

Working Paper 52

London's jobs history - a technical paper

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1 Introduction

This paper describes the data and methodology used to construct a London jobs history between 1984 and 2010. This series is used by GLA Economics to forecast long-term employment projections. Where possible, National Statistics have been used, however where they have not been available, this note sets out the options followed.

Alongside the National Statistics used, data have been developed in an 'open model' with methods and assumptions clearly stated. The source data used are available to researchers (with sufficient data access) from the Economic and Social Data Service (for Labour Force Survey data) and from the Nomis web service (for business survey data).

For the first time the historical job series for use in the GLA forecasting model have been based on the new Standard Industrial Classification 2007 (SIC 2007). ONS surveys have been harmonising to SIC 2007 over a period of time which has enabled the Blue Book (UK National Accounts) to be published for the first time on a SIC 2007 basis on 23rd November 2011.

The new classification is a step-change from its predecessor and provides a more up-to-date breakdown of a number sectors which are particularly important to London including Finance, Business Administration, Professional and Scientific Services and Information and Communication.

This paper covers:

- The user need and requirements for a historic jobs series
- Issues in constructing a long-run London jobs series
- The move to the new Standard Industrial Classification 2007
- Background on available ONS data
- Key problems to overcome and compromises needed
- Detail of the exact steps taken to generate a series
- Presentation of results

User requirements and data provided

The requirements were for a London long-run jobs series from the early 1980s to the present with sufficient industry detail to examine the change in key London sectors defined by the latest Standard Industrial Classification (SIC 2007).

There was an additional requirement for the provision of industry detail, where possible, at the London level for use in GLA Economics' models for tourism, exports and life sciences. These models rely on the use of very detailed industry data.

For borough data the requirement was for a long-run jobs series beginning in the early 1980s, but without a sector breakdown.

The requirements were met by providing two jobs series for use by the forecasting model and an additional series over a shorter time span which could be used flexibly as a spread-sheet tool to provide further industry detail:

1. London Employment Jobs: a London level series which includes Employee Jobs and Self-Employment Jobs from 1984 to 2010 with industries by GLA Economics sectors on a SIC 2007 basis
2. A borough level Employee Jobs series 1984 to 2010 (no industry breakdown)
3. A spread-sheet based tool containing detailed London Employee Jobs data from 1998 to 2010

The first two products are described and published in this paper, the third product contains a low level of industry detail and is described but not presented as it requires users to have a data access agreement to view detailed business data.

Issues in constructing a long-run jobs series for London

The main components of a long-run jobs series are business survey data for employee jobs (ie jobs where people are paid a salary by an employer) and labour force survey data for self-employment jobs. Ideally a jobs series would make use of administrative data where it is of better quality than survey data or to increase the coverage of jobs. For example, the ONS Workforce Jobs series uses administrative data for public sector jobs (a more accurate source) and administrative data on the armed services and government supported trainees (to increase coverage).

Issues in compiling a data series from business survey and labour force survey data include:

- Data availability
- Consistency of definitions
- Timing of data
- Coherence with National Statistics
- Geography

The rest of this report gives greater detail on how the data series provided were compiled and how these issues were overcome.

2. Change to SIC 2007

Periodically, new industrial classifications are introduced so that statistics remain relevant in reporting what businesses do and reflect the evolution of products and services. A new classification is also an opportunity to rebalance towards sectors which have grown – so that more detail can be provided – and to reduce detail for sectors which are shrinking.

New classifications are introduced to meet user needs. However, they do cause substantial disruption to both users and producers of statistics: Statistics need to find a judicious balance between relevance on the one hand and maintaining consistency over time on the other.

The new Standard Industrial Classification, SIC 2007, is particularly relevant for London in providing a greater breakdown of Business Services and a new, separate category for Information and Communication. Publishing is no longer grouped within Manufacturing and is now placed in the new Information and Communication section; this amends the anomaly that, for example, newspaper editors were previously counted as working in manufacturing.

SIC 2007 comprises 21 Sections (denoted by a single letter from A to U) and 88 Divisions (denoted by two digits). ONS Business surveys cover 19 of these 21 Sections, excluding sections T (Activities of Households as Employers) and U (Activities of Extra-Territorial Organisations). A summary of how the overall structure of SIC 2003 compares with SIC 2007 is shown in Table 1. Nb: all sub-sections in SIC 2003 (relating to Mining and Quarrying and Manufacturing) have been removed.

Table 1: Changes in structure: SIC 2003 to SIC 2007

	SIC 2003	SIC 2007	Difference	of which:	
				Manufacturing	Other
Sections	17	21	4	0	4
Subsections	16	0	-16	-14	-2
Divisions (two-digit SIC)	62	88	26	1	25
Groups (three-digit SIC)	224	272	48	-8	56
Classes (four-digit SIC)	514	615	101	-12	113
Subclasses (five-digit SIC)	285	191	-94	-29	-65

SIC 2007 includes a number of new sections which give greater detail on the service sector:

Section J – ‘Information and communication’ is a major new section and brings together activity from many parts of SIC 2003 including publishing; film and recording industries; broadcasting, telecommunications and internet activities.

The section ‘Real estate, renting and business activities’ (business services) under SIC 2003 has now been split into three Sections:

Section L – ‘Real estate activities’ under SIC 2007 no longer includes development and selling of real estate, which is now placed in ‘Construction’.

Section M – 'Professional, scientific and technical services' forms a new section.

Section N – 'Administrative and support services' including employment services; call centres; travel arrangements and reservation services; and investigation and security services.

Other changes to note are:

Section R – 'Arts, entertainment and recreation' forms a new section.

Retail sale of automotive fuel – the sale of fuel is now considered a retail activity rather than part of motor trades.

Recycling is no longer thought of as part of manufacturing and moved to SIC 2007 Section E, 'Water supply, sewerage, waste management and remediation activities'.

Manufacturing is now a smaller sector. Together with recycling (which moves to Section E), publishing is no longer considered part of manufacturing and has been moved to the new Section J 'Information and communication' (publishing; film and recording industries; broadcasting, telecommunications and internet activities).

For the year 2008, Annual Business Inquiry Part 1 (ABI/1) data are available on both a SIC 2003 and SIC 2007 basis, this allows a broad correspondence to be shown, see Table 2:

Table 2: A comparison of 2008 ABI/1 data on SIC 2007 and SIC 2003

ABI/1 2008 SIC 2007		ABI/1 2008 SIC 2003	
21 Sections:	Employees	17 Sections:	Employees
A : Agriculture, forestry and fishing	1,500	A : Agriculture, hunting and forestry	4,500
	0	B : Fishing	0
B : Mining and quarrying	3,300	C : Mining and quarrying	3,300
C : Manufacturing	122,400	D : Manufacturing	178,200
D : Electricity, gas, steam and air conditioning supply	6,600	E : Electricity, gas and water supply	6,900
E : Water supply; sewerage, waste management and remediation activities	16,300		
F : Construction	140,500	F : Construction	122,500
G : Wholesale and retail trade; repair of motor vehicles	565,500	G : Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	570,900
H : Transportation and storage	236,900	I : Transport, storage and communication	307,400
I : Accommodation and food service activities	302,900	H : Hotels and restaurants	303,000
J : Information and communication	295,100		
K : Financial and insurance activities	333,200	J : Financial intermediation	331,900
L : Real estate activities	79,200	K : Real estate, renting and business activities	1,116,200
M : Professional, scientific and technical activities	473,000		
N : Administrative and support service activities	451,400		
L, M, N Total	1,003,600		
O : Public administration and defence; compulsory social security	223,500	L : Public administration and defence; compulsory social security	223,500
P : Education	313,200	M : Education	309,600
Q : Human health and social work activities	387,700	N : Health and social work	390,400
R : Arts, entertainment and recreation	114,300	O : Other community, social and personal service activities	300,300
S : Other service activities	102,100		
R, S Total	216,400		
T : Activities of households as employers	0	P : Private households with employed persons	0
U : Activities of extraterritorial organisations and bodies	0	Q : Extra-territorial organisation and bodies	0
Column Total	4,168,500	Column Total	4,168,500

SIC 2007 grouping used for the London jobs series

The new London jobs series is based on the new SIC 2007 categories. However, given their size in London, SIC 2007 Sections A, B, D, E were combined into a new category 'Primary and utilities' and Sections L and M were combined as below:

Primary and utilities:

- A : Agriculture, forestry and fishing
- B : Mining and quarrying
- D : Electricity, gas, steam and air conditioning supply
- E : Water supply; sewerage, waste management and remediation activities

Professional, scientific and technical activities and real estate:

- L : Real estate activities
- M : Professional, scientific and technical activities

3. Data availability

This section looks in detail at what data are available, including ONS Workforce Jobs and Jobs Density measures and the underlying business survey and labour force survey data available to researchers.

ONS Workforce jobs

The new ONS Workforce Jobs (WFJ) series forms the basis for the London Employment Jobs series by industry.

WFJ is compiled mainly from surveys of businesses and is the preferred source of statistics on jobs by industry at the regional level. However, it does not provide data beneath the London level or at an industry detail greater than Section level. WFJ is a full measure and includes employee jobs, self-employment jobs, the armed services and government trainees.

Workforce jobs = employee jobs + self-employment jobs + HM Forces + Government-supported trainees

Data on the new SIC 2007 basis became available in July 2010. For London, the full measure is available back to 1996, with the employee jobs component available back to 1981. A complex methodology is used to combine together WFJ sources and provide a consistent time series which overcomes changes and discontinuities in surveys and administrative sources; the effects of discontinuities are phased in over a period of time rather than as step-change corrections.

Quarterly estimates of employee jobs are derived by applying movements calculated from Short Term Employer Surveys to an annual benchmark derived from the results of the Business Register and Employment Survey (BRES) or forerunners eg, the Annual Business Inquiry Part 1 (ABI/1). In addition, public sector administrative sources are used in preference to business survey data where they are available. These are taken from the ONS Public Sector Employment series.

Quarterly self-employment jobs are derived from self-employment jobs and second jobs from the Labour Force Survey.

HM forces and government trainees form a small group for London and were not included in the data provided for forecasting. Each of the components of WFJ is available separately from the Nomis website.

WFJ industry data used in the London Employment Jobs series:

- London Employee Jobs (4 quarter annual average) on a SIC 2007 basis 1984 to 2009
- London Self-Employment Jobs (4 quarter annual average) on a SIC 2007 1996 to 2010

ONS quarterly Employee Jobs data for 2010 have not yet been benchmarked to the latest business survey data estimates. The series is usually benchmarked in December, but is pending revision in January 2012 for a methodology review, as a number of series have been

volatile. It was therefore decided to use BRES growth rates between 2009 and 2010 to forecast 2010 data rather than use the non-benchmarked series.

Additional Labour Force Survey self-employment data were provided to augment ONS Employee Jobs data between 1984 and 1995 to provide a complete SIC 2007 London series for Employee Jobs + Self-employed back to 1984 (described below).

Additional business survey data were used to provide a wholesale / retail split beneath the published employee jobs series (also outlined later).

ONS Jobs Density measure

For a consistent jobs series at the borough level ONS recommends the Jobs Density total jobs measure. However, this is available from 2000 only. The Jobs Density measure is an indicator of local labour demand and is defined as the number of filled jobs in an area divided by the number of working-age people resident there.

The total number of jobs used as the denominator is a workplace-based measure of jobs at local authority level and comprises employees, self-employment jobs, government-supported trainees and HM Forces. This is an annual measure and follows the same concept as WFJ but without the additional complication of using quarterly data and admin sources for public sector jobs.

Similar to the approach taken in the ONS Workforce Jobs measure, Jobs Density uses ONS business surveys (BRES and the ABI/1) to provide employee jobs data and the Annual Population Survey (the annual version of the Labour Force Survey) is used to estimate self-employment jobs.

The series uses an up-to-date treatment of self-employment jobs recording them by place of work; in contrast WFJ requires consistency and opts for simply counting self-employment jobs at their place of residence. This more advanced treatment by the Jobs Density measure requires an LFS variable which was not available until 2000.

Therefore, due to its relatively short run, the Jobs Density series was not explicitly used but acted as an ideal model for a borough jobs series and as a sense-check for borough estimates.

Business survey data

The ONS Workforce Jobs series benchmarks annually to the main ONS business survey, currently the Business Register and Employment Survey (BRES). In order to look beneath the detail of WFJ for industry at the London Level and also for borough data we have used or considered using historic ONS business survey data including the following:

Business Register and Employment Survey (BRES)

Business Register and Employment Survey (BRES)

- 2008 to 2010
- Industry classification SIC 2007

BRES improves on earlier business survey data by surveying at the local unit (workplace) level; a new 'bottom up' methodology is used in contrast to earlier business surveys which rely more on sampling at the reporting (head-office) level and apportioning down to the local level.

To achieve this BRES brought together information collected on employment previously provided by the ABI/1 as well as information from the former Business Register Survey on business structure and on local unit (workplace) employment.

It is worth noting that 2008 BRES results are not 'true' BRES data but rather ABI/1 results for 2008 run through the BRES processing system; therefore while all efforts have been made to remove any discontinuity in the data between 2008 and 2009, 2008 BRES data are not as robust as BRES data from 2009 onwards where data are sampled, collected and processed under the new BRES methodology.

BRES ABI/1 discontinuity

The discontinuity between the two surveys was assessed for 2008 by comparing ABI/1 data for 2008 and a BRES 2008 dataset derived by processing ABI/1 returns through the new BRES system. Comparison of the results showed that the move to BRES introduced a discontinuity at the GB level of 317,000 employees in an upward direction; BRES was successful in recording additional employment, however, ABI/1 already used BRES questionnaire returns for larger businesses, so the increase was mainly for employment in smaller businesses.

BRES not only picks up local unit (workplace) employment more accurately, it also takes on the function of the former Business Register Survey which provides the accurate industry classification of workplaces. For employment BRES was successful in picking up a greater number of jobs in firms which had received a BRES survey for the first time and should also have provided more accurate industry classification.

Work on the assessment and correction for the employment discontinuity was carried out by ONS methodology but it is more difficult to assess the impact that better industry classification may have had on the results. It was noted for example that the increase in real estate jobs in London between 2008 and 2009 using BRES as a source seemed higher than expected (around a 20 per cent increase) and may have been due to improved industry classification.

Annual Business Inquiry Part 1 (ABI/1)

Annual Business Inquiry Part 1 (ABI/1)

- 2007 to 2008 available in SIC 2007
- Annually 1998 to 2008 SIC 2003 (and SIC 1992)

The ABI was introduced in 1998 to consolidate a number of surveys and ensure better consistency between employment estimates (ABI Part 1) and financial estimates (ABI Part 2) by drawing from the sample of businesses.

In contrast to the bottom-up local unit sampling approach taken by BRES, ABI/1 asked business reporting units (administrative head offices) to record employees across the whole enterprise and then apportioned the results to the local unit level. However, it has not been a step change to BRES, a number of improvements in 2006 meant that ABI/1 began using a hybrid approach and in 2008 ABI/1 was using BRES forms for larger businesses.

2006 ABI/1 discontinuity

In 2006, there were improvements in methodology, a change in survey date from December to September and use of Business Register Survey data within the ABI/1 results. The impact of these changes was a downwards discontinuity in 2006 of 417,000 employees for GB ie ABI/1 began recording a lower number of employees. Two thirds of this discontinuity was due to the change in the reference date no longer counting seasonal employees, with the retail sector most affected.

ONS has produced a range of scaling factors to help users account for the discontinuity in back series, including factors for London and for Local Authorities at 2 digit SIC.

ABI/1 discontinuity with Annual Employment Survey (AES)

As a main source of employee estimates, the ABI/1 replaced the Annual Employment Survey (AES). The main difference between the ABI/1 and the AES was in the collection method; for AES separate forms for each known workplace were sent to the reporting unit (administrative head office); ABI/1 sent a single form asking for all employees across the whole business and the results were then apportioned out by the processing system across known sites.

Substantial differences in employee estimates between ABI/1 and AES were found which could not be initially explained, with ABI/1 reporting a higher employee figure; further investigation showed that this was due to the collection method. Contacts at reporting offices had been filling in pre-printed forms only and not additional blank forms for new sites or where the reporting unit had taken on greater responsibility. This resulted in AES under-reporting 500 thousand employee jobs nationally.

Annual Employment Survey (AES)

Annual Employment Survey

- 1995, 1996, 1997 SIC 1992 available on a rescaled basis, consistent with ABI/1
- 1991, 1993, 1995, 1996, 1997, 1998 available in SIC 1992

The AES replaced the Census of Employment.

Census of Employment (CoE)

Census of Employment

- 1981, 1984, 1987, 1989, 1991 available in SIC 1980
- Annually 1971 to 1978 and 1981 in SIC 1968 sub-regional geography by Job Centre area only

4. London Employment Jobs series 1984 to 2010

The London Jobs series - detail

This section looks at the components used to build the London Employment Jobs series to cover the period 1984 to 2010. Section 5, which follows, covers the construction of the Borough Employee Jobs series 1984 to 2010.

Two series of long-run jobs have been developed:

1. London Employment Jobs series = Employee Jobs + Self-Employed Jobs
2. Borough Employee Jobs series = Employee Jobs only

The London Employment Jobs series includes full-time, part-time and second jobs. The focus is on jobs in the workplace regardless of whether they are filled by London residents or commuters¹.

For the London Employment Jobs series employee jobs only are counted from business surveys (not including working proprietors); the self-employed are derived separately from Labour Force Survey estimates (detailed below).

Employee Jobs = Workplace employee jobs paid through the PAYE system

For the London Employment Jobs series the following components were used and are discussed in more detail below:

- A method to examine data beneath the detail published in the ONS Employee Jobs measure by linking business data from 1998 to 2010
- Use of business survey data 1984 to 1997 to generate a wholesale / retail split
- Self-employment jobs derived from Labour Force Survey estimates

These components augment ONS Workforce Jobs data which was used as the base to provide:

- Employee Jobs and Self-Employment jobs data between 1996 and 2010
- Employee Jobs data between 1984 and 1995

Examination of detailed ABI/1 and BRES data 1998 to 2010

The following section describes the steps taken to link business survey data between 1998 and 2010 at a low level of industry detail (SIC 4 digit) to provide a spread-sheet tool which was used to produce 'custom' aggregates of jobs data. It was used in the forecasting process to examine data beneath SIC 2007 Section level (for wholesale and retail estimates) and to provide custom aggregates used in GLA Economics' models for tourism, exports and life sciences.

¹ In contrast, the concept of employment from a worker perspective measures the number of people working and differs from the concept of jobs, since a person can have more than one job, and some jobs may be shared by more than one person. Jobs measures are used in the data series presented.

For a consistent employment series the ONS Employee Jobs series in SIC 2007 should be used. This allows a London industry breakdown to section level in SIC 2007 (19 sections are covered by business surveys).

However, in order to examine trends in data beneath section level and to produce a wholesale / retail split, a number of steps were taken to produce a consistent back series to 1998 using both ABI/1 and BRES data. Where data were used beneath the published Section level (for wholesale and retail) they were constrained to the ONS published Employee jobs series.

These steps took account of:

- 2006 ABI/1 discontinuity
- SIC 2003 to SIC 2007 conversion
- Change from ABI/1 to BRES

Simple factors can be used to account for the 2006 discontinuity (provided by ONS) and to account for the later discontinuity in the change from ABI/1 to BRES. Factors for the ABI/1 to BRES discontinuity can be calculated by the user, by comparing the difference between ABI/1 data for 2008 and BRES data for 2008.

There is no direct one-to-one mapping between SIC 2003 and SIC 2007 – even at the most detailed industrial classification level, individual codes may be split out or combined. Therefore a conversion matrix is needed to take account of the mappings. A weighted correlation matrix is available from ONS at 2, 3, 4 and 5 digit SIC level. For this conversion 4 digit SIC data were used (the lowest level of aggregation available under ABI/1 although BRES now provides data at 5 digit SIC).

To note: direct comparison of employment in old and new equivalent SIC 2003 and SIC 2007 Sections and Divisions provides a broad idea of the change but cannot be used for conversion as it does not provide a full mapping of individual components.

Data tools and conversions

Although ABI/1 and BRES data are point in time estimates, ONS has made available a number of tools for users who have a need to use these data over a period of time for modelling. These tools include:

- Conversion factors for the ABI/1 2006 discontinuity
- Correlation tables (conversion matrix) to convert data from SIC 2003 to SIC 2007 containing percentage distributions for employment
- A BRES 2008 dataset consistent with the earlier ABI/1 2008 series (generated by processing ABI/1 2008 results through the BRES system)
- Overlapping years (2007 and 2008) of ABI/1 data in both SIC 2003 and SIC 2007
- An overlapping year of both BRES and ABI/1 data in 2008

Survey data are available at 4 digit SIC level (ABI/1) and 5 digit SIC level (BRES) via the Nomis web service to users with a data access agreement.

Detailed method to link business survey data 1998 to 2010

The method followed uses data and tools currently available to users at this stage (with sufficient data access to ABI/1 and BRES data on Nomis). Further investigation may show that alternative methods are preferable.

This method depends on access to restricted 4 digit SIC data on Nomis (available under a Chancellor's notice data access agreement). Final data outputs (eg for publication) will need to be at an aggregate level that is robust and is not disclosive (does not reveal information about individual businesses). Care should be taken that final data outputs follow disclosure rules for ABI/1 and BRES data².

Stage 1. SIC 2007 consistent series generated from ABI/1 SIC 2003 series taking account of the 2006 discontinuity.

ABI/1 data 1998 to 2006:

- 4 digit SIC 2003 ABI/1 data (from Nomis) 1998-2002.
- 4 digit SIC 2003 ABI/1 data (from Nomis) 2003-2006.

ABI/1 2006 discontinuity:

- ABI/1 2005 and earlier data were adjusted for the ABI/1 2006 discontinuity (using available factors at 2 digit SIC for London).
- 2 digit SIC factors for London were applied across relevant 4 digit SIC data.

1998 to 2006 SIC 2003 to SIC 2007 conversion:

- The employment based conversion matrix was used to convert 4 digit SIC 2003 ABI/1 data for 1998-2006 into 4 digit SIC 2007.
- Following conversion, results were re-grouped to 4 digit SIC (using the consolidate function in Excel).

2007:

- ABI/1 data for 2007 are available on 4 digit SIC 2007 ABI/1 so were added to the series without needing conversion.

Joining these data together produces a 4 digit SIC 2007 series 1998-2007 taking account of the 2006 discontinuity.

Stage 2. SIC 2007 consistent series adjusted to take account of the survey change to BRES.

ABI/1 data generated above were adjusted to 'uprate' BRES data to take account of the survey change from ABI/1 to BRES which produced a discontinuity in an upwards direction.

² Guidance on disclosure control for ONS business survey data is available on the Nomis web service <https://www.nomisweb.co.uk/notices/docs/infoguide.pdf>

BRES data for latest years were added and data aggregated into a final series to SIC 2 digit (division) level.

Steps to take account of the ABI/1 to BRES survey change in 1998 to 2007 data:

- ABI/1 2008 and BRES 2008 data were used to generate 4 digit SIC 2007 factors for London to uprate ABI/1 data to BRES.
- These factors were applied to uprate ABI/1 SIC 2007 data 1998-2007 to be consistent with BRES.
- 4 digit BRES data for 2008, 2009 and 2010 are available on a SIC 2007 basis, so needed no adjustment.

Joining the above data produces a series at 4 digit SIC level between 1998 and 2010 which is consistent with BRES results.

Clearly the series is not robust at 4 digit SIC level for London (and often disclusive) so the 4 digit SIC 2007 data were aggregated to the level required.

Notes and assumptions:

- 4 digit SIC data are used for SIC conversions between SIC 2003 and SIC 2007
- Assumes the relationship in the SIC conversion matrix as at 2009 holds true for earlier years
- Conversion matrix is at the UK (not London) level
- 2 digit SIC London factors were used to account for the 2006 discontinuity
- 4 digit SIC factors were used to take account of the ABI/1 to BRES change, factors were assumed to be 1 if no data existed in the overlapping years to calculate a factor
- Assumes ABI/1 to BRES conversion relationship holds for years before the link year used (2008)
- Factors used are applied at the same ratio retrospectively ie factors are not phased in or out over time or 'wedged'
- DEFRA farm agriculture data SIC0100 are treated separately
- 1998-2002 data on a SIC 2003 basis (available on Nomis) has already been converted from SIC 1992 so contains some missing data at 4 digit SIC level

Use of business survey data 1984 to 1997

A Wholesale / Retail split was deemed desirable to divide the higher level ONS Employee Jobs section 'Wholesale and retail trade; repair of motor vehicles and motorcycles'. Motor trades were included with wholesale for this split. The following data were used to apportion the ONS Employee Jobs series 1981 to 2010.

1. 1998 to 2010 the spread-sheet tool described above was used to generate a wholesale / retail split.

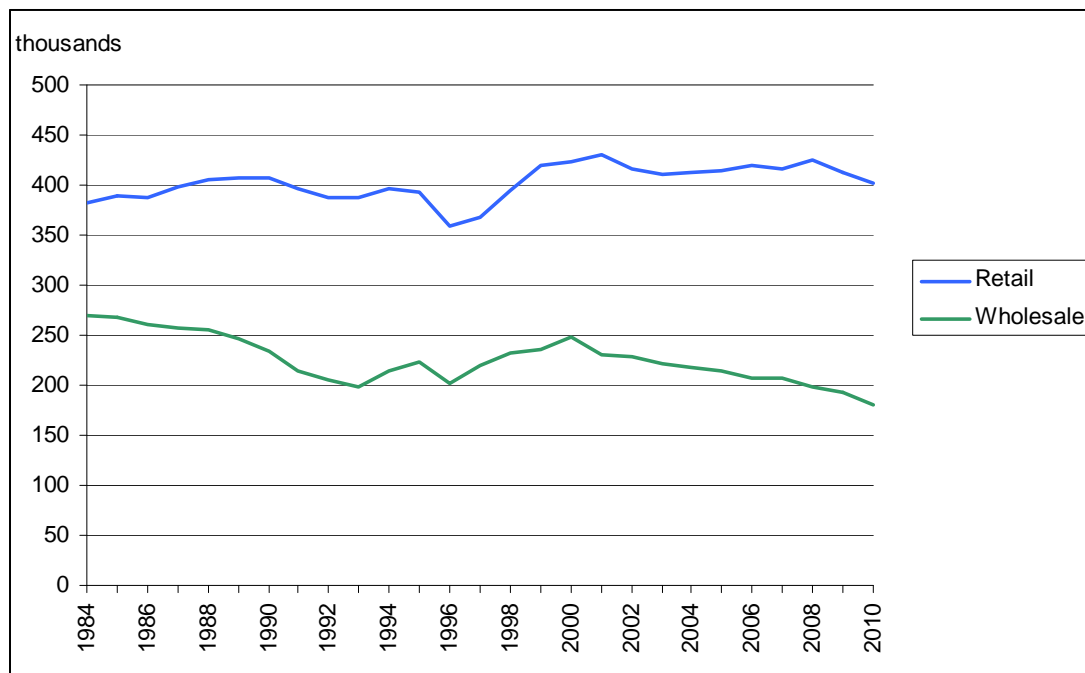
2. 1991 to 1997 Annual Employment Survey

- 1995, 1996, 1997 SIC 1992 on a rescaled basis, consistent with ABI/1
- 1991, 1993, in SIC 1992 with linear interpolation for 1992 data

- Data were converted to SIC 2007 using the SIC 2003 to SIC 2007 matrix adapted for the relatively small changes between SIC 1992 and SIC 2003
- Data were constrained to the ONS published EEJ series for section 'Wholesale and retail trade; repair of motor vehicles and motorcycles'

3. Census of Employment 1984 to 1990 SIC 1980 data. At the 3 digit SIC level the main SIC 1980 components which contribute wholesale, motor trades and retail were identified. The trends in these components were used to trend back the SIC 2007 Wholesale / Retail proportions from 1991 generated in 1 above.

Chart 1: London employee and self-employment jobs in wholesale and retail SIC 2007



Self-employment jobs

Additional Labour Force Survey (LFS) self-employment data were provided to augment the ONS Employee Jobs series by industry between 1984 and 1995 to provide a complete SIC 2007 London industry series for Employee Jobs + Self-employed back to 1984. From 1996 onwards, a self-employment jobs series is published alongside the ONS Employee Jobs series and forms part of the ONS regional Workforce Jobs series which begins in 1996.

The usual focus for the Labour Force Survey is to measure residence based employment. However LFS data can also be used to provide a workplace based jobs measure.

The primary use of Labour Force Survey data has been to provide a self-employment jobs series to add on to the employee jobs measure provided by business surveys.

Self-employed = LFS respondents who define themselves as self-employed

LFS data used:

1996 to 2010

ONS Workforce Jobs self-employment jobs series 4 quarter average was used; this series was derived from LFS data and counts self-employment main jobs and self-employment second jobs.

1994 and 1995

LFS self-employment main jobs and self-employment second jobs. Micro-data (record level data) were used and can be downloaded by researchers from the Economic and Social Data Service (ESDS) under licence arrangements. Data were in SIC 1992 and were converted to SIC 2007 Sections using a SIC 1992 to SIC 2007 conversion matrix described above.

1984 to 1993

LFS self-employment main jobs and self-employment second jobs were derived (again, from micro-data). London totals were used, but data are in SIC 1980 during this period and no agreed SIC 1980 to SIC 2007 data transition matrix exists. It was decided that the sector share of self-employment jobs should be trended back over this period using linear regression. This allowed data to be provided to fit the forecasting model. A further area of development would be to approximate a SIC 1980 to SIC 2007 transition and apply it to these data.

The assumption in using LFS data to provide self-employment data in a workforce jobs series is that there is no overlap between self-employment and employee jobs. However it is known that at the UK level there is double counting of around 450 thousand jobs. For example, company directors or people employed by a managed service company often consider themselves self-employed when they respond to a household survey, whereas they would be counted by a business survey as employees. It was decided not to try to adjust for this in data provided for forecasting (ONS does not adjust in the published Workforce Jobs series).

5. London borough data series 1984 to 2010

As noted above a published consistent jobs series for London boroughs is available from 2000 onwards only (ONS Jobs Density, total jobs measure available via Nomis); this series is essentially an annual Workforce Jobs measure at local authority level; unlike Workforce Jobs, the Jobs density total jobs measure does not offer individual components (eg employee jobs and self-employment) separately. Therefore the Jobs Density measure was not used.

Following a review of the data, it was felt that there was insufficient robust data to allow for a borough industry breakdown over the long-term. Similarly, it was considered that there was insufficient long-run robust self-employment data at the borough level.

As a result, it was decided that employee jobs only at the borough level was the most robust, long-run, data that could be provided (as opposed to the London level employment jobs series which includes both employee jobs and self-employment jobs). This is an area we see for future development.

Therefore available business survey data were used to construct a series from 1984 to 2010 following a similar method described above for linking detailed business survey data together.

The ONS Employee Jobs component of the ONS Workforce Jobs series forms the London constraint for the borough series.

The following data and adjustments were used to generate a borough series from 1984 to 2010:

Business Register and Employment Survey (BRES)

- 2008 to 2010 borough data (no adjustment)

Annual Business Inquiry part 1 (ABI/1)

- 2006 to 2007 data up-rated to BRES using borough level factors.
- 1998 to 2005 data up-rated to BRES and factors applied to account for the ABI/1 2006 discontinuity.

Annual Employment Survey

- 1995, 1996, 1997 data were used on a rescaled basis (available as an option on Nomis), consistent with ABI/1.
- 1991, 1993, linear interpolation was used for 1992 data; borough correction factors were calculated to account for the change between AES and AES re-scaled data by comparison of 1995 data available on Nomis in both rescaled and non-rescaled form.
- 1991 to 1997 AES data consistent with ABI/1 were then adjusted to be consistent with BRES and to account for the ABI/1 discontinuity.

Census of Employment

- 1984, 1987, 1989, 1991 CoE data were used.

- Since the GLA forecasting model is driven by long term trends, linear interpolation was used for 1985, 1986, 1988 and 1990 data.
- Data were adjusted to take account of the change to AES using factors calculated at borough level by comparing 1991 CoE and 1991 AES data.
- CoE data consistent with AES were then adjusted to be consistent with BRES and to account for the ABI/1 discontinuity.

Finally the 1984 to 2010 borough series was constrained to ONS Employee Jobs series at the London level.

To note: Between 1984 and 2010 London borough geography has remained stable, with a number of minor alterations. The most substantial correction in terms of jobs has been the change of Heathrow airport from Hounslow to Hillingdon on 1st April 1994. However all data used from 1984 on were on a consistent post 2009 local authority basis, so no additional correction was needed.

Apart from adjustments made to link business survey data to form a continuous series, no other adjustments were made. However, it was noted that for Greenwich in 2000 and Richmond-upon-Thames in 1998 'spikes' in the data are unexplained and appear to be outside normal sampling variation. These could be due to incorrect returns from large employers (for example employment agencies). The ONS data collection team query unusual returns a maximum of three times, but if a consistent answer is received each time they are recorded. No adjustment has been made for these two cases.

No use was made of data between 1971 and 1978 as there was no borough geography available. Data earlier than 1981 are available from Nomis sub-regionally by 'Job Centre area as at 1985' only. The 1985 job centre geography does not nest to boroughs so although London was divided into 72 job centre areas, an accurate aggregation was not possible. A 'best fit' approach appeared to be a reasonable approximation for many boroughs, but for Camden (which contains the third largest number of employee jobs) the approximation was poor. Also, notably, no job centre area was located within Kensington and Chelsea.

Annex A: Data Results

Total Employment Jobs: London by Industry

SIC 2007	GLA Sector	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
A+B+D+E	Primary & utilities	56	55	53	50	48	47	45	43	42	39	35	31	31	31
C	Manufacturing	476	455	422	401	380	374	347	300	279	261	257	266	262	262
F	Construction	237	239	232	249	254	261	256	242	221	204	209	221	206	196
G-wholesale	Wholesale	270	267	261	258	255	247	234	215	205	199	214	223	202	220
G-retail	Retail	383	389	388	399	405	408	408	397	388	388	396	392	359	368
H	Transportation and Storage	309	304	290	290	288	288	289	281	267	255	257	246	250	259
I	Accommodation and food service activities	200	205	203	208	215	221	222	207	201	207	227	234	203	227
J	Information and Communication	216	219	216	221	226	230	231	223	215	215	222	228	236	265
K	Financial and insurance activities	287	295	308	326	344	341	340	327	309	300	309	321	333	331
L+M	Real Estate, Professional, Scientific & technical	322	340	349	375	397	413	416	400	390	402	424	436	445	454
N	Administrative and support service activities	245	255	263	276	290	299	308	302	294	304	318	346	355	377
O	Public Admin and defence	279	273	270	269	264	252	256	261	254	242	233	227	224	222
P	Education	283	285	288	296	307	310	279	242	235	238	235	226	228	239
Q	Health	357	367	368	382	402	398	375	356	343	333	332	333	356	362
R	Arts, entertainment and recreation	97	101	99	104	106	110	115	122	121	122	126	127	135	138
S	Other services	74	77	76	79	81	83	88	94	93	93	96	96	110	118
	All sectors	4094	4126	4085	4183	4262	4282	4211	4012	3858	3803	3897	3960	3934	4070

Source: ONS Employee Jobs, LFS, GLA Economics assumptions

* 2010 data are provisional

Total Employment Jobs: London by Industry

SIC 2007	GLA Sector	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010*
A+B+D+E	Primary & utilities	35	34	38	37	31	25	25	30	29	31	32	28	28
C	Manufacturing	259	254	252	231	206	196	189	176	167	168	157	131	131
F	Construction	222	215	235	233	232	234	242	245	258	265	276	261	251
G-wholesale	Wholesale	232	236	249	230	228	222	218	215	207	208	198	192	180
G-retail	Retail	395	420	424	431	416	411	413	414	420	416	425	413	401
H	Transportation and Storage	274	274	273	272	264	265	259	268	265	269	282	277	262
I	Accommodation and food service activities	252	277	284	292	299	308	313	315	315	313	327	314	323
J	Information and Communication	288	322	344	356	341	339	314	326	345	346	355	336	360
K	Financial and insurance activities	334	339	353	365	353	354	337	334	337	351	362	349	365
L+M	Real Estate, Professional, Scientific & technical	476	493	521	545	528	545	542	582	611	639	669	669	672
N	Administrative and support service activities	412	435	468	478	457	447	450	459	468	490	491	456	490
O	Public Admin and defence	222	228	229	215	237	244	242	256	245	234	235	245	257
P	Education	248	269	273	263	280	294	306	302	305	313	318	345	341
Q	Health	355	348	364	383	381	402	414	435	424	402	450	497	472
R	Arts, entertainment and recreation	136	149	154	158	163	152	153	157	167	165	180	156	168
S	Other services	124	133	138	132	134	140	141	144	146	149	145	136	137
	All sectors	4263	4426	4598	4619	4546	4577	4556	4658	4709	4759	4903	4803	4837

Source: ONS Employee Jobs, LFS, GLA Economics assumptions

* 2010 data are provisional

London's jobs history – a technical paper**Employee Jobs by London Borough****For GLA forecasting**

Borough	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Barking and Dagenham	62	61	60	59	59	57	57	55	53	51	50	49	48	49
Barnet	97	98	98	99	98	95	96	95	95	91	91	94	96	105
Bexley	58	57	57	57	59	59	59	56	53	51	53	58	53	54
Brent	102	101	100	100	103	103	102	96	91	88	85	84	87	91
Bromley	85	86	86	88	91	92	94	90	87	85	88	94	83	89
Camden	222	222	222	223	230	230	230	218	209	203	207	215	205	227
City of London	352	350	347	348	333	309	284	270	260	255	270	288	298	290
Croydon	141	141	141	142	146	145	145	138	132	127	124	125	117	120
Ealing	120	121	122	124	125	122	117	110	105	103	102	103	102	111
Enfield	89	91	93	96	99	99	95	86	81	81	82	83	82	84
Greenwich	69	68	67	66	69	69	68	64	57	53	51	53	57	57
Hackney	84	82	79	77	81	81	80	75	72	72	71	70	71	79
Hammersmith and Fulham	84	82	81	80	84	86	90	87	83	78	81	87	82	85
Haringey	63	65	66	68	67	63	59	55	57	60	59	55	53	58
Harrow	60	60	60	60	61	59	59	58	57	55	55	56	56	61
Havering	66	66	65	65	68	69	70	66	63	61	62	64	63	65
Hillingdon	137	137	136	138	143	145	149	145	145	144	143	141	137	139
Hounslow	98	98	98	100	106	109	110	104	100	98	96	93	103	108
Islington	123	123	123	125	131	133	132	122	115	113	116	121	125	135
Kensington and Chelsea	90	93	96	99	104	105	104	96	94	95	100	102	103	115
Kingston-upon-Thames	64	65	67	69	73	74	72	66	61	61	65	68	79	79
Lambeth	140	134	127	122	129	133	127	113	106	110	109	103	99	100
Lewisham	63	63	62	62	62	61	59	57	55	54	52	50	51	54
Merton	56	55	54	54	55	55	58	58	59	58	57	58	54	55
Newham	76	75	75	75	73	68	66	65	64	62	59	58	58	60
Redbridge	59	56	52	49	52	54	58	58	56	54	52	53	56	56
Richmond-upon-Thames	56	56	57	57	58	57	58	58	56	54	56	60	60	60
Southwark	142	140	138	138	145	149	147	135	125	123	130	136	131	134
Sutton	56	58	59	61	64	65	65	61	56	53	53	55	55	57
Tower Hamlets	89	94	99	105	111	115	120	116	114	112	114	117	108	120
Waltham Forest	57	58	59	61	61	59	56	51	51	53	53	51	47	45
Wandsworth	86	86	86	88	93	96	95	87	81	81	84	86	90	88
Westminster, City of	566	568	567	572	570	552	531	504	493	490	507	522	514	542
London	3711	3713	3698	3727	3803	3770	3712	3515	3386	3328	3377	3451	3423	3572

London's jobs history – a technical paper

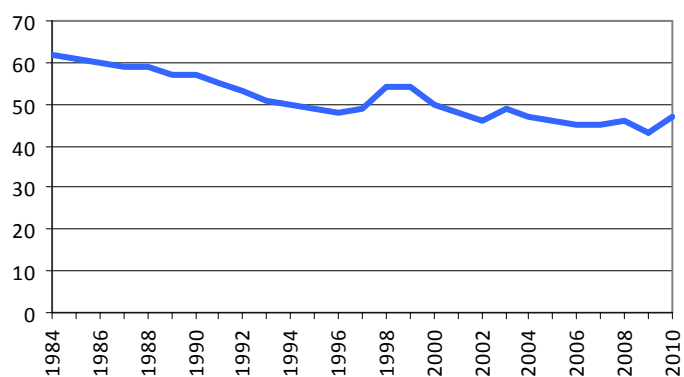
Employee Jobs by London Borough cont.

Borough	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010*
Barking and Dagenham	54	54	50	48	46	49	47	46	45	45	46	43	47
Barnet	107	113	114	113	109	107	109	110	110	107	113	112	109
Bexley	61	65	64	64	66	63	67	63	63	64	65	64	65
Brent	95	94	103	99	101	99	95	96	93	93	95	93	96
Bromley	92	100	97	96	99	104	104	102	105	111	106	103	99
Camden	235	246	256	262	265	251	248	255	260	274	283	280	279
City of London	296	327	342	326	330	327	306	316	322	325	328	323	346
Croydon	124	131	140	138	132	132	127	127	128	128	131	121	118
Ealing	117	112	115	116	119	116	114	118	119	118	114	106	108
Enfield	93	93	98	96	94	95	93	93	93	92	94	93	94
Greenwich	61	62	74	63	62	64	65	66	65	67	69	68	69
Hackney	81	83	90	93	92	83	80	80	79	84	83	85	84
Hammersmith and Fulham	86	98	106	110	106	110	112	120	119	115	121	118	124
Haringey	59	61	61	61	62	64	65	65	62	62	62	60	59
Harrow	63	66	66	69	67	67	66	67	68	66	68	64	64
Havering	70	71	74	75	76	75	76	75	75	70	73	72	71
Hillingdon	154	157	160	174	166	169	178	180	185	187	190	185	181
Hounslow	117	122	129	133	118	115	112	115	116	119	123	122	125
Islington	137	145	158	156	155	159	160	174	170	186	192	183	182
Kensington and Chelsea	111	121	126	128	122	114	110	112	113	109	114	110	111
Kingston-upon-Thames	79	79	79	77	73	72	76	75	74	74	77	76	75
Lambeth	104	109	121	116	124	124	126	124	120	119	128	127	123
Lewisham	57	57	61	63	62	65	61	62	61	61	62	59	59
Merton	58	62	67	65	64	61	69	64	65	65	67	65	67
Newham	64	69	75	75	68	67	72	75	73	74	72	73	73
Redbridge	59	63	66	64	65	64	66	65	60	64	66	65	64
Richmond-upon-Thames	78	65	64	70	66	67	67	66	68	69	73	68	69
Southwark	145	154	161	166	150	147	156	158	162	171	178	174	178
Sutton	60	61	66	65	64	64	64	66	63	60	69	64	65
Tower Hamlets	125	139	144	160	155	156	180	187	196	202	208	205	209
Waltham Forest	55	57	60	56	57	55	55	57	59	57	57	54	55
Wandsworth	91	99	104	103	105	102	101	102	107	106	109	103	102
Westminster, City of	536	574	574	585	574	571	560	577	584	591	618	609	601
London	3727	3913	4063	4086	4016	3980	3985	4060	4081	4135	4255	4148	4172

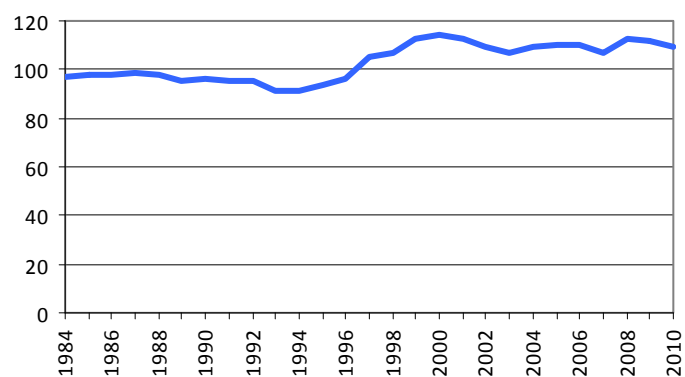
Source: ONS, Business Surveys, Employee Jobs, GLA Economics assumptions

*2010 data are provisional

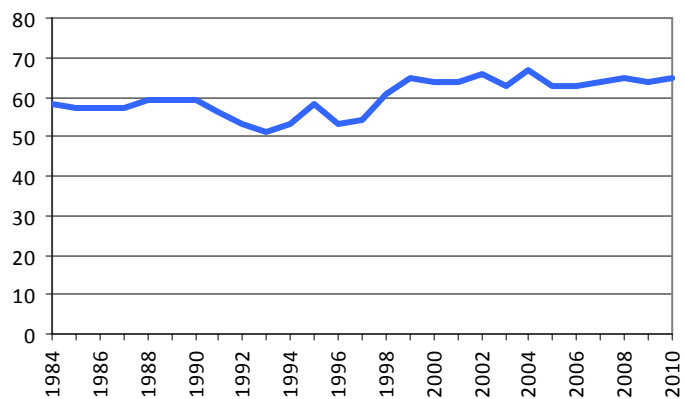
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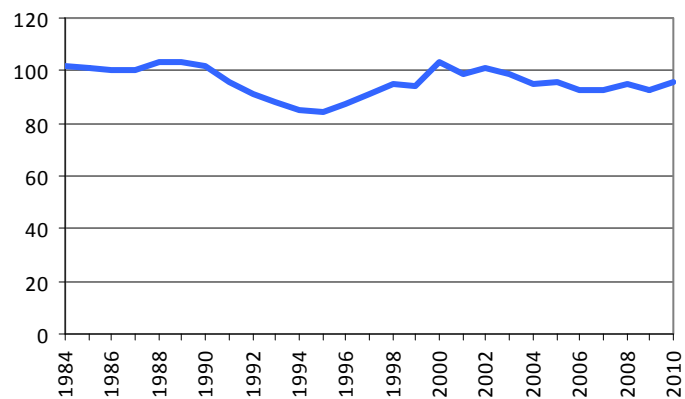
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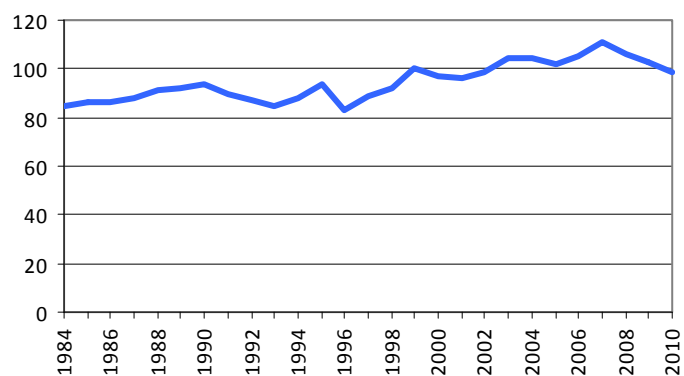
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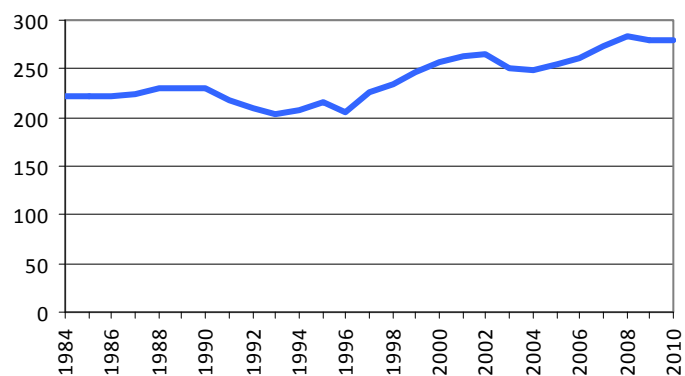
Brent



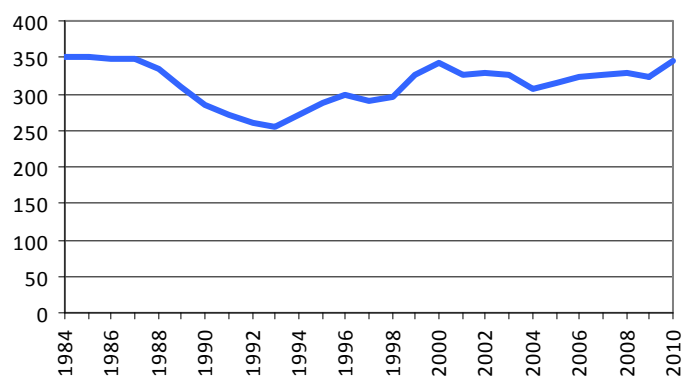
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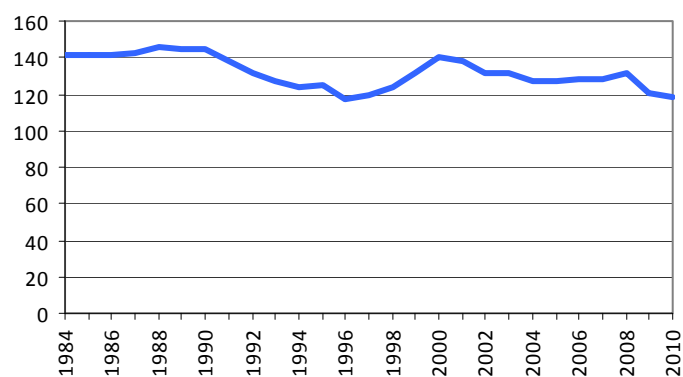
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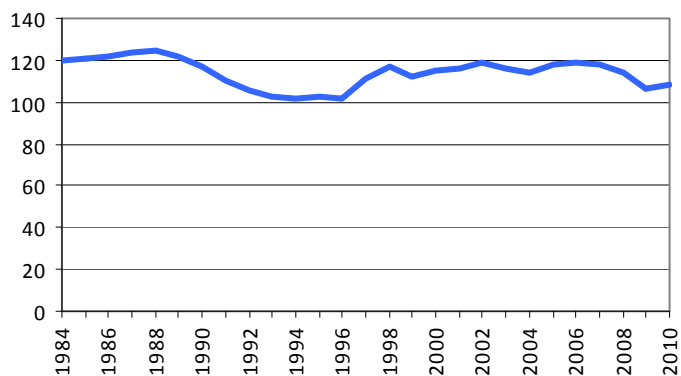
City of London



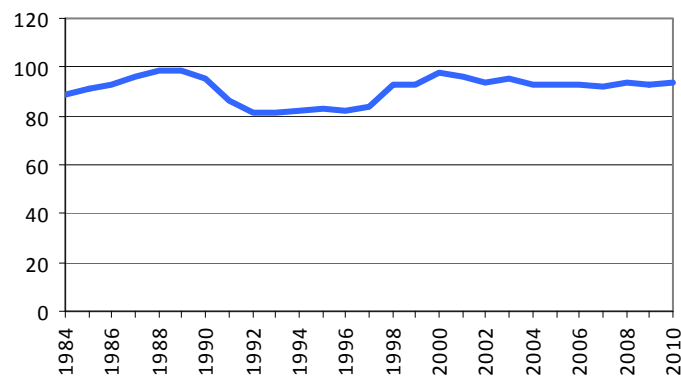
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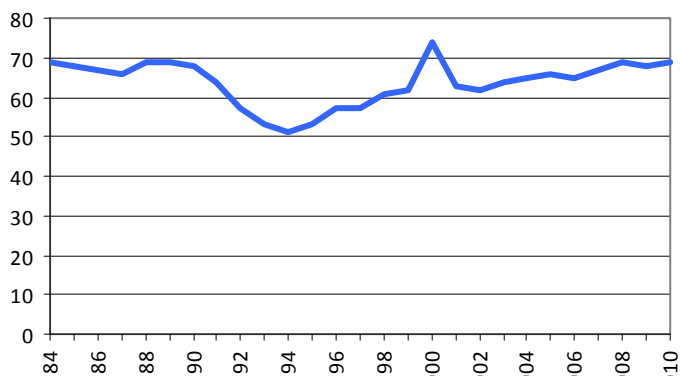
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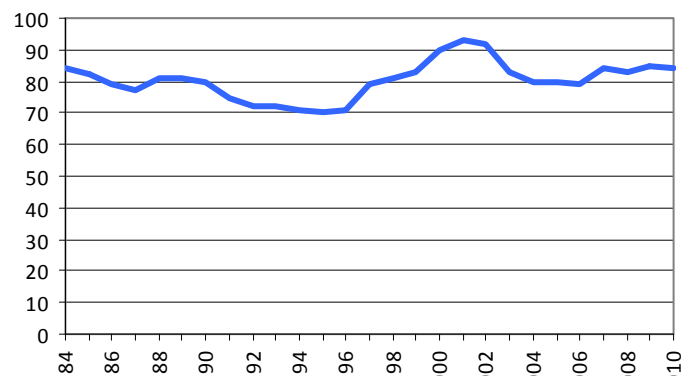
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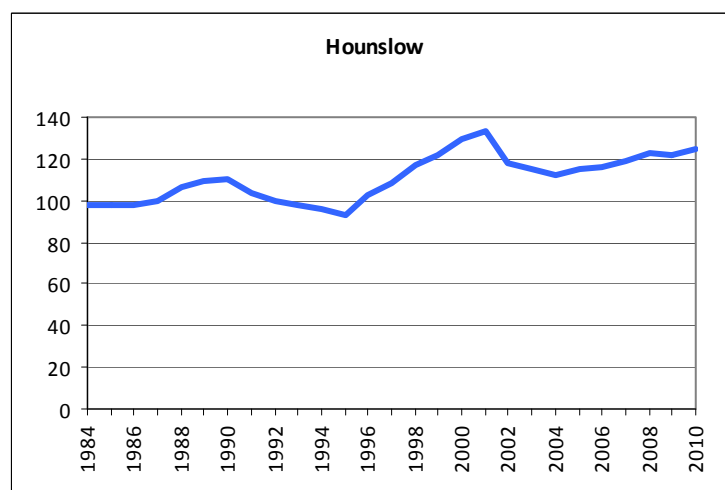
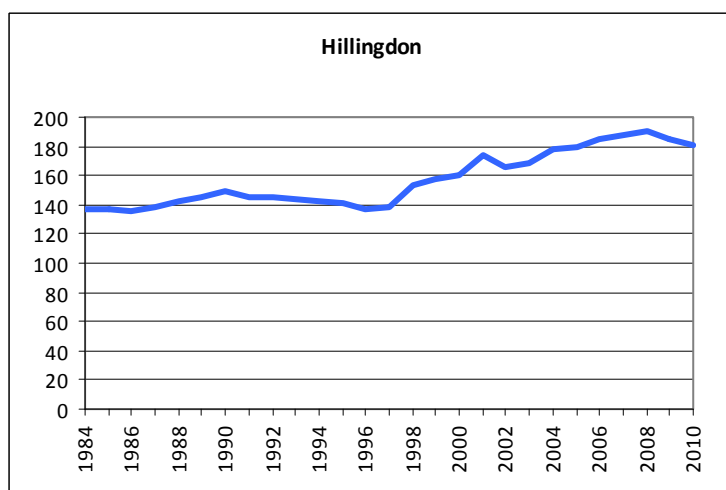
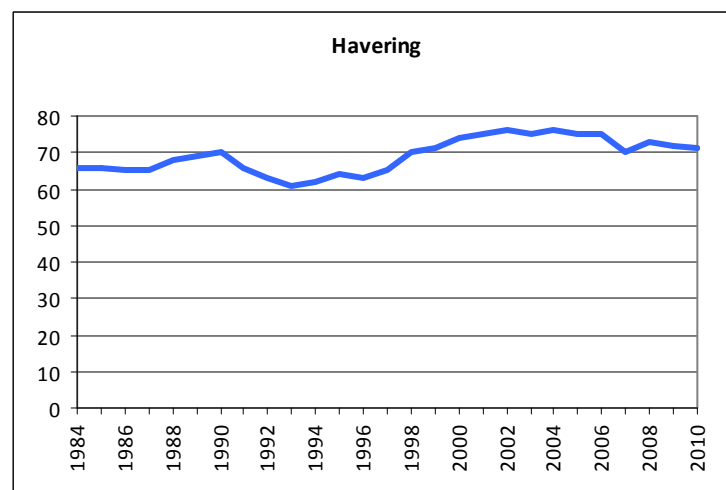
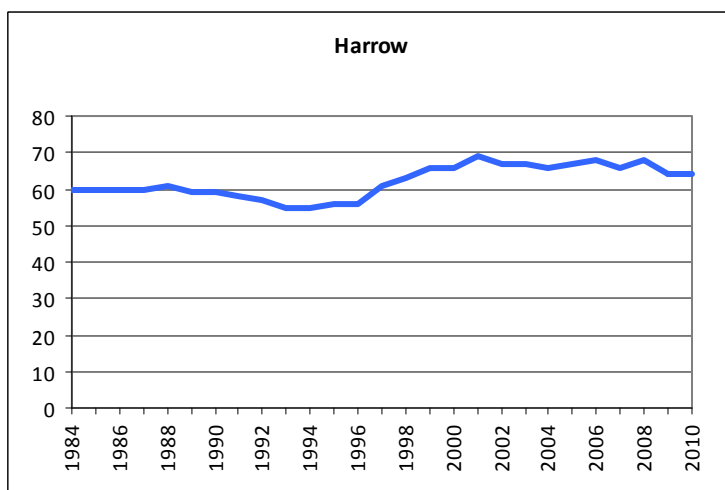
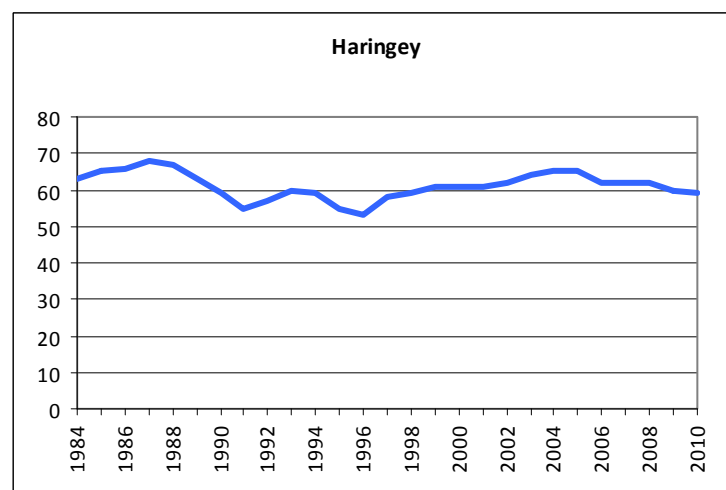
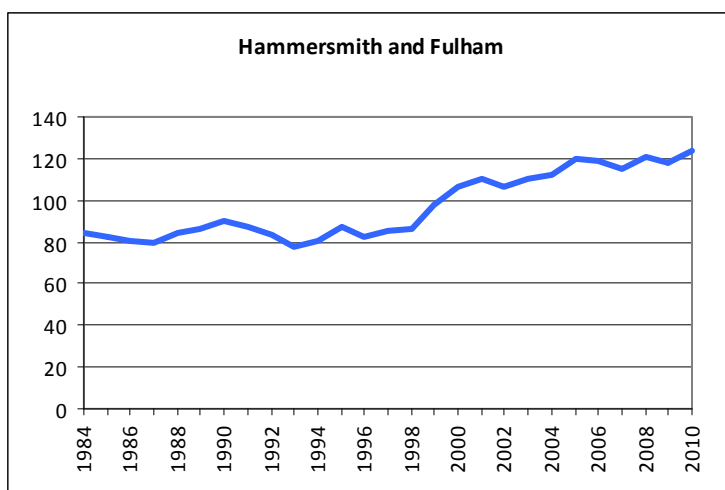


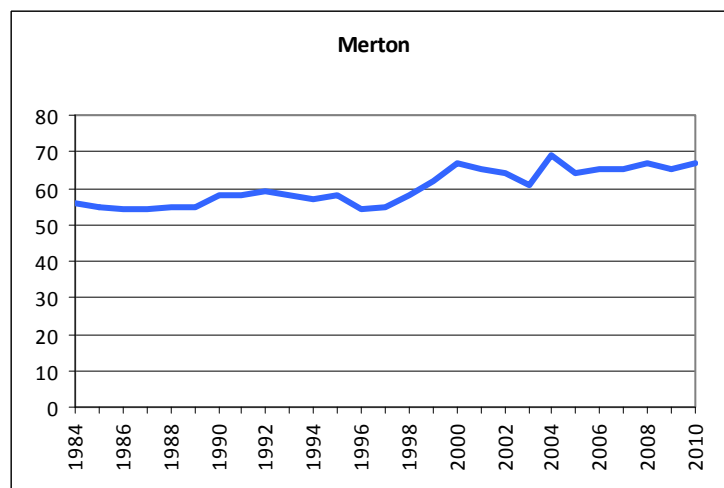
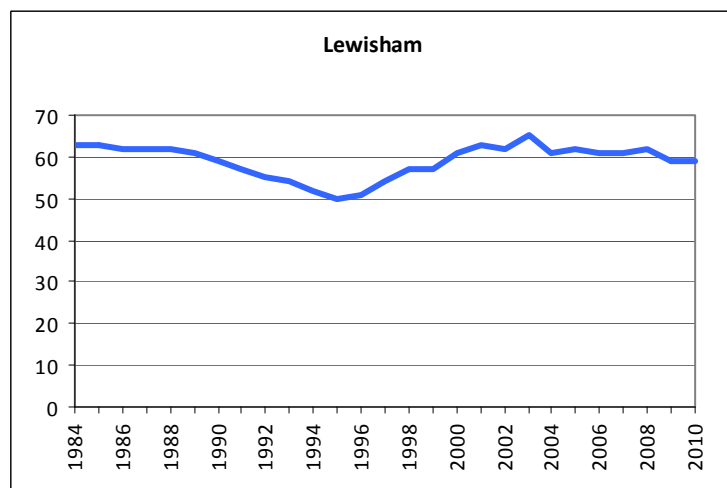
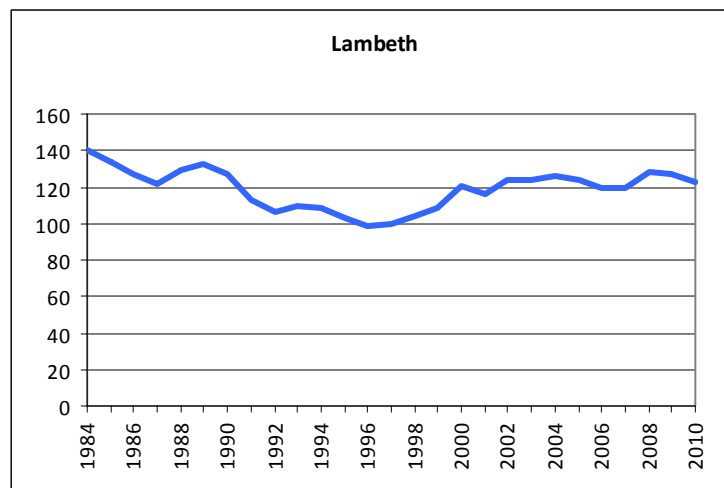
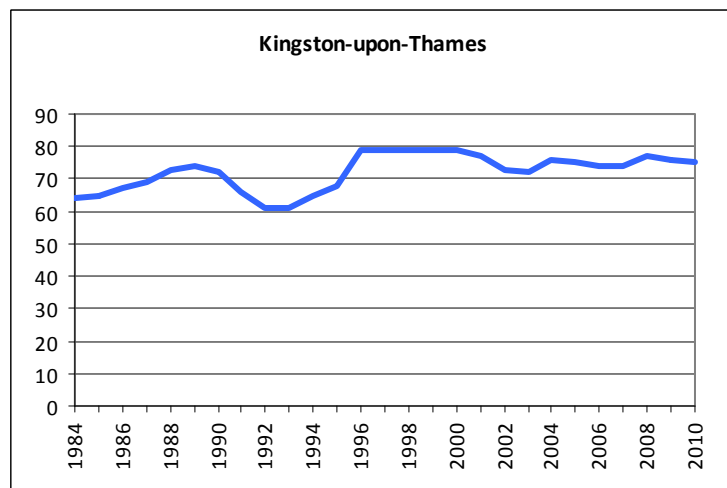
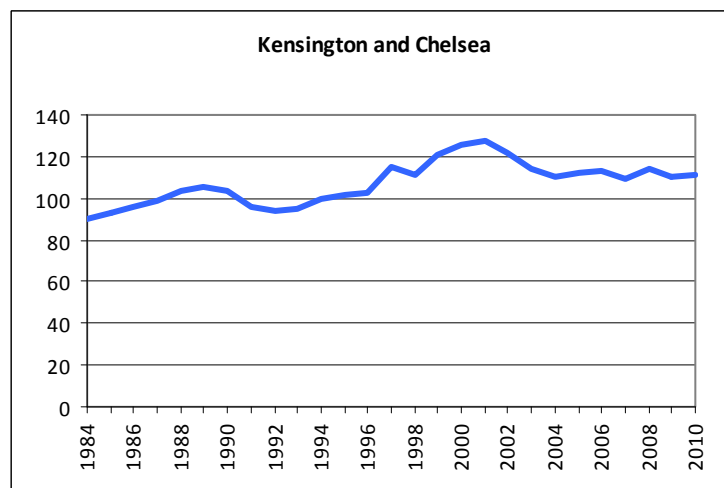
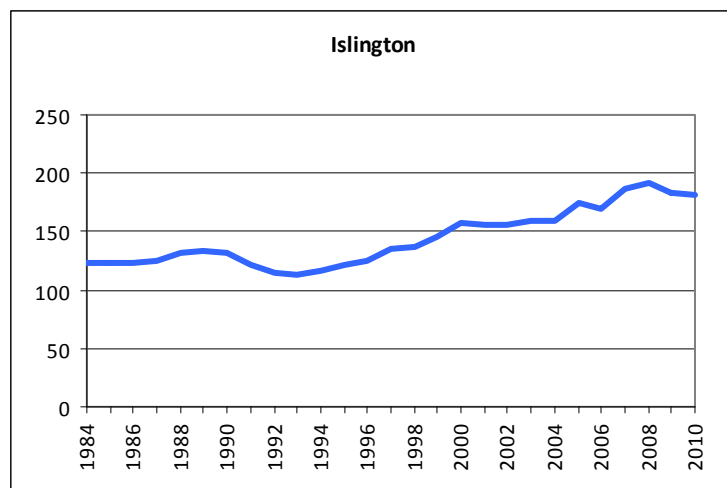
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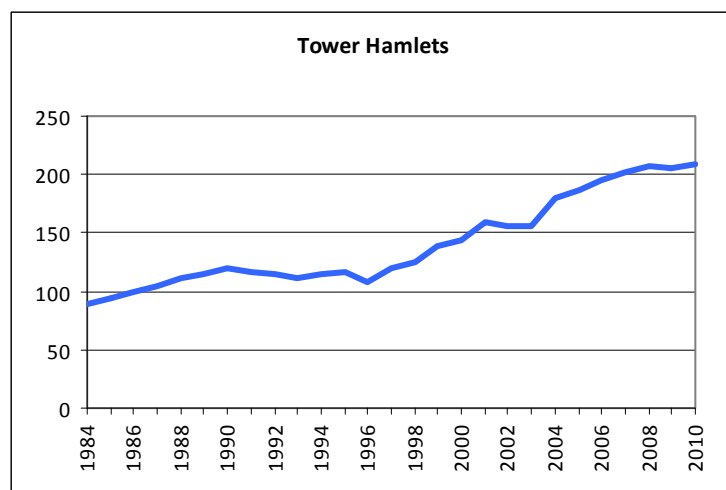
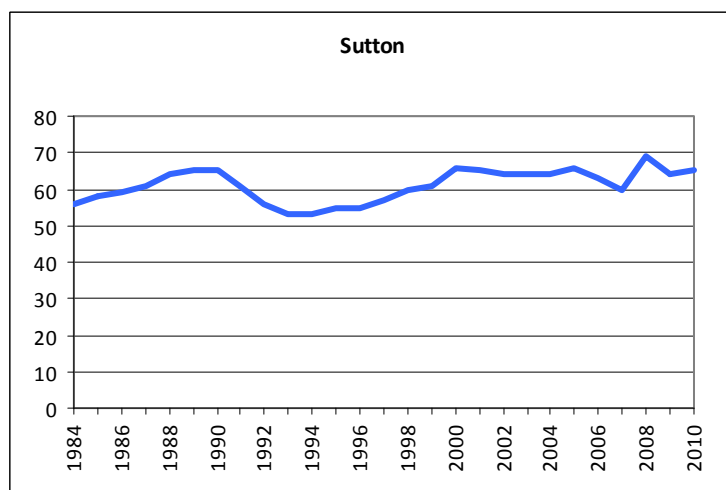
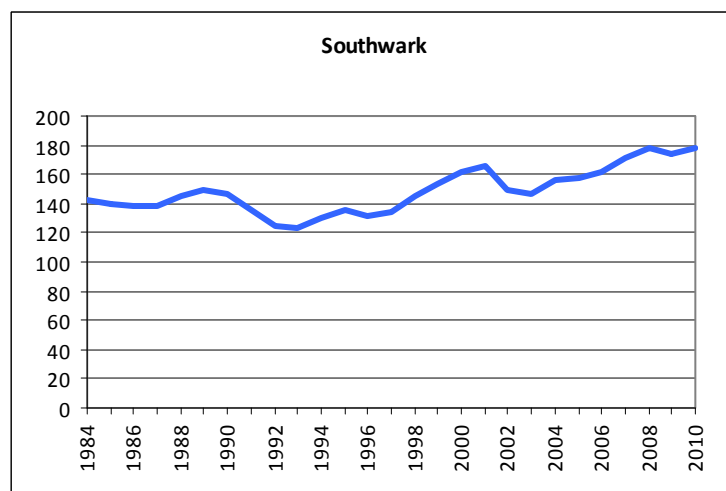
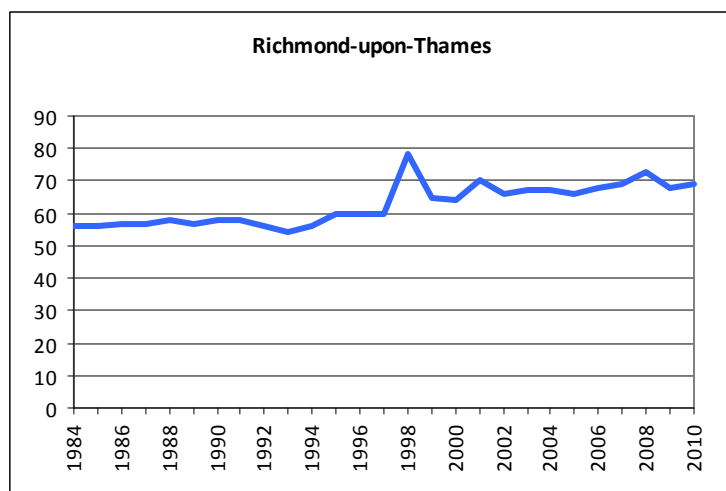
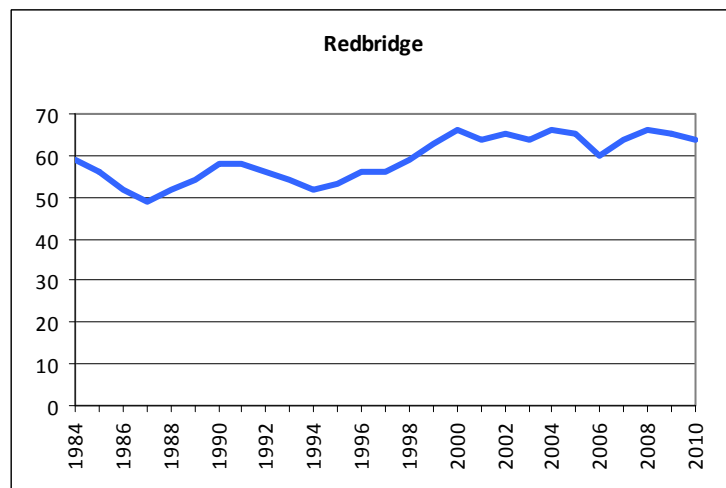
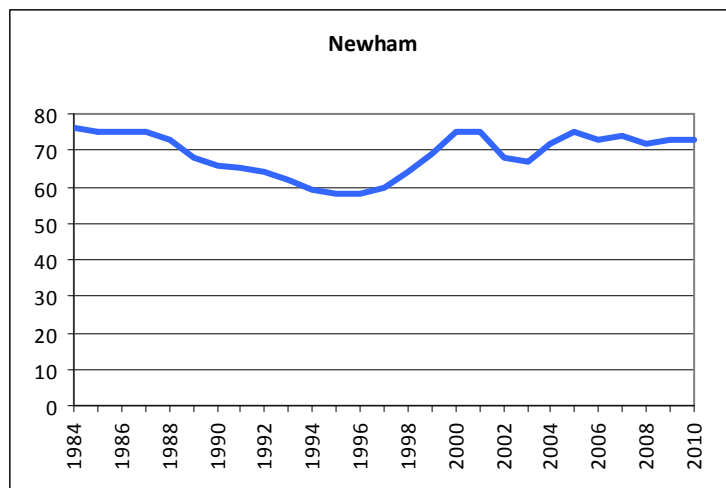


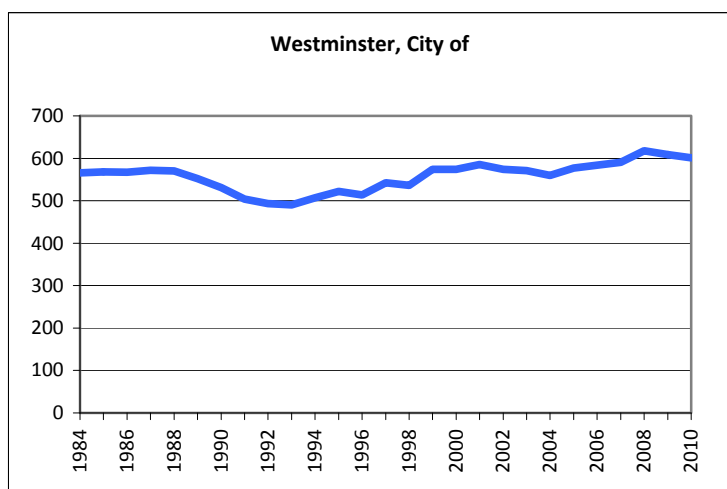
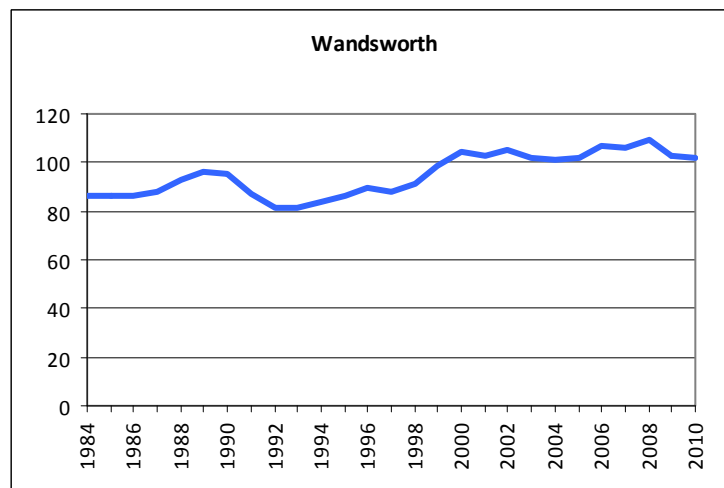
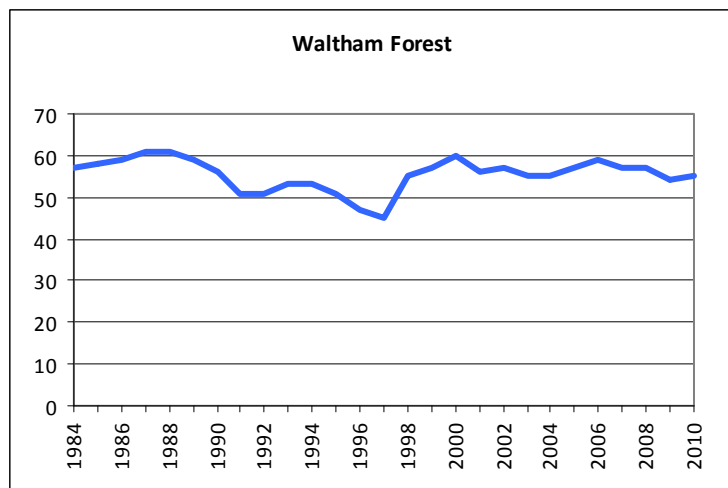
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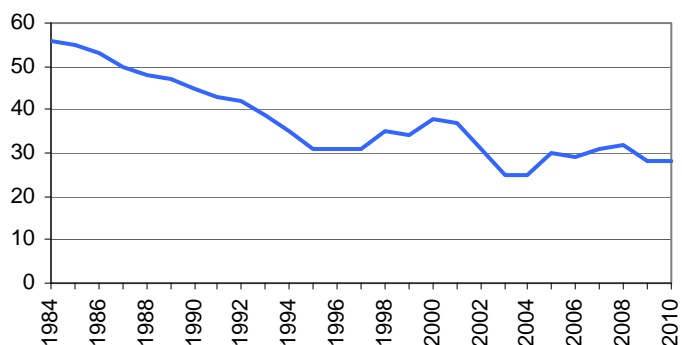




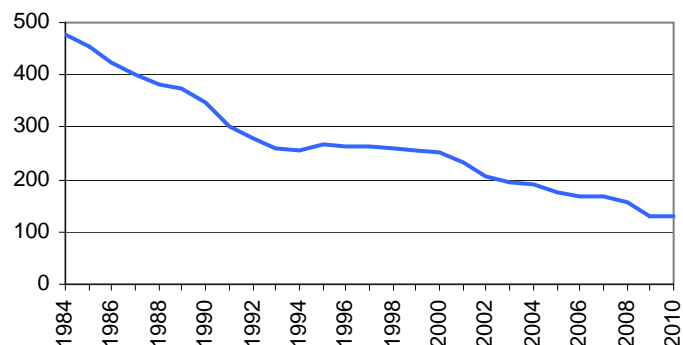




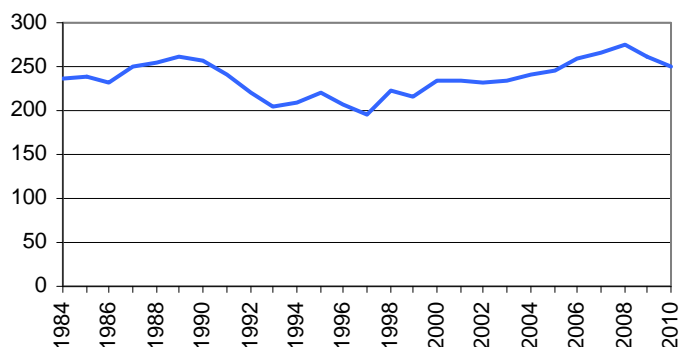
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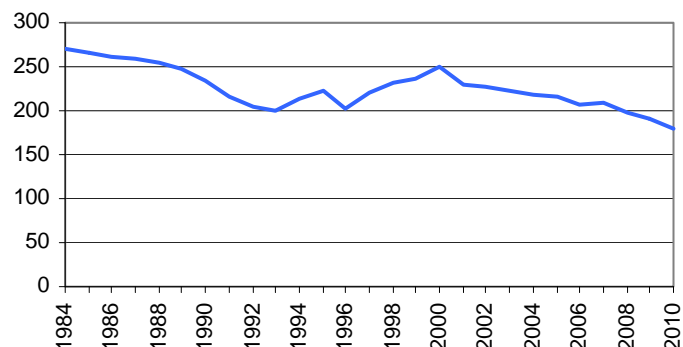
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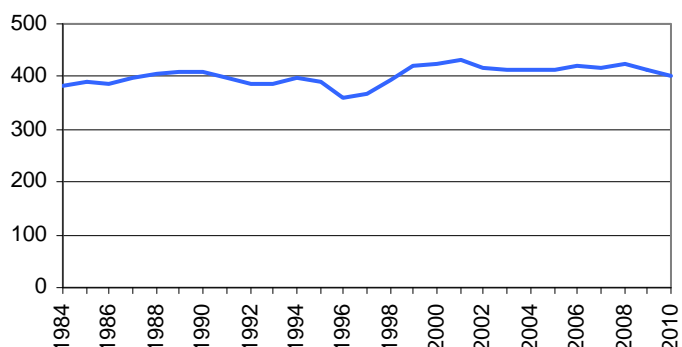
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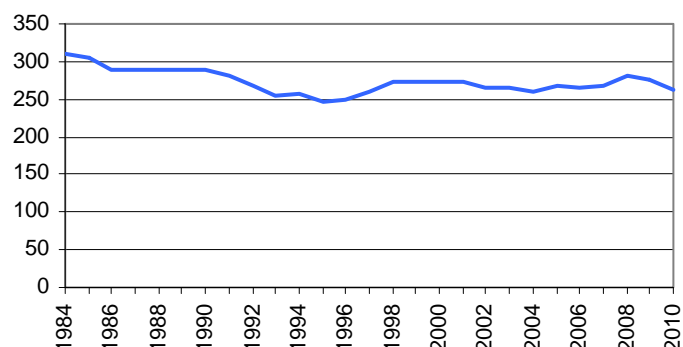
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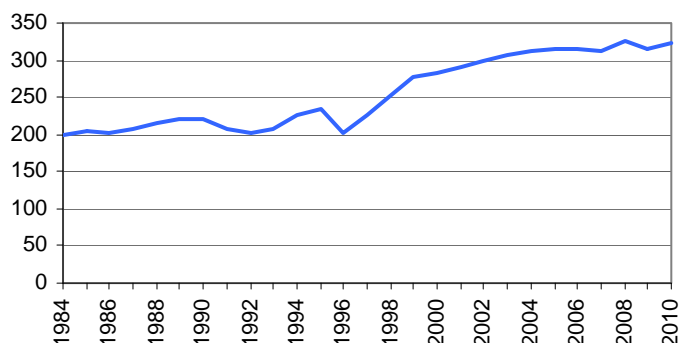
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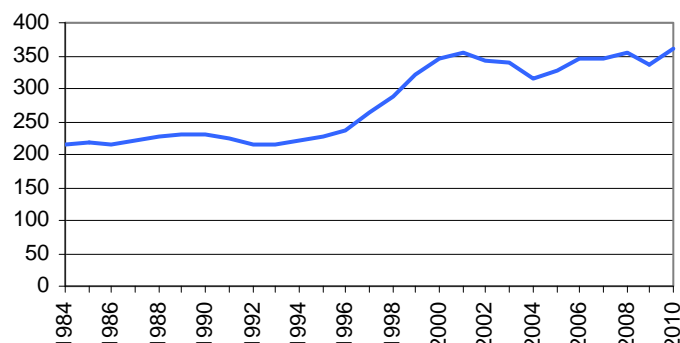
Transportation and Storage



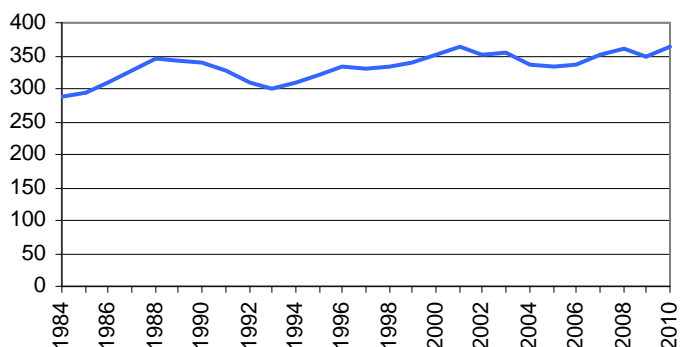
Accommodation and food service activities



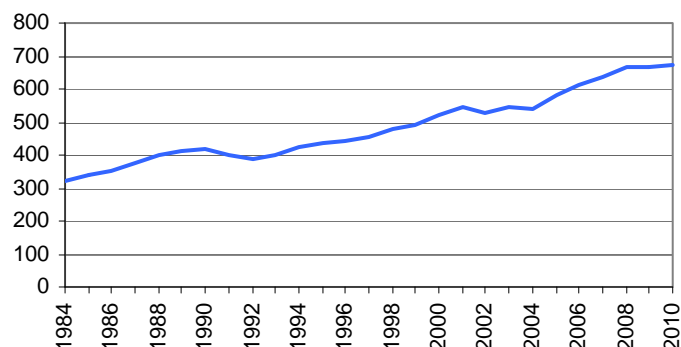
Information and Communication



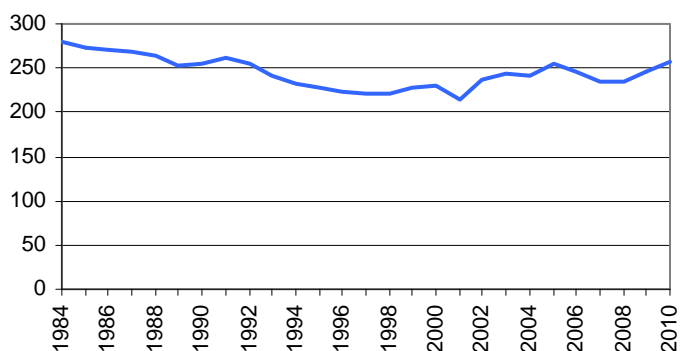
Financial and insurance activities



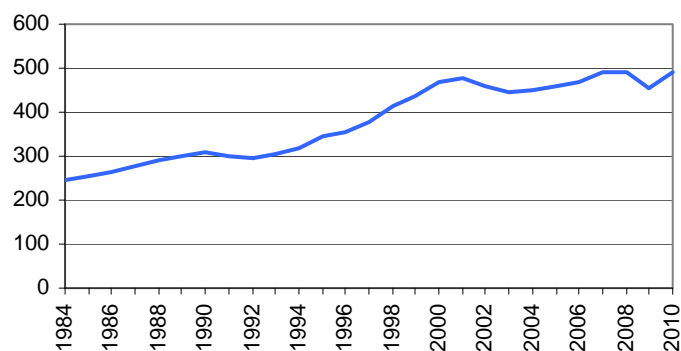
Real Estate, Professional, Scientific & technical



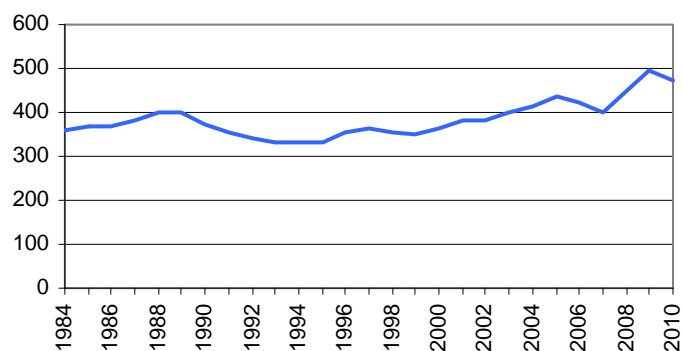
Public Admin and defence



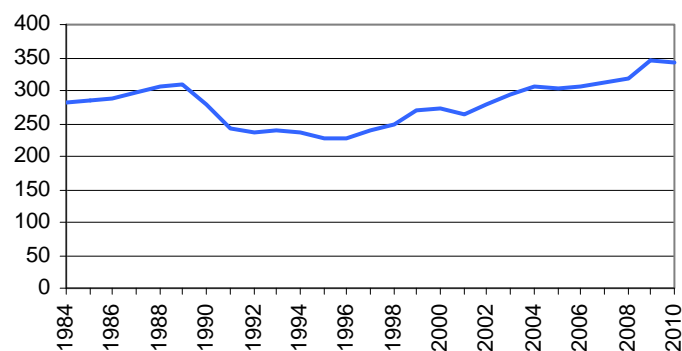
Administrative and support service activities



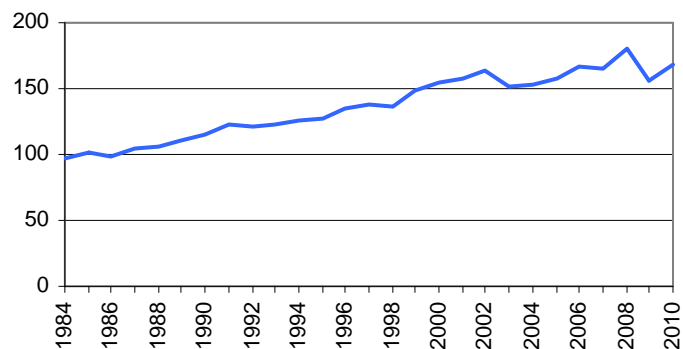
Health



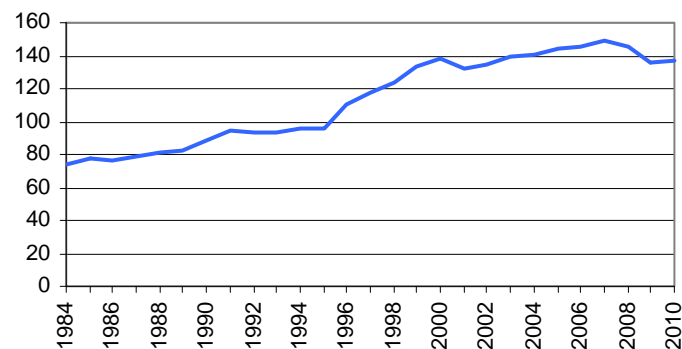
Education



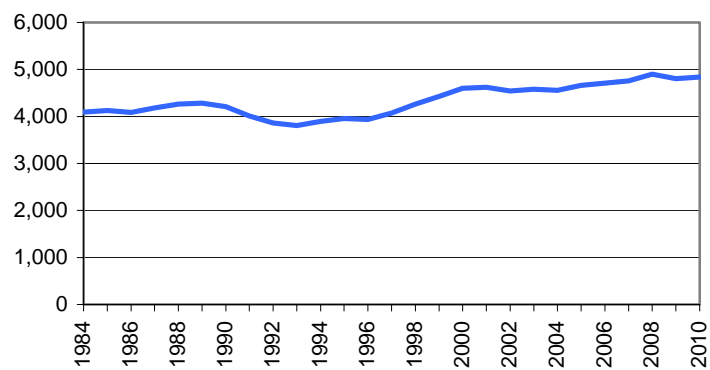
Arts, entertainment and recreation



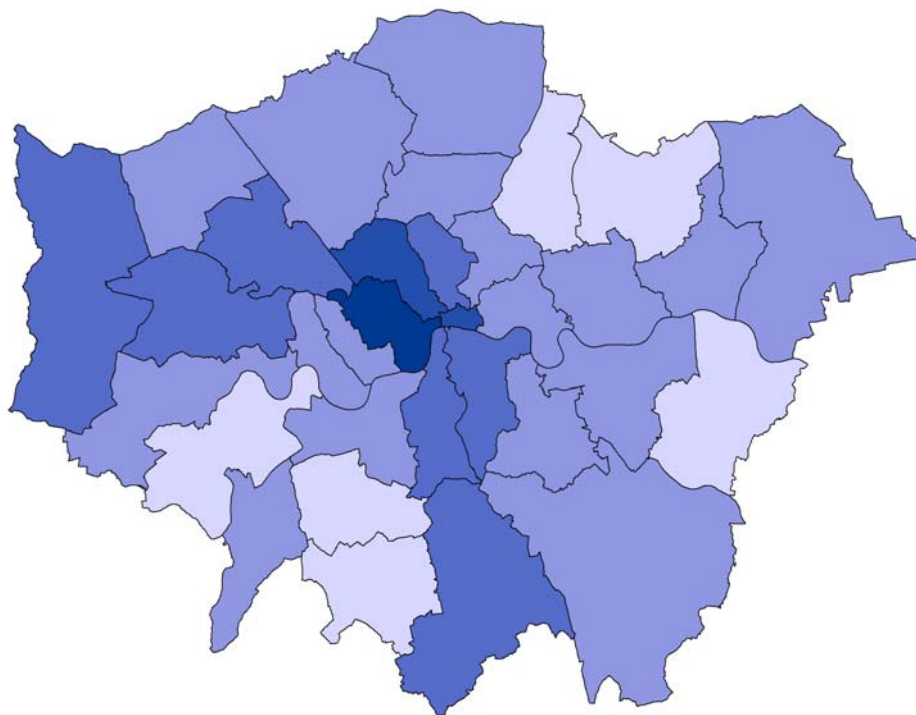
Other services



All sectors



Employee jobs by London borough: 1984

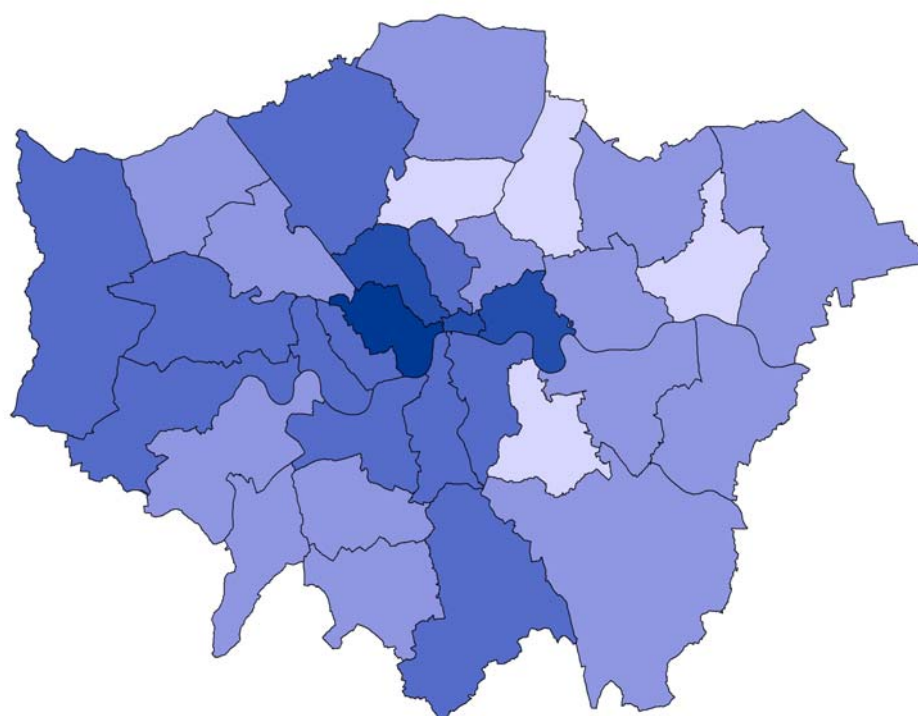


Number of employee jobs

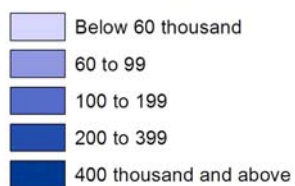


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Employee jobs by London borough: 2010



Number of employee jobs



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Nếu bạn muốn có văn bản tài liệu này bằng ngôn ngữ của mình, hãy liên hệ theo số điện thoại hoặc địa chỉ dưới đây.

Greek

Αν θέλετε να αποκτήσετε αντίγραφο του παρόντος εγγράφου στη δική σας γλώσσα, παρακαλείστε να επικοινωνήσετε τηλεφωνικά στον αριθμό αυτό ή ταχυδρομικά στην παρακάτω διεύθυνση.

Turkish

Bu belgenin kendi dilinizde hazırlanmış bir nüshasını edinmek için, lütfen aşağıdaki telefon numarasını arayınız veya adrese başvurunuz.

Punjabi

ਜੇ ਤੁਹਾਨੂੰ ਇਸ ਦਸਤਾਵੇਜ਼ ਦੀ ਕਾਪੀ ਤੁਹਾਡੀ ਆਪਣੀ ਭਾਸ਼ਾ ਵਿਚ ਚਾਹੀਦੀ ਹੈ, ਤਾਂ ਹੇਠ ਲਿਖੇ ਨੰਬਰ 'ਤੇ ਫ਼ੋਨ ਕਰੋ ਜਾਂ ਹੇਠ ਲਿਖੇ ਪਤੇ 'ਤੇ ਰਾਬਤਾ ਕਰੋ:

Hindi

यदि आप इस दस्तावेज की प्रति अपनी भाषा में चाहते हैं, तो कृपया निम्नलिखित नंबर पर फोन करें अथवा नीचे दिये गये पते पर संपर्क करें

Bengali

আপনি যদি আপনার ভাষায় এই দলিলের প্রতিলিপি (কপি) চান, তা হলে নীচের ফোন নম্বরে বা ঠিকানায় অনুগ্রহ করে যোগাযোগ করুন।

Urdu

اگر آپ اس دستاویز کی نقل اپنی زبان میں چاہتے ہیں، تو براہ کرم نیچے دئے گئے نمبر پر فون کریں یا دیئے گئے پتے پر رابطہ کریں

Arabic

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Gujarati

જો તમને આ દસ્તાવેજની નકલ તમારી ભાષામાં જોઈતી હોય તો, કૃપા કરી આપેલ નંબર ઉપર ફોન કરો અથવા નીચેના સરનામે સંપર્ક સાધો.

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