stylised facts on the labour share, market concentration, and business dynamism. Section 3 concludes and outlines goals for further research. Appendix A presents robustness checks.

## 2 Stylised Facts

This section presents stylised facts on the labour share, market concentration, and business dynamism. I begin by showing evidence of a rising labour share from 1750 onward, followed by an analysis of how deviations in the labour share follow market concentration between 1851 and 1881. Finally, I link the labour share and market concentration to business dynamism and compare these patterns with those observed from the 1970s onward.

## 2.1 Labour Share

The Industrial Revolution did not lead to a sustained decline in the labour share. On the contrary, the labour share has continued to grow. Figure 1 illustrates the labour share growth indexed by 1750 onward.

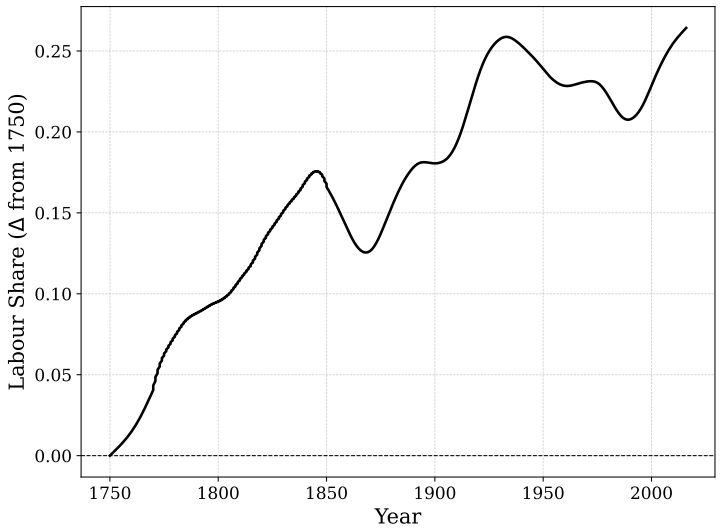


Figure 1: Labour Share Changes in England, 1750–2016

The growth of the labour share is consistent with the literature on labour's contribution to TFP growth during the British Industrial Revolution, such as Antràs and Voth 2003; Crafts 1995b. Labour impacted proportionally close-by capital to rising TFP, in part through what Mokyr 2021; Kelly, Mokyr, and Gráda 2023 describe as improvements in labour quality. Yet, it remains unclear how to explain fluctuations in labour share based solely on this, which is also pointed out by Allen 2009. In particular, Allen 2009 documents the gap between output growth and real wages from 1770 to 1840.

The labour share dynamics differ from real wages over a broader period, between the 1750s and the 1870s. Moreover, the labour share does not closely follow real wages in general. Figure 2 presents real wages, adjusted for living costs based on Crafts and Mills 1994, and the labour share, both indexed to 1750. Figure 2 shows that the labour share decreased between 1845 and 1865, equalising with real wages in trends. Still, after the 1860s, the labour share and real wages responded differently to fluctuations around the trend.

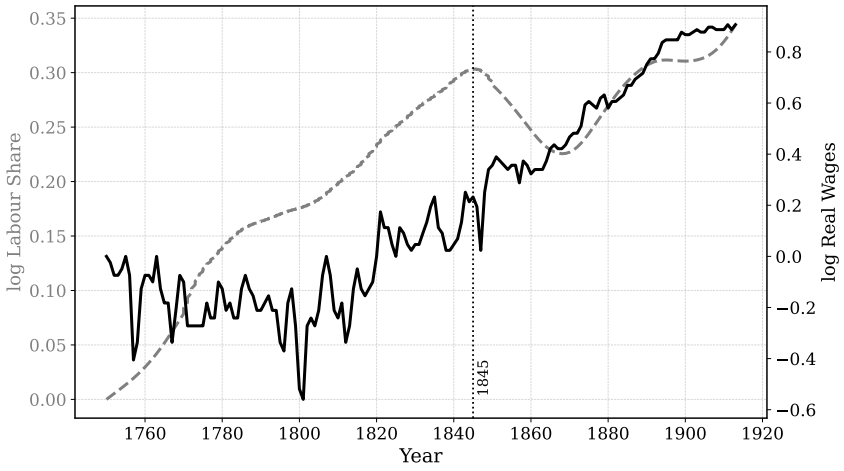


Figure 2: Labour Share and Real Wages, 1750–1913

I then pursue a research question related to Figure 1 and Figure 2: While the labour share has experienced multiple fluctuations from 1750 to the present, what does the period of the British Industrial Revolution reveal? In the first stage of the Industrial Revolution, the labour share followed a different trajectory from that of real wages. In the second stage, beginning around 1845, a sharp decline in the labour share led to a closer co-movement.

The growth accounting literature emphasises that labour productivity growth complements capital accumulation. Antràs and Voth 2003 even accounts for proportional gains to labour as to capital, making a strong but overlooked claim that gains from the rise of total factor productivity during the Industrial Revolution were proportionally distributed across both labour and capital. A key conclusion of this literature, notably Allen 2012, is that relative input prices shaped productivity growth in Britain.

The input prices view offers only a static snapshot. When the labour share is considered dynamically, we observe a sharp increase in labour income beginning with the Industrial Revolution, following a prolonged period of decline.[3] This suggests that labour income declined before the Industrial Revolution and began to rise only around the 1750s, which does not entirely fit the earlier decline in the labour share, nor its disconnect from real wages.

Thus, I propose an explanation for the observed variation in the labour share and the subsequent pattern of real wages. I begin with market concentration, a leading explanation in the literature for the dynamics of the labour share. The theory, built on data starting in the 1970s, predicts that market concentration would decline if the labour share were increasing.

3. According to Humphries and Weisdorf 2019, the decline in the labour share began in the aftermath of the Black Death and ended in the mid-18th century.

## 2.2 Market Concentration

Based on data availability, market concentration can be measured using either labour market or sales data. On the one hand, Berger, Herkenhoff, and Mongey 2022; Amodio, Medina, and Morlacco 2024 propose an explanation based on an imperfect productivity–wage pass-through channel, through which market concentration in labour markets lowers both the labour share and output. On the other hand, Autor et al. 2020; Autor, Patterson, and Reenen 2023, using sales data, show more generally that high market concentration is associated with a capital-favoured environment and leads to higher markups.

However, both approaches are constrained by data that begin only in the 1970s. To overcome this limitation, I am going to show the relationship between the labour share and market concentration in an earlier period, using labour market data from 1581 to 1881. This period captures both the decline and the rise of the labour share, and thus provides rich context to study technological change and the labour share.

Industry-level labour market concentration increased between 1851 and 1881, regardless of labour share dynamics. Figure 3 presents two specifications, one using the Herfindahl-Hirschman Index and the other the 90/10 ratio, both of which confirm a significant rise. The most plausible explanation for this trend is the parallel growth in average firm size, particularly among already large firms, as confirmed by Figure 4.

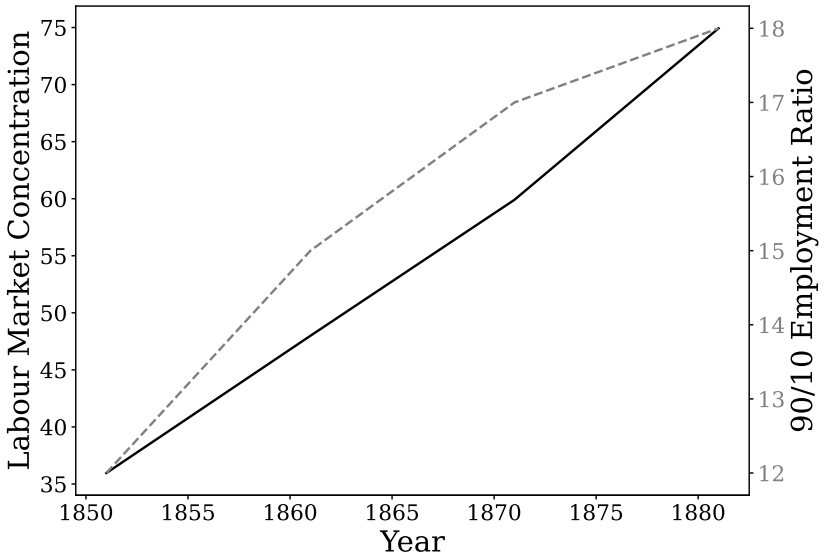


Figure 3: Industry-Level Labour Market Concentration, 1851–1881

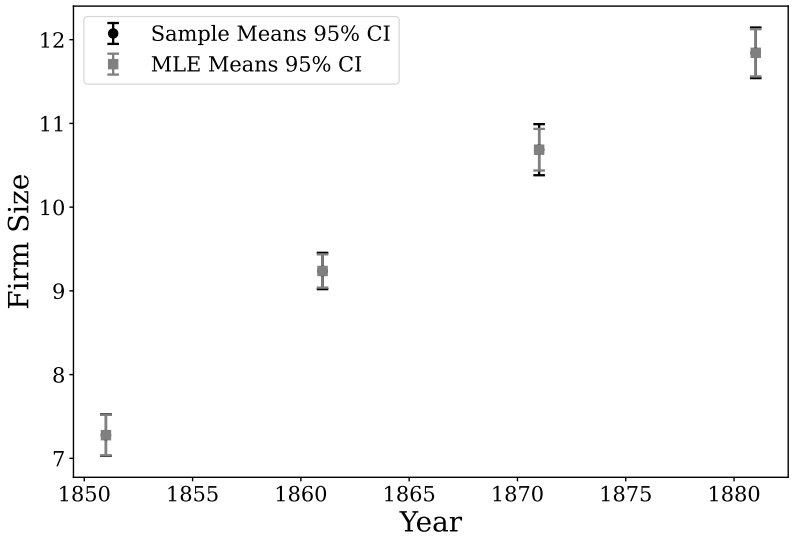


Figure 4: Average Firm Size by Number of Workers, 1851–1881

The rise in market concentration is driven by the reallocation of labour toward industries that are themselves becoming more concentrated. I decompose industry-weighted $\Delta HHI_t^{EW}$ into three components following Autor, Patterson, and Reenen 2023: within-industry reallocation toward larger firms, reallocation across industries, and a covariance. The specification follows Equation (1) at the two-digit industry level $k$.

$$\Delta HHI_t^{EW} = \underbrace{\sum_k w_{k0}^l \Delta HHI_{kt}^{EW}}_{\text{within effect}} + \underbrace{\sum kHHI_{k0}^{EW} \Delta w_{kt}^l}_{\text{between effect}} + \underbrace{\sum k\Delta w_{kt}^l \Delta HHI_{kt}^{EW}}_{\text{covariance effect}} \tag{1}$$

To estimate the size and magnitude of reallocation, I use a bootstrap estimator, following Equation (1). The results, presented in Figure 5, confirm that covariance effects are the main driver of changes in market concentration. These findings remain robust when I fix industry shares at their 1851 levels to avoid correlation between shifts and shares, following Jaeger, Ruist, and Stuhler 2018, and when I apply alternative frameworks for constructing confidence intervals, such as PoSI or HySi.

To provide further intuition, I run a synthetic difference-in-differences analysis with a placebo group with fixed industry-level weights. The results, presented in Appendix A, confirm that changes in industry shares alone do not drive market concentration.

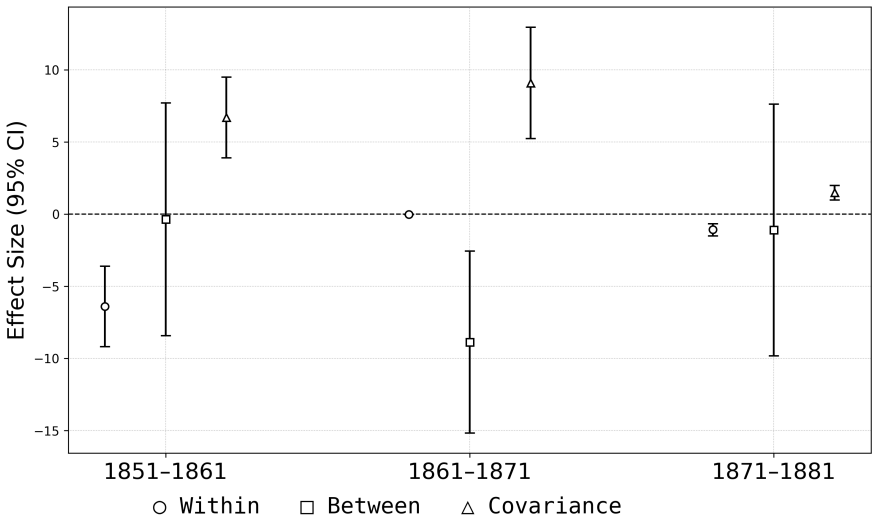


Figure 5: Industry-Level Components of Market Concentration, 1851–1881

To examine disaggregated effects of market concentration, I define local labour markets as four-digit industries in local areas with more than one employee. In the data I use, this corresponds to towns and cities, excluding rural areas. To assess the potential bias from excluding rural areas, I use data on the labourers' occupations in these areas to simulate how many rural firms are missing from the dataset if firms in both rural and city areas follow a Pareto distribution, and condition my results accordingly in Appendix A.

To match the labour share, I aggregate local labour market concentration by taking the average of the Herfindahl-Hirschman Index within each four-digit industry in the local area cell. Each urban area corresponds to fifty-one four-digit industries. As a robustness check, I present a two-digit, seventeen-industry classification in Appendix A.

Local labour market concentration moves with the labour share: a decline in the labour share is associated with increased market concentration, and vice versa. Real wages, however, do not respond to rising market concentration. Figure 6 illustrates local labour market concentration, along with trends in labour share, and real wages.

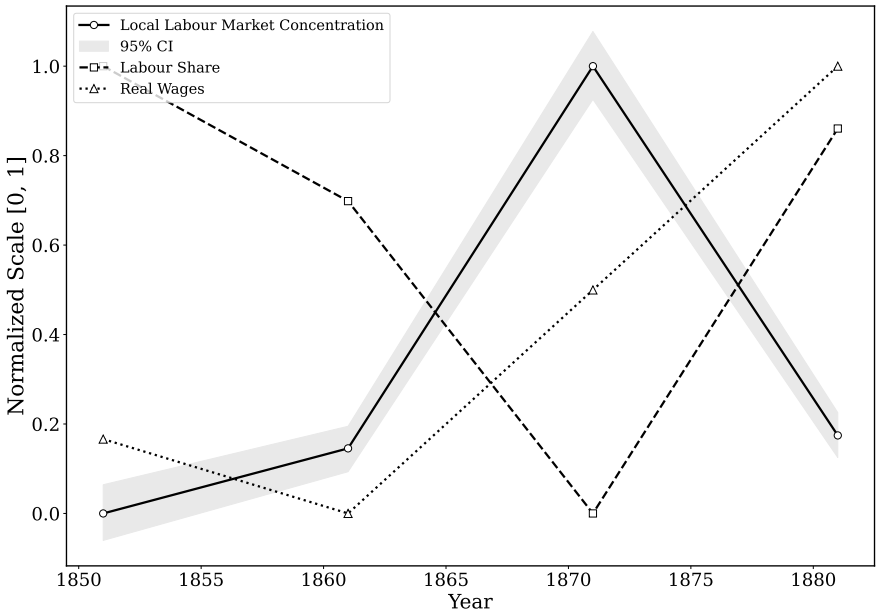


Figure 6: Local Labour Market Concentration, 1851–1881

To minimise the influence of outliers, including specific local markets such as London, I present the estimates using a non-parametric bootstrap, ensuring that changes in concentration remain consistent on average and across different samplings of local markets. In addition, the results are robust when using either the mean, the median, or other summary statistics, as detailed in Appendix A.

In opposite to industry-level concentration, local labour market concentration is driven by changes in the labour share. This relationship is consistent across different samples of local labour markets and shows that both increases and decreases in the labour share correspondingly reduce or raise labour market concentration.

Furthermore, there is no evidence of such a relationship for real wages after the 1860s. Even though real wages began to grow apace with output in the 1840s, according to Allen 2009, they no longer appear to have acted as a check on market concentration after the 1860s. This aligns with both Marxian and Malthusian views, as population growth outpaced the capacity of market concentration to check real wages after the 1860s. Nevertheless, both dynamics were present, as I conclude from the pre-1860s period and the observed check of market concentration on the labour share.

The primary source of both the rise and decline in local labour market concentration is the redistribution within local industries. Following Equation (2), at the two-digit industry level $j$ and local labour market $L$, I estimate what drives the average change in market concentration within each industry in each local labour market.

$$\Delta HHI_{jtL} = \underbrace{\sum_i w_{i0}^{jL}\, \Delta HHI_{ijtL}}_{\text{within effect}} + \underbrace{\sum_i HHI_{i0}^{jL}\, \Delta w_{ijtL}}_{\text{between effect}} + \underbrace{\sum_i \Delta w_{ijtL}\, \Delta HHI_{ijtL}}_{\text{covariance effect}} \tag{2}$$

Figure 7 shows that only redistribution within industries explains changes in market concentration. Within-industry reallocation toward larger firms within local markets has a large effect across all periods when 1851 is fixed as the base year. The effect is most pronounced in 1871, although it remains consistent across all periods. The magnitude of this effect is much lower than that of industry-wide changes presented in Figure 5, which is consistent with the fact that it reflects the average effect of changes in market concentration across each industry-local market cell.

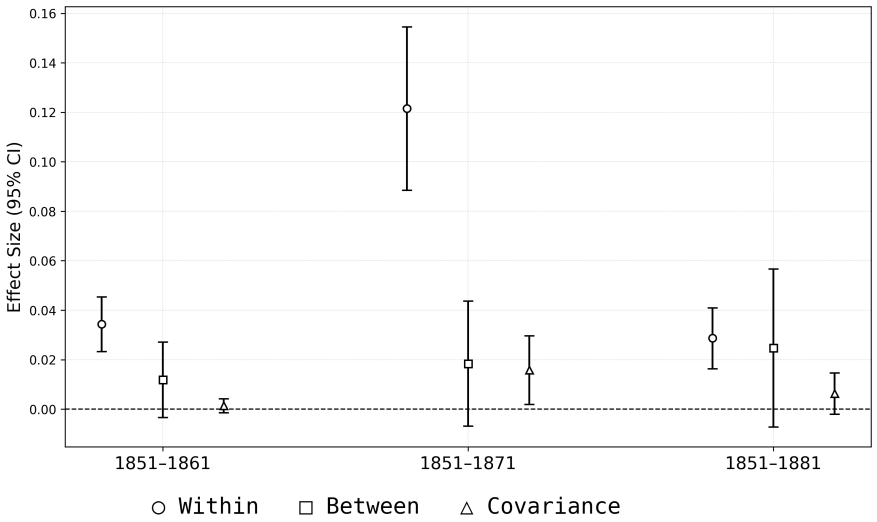


Figure 7: Components of Local Market Concentration, 1851–1881

There are two sources behind the rise and fall of market concentration. First, large firms grow even larger, and this effect is significant on average across all local markets. Second, growing industries tend to become more concentrated, in contrast to already concentrated industries, where firms be-

come more equal in size over time at the country level. Thus, redistribution between industries plays an important role in increasing overall market concentration, although there is little evidence of such redistribution at the local level. In addition, while within-industry changes reduce concentration at the country level, they increase market concentration at the local level.

Firm size and local market concentration follow labour share and real wages, but aggregate market concentration does not. I argue that this reflects a logic whereby local market concentration does not represent technological advancements among large firms during the period, as suggested by Payne 1967, but rather reflects changes in the broader conditions of business dynamism. Changes in local market concentration reflect competition in these markets, whereas average market concentration appears to be related to broader technological changes that occurred in the textile industry and in the North of England, as argued by Mokyr 2021.

Competition, proxied by changes in local market concentration, is related to changes in the labour share, as Autor et al. 2020 argue. Higher competition leads to a decline in market concentration and an increase in the labour share, and vice versa. This is consistent with the absence of an effect for industry-wide market concentration, as it does not capture changes in the full distribution of firms across different markets.

To further explore the sources of market concentration, I present stylised facts on business dynamism over the longer period from 1750 to 1911.

## 2.3 Business Dynamism

By business dynamism, I refer to firm growth, entry, exit, and other dynamic firm-level characteristics, such as firm age. Even though, on average, firms are stable over time and exhibit stable distribution, there is a significant heterogeneity and dynamism among them, as in the classic example provided by Haltiwanger 2012. I explore the following questions:

- How often do large firms exit the market? Did the large businesses become bigger and more stable over time?
- From which part of the distribution does employment growth originate?

First, Figure 8 highlights concentration ratio of the top 1% of firms in the total employment of the top 10% of firms. The results show that the largest firms are not shrinking in terms of employment, despite many new entrants and rising employment at the bottom of the distribution.

Second, employment growth initially came from small businesses; however, between 1861 and 1881, the number shifted to firms with more than 50 employees, as depicted in Figure 9. This empirical finding contradicts the literature, as conventional theory suggests that net job creation primarily comes from small firms. There could be many explanations, and I stress that the rise of fixed costs may move the net job creation to the medium firms. This shift remains robust when controlling for the relative age of business.

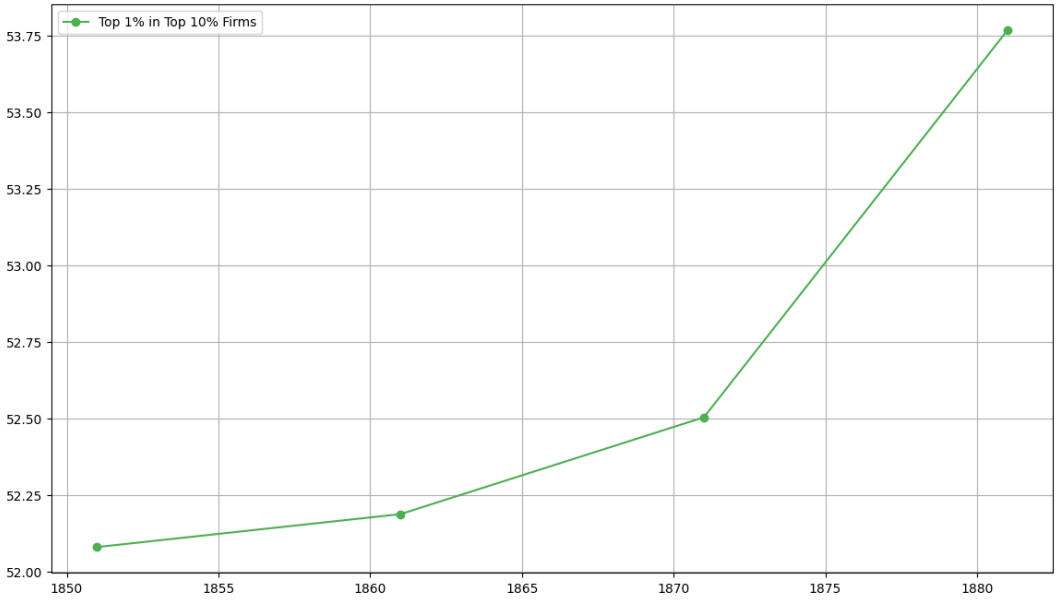


Figure 8: Top 1% within the Top 10%, 1851-1881.

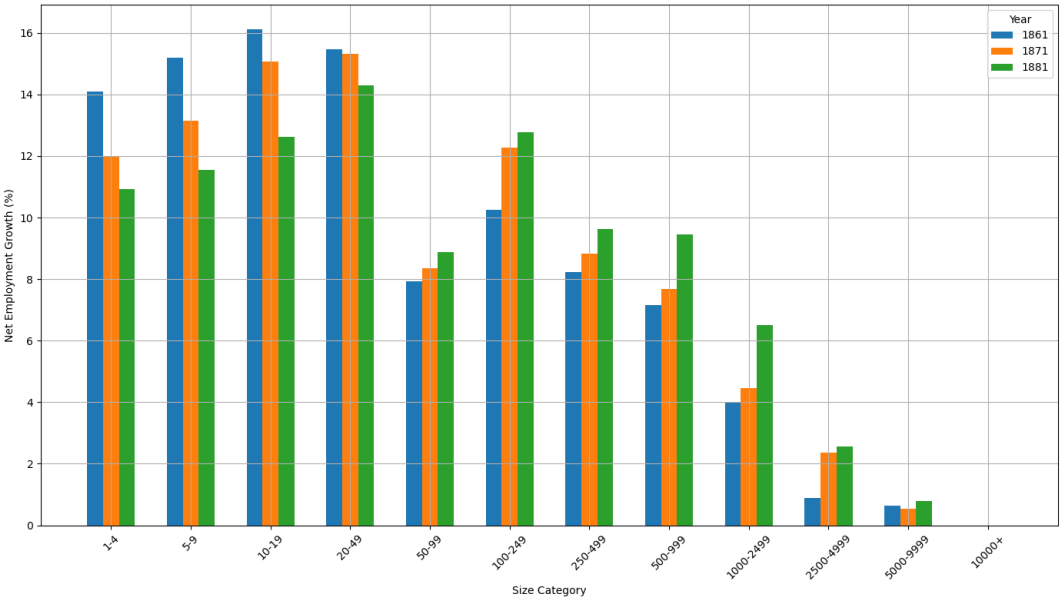


Figure 9: Net Employment Growth by Size, 1851-1881.

# 3 Conclusion

The second stage of the British Industrial Revolution, between 1851 and 1881, coincided with a rise in market concentration. This paper suggests that both increases and declines in the labour share may contribute to higher concentration, although through different channels, a tendency that resembles recent evidence for the United States Kwon, Ma, and Zimmermann 2024.

Contrary to much of the literature on this period, I show a mechanism of uneven growth, as employment shifted toward larger businesses within local labour markets. Facts on firm-size distributions, market concentration, and business dynamism help explain how the labour share began to grow steadily after 1871 and how heterogeneous this growth was.

The labour share began to grow steadily after 1871 in a context where local labour market concentration declined, business dynamism and reallocation rates were extensive, and nationwide market concentration continued to increase. As discussed in the Introduction, this pattern suggests that labour-share booms generated uneven growth: employment shifted across firms within local labour markets, while concentration among larger businesses at the national level remained stable or continued to rise. Labour-share busts, in turn, disproportionately affected new entrants, increasing early exits and allowing incumbents to expand by absorbing labour and capital from exiting firms. Overall, these stylised facts allow us to bring together firm size, market concentration, and business dynamism in a single frame-

work to explain the heterogeneous growth dynamics of the British Industrial Revolution.

A natural direction for future work is to extend the analysis further back, from 1750 to the 17th century, in order to study the early dynamics of the British Industrial Revolution. Trade directories, collected by University of Leicester 2024 for England and Wales, provide a promising source for this extension, as they make it possible to observe business entries, exits, and changes in specialisation within local labour markets. In future work, I plan to link de-anonymised I-CeM records and BBCE entrepreneurs to trade directories using full names, exact addresses, street names, house numbers, and occupations. The current directory data include 689 OCRed directories covering 40 areas between 1760 and 1850. Because the BBCE provides a sample of entrepreneurs, while trade directories offer broader population coverage, the overlap between the two sources can also be used to estimate BBCE coverage in selected areas such as Liverpool and London.

Preliminary linkage suggests that, on average, 61 percent of firms can be matched between the BBCE and trade-directory records. This extension would make it possible to reconstruct business dynamism before 1851 and to assess more directly how local firm entry, exit, and reallocation shaped the mechanisms of the Industrial Revolution.

# A Appendix: Robustness checks

## A.1 Business-Size Distribution, 1851-1881: calculations

To begin with, I plot CDFs and CCDFs for the 1851, 1861, 1871, and 1881 firm-size distributions, using the following definitions:

$$F(x) = P(X \leq x), \qquad \bar{F}(x) = P(X > x) = 1 - F(x), \qquad f(x) = F'(x) = -\bar{F}'(x). \tag{3}$$

where:

- $f(x)$ is the probability density function (PDF), and $F(x)$ is the cumulative distribution function (CDF).
- The probability that the random variable $X$ has a realization larger than $x$ is $P(X > x) = F(x)$.
- The probability density function is given by $f(x) = -\overline{F}'(x)$.

Using these relationships between distribution functions, I have plotted the CDFs and CCDFs below.

Next, I calculate the PDFs for 1851, 1861, 1871, and 1881. First, I report the initial Pareto-style PDFs.

Second, I use the concept of a frozen PDF to compare them across years.

To investigate the coverage of BBCE data, I apply the Weak Law of Large Numbers and report the results below.

To provide evidence of Zipf's law of firm size, I use three specifications. The first is based on Axtell's paper and applies OLS regression in the following specification:

$$\log(i - \gamma) = b - \delta \log a_i + \nu_i \tag{4}$$

where $\gamma$ is a shift parameter.(Axtell 2001)

Based on this OLS specification, I construct Zipf's law graphs for 1851, 1861, 1871, and 1881 below.

The second specification is an empirical plot of ranks against frequencies of the firm size distribution, as reported below.

The third specification is to plot the empirical distribution against the exponential distribution to reject the hypothesis of an exponential nature of the firm size distribution.

Lastly, I report the values used to construct confidence intervals in Figure 4. Table 8 summarizes the upper-bound calculations based on Markov's equation. In addition, Table 9 highlights the results based on Chebyshev's equation. Table 10 reports a frequentist approach to constructing confidence intervals. Table 11 presents the values calculated using Maximum Likelihood

Estimations.

Table 1: Table of Mean Firm Size, Empirical Probability, and Markov's Bound for 1851-1881

| **Year** | **Mean Firm Size** | **Empirical P(Size $\geq$ 100)** | **Markov's bound** |
|---|---|---|---|
| 1851 | 7.2769 | 0.0063 | 0.0728 |
| 1861 | 9.2375 | 0.0099 | 0.0924 |
| 1871 | 10.6862 | 0.0132 | 0.1069 |
| 1881 | 11.8432 | 0.0159 | 0.1184 |

Table 2: Table of Mean Firm Size, Variance, Empirical Probability, and Chebyshev's Bound for 1851-1881

| **Year** | **Mean** | **Variance** | **Empirical P(Size$\geq$ 20)** | **Chebyshev's bound** |
|---|---|---|---|---|
| 1851 | 7.2769 | 3060.3629 | 0.0319 | 7.6509 |
| 1861 | 9.2375 | 2056.4645 | 0.0400 | 5.1412 |
| 1871 | 10.6862 | 3213.3362 | 0.0453 | 8.0333 |
| 1881 | 11.8432 | 4145.8936 | 0.0502 | 10.3647 |

Table 3: Table of Sample Mean, Sample Variance, and Standard Error using the Frequency Approach for 1851-1881

| **Year** | **Mean** | **Variance** | **Standard Error (SE)** |
|---|---|---|---|
| 1851 | 7.2769 | 3060.3629 | 0.1238 |
| 1861 | 9.2375 | 2056.4645 | 0.1083 |
| 1871 | 10.6862 | 3213.3362 | 0.1525 |
| 1881 | 11.8432 | 4145.8936 | 0.1511 |

Table 4: Table of MLE Mean ($\mu$), MLE Variance ($\sigma^2$), and Standard Error (SE) using Fisher Scoring for 1851-1881.

| **Year** | **MLE Mean ($\mu$)** | **MLE Variance ($\sigma^2$)** | **Standard Error (SE)** |
|---|---|---|---|
| 1851 | 7.2769 | 3060.3476 | 0.1238 |
| 1861 | 9.2375 | 2056.4528 | 0.1014 |
| 1871 | 10.6862 | 3213.3130 | 0.1262 |
| 1881 | 11.8432 | 4145.8707 | 0.1440 |

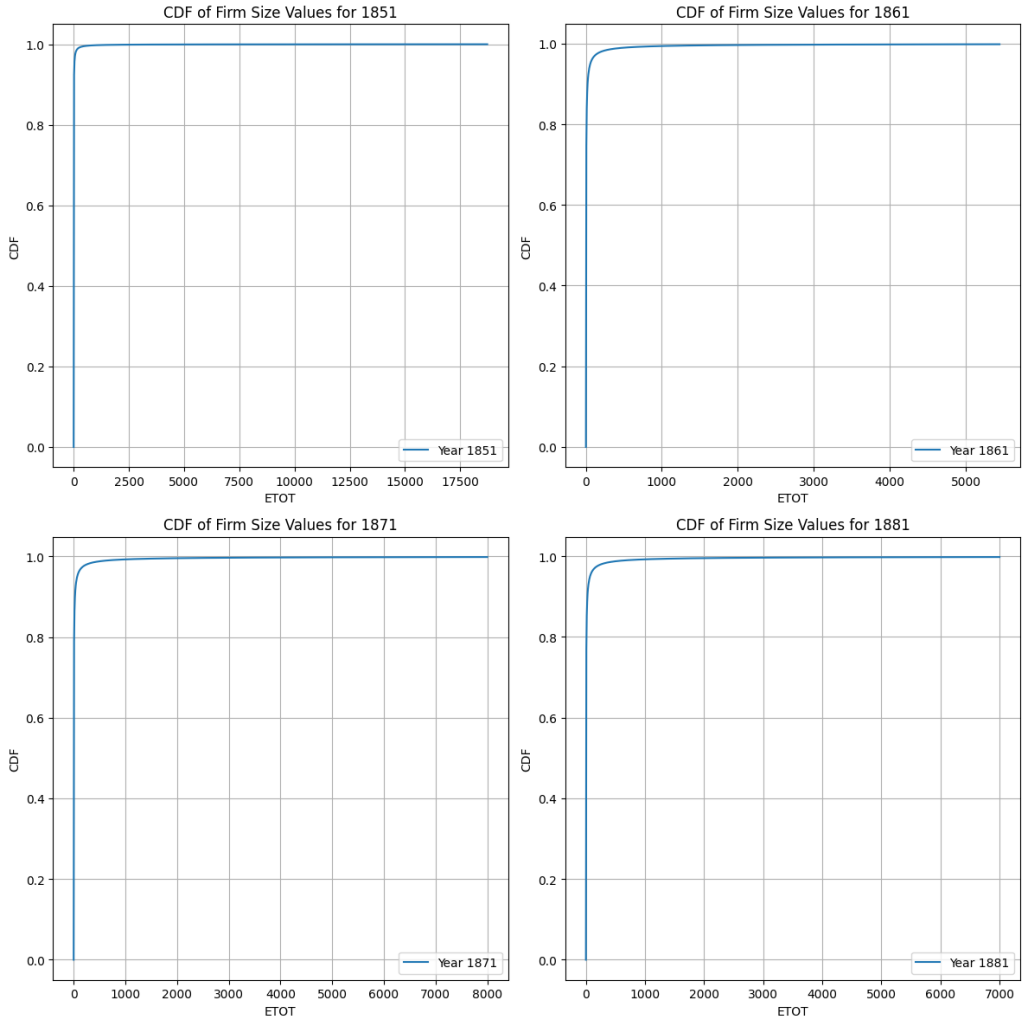


Figure 10: CDFs Functions of Firm Size for the 1851, 1861, 1871, and 1881 Censuses.

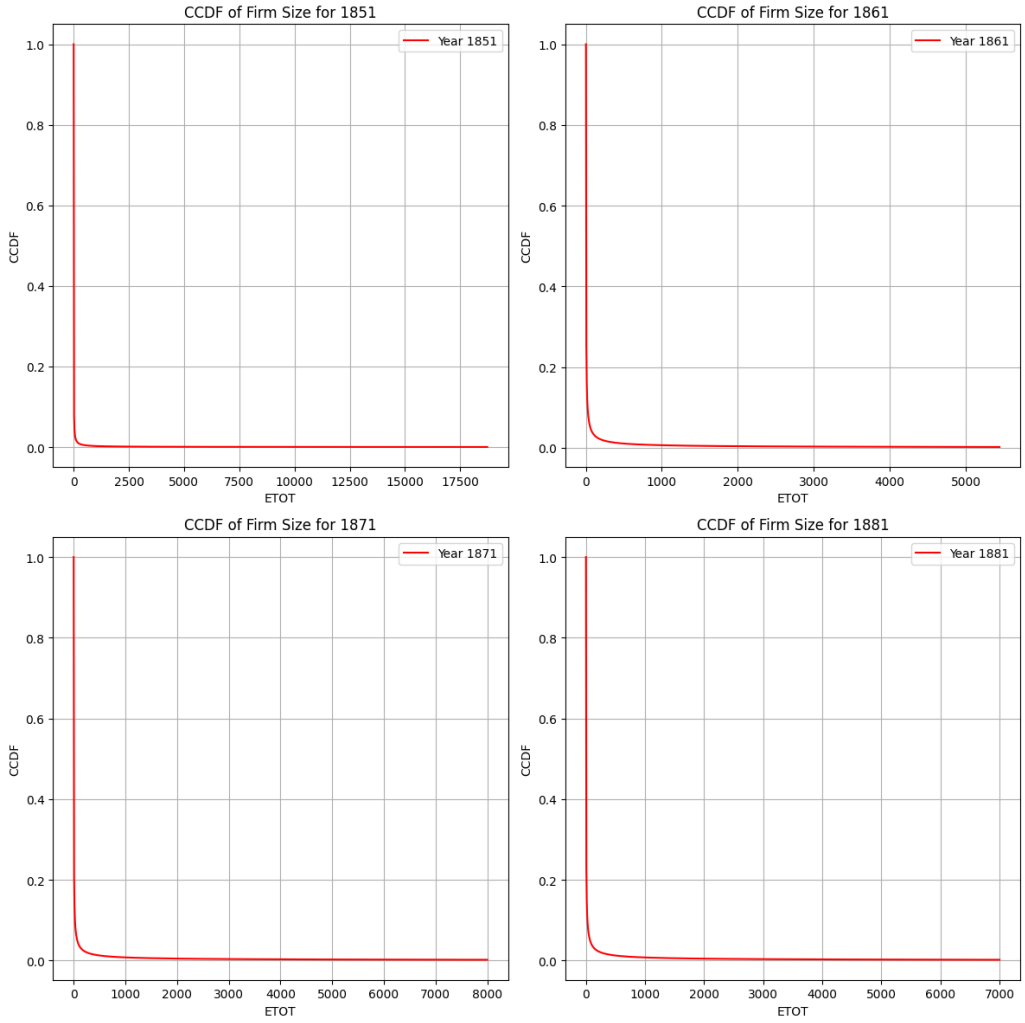


Figure 11: CCDFs Functions of Firm Size for the 1851, 1861, 1871, and 1881 Censuses.

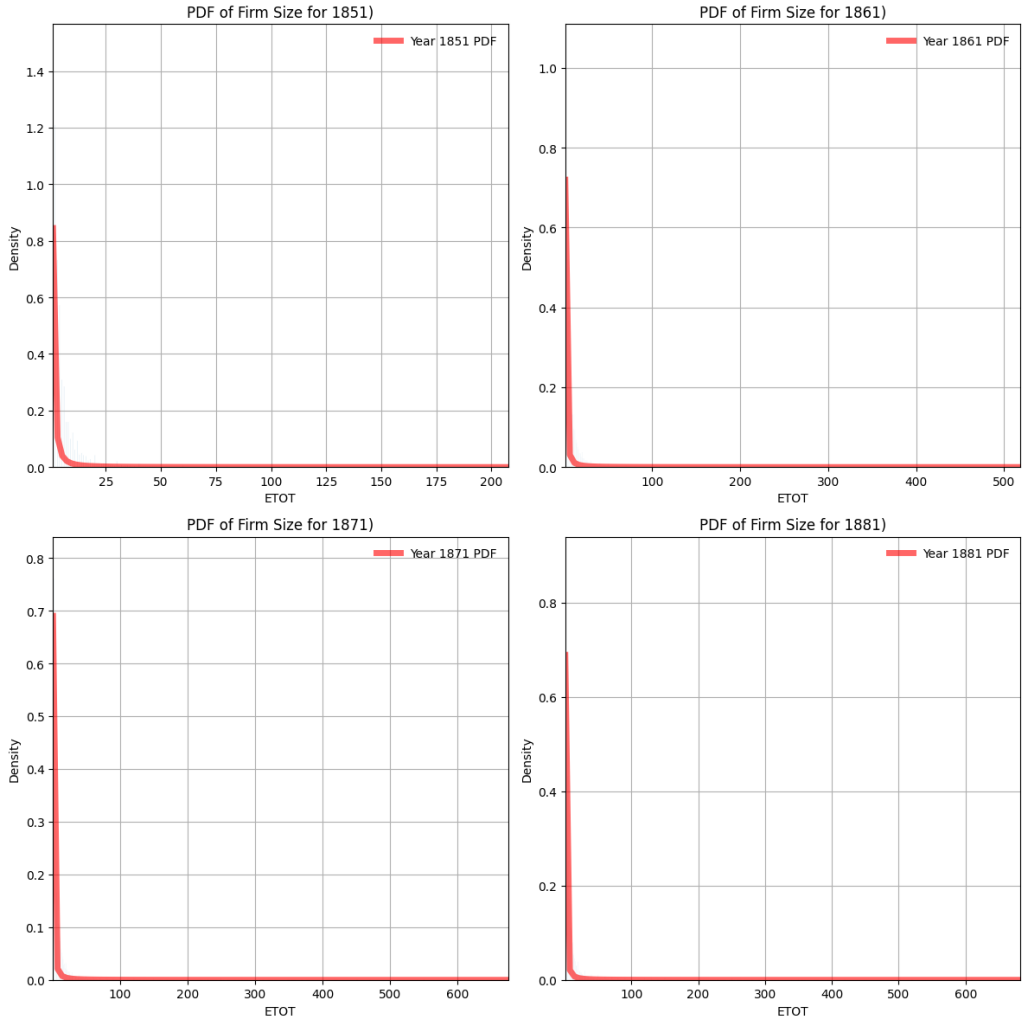


Figure 12: PDFs Functions of Firm Size for the 1851, 1861, 1871, and 1881 Censuses.

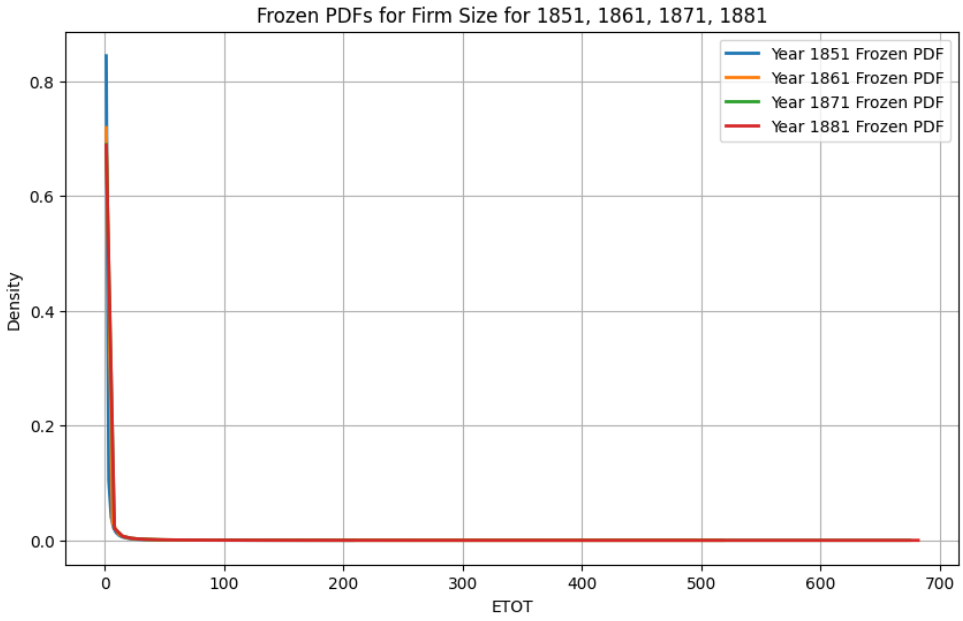


Figure 13: Frozen PDFs Functions of Firm Size for the 1851, 1861, 1871, and 1881 Censuses.

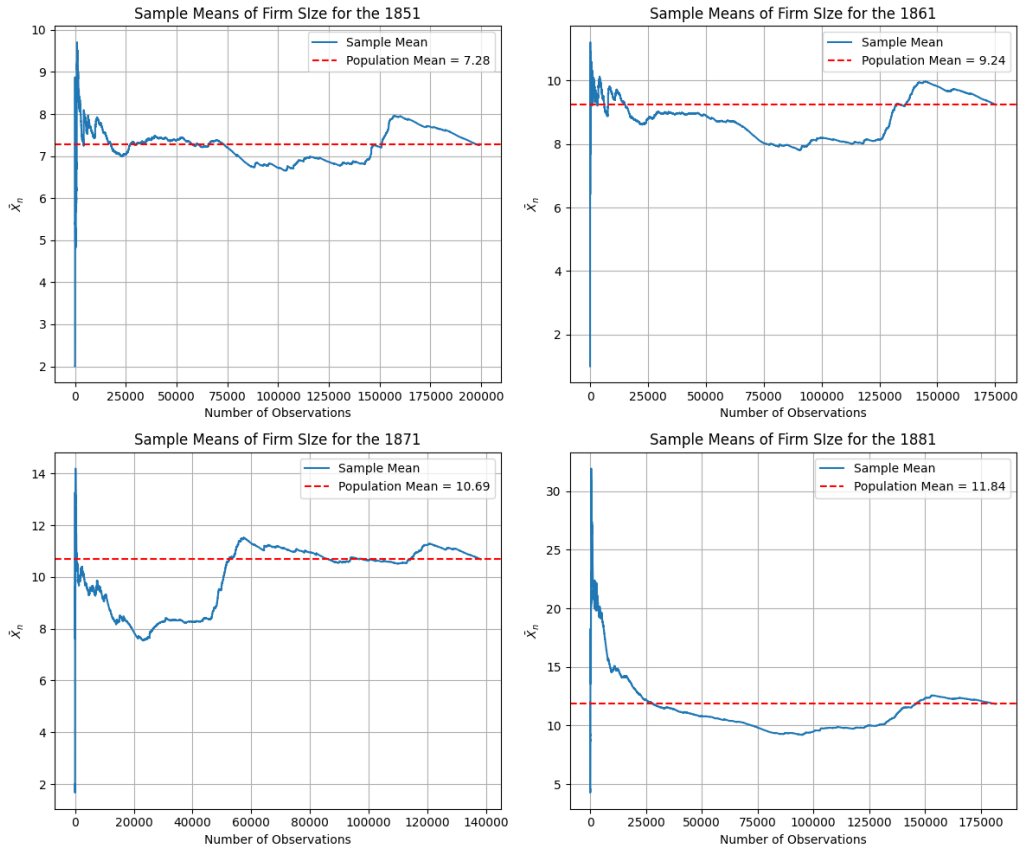


Figure 14: Sample Means of Firm Size for the 1851, 1861, 1871, and 1881 Censuses.

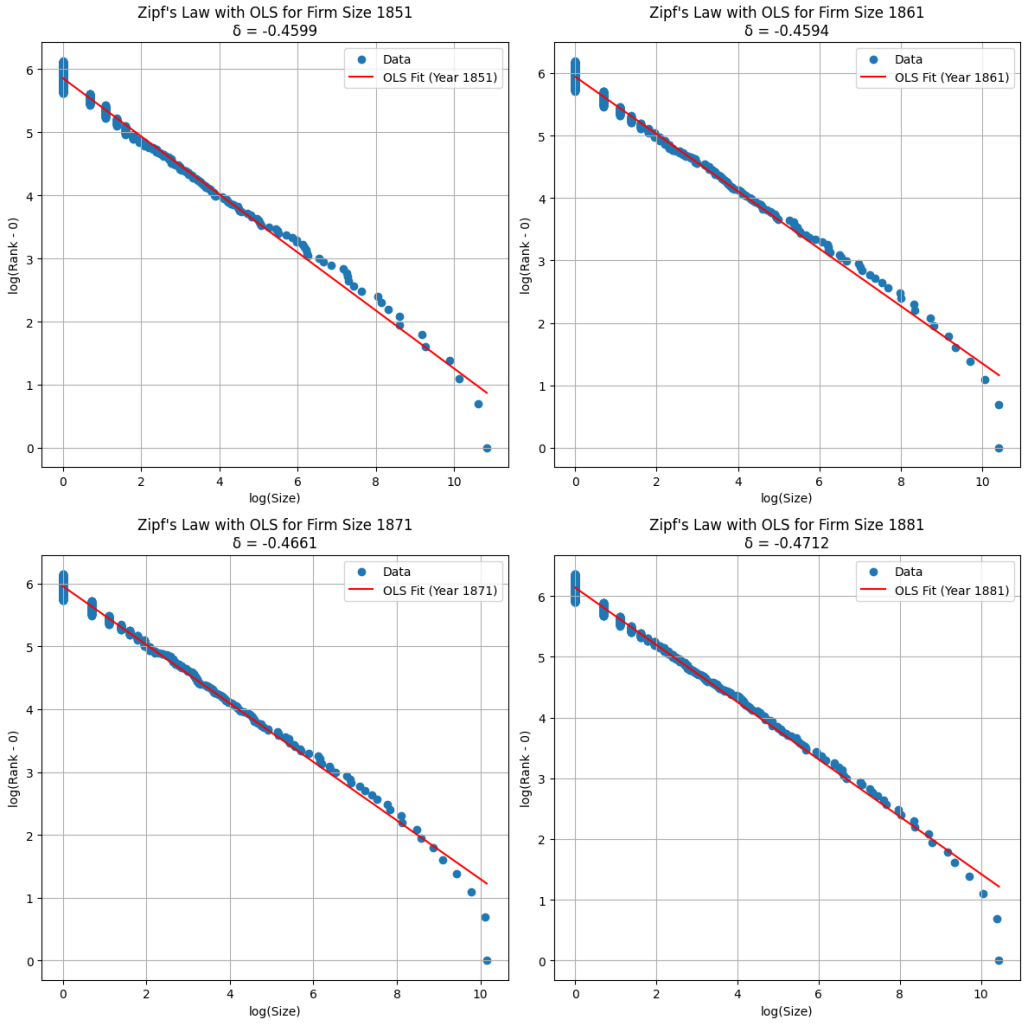


Figure 15: Zipf's Law of Firm Size for the 1851, 1861, 1871, and 1881 Censuses (Axtell's Check).

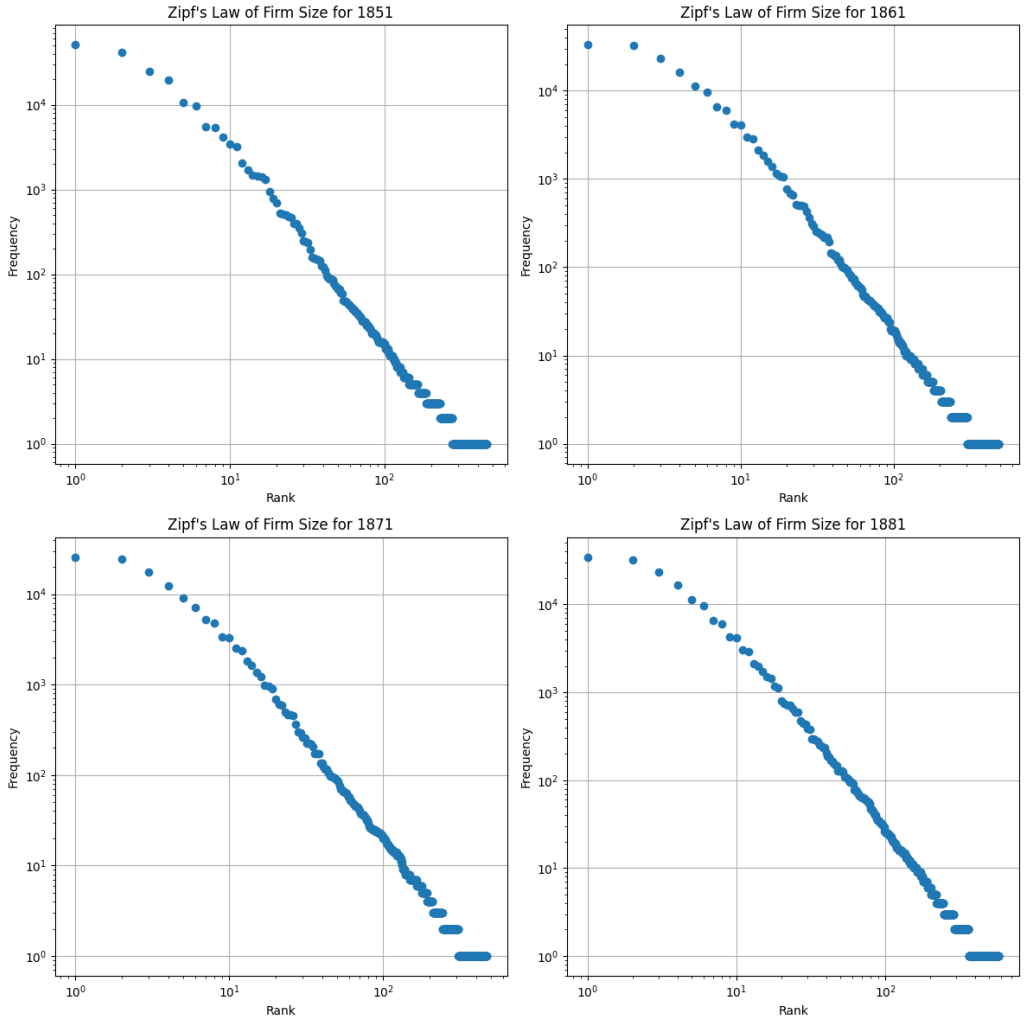


Figure 16: Zipf's Law of Firm Size Using Ranks Against Frequencies for 1851, 1861, 1871, and 1881 Censuses.

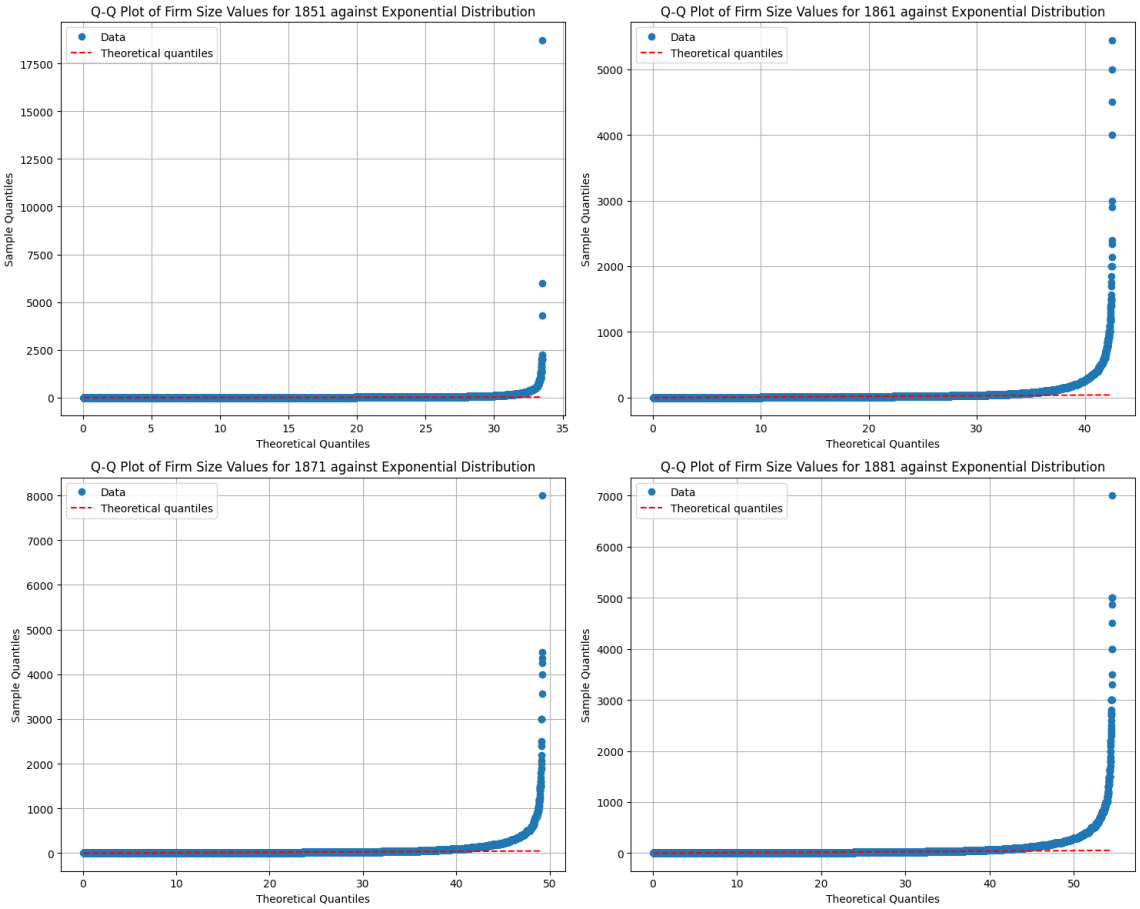


Figure 17: The Empirical Distribution Compared to the Theoretical Exponential Distribution for 1851, 1861, 1871, and 1881 Censuses.

## A.2 Local Labour Market Concentration: additional calculations

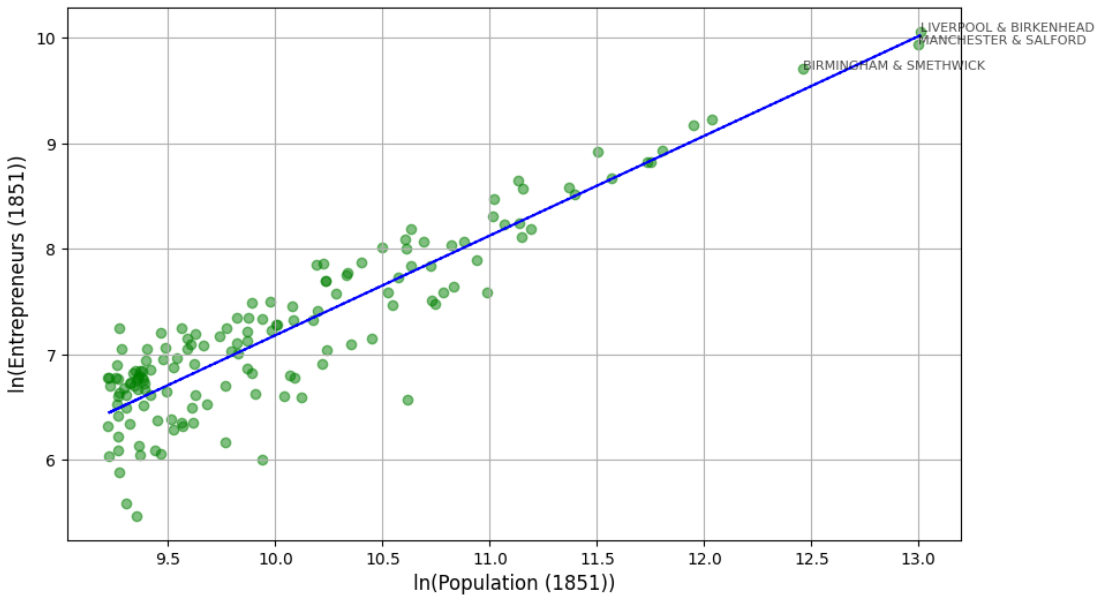


Figure 18: Cross-Sectional Association Between Population Growth and New Entrepreneurs (Excluding London), 1851-1861.

Note: The correlation is 0.63. Regression specification: y = 0.43x + 3.71, R2 = 0.40.

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